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Economic Cooperation

APEC Energy Overview

2026

Asia Pacific Energy Research Centre

Disclaimer

The views and opinions expressed in this publication belong solely to the authors. The expert group on energy data and analysis focal points and energy working group members of the respective economies were consulted to ensure the veracity of the information within.

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Foreword

The ***APEC Energy Overview*** (the Overview) is an annual publication that highlights the current energy situation in each of the 21 APEC economies. Since its first publication in January 2001, it has been the pioneer publication for APERC, showcasing the latest APEC energy data compiled by the Expert Group on Energy Data and Analysis (EGEDA).

The APEC Energy Overview 2026 is based on official economy data through 2023. It provides an overview of recent trends in the region's economic growth and energy use. Across APEC, both economic activity and energy indicators continued to increase, with GDP, energy production, and final energy consumption all reaching record levels.

Each economy chapter examines energy production, supply, demand, and power generation, as well as progress in the energy transition and relevant policies, initiatives, and notable developments.

In addition, the Overview relies on EGEDA data in monitoring progress toward meeting the two APEC energy goals:

1. *Energy intensity improvement of 45% by 2035 relative to 2005.*
2. *Doubling the renewable energy share in the APEC energy mix by 2030 (relative to 2010).*

As of 2023, APEC-wide energy intensity had improved by 30% from 2005 levels, leaving a further 15% reduction needed to meet the 2035 target. Progress has also been made in expanding renewable energy. The share of modern renewables in final energy consumption rose from 6.0% in 2010 to 11% in 2023, reaching around 75% of the 2030 goal. Renewables have also increased by over 70% in both total primary energy supply and power generation since 2010.

We thank EGEDA members for their continued support in providing us with these data. We encourage APEC member economies and other stakeholders to make use of this publicly available resource to support energy policy analysis and decision making.

Full discussion on key energy trends in APEC is found in the succeeding sections.

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The ***APEC Energy Overview 2026*** could not have been accomplished without the contributions of many individuals and organisations in APEC. We would like to thank all those whose efforts made this publication possible.

We would also like to thank, in particular, those named below who contributed to the successful completion of this publication.

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Commonly Used Abbreviations

Abbreviation	Term
2021 USD PPP	2021 USD purchasing power parity
APEC	Asia-Pacific Economic Cooperation
APERC	Asia Pacific Energy Research Centre
ASEAN	Association of Southeast Asian Nations
B/D	barrels per day
Bcf	billion cubic feet
bcm	billion cubic metres
Btu	British thermal units
GW	gigawatt
GWh	gigawatt-hour
kL	kilolitre
km	kilometre
km/L	kilometres per litre
ktoe	kilotonne of oil equivalent
kV	kilovolt
kW	kilowatt
kWh	kilowatt-hour
Mbbl/D	thousand barrels per day
ML	million litres (megalitre)
Mloe	million litres of oil equivalent
MMbbl	million barrels
MMbbl/D	million barrels per day
MMBFOE	million barrels of fuel oil equivalent
MMBtu	million British thermal units
MMcf/D	million cubic feet per day
MMscf/D	million standard cubic feet per day
mpg	miles per gallon
Mt	million tonnes
Mtce	million tonnes of coal equivalent
Mtoe	million tonnes of oil equivalent
MW	megawatt
PJ	petajoules
Tbbl/D	trillion barrels per day
tce	tonnes of coal equivalent
Tcf	trillion cubic feet
toe	tonnes of oil equivalent
tU	tonnes of uranium metal
TWh	terawatt-hours
W	watt
Wh	watt-hours

Currency Codes

Code	Currency	Economy	Code	Currency	Economy
AUD	Australian dollar	Australia	NZD	New Zealand dollar	New Zealand
BND	Brunei dollar	Brunei Darussalam	PGK	kina	Papua New Guinea
CAD	Canadian dollar	Canada	PEN	nuevo sol	Peru
CLP	Chilean peso	Chile	PHP	Philippine peso	Philippines
CNY	yuan renminbi	China	RUB	Russian ruble	Russia
HKD	Hong Kong dollar	Hong Kong, China	SGD	Singapore dollar	Singapore
IDR	rupiah	Indonesia	TWD	New Taiwan dollar	Chinese Taipei
JPY	yen	Japan	THB	baht	Thailand
KRW	won	Korea	USD	US dollar	United States
MYR	Malaysian ringgit	Malaysia	VND	dong	Viet Nam

Executive Summary

Introduction

The **APEC Energy Overview 2026** utilises official economy data up to 2023 to outline recent trends in the region's economic growth and energy use. Across APEC, both economic activity and energy indicators continued to increase, with GDP, energy production, and final energy consumption all reaching record levels.

APEC's gross domestic product (GDP, PPP[1] at constant 2021 USD) increased by 3.8% from 2022 to 2023, reaching over USD 91 trillion. This annual activity growth is in line with the region's long-term compound annual growth rate (CAGR) since 2000. Similarly, energy production and final energy consumption rose to 376 exajoules (EJ) and 217 EJ, respectively. In 2023, APEC economies produced 54% of global economic output while consuming 59% of global total energy supply.

In addition to the energy data covering the period from 2000 to 2023, each APEC member economy chapter provides an up-to-date overview of energy policies and notable energy developments through early 2026.

[1] PPPs are both currency conversion factors and spatial price indexes. They convert different currencies to a common currency and, in the process of conversion, equalise their purchasing power by controlling for the differences in price levels between economies.

Energy Supply and Consumption

Total Primary Energy Supply

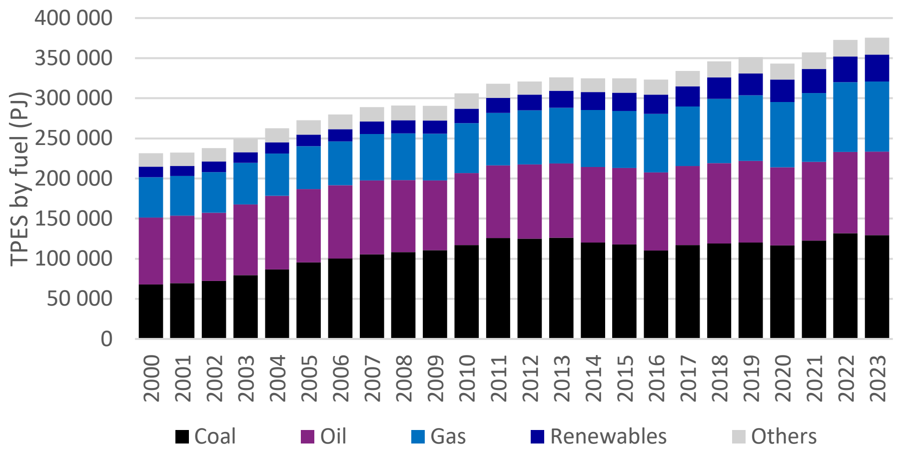
Total primary energy supply (TPES) in APEC increased by 0.7% to 376 EJ in 2023 *(Figure 1)*. This rate of change is approximately one-third of the CAGR observed between 2010 and 2023, indicating a moderation of growth in energy supply relative to the long-term average. This growth was also about 1 percentage point lower than the 10-year average, further reinforcing this trend. Despite this slower growth, TPES reached a record high in 2023, reflecting continued underlying demand across the region. Approximately 3% of TPES was met through net imports.

Renewable energy, comprising solar, wind, hydro, and biomass, accounted for around 9.0% of TPES (33 EJ) in 2023, increasing by over 4.0% from 2022 and continuing its upward trend. Fossil fuels nonetheless remained dominant, representing 86% of APEC's TPES, or 320 EJ. Coal was the largest contributor, accounting for about 35% of TPES, although its supply declined by 1.8% to 130 EJ in 2023. In contrast, oil and gas, the second- and third-largest energy sources, both increased from 2022, contributing 28% and 23% of TPES in 2023, respectively.

By subregion[2], China drove the overall expansion in TPES, increasing by 3.0% to 160 EJ in 2023. More moderate growth was recorded in Oceania (1.9%), Southeast Asia (1.8%), and "other Americas" (0.8%). In contrast, TPES declined in Russia (2.1%), the United States (1.5%), and "other Northeast Asia" (2.8%).

[2] Unless otherwise specified, China, Russia and the United States were considered as subregions in the analyses in view of the significant differences in scales with other APEC economies. Other subregions include Southeast Asia (Brunei Darussalam; Indonesia; Malaysia; the Philippines; Singapore; Thailand; and Viet Nam), Oceania (Australia; New Zealand; and Papua New Guinea), "other Northeast Asia" (Hong Kong, China; Japan; and Korea) and "other Americas" (Canada; Chile; Mexico; and Peru).

Figure 1: APEC's energy supply by fuel (PJ), 2000 to 2023

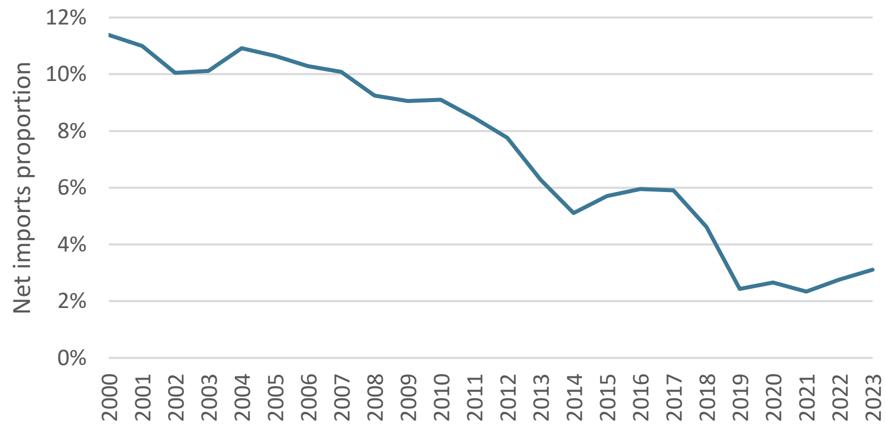


Source: EGEDA (2025)

APEC maintained its status as a net energy importer in 2023. Net imports (imports minus exports) reached 11.7 EJ or 3% of total energy supply, higher than levels observed between 2018 and 2022, but still below those recorded prior to 2018. The share of net imports in TPES increased only marginally from 2022 to 2023 *(Figure 2)*.

At the subregional level, Southeast Asia remained a net importer in 2023, following its return to net importer status in 2022 after three consecutive years as a net exporter from 2019 to 2021. China and "other Northeast Asia" also continued to be net importers, with all economies in this subregion remaining import dependent. In contrast, the remaining subregions were net exporters, including the United States, which has maintained net exporter status since 2019.

Figure 2: APEC's net energy imports as a proportion of supply (%), 2000 to 2023



Source: EGEDA (2025)

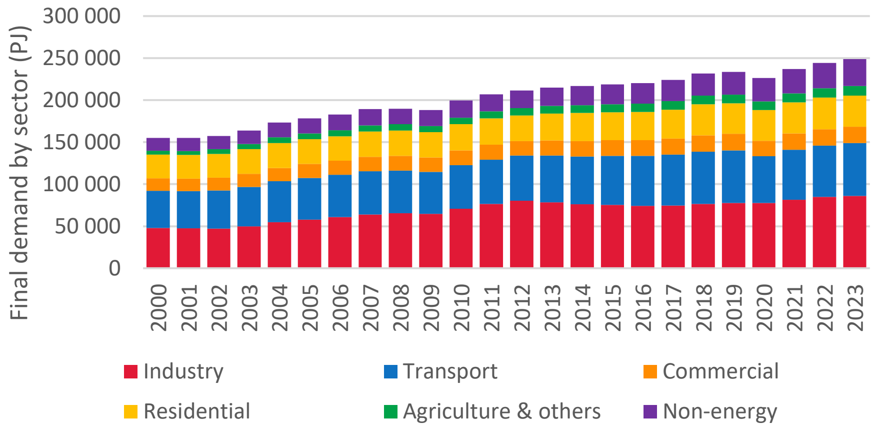
Total Final Consumption

Total final consumption (TFC) in APEC (including non-energy use of fuels) increased by about 2.0% to over 248 EJ in 2023 *(Figure 3)*.

Non-energy use was the primary driver of this growth, rising by 7.5% (a net increase of 2.2 EJ) to reach 32 EJ. China accounted for the largest share of this increase, with non-energy use expanding by 2.4 EJ, attributed in part to a growing chemicals sector. The transport sector recorded the second-largest increase, growing by 3.1% (1.9 EJ) to just under 63 EJ due in part to rising vehicle adoption.

By sector, industry remained the largest contributor to APEC TFC, accounting for 35% in 2023. Combined with non-energy use (13%), these accounted for nearly half of total consumption. Transport followed at 25%, with residential, commercial, and agriculture accounting for 15%, 8%, and 5%, respectively. Notably, residential consumption declined by 2.4% from 2022, moving closer to pre-pandemic levels.

Figure 3: APEC's final consumption by sector (PJ), 2000 to 2023



Source: EGEDA (2025)

Total final energy consumption (TFC excluding non-energy use) increased from 2022 to 2023. Oil remained the largest energy source at 71 EJ, accounting for 33% of consumption and rising by 1.3%. Electricity retained its position as the second-largest energy source, representing 28% of total consumption and growing by 3.0% to 61 EJ.

Gas and coal ranked third and fourth, respectively, with both declining from 2022 levels. Gas consumption fell slightly by 0.5% to 37 EJ. Coal consumption, which had increased from 2021 to 2022, declined again in 2023 by 4.4% to 26 EJ, although it remained above 2021 levels.

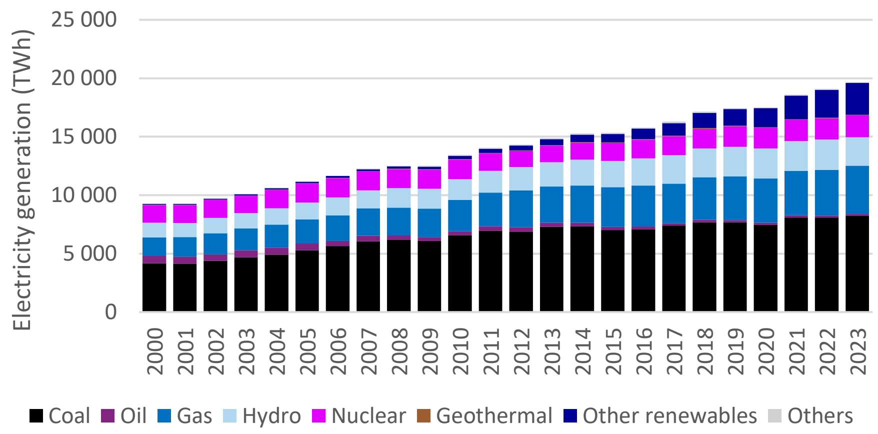
Renewable energy consumption continued to expand, increasing by 4.9% to 9.0 EJ.

Transformation

Power Sector

Power generation in APEC grew by 3.0% to a record 19,675 TWh in 2023 *(Figure 4).* While output from oil, hydro, and other sources declined by a combined 180 TWh, these decreases were more than offset by gains in other fuels. In particular, generation from other renewables (comprised of solar, wind, biomass, and ocean energy) increased by 341 TWh, accounting for a large share of the total net increase of 577 TWh. Additional contributions came from coal (165 TWh), gas (206 TWh), and nuclear (45 TWh).

Figure 4: APEC's electricity generation by fuel, 2000 to 2023



Source: EGEDA (2025)

China drove much of the growth in renewable generation, with output from renewables increasing by 214 TWh from 2022 to 2023. Thailand recorded the next-largest renewables increase, at 5 TWh in 2023.

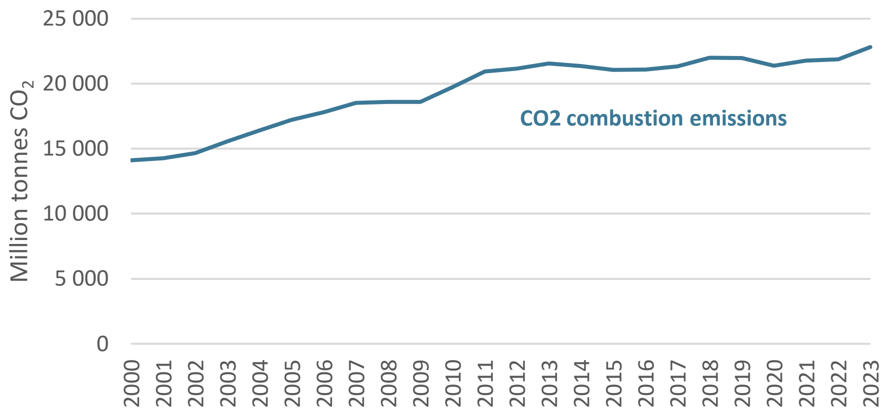
Overall, APEC's power generation mix remains dominated by fossil fuels. Coal and gas-fired generation together accounted for 63% of total electricity generation in 2023, while hydro, nuclear, and "other renewables" contributed 12%, 9%, and 14%, respectively.

Energy Transition

Emissions

CO_2 emissions from fuel combustion increased by 4.3% (net 951 million tonnes) from 2022 to 2023, marking the largest annual percent increase since 2005 *(Figure 5)*. This rise occurred despite growth in renewable energy.

Figure 5: APEC's CO_2 combustion emissions (million tonnes), 2000 to 2023



Source: EGEDA (2025)

The increase reflects continued growth in emissions from demand-side sectors, which remain reliant on fossil fuels for both electricity and non-electric applications such as gasoline-based transport. While decarbonising the power sector is a key component of emissions reduction, these trends highlight the importance of addressing emissions across a broader range of sectors.

China accounted for the largest net increase in emissions, at 930 million tonnes CO_2, while the Philippines recorded the largest percentage increase at 11%. In contrast, the United States saw the largest net decrease (193 million tonnes CO_2). Chile recorded the largest percentage decline at 13%. Overall, 10 of the 21 APEC economies registered decreases in emissions between 2022 and 2023.

Energy Security

As a net energy importer, the APEC region remains exposed to volatility in global markets, including price shocks, supply disruptions, and geopolitical tensions. This exposure is not uniform, with some subregions significantly more import-dependent than others, leaving them particularly vulnerable to external risks and price fluctuations.

Concurrently, the transition toward higher shares of variable renewable energy introduces new challenges. Without sufficient grid planning, flexibility measures, and storage capacity, rapid integration can strain power systems, leading to reliability concerns and inefficiencies.

Going forward, policymakers may strive to strike a careful balance between enhancing energy security and advancing new energy development. Diversifying supply sources, investing in grid infrastructure, interconnections and, and ensuring that renewable deployment is matched with the necessary system flexibility remain key.

APEC Energy Goals

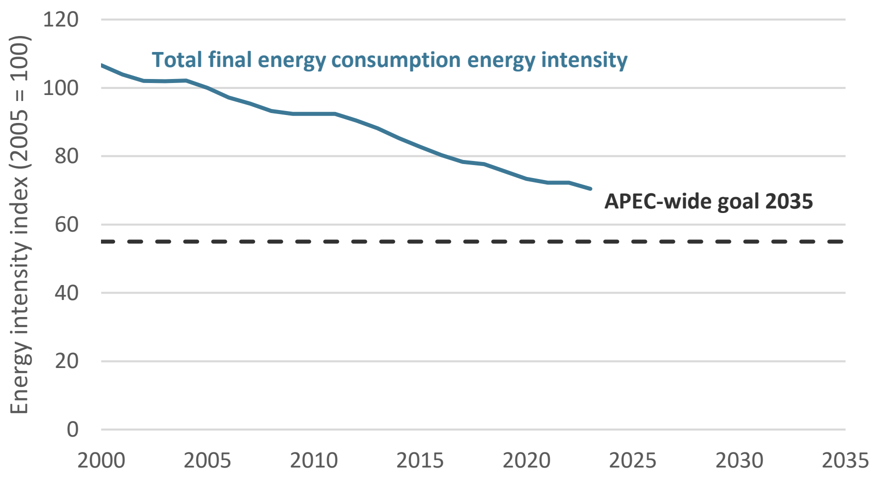
There are two energy-related objectives that APEC member economies have agreed to meet as a collective: to improve energy intensity and double the share of modern renewables.

Energy Intensity Goal

In 2011, APEC member economies agreed to increase their ambition to reduce energy intensity by 45% in 2035, relative to a 2005 baseline.[3] The goal does not impose individual economy targets, but it is possible to track the progress of individual APEC economies relative to the overarching proportional improvement.

The APEC region has made steady progress toward its 2035 target. Between 2005 and 2023, APECs total consumer energy intensity declined by 30%, leaving a remaining reduction of 15% to meet the target.

Figure 6: APEC's total final energy consumption intensity index, 2000 to 2023 (2005 = 100)



Source: EGEDA (2025)

From 2022 to 2023, APEC's GDP grew slightly faster than its 2010-2023 average, while final energy consumption grew more slowly. As a result, energy intensity, measured as total final energy consumption per unit of GDP, declined by 2.5%, following two years of lesser declines. Extrapolating the 10-year average annual decline of 2.3%, and assuming stable economic conditions, suggests that APEC is on track to meet its 2035 target if this rate is sustained

Improvements in primary energy supply intensity are similar to those of final energy consumption intensity improvements. As of 2023, TPES intensity had decreased 28% relative to 2005.

Doubling of Renewables

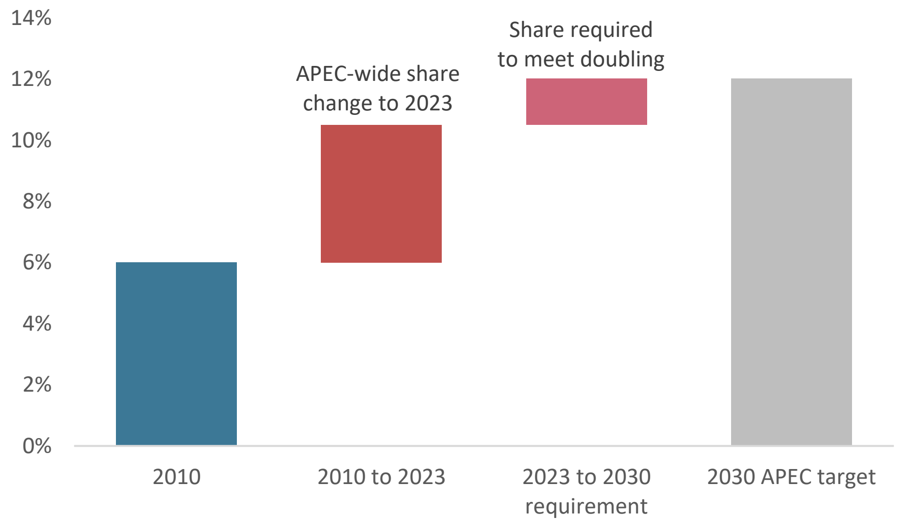
The second energy goal is doubling the share of modern renewables in the APEC energy mix for the period 2010 to 2030. There is no economy-level goal for individual member economies, but improvements by individual economies will contribute to the doubling goal.

Modern renewables exclude traditional biomass, which is used in some economies for household energy needs and is associated with adverse health outcomes. Many APEC economies are implementing policies to reduce traditional biomass consumption, including promoting improved cooking stoves and facilitating a shift to alternative fuels such as natural gas, liquefied petroleum gas, and electricity.

As of 2023, the share of modern renewables in final energy consumption increased by around 75% compared to 2010 levels, rising from 6% to 10.5%. Based on this upward trend, the APEC goal of doubling the renewable share in final energy demand appears to be within reach by 2030 *(Figure 7)*.

[3] The original goal was set in 2007 as a 25% improvement by 2030, relative to a 2005 baseline, but it had become obvious it would be easily exceeded.

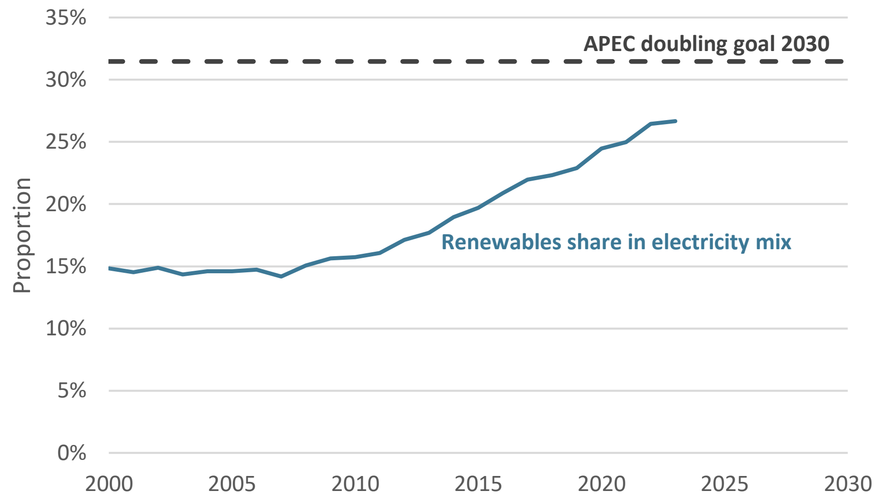
Figure 7: APEC's modern renewable energy share, 2010 and 2023



Source: EGEDA (2025)

In terms of total primary energy supply, the share of renewable energy increased from 4.8% in 2010 to 8.2% in 2023. As with final energy consumption, this suggests that the share of renewables in TPES is on track to meet the goal of doubling from 2010 levels.

Figure 8: APEC's renewable electricity generation share, 2000 to 2023



Source: EGEDA (2025)

Progress has also been made in doubling the share of modern renewables in the electricity mix by 2030 relative to 2010. In 2023, renewable energy accounted for around 27% of total electricity generation, representing an increase of more than 70% compared to 2010 *(Figure 8)*.

Australia

Introduction

Australia updated its Nationally Determined Contribution (NDC) in September 2025, committing itself to reducing greenhouse gas emissions to 62%-70% below 2005 levels by 2035. This is a significant expansion of the prior commitment of a 43% reduction by 2030. Australia remains committed to achieving net zero emissions by 2050.

Underpinning the NDC is an Australian Government plan to reach 82% renewable generation for its domestic grids by 2030 (DCCEEW, 2025). The share of renewables generation for financial year (FY) 2023-24 was 35% (Australian Energy Statistics, 2025), an increase of 1% over the previous year. Reaching 82% generation will require significant acceleration of wind energy, rooftop and utility-scale solar PV projects, and for the Snowy 2.0 Pumped Storage Power Station (2.2 GW, 350 GWh) to become operational. Other factors such as regulatory approval, integration, distribution, and overcoming transmission challenges will be important factors in accelerating the rollout of renewables.

Australia's population is anticipated to reach almost 37 million in 2050 (Intergenerational Report, 2023), an increase of 10 million from the current population of 27 million. Electricity demand is expected to roughly double by 2060 under the 9th APEC Outlook's Reference case and triple under the Target case from current levels as end use sectors rapidly electrify. This will be an additional challenge Australia will face as it transitions away from centralised fossil fuel energy sources to decentralised variable renewable energy (VRE) sources of electricity.

Table 1: Australia's macroeconomic data and energy reserves

Key data [a, b]		Energy reserves [c, d]	
Area (million km^2)	7.7	Oil (billion barrels)	2.4
Population (million)	27	Gas (trillion cubic feet)	95
GDP (2021 USD billion PPP)	1,640	Coal (million tonnes)	150,227
GDP per capita (2021 USD PPP)	60,308	Uranium (kilotonnes U < USD 130/kgU)	1,236

Source: a ABS (2024); b World Bank Group (2024); c Energy Institute (2023); d UN (2024), Geoscience Australia (2025)
Note: Reserves are total proved reserves and reasonably assured recoverable resources for uranium.

Energy Production

Following the 5.8% fall in energy production in 2021, energy production somewhat recovered in 2023 but has still not been able to reach pre-COVID highs primarily due to reductions in coal supply. However, overall energy production has increased more than 80% since 2000 with most of this production destined for export markets, mostly in Asia.

Export earnings from key commodities such as LNG, thermal and metallurgical coal all declined in FY 2025 due to a combination of reduced global prices, market pressures, and global decarbonisation efforts.

Coal generation has declined in Australia's power sector, while renewable generation is rapidly rising, particularly solar PV. However, in 2025, utility wind and solar installations have slowed due to a combination of planning, grid connection and transmission-related barriers and delays.

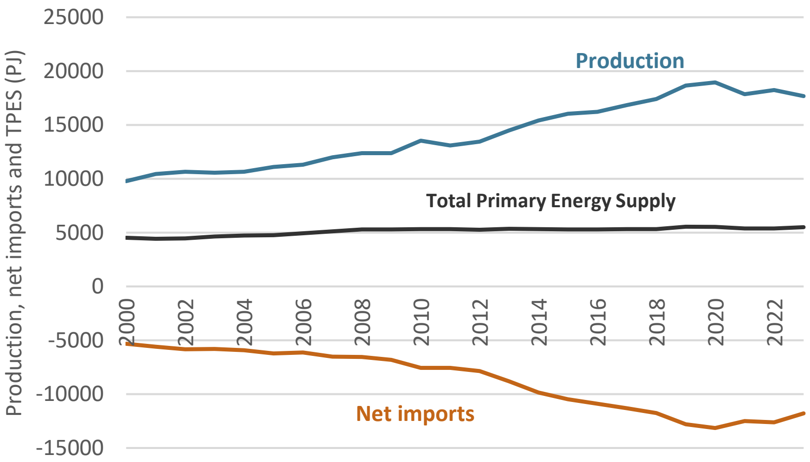
Australia has progressed towards meeting APEC's dual goals of reducing energy intensity by 45% in 2035 relative to 2005 and doubling its renewables share from 2010 to 2030. As of 2023, Australia's energy intensity has improved 28% since 2005. Renewables' share in the final energy demand mix doubled, increasing from 6.3% in 2010 to 13% in 2023.

Energy Supply and Consumption

Total Primary Energy Supply

Australia's energy supply (energy that is consumed domestically) rose slightly, by 2.2% in 2023 to just over 5,500 PJ. The overall increase was primarily driven by increased oil use. By 2023, transport activity had already increased to pre-COVID levels.

Figure 1: Australia's energy supply, production, and net imports (PJ), 2000 to 2023



Source: EGEDA (2025)

Australia was the fifth-largest global producer of coal and the seventh-largest global producer of natural gas in 2024 (Energy Institute, 2025). Almost 90% of black coal production is exported to meet demand from coal-fired power plants (thermal coal) and for steel production (metallurgical coal) in Asia (Geoscience Australia, 2025). Metallurgical coal accounts for less than one-fifth of APEC's coal consumption, though it accounts for almost half of Australia's coal exports.

The high prices for energy commodities brought about by the COVID-19 recovery and supply crunches from geopolitical volatility have abated but remain historically high. Nevertheless, even with the fall in prices, Australia's thermal coal export revenues decreased 16% in real terms from FY 2023-24 to FY 2024-25, dropping to AUD 33 billion (REQ, 2025). A combination of factors, including key importers such as China and India expanding their renewable energy capacity while increasing domestic coal production has resulted in slower demand growth, putting downward pressure on prices and in turn, Australia's export revenues.

Metallurgical coal export earnings were AUD 57 billion in FY 2023-24 and declined to AUD 41 billion in FY 2024-25 in real terms (REQ 2025). A combination of lower spot prices, smaller demand from China due to falling steel production, and sequencing and maintenance in Australian mines all contributed to the reduction in Australia's export revenue.

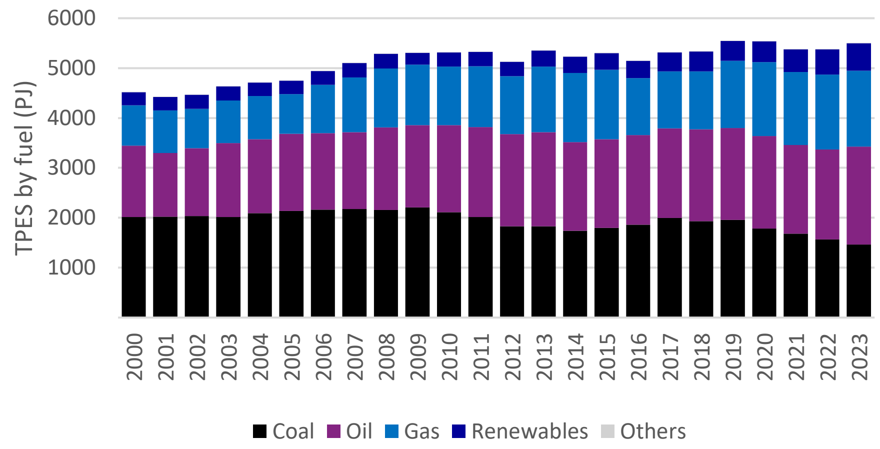
LNG has been the largest energy commodity earner for Australia for the past few years. It generated export earnings of AUD 73 billion in 2023-24 but declined to AUD 67 billion in real terms in FY 2024-25 (REQ 2025). Expanded LNG supplies, particularly from the United States, have contributed to declining prices and, consequently, lower Australian export earnings in recent years, with this trend expected to continue. Additionally forecasts for gas revenues have been revised downwards, reflecting the impact of lower oil prices on the linked price of LNG under long-term contracts (REQ 2025).

Australia shipped its first LNG cargo from the Northwest Shelf, Western Australia in 1989. Conventional gas resources comprise approximately three-quarters of Australia's total gas volume produced. The north-western regions hold 93% of Australia's identified conventional gas resources with most gas exported. Most of Australia's unconventional coal seam gas reserves are in the Surat and Bowen basins in Queensland, with smaller reserves in New South Wales and yet to be commercialised shale gas resources in the Northern Territory.

The first east coast LNG cargo was shipped from Gladstone, Queensland in 2015. LNG has since then contributed to Australia consistently being a top LNG exporter globally. In 2024, Australia was the second largest LNG exporter just behind the United States, with export volumes of 81 million tonnes (Cedigaz, 2025).

Final environmental approval was granted for the extension of the Northwest Shelf Project, allowing it to maintain its operating life out to 2070. The Scarborough and Pluto Train 2 Projects also passed majority completion in 2025 with LNG outputs expected in late 2026. A potentially significant gas discovery was made in the Otway Basin in late 2025 and pilot projects for shale gas are being developed in the Beetaloo Basin in the Northern Territory.

Figure 2: Australia's energy supply by fuel (PJ), 2000 to 2023

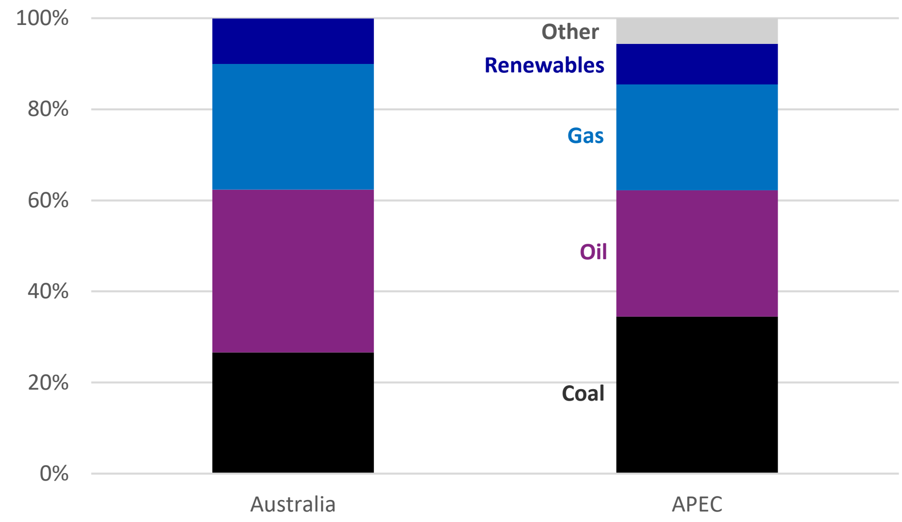


Source: EGEDA (2025)

Australia's energy supply increased slowly until the global financial crisis in 2008. Energy supply has plateaued since then, despite the population increasing by a fifth and economic output increasing by more than a quarter. Improvements in energy efficiency have moderated this increase. Additionally, given how variable renewable resources such as wind and solar do not have the high transformation losses of fossil fuels, replacing the latter with the former in the energy mix has prevented the energy supply from increasing.

Domestic coal supply has shown a recent decline, driven primarily by reduced demand as domestic coal plants wind down operations and shut down. Total Primary Energy Supply of coal fell for the fourth year in a row in 2023, representing just 27% of the TPES fuel mix in that year.

Figure 3: Energy supply mix, Australia and APEC, 2023



Source: EGEDA (2025)

Oil Total Primary Energy Supply (including petroleum product imports) also increased in 2023 by 161 PJ (+9%) remaining the most prominent source of energy supply for the 4th year running.

Looking at Final Energy Demand, natural gas supply continued its downward trend, falling by 4.1% in 2023 as the trend of fuel switching from gas to electricity continues in end-use applications. This trend continues to be bolstered by state and local policies that ban new gas installations from certain years (Australian Capital Territory from 2023, Victoria from 2024, City of Sydney from 2026) in new housing developments. However, future declines may be tempered, as gas will continue to be used by gas-fired peaking power turbines to provide firming capacity in an electric grid transitioning from coal to renewables.

LNG energy exports are expected to grow as Australia's trading partners seek to rely on gas as a "bridging fuel" in their energy transition. The production of LNG demands a significant consumption of natural gas so it is likely that gas production to support liquefaction will increase.

Renewable energy supply increased by 42 PJ (+8%) in 2023 and now accounts for 10% of Australia's Total Primary Energy Supply. Australia has world-leading levels of solar PV, with one in three households now having solar PV systems installed. Additionally, there has been a strong uptake of utility-scale wind and solar. Compared to Australia, APEC has a similar share of renewables (8.9%); however, this is mostly due to the large hydropower reserves of certain APEC economies.

Oil is more prominent in the fuel mix when compared to APEC (Figure 3), due to Australia's large transport sector. Australia has high levels of car ownership, as people and freight move greater distances between population centres than in many other APEC economies. Recent energy efficiency gains have been offset by heavier energy-hungry vehicles preferred by Australian consumers (DCCEEW, 2025). However, the implementation of the New Vehicle Efficiency Standards (NVES) for new vehicles entering the market from 1 July 2025, set new CO_2 limits on light duty vehicles, primarily achieved through increased vehicle fuel efficiency. This combined with growing EV adoption across Australia should reduce oil consumption in the transport sector and bring Australia's oil consumption in line with APEC's. The latest Outlook estimates that if the more stringent NVES policies are adopted, gasoline usage in transport will be phased out by 2050 in the Target scenario.

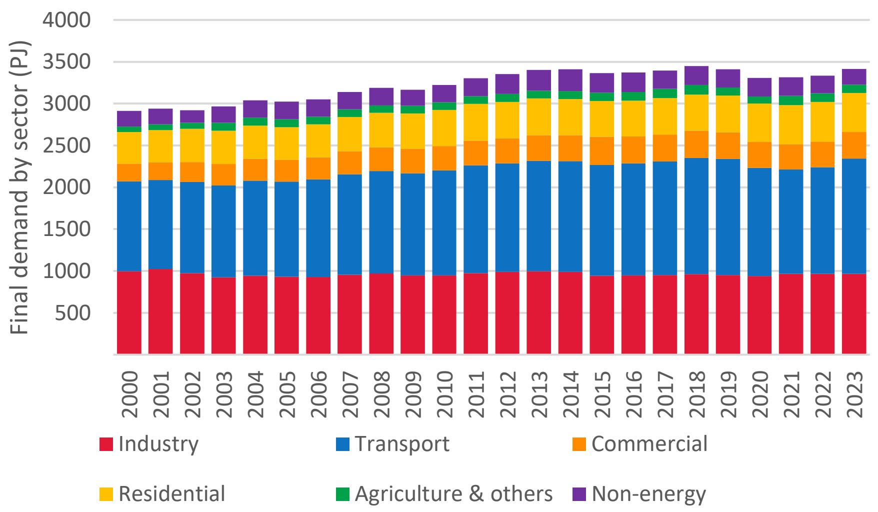
Total Final Consumption

Of the 5,500 PJ of Total Primary Energy Supply in Australia, only 3,227 PJ is consumed by end users as final end-use demand. The balance, almost two-fifths, is consumed as both own use and thermodynamic losses in transformation processes. Total final consumption, which includes the consumption of energy commodities by the non-energy sector, increased in 2023 to pre-COVID levels with the strongest growth being seen in transport total final consumption.

Transport sector energy consumption rose significantly 107 PJ (8%) in 2023 as activity normalised following COVID-19. By 2023, all lockdowns and COVID-related interstate travel restrictions had been removed allowing for business travel, tourism, commuting, and freight activity to return to pre-COVID levels.

Residential final consumption declined slightly by 2%, driven by continued improvements in energy efficiency and changing consumer behaviour (Australian Energy Statistics, 2025).

Figure 4: Australia's final consumption by sector (PJ), 2000 to 2023



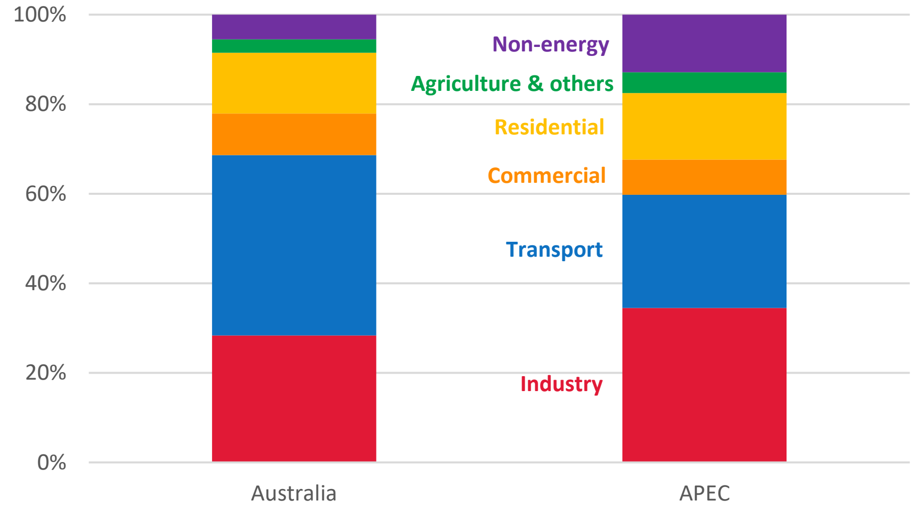
Source: EGEDA (2025)

Australia's industrial energy consumption has been stable for most of the last two decades (Figure 4) with no change from 2022 to 2023. The commodity and resources boom of the 2000s and 2010s saw increased minerals mining activity, leading to increased energy consumption. A strong AUD made Australian exports less competitive, and many industrial enterprises were offshored, offsetting this increase. As a result, industrial energy consumption has been generally flat since 2000. However, the accelerating global renewables and batteries uptake will require large quantities of minerals such as lithium and rare earth elements that Australia is well placed to supply. Increased production of this may see higher future final energy consumption by the industrial sector.

The Australian Government has expanded its *Critical Minerals Strategy* (2023) prioritising greater mining activity and expanding downstream processing that could contribute to an industrial revival in the future.

Securing reliable, long-term gas supplies at competitive prices remains challenging for Australian manufacturers, creating a strong incentive to electrify many industrial processes. The rise of renewable-powered industries, such as green steel, which require large amounts of renewable electricity to produce green hydrogen, presents an opportunity for Australia given its vast wind and solar renewable potential. However, doing so will require significant investment and support from the government given the infancy of this industry and concerns from the private sector over the profitability of these sectors.

Figure 5: Final consumption by sector, Australia and APEC, 2023



Source: EGEDA (2025)

Recent government initiatives under the *Future Made in Australia* framework include multi-billion dollar production tax credits and financing to support green metals and critical minerals value chains. Initiatives like these will help reduce investment costs barriers, build supply chains, and allow Australia to leverage its abundant wind and solar resources.

Final Energy Demand

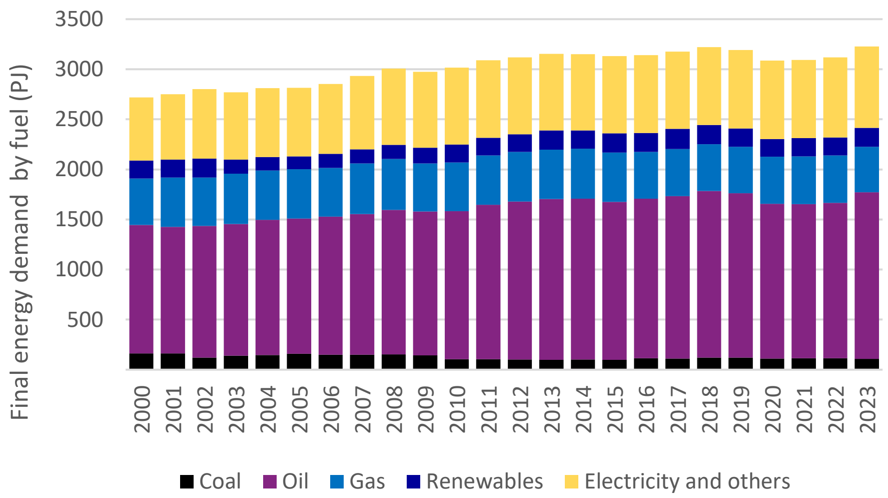
Final energy demand excludes the consumption of energy products by the non-energy sector and is a subset of final consumption.

Transport energy consumption is still tied to refined oil products in all APEC economies. For Australia, the transport sector consumes almost four-fifths of refined oil products given high car dependence and long-distance freight routes. Refined products are also used in all other end-use sectors, such as diesel in mineral mining (industry), LPG in residential and commercial buildings, and diesel generators in commercial buildings. Combined, these use cases contributed towards oil increasing from 47% in 2000 to 52% of final energy demand in 2023.

Wide-scale electrification of end-use applications is still emerging, with electricity consistently making up roughly 25% of final energy demand. Despite this share, it is important to note that electricity is more efficient than oil and coal at the end use level so it's contribution to useful energy services may be higher than its final energy demand.

Though with higher Electric Vehicle (EV) adoption and moves to electrifying other sectors, electricity is expected to significantly grow in the coming decades. This is bolstered by recent government initiatives such as the recently announced National Electric Vehicle Strategy, which aims to grow domestic EV market share. Please refer to the 9th edition of the *APEC Energy Demand and Supply Outlook* for an in-depth look.

Figure 6: Australia's final energy demand by fuel (PJ), 2000 to 2023

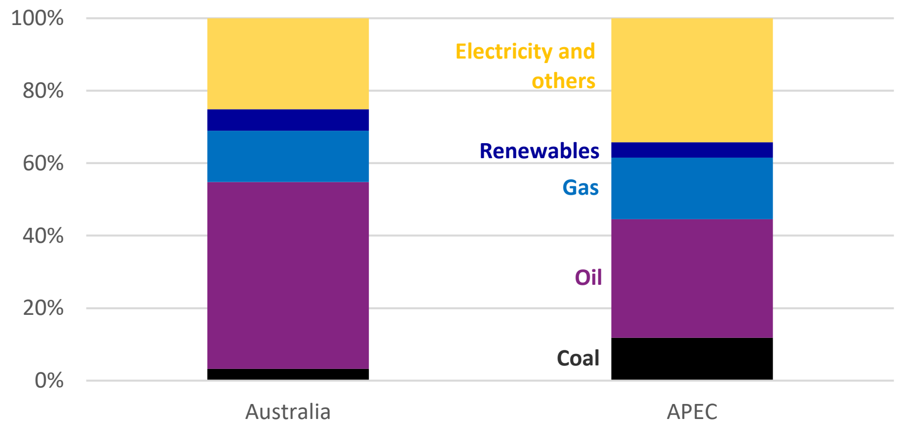


Source: EGEDA (2025)

Note: Figure 6 does not include non-energy sector consumption of energy products.

Australia's heavy industry sector is relatively small compared to other APEC economies, providing a partial explanation for the lower rates of coal consumption. Coal consumption in applications such as steelmaking, cement, and chemicals manufacturing is low and the other end-use sectors in Australia use almost no coal.

Figure 7: Final energy demand fuel share, Australia and APEC, 2023



Source: EGEDA (2025)

About 70% of Australia's natural gas production was exported in 2023 (Geoscience Australia, 2025). A large portion of this production occurs in the north-west with the Northern Territory and Queensland also contributing to LNG exports. Future potential domestic gas shortages in the south-east coast (the main gas demand centres), will require additional supplies either from additional southern production, LNG import terminals or expanded pipeline connections to transport gas from northern regions.

Heating and cooking applications within the household and commercial sectors have been among the most prominent users of natural gas. Multiple manufacturing applications have also relied on the consistent heating properties of natural gas and its ability to generate high heat.

In 2023, final energy demand for gas fell by 4%, continuing the longer-term decline in domestic natural gas consumption as manufacturing and industry reduce gas use and households fuel switch to electricity. Australia's domestic consumption of gas is likely to stay lower compared to the broader APEC region (Figure 7) as these trends continue.

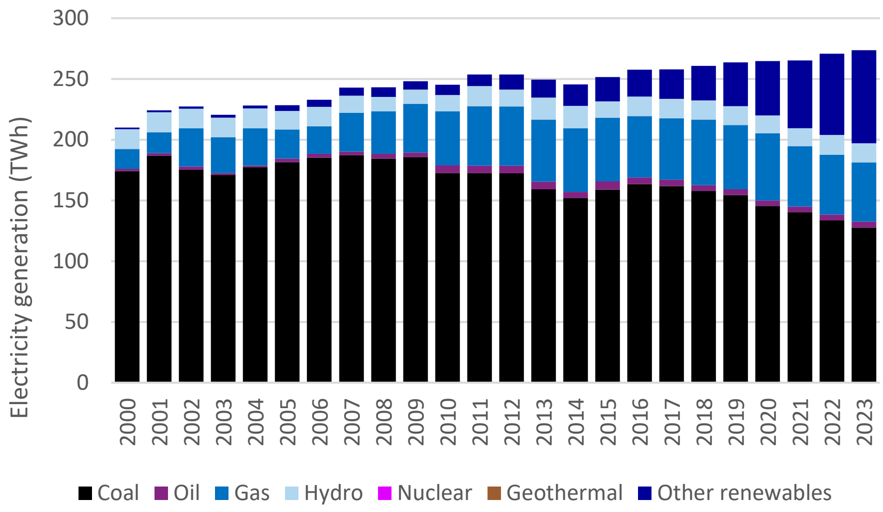
Australia's relatively lower consumption of electricity (compared to other APEC economies) can also be explained by the low levels of electrification in the transport sector especially in heavy transport which still has limited electrification options.

Transformation

Power Sector

Coal remains the dominant source of electricity generation but its share in the generation mix has fallen from 83% in 2000 to 47% in 2023. The rapid rise in renewable generation, particularly solar PV, has negatively impacted the economics of coal-fired power with intraday profits being heavily reduced by the growth of solar power. With continued rapid renewables deployment, coal is likely to continue to be phased out, notwithstanding the recent life extensions of Eraring and plants in Queensland. Ensuring a smooth transition from coal will require overcoming significant integration challenges, timely transmission builds, and provision of dispatchable generation.

Figure 8: Australia's electricity generation by fuel, 2000 to 2023

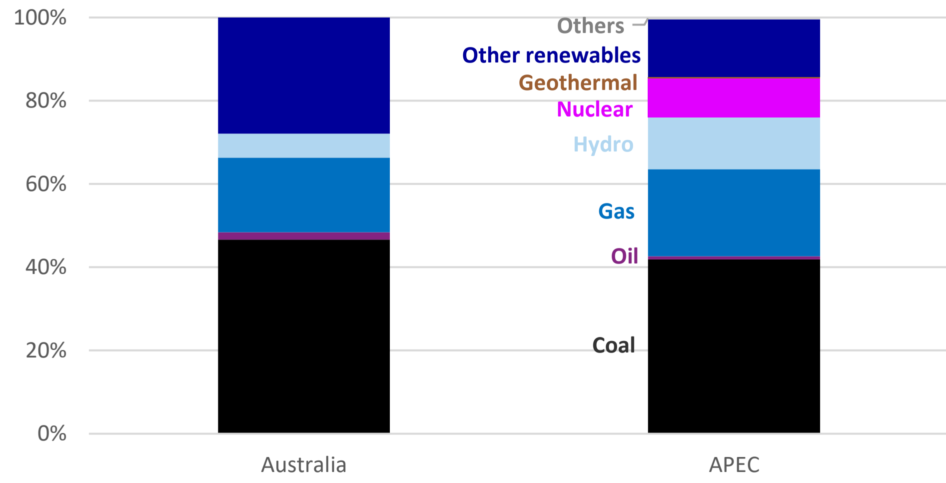


Source: EGEDA (2025)

Natural gas-fired generation increased strongly for a decade but fell by over 11.5% from 2020 to 2023. Much of this fall accommodated the sustained very large increase in renewable generation, which grew from 22% in 2020 to 34% in 2023 as a percentage of total generation.

State and federal policy support, favourable solar irradiance, and a higher proportion of standalone housing (relative to other APEC economies) continue to drive rooftop PV adoption. One in three Australian homes have a solar panel system installed, which will add pressure on coal intraday profits. The complementary rise of utility-scale solar and wind means that renewable generation is continuing to accelerate into 2023 (Figure 8).

Figure 9: Electricity generation fuel share, Australia and APEC, 2023



Source: EGEDA (2025)

Refining

The federal government continues to support Australia's remaining two refineries in Geelong, Victoria and Lytton, Queensland to meet Australia's energy security needs. When combined, these two refineries have an output that fulfilled 20% of Australia's petroleum product consumption in 2024 (Australian Energy Statistics, 2025). Given their advanced age and their uncompetitiveness with global refineries, they will most likely require government support to continue operating into the foreseeable future. Approximately AUD 150 million worth of funding has already been allocated for major infrastructure updates for each refinery to help maintain operations (DCCEEW, 2025).

Energy Transition

With the re-election of the incumbent government, policies that support Australia's legislated net zero 2050 commitment and its core target of 82% of its electricity being generated from renewable sources by 2030, remain in force.

At the end of 2022, Australian federal, state and territory, energy ministers introduced the Capacity Investment Scheme (CIS). The scheme aims to underwrite revenue for a capacity market for clean dispatchable storage and generation to help Australia meet its emission reduction commitments.

In July 2025, the Australian Government announced an additional expansion to the scheme to target a total of 40 GW of new capacity by 2030. This is equivalent to around half of the present National Electricity Market capacity. The scheme targets:

- 26 GW of renewable capacity costing AUD 52 billion.
- 14 GW of clean dispatchable capacity costing AUD 21 billion.

The expanded CIS is currently being rolled out from 2024 to 2027 with regular competitive tenders held approximately every six months, with first successful projects announced in September 2024. As of May 2026, some 21.2 GW of capacity has been announced from completed CIS storage and generation tenders in the National Electricity Market and West Australian Wholesale Energy Market.

New transmission infrastructure to enable delivery of renewable energy and increased generation is still being supported by low-cost finance by the AUD 20 billion Rewiring the Nation programme. These new power lines will be delivered to government-recognised Renewable Energy Zones (REZs) where most of the renewable energy infrastructure is expected to be built (AEMO 2022). New transmission infrastructure is also planned to enable the development of an offshore wind industry off the Victorian Coast.

The Australian Government has also announced a range of support measures under its Future Made in Australia initiative. Valued at AUD 20 billion over 10 years, this supports renewable energy manufacturing, allowing for lower renewables cost, faster deployment, and reduced reliance on imports.

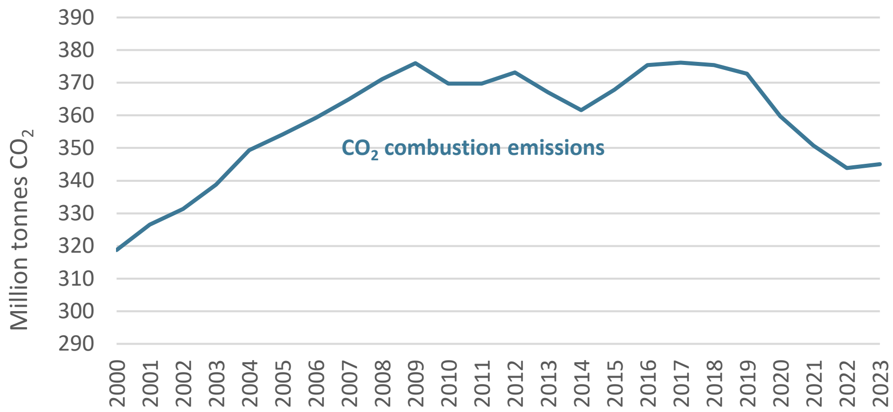
To support the energy transition from coal-based power to renewables, a AUD 1.9 billion Powering the Regions Fund was set-up to support regional decarbonisation and industrial transformation. This would support communities affected by coal exits, often the economic lifeblood of regional communities. Additionally, the National Net Zero Authority has been established to assist in the smooth and equitable coordination of the energy transition (Prime Minister of Australia, 2023).

Emissions

In addition to energy data compiled by EGEDA, CO_2 emissions from combustion activities in the energy sector are recorded. These emissions are a subset of total greenhouse gas (GHG) emissions that are considered in the context of climate change, under the United Nations Framework Convention on Climate Change.

For Australia, CO_2 combustion emissions have maintained a high plateau for most of the last decade, though they fell in 2020 and 2021. The fall in emissions is due to both the decline in economic activity brought on by the COVID-19 pandemic and the rapid rise in renewable generation. However, emissions rose slightly in 2023, driven primarily by increased transport emissions as economic activity recovered.

Figure 10: Australia's CO_2 combustion emissions (million tonnes), 2000 to 2023



Source: EGEDA (2025)

Energy Security

Even though Australia produces much more energy than it consumes, energy security is still an increasingly important issue, with geopolitical volatility impacting Australian consumers of natural gas. The tight market conditions that have been a feature of the Australian east coast natural gas market since LNG exports began in 2015 has also been a factor. Despite falling from their 2022 highs, global prices for energy commodities remain higher than pre-2022 levels and have been passed onto many Australian consumers. With the lack of a reservation policy and the market being dominated by LNG exporters selling gas at export parity prices, tensions emerged between domestic supply and export commitments. This difficulty in securing a natural gas supply for southern states, and the much higher prices for that supply, mean that Australian consumers continue to be in a similar situation to many European and Asian consumers.

Furthermore, the much higher global price for coal and gas has also impacted Australia's electricity markets and was a prominent reason for the increased levels of inflation that Australia has experienced since 2022.

In December 2022, the Australian Government implemented a wholesale market price cap of AUD 12 per GJ for natural gas and AUD 125 per tonne of black coal. Both caps have since expired but have been replaced with other mechanisms (the Gas Market Code for gas). The upstream gas market remains highly concentrated and dominated by the east coast LNG producer-exporters (ACCC, 2025). Uncertainty over how the gas market and gas demand will develop over the next few decades has also hampered investment in pipelines that would more readily transport gas domestically and meet gas supply shortfalls in southern demand centres.

With the removal of the price caps, policy attention has shifted towards a Domestic Gas Reservation Scheme announced in 2025, which would require east coast gas producers to set aside part of their production for domestic markets. The amount set aside is estimated to be around 15-25% of new domestic gas production when fully implemented around 2027. Such a scheme could potentially improve gas availability, easing pressure on prices for consumers.

Wholesale gas and electricity prices in Western Australia are lower, in part, due to a policy of domestic gas reservation, but delays in new gas supply and rising demand from domestic consumers are also bringing about price rises (S&P Global, 2023).

Australia is still non-compliant with the International Energy Agency (IEA) 90 days of oil stock requirement. A combination of falling production and rising domestic demand has delayed progress despite aiming for compliance by 2026. In FY 2024-25, government reporting showed Australia only had a yearly average stock level of 50 days of oil net-import coverage. While the federal government signed an agreement with the United States in 2020 to lease a portion of the U.S. Strategic Petroleum Reserve (SPR), from July 2022 onwards, only stocks in Australia (on land and domestic and coastal waters) are counted towards the obligation.

Complementary security measures have included the Minimum Stockholding Obligation (MSO), requiring refineries to maintain a baseline level of gasoline, jet fuel, and diesel oil stocks, and the Boosting Australia's Diesel Storage Program, which allocated AUD 260 million to expand diesel storage capacity in Australia.

Most of Australia's relatively small level of oil production is from the remote North West Shelf. Distance from Australia's refineries and ill-suited grades mean that most of the oil is exported instead of being processed by domestic refineries (Geoscience, 2025).

The closure of two of the remaining four oil refineries in Australia in 2021 resulted in Australia becoming more reliant on imported refined products supply, with 80% of refined petroleum products consumed in Australia being imported in FY 2023-24 (Australian Energy Statistics, 2025). However, Australia's reliance on foreign oil and petroleum products exposes its economy to geopolitical shocks, such as those that occurred in the Middle East in early 2026. With transport, industrial and agricultural sectors all relying on these products, such black swan events have the potential to cause significant economic harm.

APEC Energy Goals

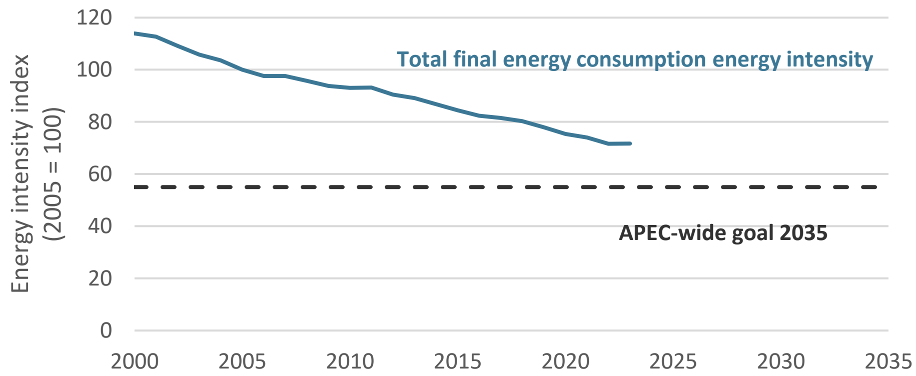
There are two energy-related objectives that APEC member economies have agreed to meet as a collective: to improve energy intensity and to double the share of modern renewables.

Energy Intensity Goal

In 2011, APEC member economies agreed to increase their ambition to reduce energy intensity by 45% in 2035, relative to a 2005 baseline. The original goal was a 25% improvement by 2030, relative to a 2005 baseline.

APEC is on track to achieve this energy intensity improvement. The goal does not impose individual economy targets, but it is possible to track the progress of individual APEC economies relative to the overarching proportional improvement.

Figure 11: Australia's total final energy consumption intensity index, 2000 to 2023 (2005 = 100)



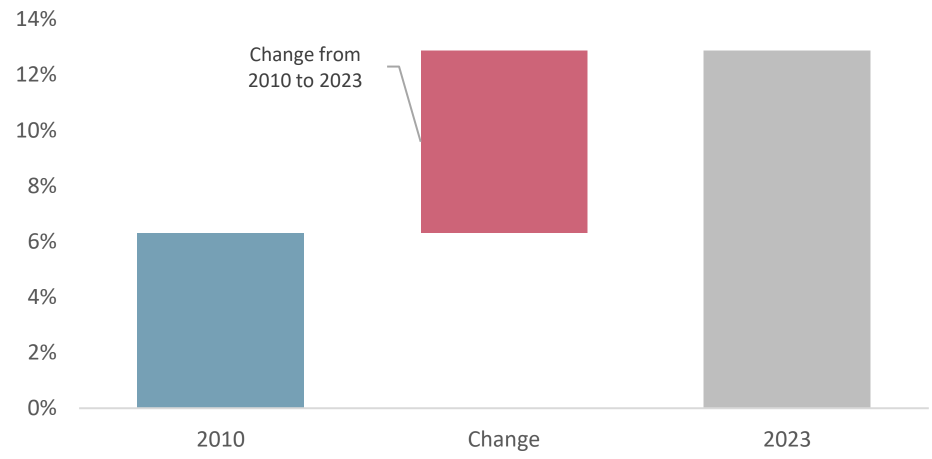
Source: EGEDA (2025)

Australia's final energy demand energy intensity has been consistently improving at a rate of between 1.5% and 2% per annum for the two decades prior to 2023 (Figure 11). This represents more than a 29% improvement since 2005. Energy intensity has improved given Australia's shift away from energy intensive sectors such as manufacturing since the early 2000s, stricter efficiency standards for buildings, vehicles, and home appliances, and increased electrification.

Doubling of Renewables

The second energy goal involves doubling the share of modern renewables in the APEC energy mix for the period 2010 to 2030. There is no economy-level goal for individual member economies, but improvements by individual economies will contribute to the doubling goal.

Figure 12: Australia's modern renewable energy share, 2010 and 2023

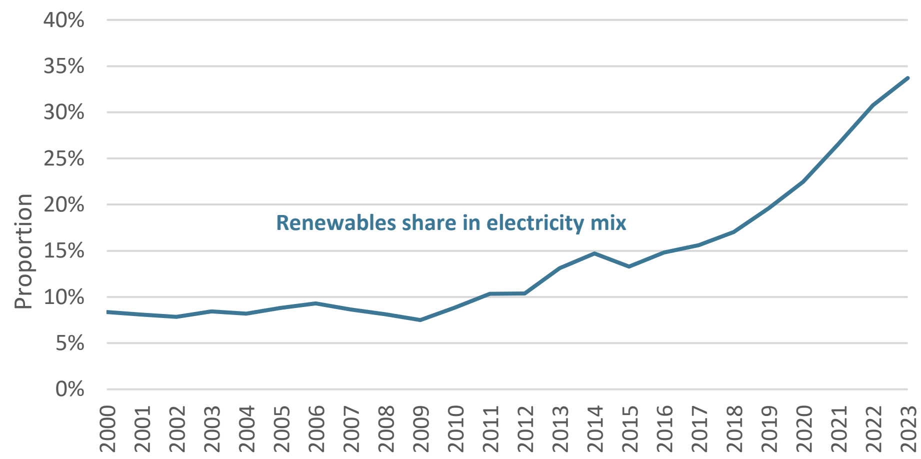


Source: EGEDA (2024)

Note: Biomass used in the residential and commercial sectors is assumed to be traditional biomass and is not included in the definition of modern renewables. All other renewables (biomass used by industry, hydro, geothermal, etc.) are considered modern renewables. Modern renewables also include the share of electricity that is generated from renewable sources.

The share of modern renewables in Australia's final energy consumption mix (including biomass) doubled from 190 PJ (6.3%) in 2010 to 415 PJ (12.9%) in 2023. Australia's large yearly increases in renewable generation explain most of this increase. Electricity generation from renewables (as a percentage of total electricity generation) increased from 22% in 2020 to 34% in 2023, more than triple the 2005 level of 8.8% (Figure 13).

Figure 13: Australia's renewable generation share, 2000 to 2023



Source: EGEDA (2024)

The increase is attributed to the rise of rooftop solar, and the growth of utility-scale solar and wind generation capacity. Renewable energy growth is now primarily being driven by rooftop solar and behind-the-meter battery installation in households as they seek lower energy bills. Growth in utility scale renewables has slowed recently, however, due to a combination of planning delays and uncertainties, project cost blow-outs, and transmission constraints.

In 2023, the annual increase in renewable generation was more than 14%, down from the 20% increase from 2021 to 2022. Overall, solar and wind capacity continues to grow and is supporting the updated 2025 NDC. However it is not certain whether the current pace can deliver the required uptake for the 82% target to be met by 2030.

Energy Policy

Energy Policy	Details	Reference
Net Zero 2050 Plan	A whole-of-economy policy framework to achieve net zero emissions by 2050. It will set out government priorities, establish policies and measures to drive down emissions, and support ongoing and new investment in low emissions and renewable activities.	Department of Climate Change, Energy, the Environment and Water
Capacity Investment Scheme	A revenue underwriting scheme to accelerate investment in renewable energy generation, such as wind and solar, and clean dispatchable energy, such as battery storage. By 2030 an additional 40 GW of capacity worth of these technologies will be constructed helping the government meet its 82% renewable electricity target.	Department of Climate Change, Energy, the Environment and Water
82% renewable electricity target	Australia's goal to ensure that 82% of electricity generation from all domestic grids is derived from renewable sources by 2030.	Climate Change Authority
Safeguard Mechanism	A policy to set legislated limits on the greenhouse gas emissions of Australia's largest industrial facilities. These emissions limits will decline over time, predictably and gradually, helping Australia meet its emissions reductions targets.	Department of Climate Change, Energy, the Environment and Water
New Vehicle Efficiency Standard	A new fuel efficiency standard to be applied to new cars sold in the Australian market. Each vehicle manufacturer has a set average CO_2 target for the vehicles they produce, which they must meet or beat, with the limit being progressively lowered over time.	Department of Climate Change, Energy, the Environment and Water
The National Electric Vehicle Strategy	Strategy to increase the uptake of electric vehicles to reduce emissions and improve the wellbeing of Australians. The strategy relies on three main principles: 1) to increase the supply of affordable and accessible EVs, 2) to establish the resources, systems and infrastructure to enable rapid EV uptake, and 3) to encourage EV demand.	Department of Climate Change, Energy, the Environment and Water
Future Made in Australia, National Interest Framework	Industries will be prioritised for investment that will make a significant contribution to achieving net zero including renewable hydrogen, critical minerals processing, green metals and clean energy manufacturing.	Australian Treasury Department
National Hydrogen Strategy	A strategy providing a framework to guide Australia's production, use, and export of hydrogen, allowing Australia to position itself as a global hydrogen leader. The new strategy focuses on accelerating clean hydrogen industry growth. This will be achieved through increasing global cost competitiveness by supporting industry development at scale.	Department of Climate Change, Energy, the Environment and Water
Victorian offshore wind targets	Victoria, Australia's second largest state, set targets of building at least 2 GW of offshore wind generation capacity by 2032, 4 GW by 2035 and 9 GW by 2040.	Victoria State Government

Rewiring **the Nation**	An AUD 20 billion program to upgrade and expand electricity transmission networks, providing low-cost finance for major grid projects to connect renewable energy zones, improve reliability and support the renewable transmission.	Department of Climate Change, Energy, the Environment and Water

Notable Energy Developments

Energy Development	Details	Reference
Reliable Affordable Clean Energy Cooperative Research Centre	Focused on opportunities from low-cost renewable energy, network integration, and smart energy management. The Australian Government has committed AUD 69 million over 10 years, with industry and research partners committing AUD 279 million.	RACE for 2030
Future Battery Industries Cooperative Research Centre	Drives collaboration on research and development across all segments of the battery value chain. The Australian Government has committed AUD 25 million over six years, while industry and research partners have committed AUD 111 million.	Future Battery Industries
Rio Tinto's Renewable Energy Agreements	Rio Tinto, one of the world's largest metal and mining companies, has entered into various PPAs, to reach its goal of halving scope 1 and 2 carbon emissions by the end of this decade. This includes for example, signing Australia's largest renewable PPA to date, agreeing to purchase 80% of electricity generated from the 1.4 GW Bungaban wind plant.	Macquarie
Project EnergyConnect	A 900 km electricity transmission line connecting South Australia and New South Wales. Aimed at enhancing energy security and facilitating renewable energy sharing between the states, completion of the project is expected later in the decade.	Project EnergyConnect
Snowy 2.0 Pumped Storage Power Station	An expansion of the original Snowy Mountains Scheme, Snowy 2.0 is a pumped-hydro project designed to provide 2.2 GW of capacity and approximately 350,000 MWh of large-scale storage to the electricity market. Construction began in 2019, however with a recent string of cost and development blow-outs, completion is not expected until late 2020s.	Snowy Hydro
Hydrogen Hubs	Australia's Regional Hydrogen Hubs program is investing over AUD 500 million to co-fund infrastructure and establish production, user and export clusters in locations across Australia. The hubs will accelerate Australia's clean-hydrogen industry by scaling up domestic supply and anchor export markets. However, the programme has progressed unevenly, with some hubs delayed or rescaled amid changing market conditions and participant concerns over profitability.	Growing Australia's Hydrogen industry

Useful Links

Australian Bureau of Statistics – https://www.abs.gov.au/

Australian Competition and Consumer Commission – https://www.accc.gov.au/

Australian Energy Market Commission – https://www.aemc.gov.au/

Australian Energy Market Operator – https://aemo.com.au/

Australian Energy Regulator – https://www.aer.gov.au/

Australian Renewable Energy Agency – https://arena.gov.au/

Clean Energy Finance Corporation – https://www.cefc.com.au/

Clean Energy Regulator – www.cleanenergyregulator.gov.au/

Department of Climate Change, Energy, the Environment and Water – https://www.dcceew.gov.au/

Department of Industry, Science and Resources – https://www.industry.gov.au/

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Brunei Darussalam

Introduction

Brunei Darussalam is committed to a just and equitable transition to a low-carbon economy. It aims to reach net-zero emissions by 2050. The Brunei National Climate Change Policy (BNCCP) is the policy foundation for the economy's NDC target and net-zero emissions. It outlines key strategies to reduce emissions across the energy sector, and in carbon sinks in the forestry sector and climate adaptation.

Brunei Darussalam remains committed to reinforcing its oil and gas industry, which accounts for almost 90% of the economy's revenue. As part of this commitment, the Petroleum Authority of Brunei Darussalam (PABD) launched the Brunei Offshore Licensing Round 2025, offering exploration contracts to oil and gas companies to develop two hydrocarbon blocks (Blocks A and D), leveraging proven basins and uncovering further discoveries and prospects. Renewable developments are underway. In a joint venture with Seri Suria Power, Brunei Darussalam has commenced construction of a 30 MW solar PV power plant. Once operational, the facility will be the economy's largest installation, generating over 64 GWh of electricity for the public grid. Hengyi Industries has already launched its Sustainable Integration of Natural and Renewable Energy Project (SINAR), which will become the largest in Brunei Darussalam in 2025. SINAR will reach a total capacity of 476 MW in three phases: 30 MW (first phase), 156 MW (second phase), and 272 MW (third phase). These initiatives achieve around 20% renewable electricity progressing towards Brunei Darussalam's commitment to reaching 30% renewable energy in the economy's electricity generation mix by 2035.

Table 1: Brunei Darussalam's macroeconomic data and energy reserves

Key data [a, b]		Energy reserves [c]	
Area (million km^2)	5,765	Oil (billion barrels)	1.1
Population (million)	0.5	Gas (trillion cubic feet)	7.9
GDP (2021 USD billion PPP)	35.2	Coal (million tonnes)	0
GDP per capita (2021 USD PPP)	76,617	Uranium (kilotonnes U < USD 130/kgU)	0

Source: a Prime Minister's Office (2024); b World Bank (2025); c EI (2025)

Note: Reserves are total proved reserves and reasonably assured recoverable resources for uranium.

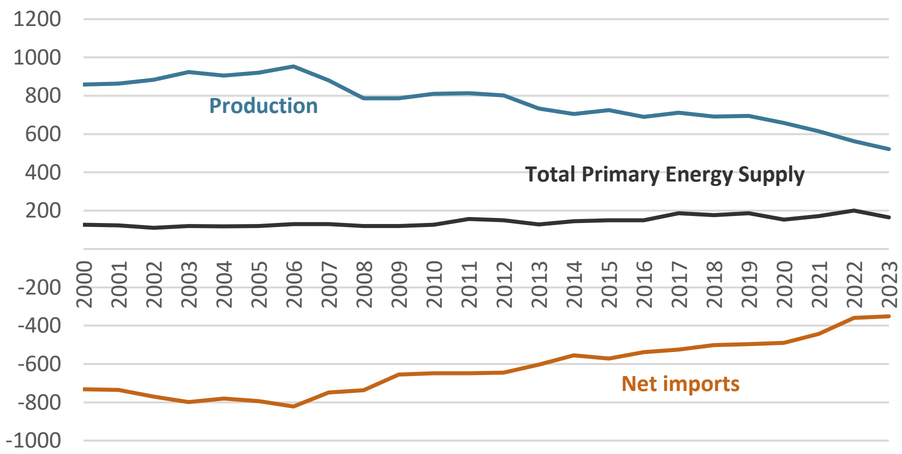
Energy Supply and Consumption

Total Primary Energy Supply

The total primary energy supply (TPES) of Brunei Darussalam declined by almost 201 PJ, or 18%, from 2022 levels to 165 PJ in 2023 (Figure 1). Production of indigenous crude oil declined in 2023, although it rebounded in the third and fourth quarters of that year. Imports of crude oil also decreased by 9 PJ or -14%, due to reduced domestic refinery requirements.

Despite the decline in crude oil production, Brunei Darussalam managed to increase exports by 4%, likely due to increased drawdowns from domestic stockpiles. Over 90% of the crude oil was exported to APEC economies: Australia; Indonesia; Japan; Malaysia; Singapore and Thailand.

Figure 1: Brunei Darussalam's TPES, production, and net imports (PJ), 2000 to 2023

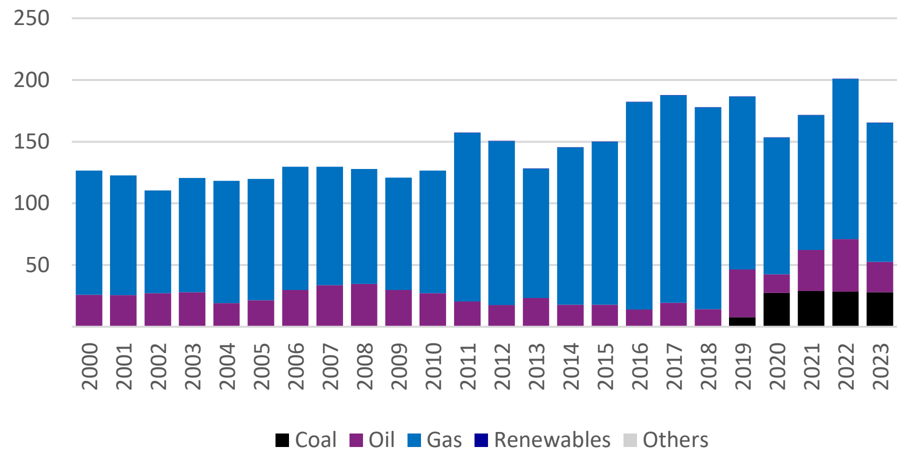


Source: EGEDA (2025)

Natural gas production declined by 6% in 2023, continuing a downward trend due to maturing fields. Consequently, exports of LNG reduced by over 2%. Japan remained the top purchaser of Brunei Darussalam's LNG in 2023, accounting for over half of the total exports. China and Korea purchased 17% and 11% of the total exports, respectively. Coal imports remained similar to 2022 in 2023.

Natural gas remains the cornerstone of the economy's energy supply. Underpinned by Brunei Darussalam's abundant reserves, it accounted for 113 PJ, or 68% of TPES, in 2023, serving as the main fuel for electricity generation and the backbone of energy exports as LNG. Domestic or imported coal and oil contributed 17% and 15% of TPES, respectively (Figure 2).

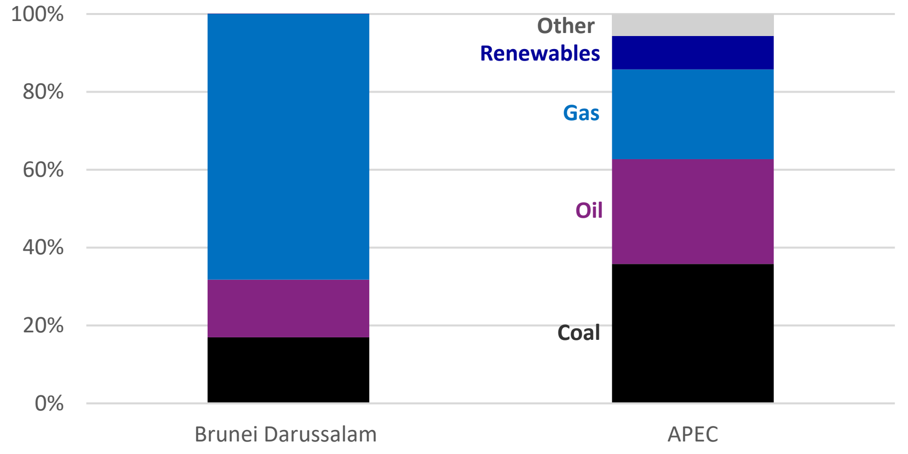
Figure 2: Brunei Darussalam energy supply by fuel (PJ), 2000 to 2023



Source: EGEDA (2025)

Brunei Darussalam's energy supply mix is entirely based on fossil fuels. Natural gas is 68.2% of TPES and three times higher than the APEC average for gas in the economy fuel mix. The oil share of Brunei Darussalam's TPES was nearly two times higher than that of the APEC average economy mix. The share of coal in the economy was significantly below that of APEC average for coal in economy share of fuels as coal was utilised solely in the domestic refinery (Figure 3).

Figure 3: Energy supply mix – Brunei Darussalam and APEC, 2023

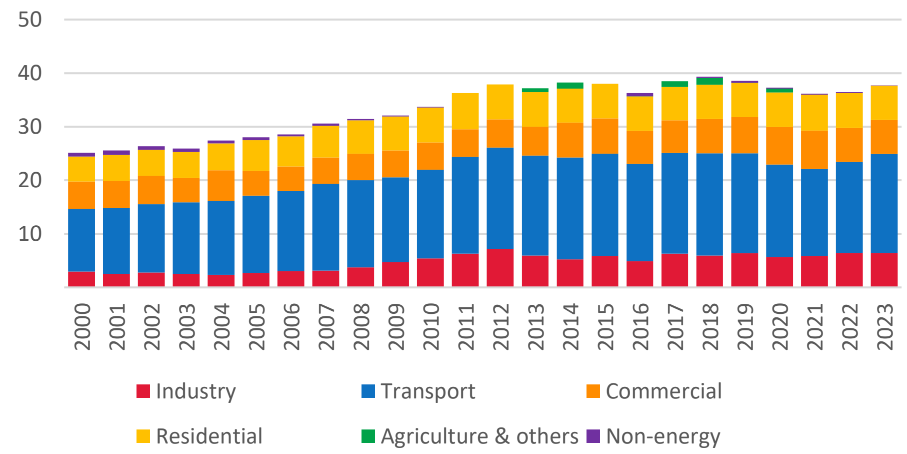


Source: EGEDA (2025)

Total Final Consumption

Brunei Darussalam's total final consumption (TFC) grew by 4% between 2022 and 2023 (Figure 4). This was primarily driven by transport sector, which rose by 10,000 newly registered vehicles, an increase of 9%, between 2022 and 2023. The industry sector also recorded a substantial increase of 5% in its consumption during the same period. On the other hand, commercial and residential sector consumption declined marginally by 0.5% and 1%, respectively.

Figure 4: Brunei Darussalam final consumption by sector (PJ), 2000 to 2023



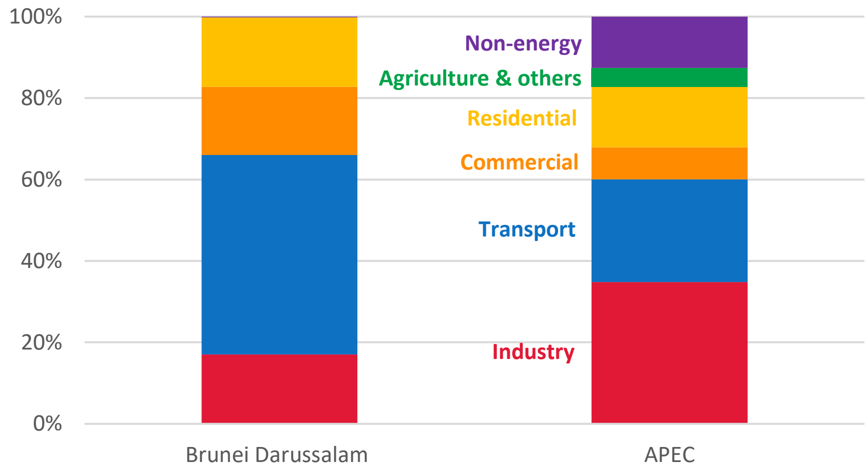
Source: EGEDA (2025)

In 2023, the proportion of the transport sector energy in Brunei Darussalam was 18.5 PJ, 25% higher than the average of all APEC economies (Figure 5). This is due to high ownership of private vehicles coupled with minimal use of public transport.

The lower share of the industry sector in Brunei Darussalam compared to that of APEC can be attributed to the economy's heavy reliance on oil and gas export earnings rather than domestic industry activity.

The share of the commercial sector in the economy was higher than in APEC, while the residential sector's share in both Brunei Darussalam and APEC was identical. The shares for "Agriculture & others", and non-energy sectors in Brunei Darussalam were well below those of APEC, given the negligible size of both sectors.

Figure 5: Final consumption by sector, Brunei Darussalam and APEC, 2023



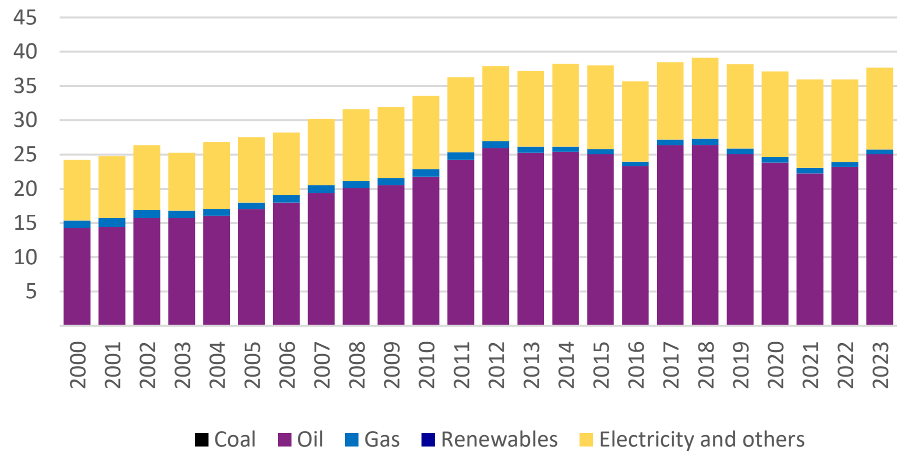
Source: EGEDA (2025)

Final Energy Demand

Brunei Darussalam's total final energy demand (TFED) increased by 2 PJ or +5%, driven by oil which grew by 8% due to increased transport and industrial activities between 2022 and 2023 (Figure 6). The demand for natural gas continued to decline by -4%. This possibly being due to fuel switching from reticulated natural gas to liquefied petroleum gas (LPG) for most households in the Belait District, as the use of LPG within the residential sector recorded a 7% growth in the same period.

Electricity demand registered a marginal decrease of 1%, contributed primarily by declines in commercial and residential sectors, although the industry sector recorded an increase of 6% in its electricity demand.

Figure 6: Brunei Darussalam final energy demand by fuel (PJ), 2000 to 2023

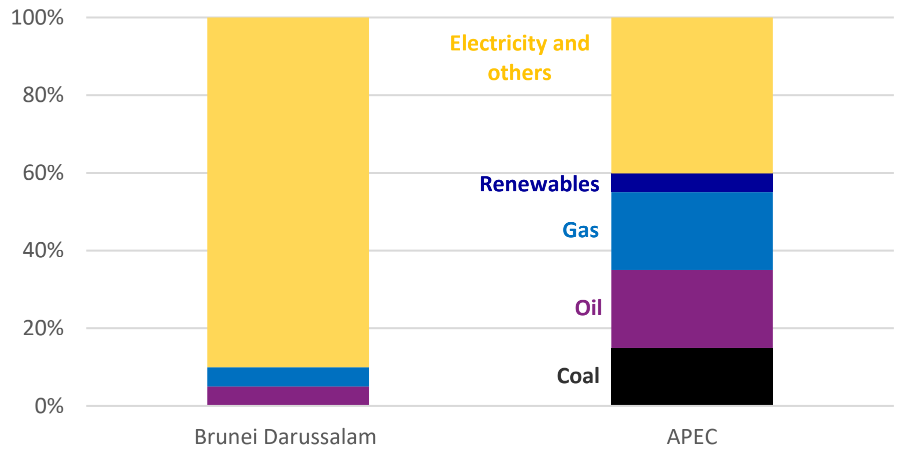


Source: EGEDA (2025)

Note: Figure 6 does not include non-energy sector consumption of energy products.

High electricity usage per capita, 24,000 MJ/capita, and the 99% electrification rate meant that Brunei Darussalam was well above the APEC average in terms of electricity share (Figure 7). The direct consumption of natural gas in Brunei Darussalam is very low, 25 PJ, because only a small number of households in the Belait District are directly connected to the gas supply via pipelines, as most households use LPG cylinders for cooking.

Figure 7: Final energy demand fuel share, Brunei Darussalam and APEC, 2023



Source: EGEDA (2025)

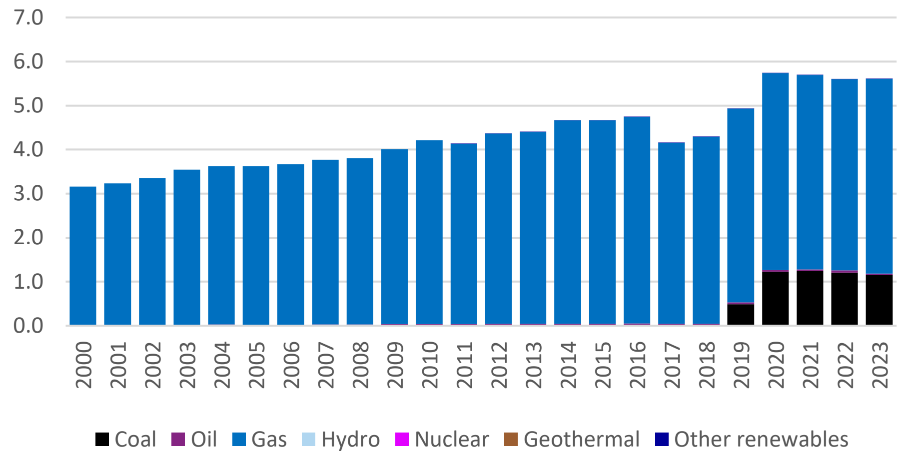
Transformation

Power Sector

Total electricity generation in Brunei Darussalam amounted to 5.6 TWh in 2023, unchanged from 2022 levels (Figure 8). Electricity from gas, contributed 79% of the economy's electricity generation mix, and increased by 2% to 4.4 TWh in 2023.

Electricity output from coal, solely for Hengyi Industries' refinery and petrochemical complex, declined by 5% to 1.1 TWh. Coal contributed 20% of Brunei Darussalam's electricity generation in 2023.

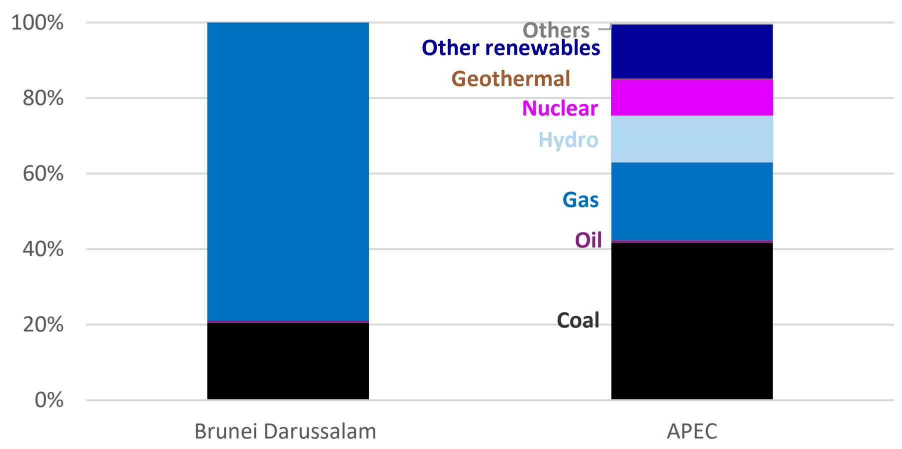
Figure 8: Brunei Darussalam electricity generation by fuel, 2000 to 2023



Source: EGEDA (2025)

The dominance of natural gas in Brunei Darussalam's electricity generation mix places the economy well above the APEC average for gas power generation (Figure 9). Conversely, coal-fired electricity generation was significantly lower than APEC's share, given that it is supplied only to Hengyi Industries' refinery and petrochemical complex.

Figure 9: Electricity generation fuel share, Brunei Darussalam and APEC, 2023



Source: EGEDA (2025)

Refining

China-based Hengyi Industries Sdn Bhd owns and operates the sole refinery and petrochemical complex in Brunei Darussalam. Phase 1 of the complex, with an investment of USD 3.5 billion, has been in operation since November 2019 following over 2.5 years of construction and commissioning activities (Hengyi, 2025). The integrated complex currently refines about 175,000 barrels of crude oil per day, of which more than half is imported from overseas.

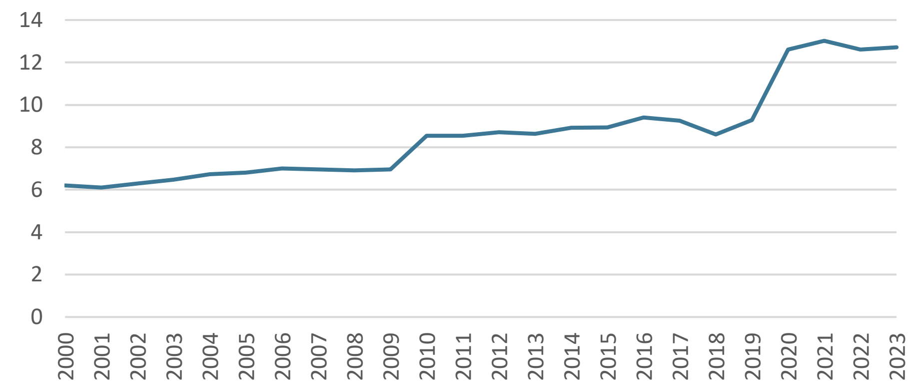
Between 2022 and 2023, crude oil throughput declined by 10% to reach 349 PJ in 2023. On the other hand, throughput of refinery feedstocks increased by 21%. Petroleum products comprised mainly diesel, with a share of 38% of the total output, followed by other products (benzene, paraxylene, etc) (26%), motor gasoline (20%), naphtha (9%), LPG (6%), and jet fuel (1%). In terms of yearly changes, jet fuel more than doubled but other products registered declines.

Energy Transition

Emissions

Brunei Darussalam's emissions increased marginally to 13 $MtCO_2$ in 2023 from 2022 levels (Figure 10). This was driven by increased gas inputs for electricity generation in 2023, despite being offset by a decline in coal input. In addition, the growth in activities in industry and transport sectors contributed to the increase in demand-side emissions between 2022 and 2023.

Figure 10: Brunei Darussalam CO_2 combustion emissions (million tonnes), 2000 to 2023



Source: EGEDA (2025)

Energy Security

Despite being one of APEC's main net energy exporters, Brunei Darussalam continues to develop its upstream oil and gas activities for its long-term energy security and sustainability.

In mid-2025, the Petroleum Authority of Brunei Darussalam (PABD) awarded a Production Sharing Agreement (PSA) to EnQuest for offshore

Block C. This should see the first gas production in 2029. As this was the first PSA in over 10 years, this was regarded as a significant step towards reviving the economy's oil and gas sector. Earlier, Brunei Darussalam announced the first upstream licensing round for its Block A and Block D areas, which will help reinforce the economy's commitment to attract new investments and enhance resource development.

Brunei Darussalam is also committed to accelerating its renewable energy deployment, aiming for 30% renewable energy in the total installed capacity by 2035. The economy has begun construction of a 30 MW Seri Suria solar PV plant in Kampong Belimbing, Brunei-Muara District, developed on a 32-ha remediated landfill site. Scheduled for completion by the end of 2026, the plant is expected to produce over 64 GWh electricity yearly and offset 41 kt of annual CO_2 emissions as well as over 200,000 MMBTU of natural gas consumption.

APEC Energy Goals

There are two energy-related objectives that APEC member economies have agreed to meet as a collective: to improve energy intensity and double the share of modern renewables.

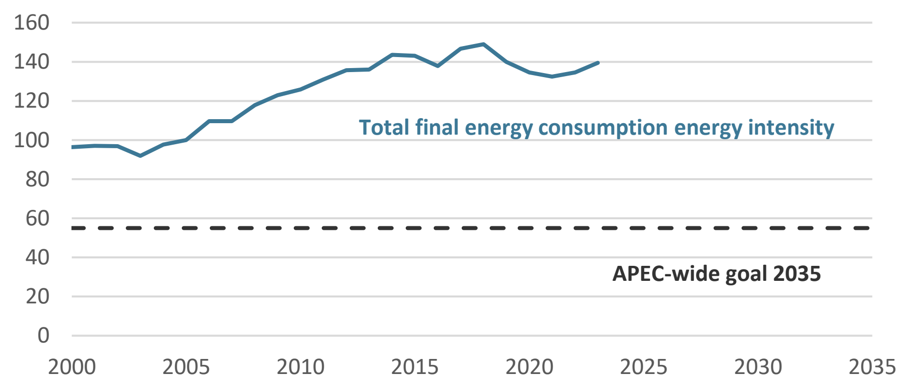
Energy Intensity Goal

In 2011, APEC member economies agreed to increase their ambition to reduce energy intensity by 45% in 2035, relative to a 2005 baseline. The original goal was a 25% improvement by 2030, relative to a 2005 baseline.

APEC is on track to achieve this energy intensity improvement. The goal does not impose individual economy targets, but it is possible to track the progress of individual APEC economies relative to the overarching proportional improvement.

Since 2005, Brunei Darussalam's energy intensity has been increasing. The growth rate of total final energy consumption exceeded the rate of increase of the economy's GDP (Figure 11). Development of energy-intensive downstream industries also contributed to the trend. Measures like the enforcement of Energy Efficiency (Standards and Labelling) in Order 2021 will be key to reducing Brunei Darussalam's energy intensity over time.

Figure 11: Brunei Darussalam total final energy consumption intensity index, 2000 to 2023 (2005 = 100)

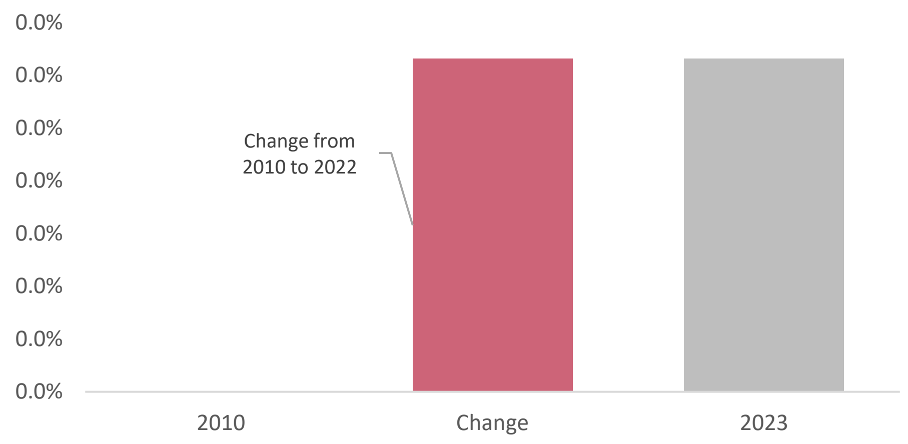


Source: EGEDA (2025)

Doubling of Renewables

The second energy goal involves doubling the share of modern renewables in the APEC energy mix for the period 2010 to 2030. There is no economy-level goal for individual member economies, but improvements by individual economies will contribute to the doubling goal.

Figure 12: Brunei Darussalam modern renewable energy share, 2010 and 2023

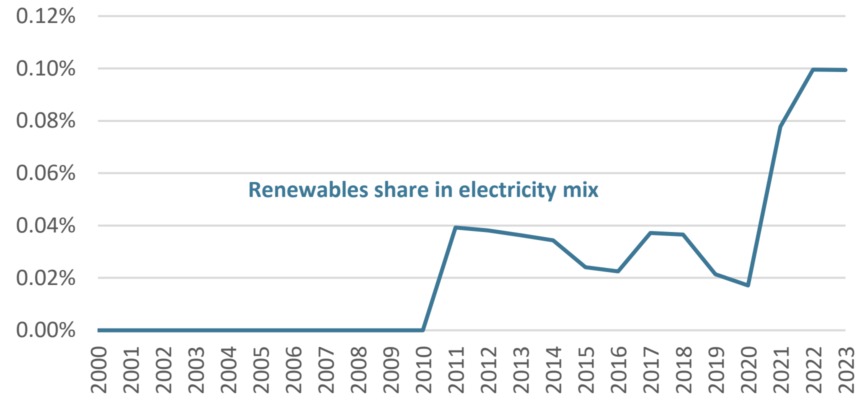


Source: EGEDA (2025)

Note: Biomass used in the residential and commercial sectors is assumed to be traditional biomass and is not included in the definition of modern renewables. All other renewables (biomass used by industry, hydro, geothermal, etc.) are considered modern renewables. Modern renewables also include the share of electricity that is generated from renewable sources.

The share of renewables with respect to the total electricity generation was still low in 2023 at 0.1%. The share is expected to rise to over 1%, once the 30 MW solar PV plant commences operation by end of 2026. The realisation of a 30% renewable energy capacity share as well as potential hydropower trade between Sarawak and Brunei Darussalam would further boost Brunei Darussalam's renewables share in the future, hence reducing the dependence on natural gas in the power sector.

Figure 13: Brunei Darussalam renewable generation share, 2000 to 2023



Source: EGEDA (2025)

Energy Policy

Energy Policy	Details	Reference
Nationally Determined Contributions	A 20% reduction of GHG emissions relative to business-as-usual levels by 2030.	UNFCCC (2020)
Brunei Darussalam National Climate Change Policy	The policy was established to pave the way for Brunei's low-carbon and climate-resilient pathways for a sustainable economy, through the adoption of 10 key strategies in the following areas: industrial emissions, forest cover, electric vehicles, renewable energy, power management, carbon pricing, waste management, climate resilience and adaptation, carbon inventory, awareness and education.	BNCCC (2020)
Net Zero Emissions	Brunei Darussalam is moving towards net zero emissions by 2050, announced at UNFCCC COP26 in Glasgow, Scotland, United Kingdom.	UNFCCC (2021)
Energy Efficiency (Standards and Labelling) Order, 2021	The Department of Energy at the Prime Minister's Office introduced the order in 2021, in line with its energy efficiency and conservation initiatives. The order requires manufacturers, suppliers, wholesalers and retailers in Brunei Darussalam to import and sell appliances that meet the minimum energy performance standards.	Department of Energy, Prime Minister's Office (2022)
Directive on the Mandatory Reporting of Greenhouse Gas	Beginning 2023, all facilities that emit GHG emissions are required to report their GHG emissions on a quarterly and annual basis, in line with the objective of Strategy 9 of the BNCCP (Carbon Inventory).	BNCCC (2023)

Notable Energy Developments

Energy Development	Details	Reference
Offshore Licensing Round 2025	Brunei Darussalam is offering two offshore oil and gas blocks for competitive bidding. The two offshore blocks are Block A (spanning an area of 1,728 km^2) and Block D (with an area of 2,294 km^2).	PABD (2025)
30 MW Solar PV plant in Kampong Belimbing	A joint venture between Seri Suria Power, Serikandi Oilfield Services and Khazanah Satu will develop Brunei Darussalam's largest domestic solar project. The 30 MW power plant, set to commence operations by end of 2026, will be built on a remediated landfill site in Kampong Belimbing.	BizBrunei (2025)
476 MW solar PV plant launched by Hengyi Industries.	Hengyi Industries have already launched its Sustainable Integration of Natural and Renewable Energy Project, (SINAR), which is set to become the largest in Brunei Darussalam in 2025. SINAR will reach a total capacity of 476 MW in three phases: 30 MW (first phase), 156 MW (second phase), and 272 MW (third phase).	Hengyi (2026)
Production Sharing Agreement (PSA) for offshore Block C	Brunei's Petroleum Authority (PA) has awarded a production sharing agreement (PSA) for offshore Block C to EnQuest EP BV Limited (EnQuest), with first gas production targeted for 2029.	BizBrunei (2025)

Useful Links

Brunei National Council on Climate Change – https://climatechange.gov.bn

Brunei Shell Petroleum – https://www.bsp.com.bn/

Brunei LNG – https://www.bruneilng.com/

Department of Economic Planning and Statistics, Ministry of Finance and Economy – https://deps.mofe.gov.bn

Department of Energy, Prime Minister's Office – https://www.energy.gov.bn/

Hengyi Industries – https://www.hengyi-industries.com/

Petroleum Authority of Brunei Darussalam – https://www.pa.gov.bn/

Canada

Introduction

Canada's energy policy perspective has recently shifted from introducing new climate regulations to implementing, refining, and reassessing existing measures. While Canada's legislated emissions reduction targets remain in place, policy attention is increasingly focused on economic competitiveness, energy affordability, and investment certainty. This shift occurred against the backdrop of an energy system that continues to account for approximately 80% of Canada's greenhouse gas emissions, reinforcing the central role of energy policy in shaping both climate and economic outcomes. As a result, climate policy developments in 2025 were closely linked to broader discussions about the role of Canada's energy system in supporting economic growth, energy security, and trade in a changing global context.

Recently, Canada has made significant commitments to expand clean energy capacity. Federal budgets and strategy announcements propelled large clean electricity investments, including tax incentives and infrastructure funding to scale renewables, grid interconnections, and energy storage. At the same time, governments as well as system operators increasingly highlighted challenges related to grid reliability, interprovincial transmission, and the need for firm, dispatchable capacity. This prompted renewed attention to nuclear energy, including options like small modular reactors (SMRs), long-duration storage, and other non-emitting baseload generation.

Under the Canadian Net-Zero Emissions Accountability Act, the federal government is required to set an economy-wide greenhouse gas emissions target every five years, with a 10-year outlook, to guide the economy towards achieving net zero emissions by 2050. Canada's current targets include a 40%-45% reduction by 2030 and a 45%-50% reduction by 2035 relative to 2005 emissions levels.

The Canadian government, along with provincial and territorial governments, continues to emphasise the importance of Indigenous equity and full participation in resource management and energy projects. This reflects the recognition that Indigenous communities bring unique perspectives and deep knowledge of Canada's diverse northern landscape and environment to resource development.

Table 1: Canada's macroeconomic data and energy reserves

Key data [a, b]		Energy reserves [c, d, e]	
Area (million km^2)	10	Oil (billion barrels)	170
Population (million)	40	Gas (trillion cubic feet)	196
GDP (2021 USD billion PPP)	2,306	Coal (million tonnes)	6,580
GDP per capita (2021 USD PPP)	57,517	Uranium (kilotonnes U < USD 130/kgU)	493

Source: a StatCan (2016); b EGEDA (2025); c NRCan (2026); d EIA (2025); e NEA (2025)

Note: Reserves are total proved reserves and reasonably assured recoverable resources for uranium.

Table 1 provides an overview of key data and reserves in Canada for 2023. Economic output continued to grow, reflecting a 1.5% increase from 2022, but a 1.4% decrease in GDP per capita.

Energy Supply and Consumption

Total Primary Energy Supply

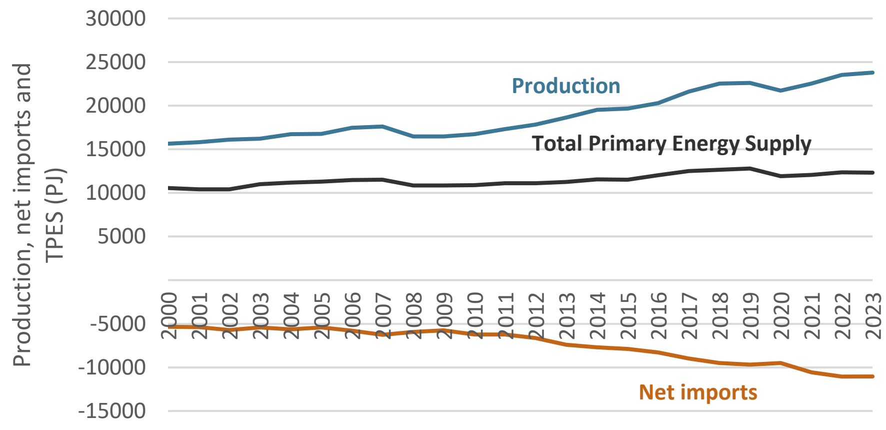
Canada is a leading producer of energy and a net energy exporter, with much of its production driven by global market demand. Canada is a global top-four producer of crude oil and top-five producer of natural gas and hydroelectricity. It is a top-three exporter of both crude oil and electricity, a top-six exporter of natural gas, and the world's second largest producer and exporter of uranium. The energy sector is an important contributor to Canada's economy, directly and indirectly accounting for approximately 9.8% of GDP in 2025 (NRCan, 2026).

With more than 90% of its energy exports by value landing in the United States, Canada is trying to diversify its export market. To that end, the first phase of the LNG Canada project became operational in mid-2025, and the Trans Mountain expansion, which increased oil export capacity by 590,000 barrels per day, began commercial operations in May 2024 (LNG Canada, 2025; Trans Mountain, 2024). Both projects now provide strategic sources of energy supply for APEC members, with additional projects in development.

Although Canada's crude oil sources vary geographically, oil predominantly comes from Western Canada. Almost two-thirds of the total production comes from the oil sands, while conventional, offshore, and tight oil production comprise the remainder. As for natural gas, approximately 99% of production occurs in Western Canada. While the output from conventional resources is declining, advances in hydraulic fracturing have enabled the development of tight gas resources in the Montney Formation and the Alberta Deep Basin. Production from these basins is expected to dominate any future production and LNG exports in the coming decades, dictated largely by domestic energy policy, gas prices, and global demand.

Energy production increased by 1.2% from 2022 to 2023, to a record high of 23,793 petajoules (PJ) (EGEDA, 2025). Fossil fuels continue to dominate production with a share of over 75%.

Figure 1: Canada's energy supply, production, and net imports (PJ), 2000 to 2023

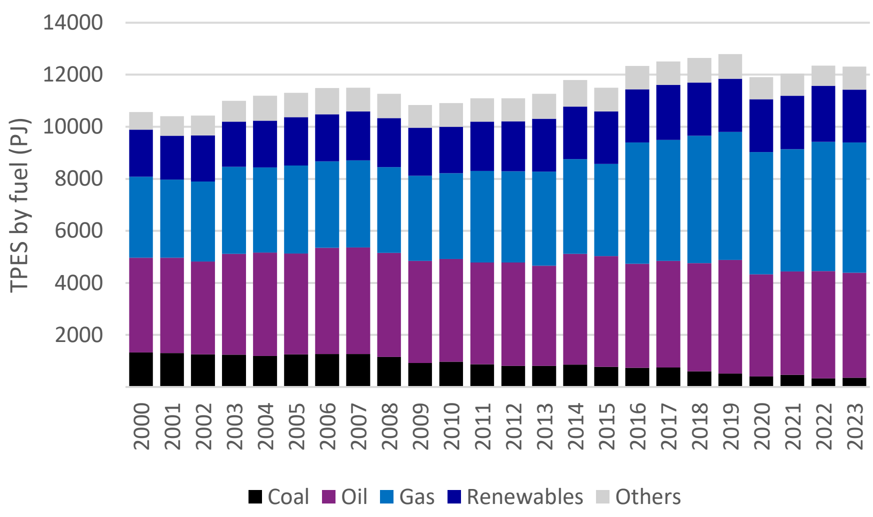


Source: EGEDA (2025)

Net imports remained steady from 2022 to 2023. In 2024, oil and gas domestic exports totalled CAD 188 billion, of which 94% were to the United States (NRCan, 2026).

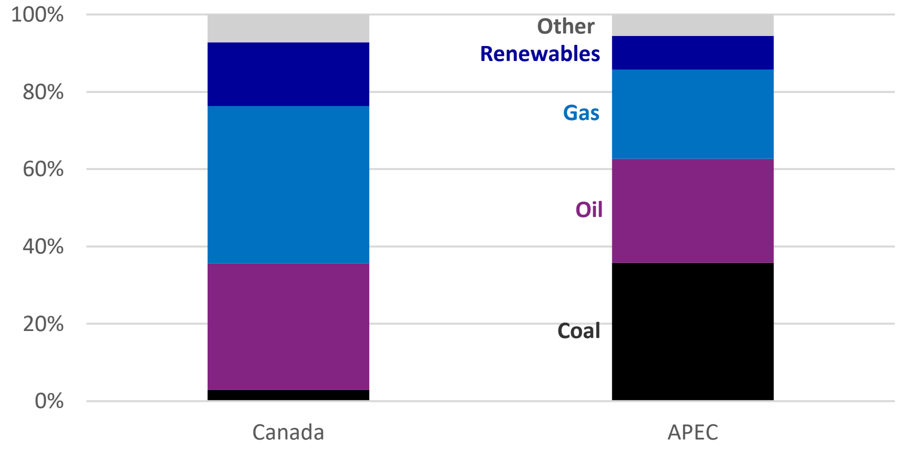
Figures 2 and 3 illustrate how dominant fossil fuels continue to be in Canada's energy mix. While coal has been steadily declining over the past two decades, oil and gas persist as predominant fuel sources in Canada's energy mix at just under 80% of the energy supply mix in 2023. Canada has significant renewable potential and continues to realise more of its potential with the deployment of solar and wind-generating capacity across the economy. Hydroelectricity is currently the most prominent source of renewable energy in Canada, with an installed capacity of 83 GW in 2023.

Figure 2: Canada's energy supply by fuel (PJ), 2000 to 2023



Source: EGEDA (2025)

Figure 3: Energy supply mix – Canada and APEC, 2023

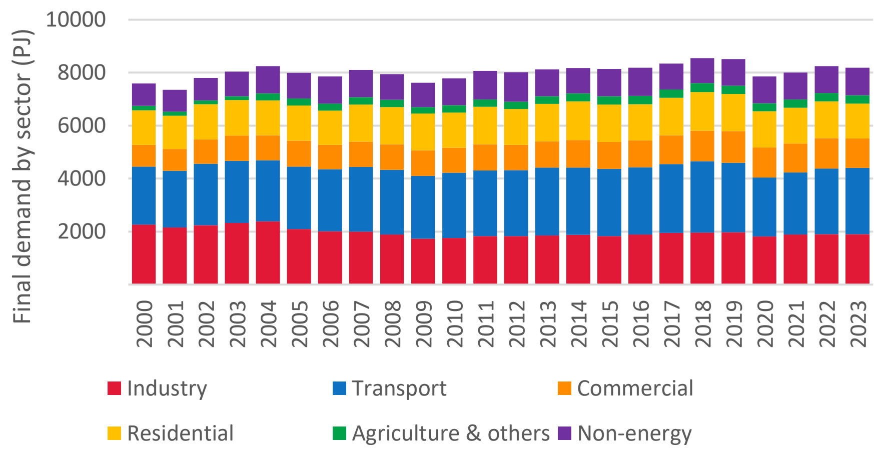


Source: EGEDA (2025)

Total Final Consumption

Canada's total final consumption decreased 1.1% from 2022 to reach 8,189 PJ in 2023 (EGEDA, 2025). This positions Canada as the fifth-largest energy consumer in APEC, after China; United States; Russia; and Japan.

Figure 4: Canada's final consumption by sector (PJ), 2000 to 2023

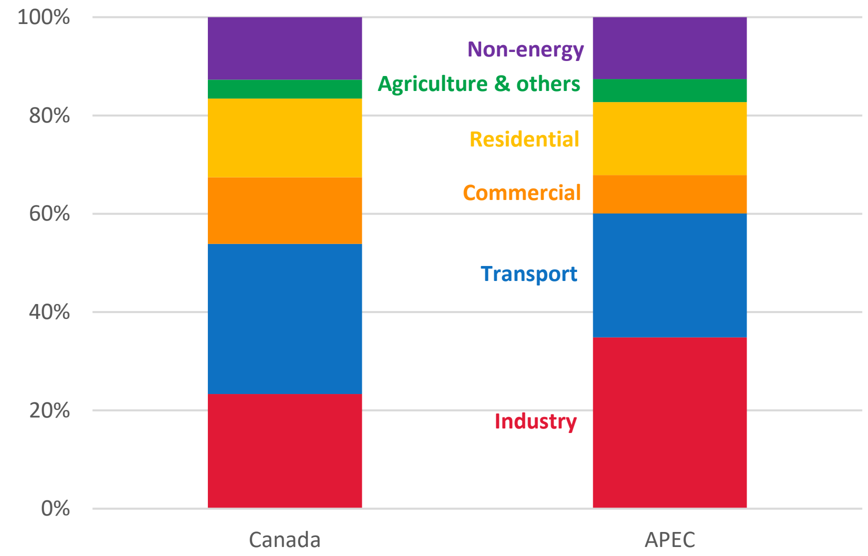


Source: EGEDA (2025)

The transport sector continues to account for the largest share of final consumption. Consumption in the transport sector is (2,501 PJ) 31% of final consumption, followed by the industrial sector (1,908 PJ) at 23% of final consumption. However, the industrial sector and non-energy use together account for 36% of total consumption (2,947 PJ).

Canada's expansive geography places a high reliance on road transport, with its share of transport energy demand being consistently higher than the APEC average. However, Canada's service-oriented economy is associated with higher commercial energy consumption and lower industrial consumption than the APEC average. Nonetheless, the overall decrease in total final consumption from 2022 to 2023 was driven by decreases in both residential and commercial energy use. The decreases can likely be attributed to ongoing improvements in energy efficiency gains and building retrofits, as well as warmer weather in 2023, thereby reducing the need for space heating in winter.

Figure 5: Final consumption by sector, Canada and APEC, 2023

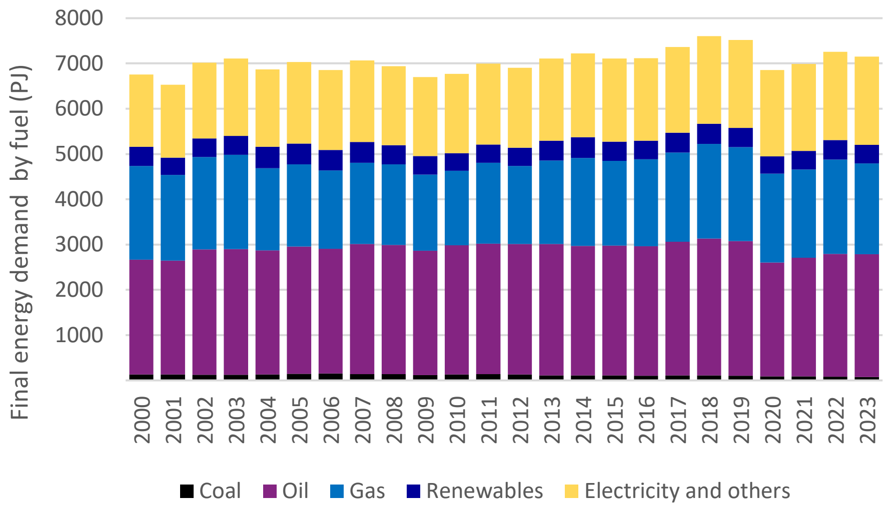


Source: EGEDA (2025)

Final Energy Demand

As the change in non-energy fuel use was minimal, Canada's final energy demand paralleled total final consumption, decreasing 1.5% to 7,150 PJ in 2023 (EGEDA, 2025).

Figure 6: Canada's final energy demand by fuel (PJ), 2000 to 2023



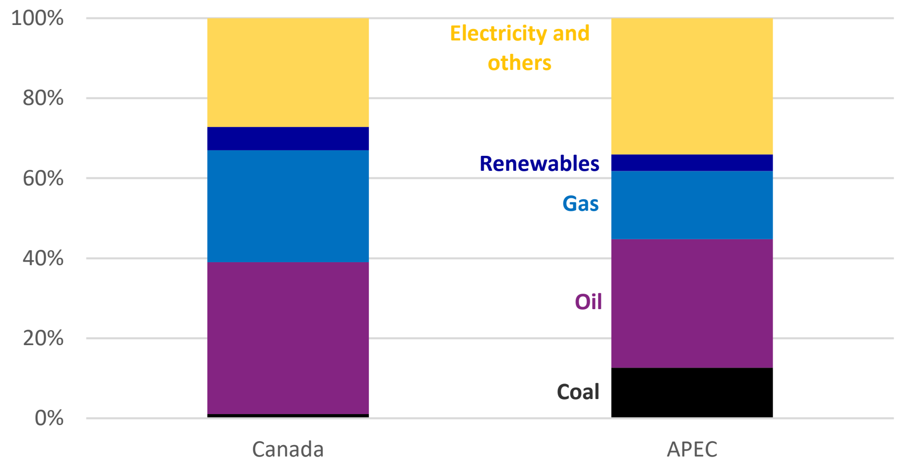
Source: EGEDA (2025)

Note: Figure 6 does not include non-energy sector consumption of energy products.

In 2023, fossil fuels accounted for two-thirds of final energy demand[1], comprising; oil (2,710 PJ, 38%), gas (2,002 PJ, 28%), and coal (78 PJ, 1.1%) (EGEDA, 2025). The remainder was formed by the share of renewables (414 PJ, 5.8%) and "electricity and others" (1,945 PJ, 27%), of which the share of renewable electricity and others was 1,327 PJ. Although coal makes up less of Canada's fuel mix than the APEC region, Canada still has a higher reliance on fossil fuels more broadly.

[1] Note that the demands in the EGEDA energy balance differ than those in the Report on Energy Supply and Demand (RESD) energy balances due to differences in energy accounting frameworks (StatCan, 2024).

Figure 7: Final energy demand fuel share, Canada and APEC, 2023



Source: EGEDA (2025)

Transformation

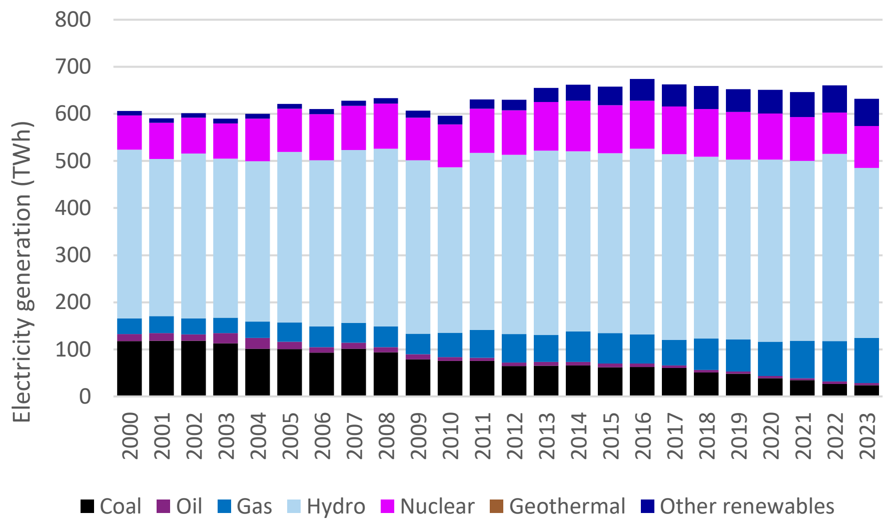
Power Sector

Canada generated 633 terawatt-hours (TWh) of electricity in 2023, a decrease of 3.9% from the previous year. Non-emitting electricity generation constituted the largest share of this generation (80%), with hydro as the major contributor at 57% followed by nuclear at 14% and other non-emitting sources at 9.2%. The contribution from hydro decreased 9.3% due to a drought, while nuclear increased 2.1% from 2022 to 2023.

Fossil generation accounted for 20% of total power generation in 2023. The proportion of power generated from coal continued its downward trajectory, dropping to 3.7% as Canada advanced in its efforts to phase out coal-fired power plants. Natural gas-fired generation remained the primary fossil generation type, reaching 15% of total power generation.

Hydro is also a key fuel source for Canada's electricity exports, making up more than 85% of electricity generation in three (British Columbia, Manitoba, and Quebec) of the four provinces with the largest exports of electricity to the United States (NRCan, 2026).

Figure 8: Canada's electricity generation by fuel, 2000 to 2023



Source: EGEDA (2025)

Nuclear energy is playing an increasing role in decarbonising electricity systems, with plans for both small- and large-scale nuclear expansion being considered across Canada. In particular, Ontario is supporting the refurbishment of several nuclear reactor units. Of note, in early 2026, the refurbishment project at Darlington in Ontario was completed ahead of schedule and under budget, adding 30 years of operation (Government of Ontario, 2026). As for the Bruce refurbishment, Bruce Power's Major Component Replacement (MCR) project is underway, with unit 3 on track to return to service in 2026. Additionally, at the end of 2025, Ontario received approval to refurbish Pickering “B” units 5-8, with completion targeted for the mid-2030s. In general, these refurbishments will add approximately 25-30 years to the operational life of each unit and will allow Ontario to maintain a dependable source of clean electricity.

Ontario is also advancing new nuclear energy generation plans. The Darlington New Nuclear Project (DNNP) is a project to construct up to four GE Hitachi BWRX-300 small modular reactors (SMRs) at the existing Darlington Nuclear Generating Station, owned by Ontario Power Generation (OPG). Together, the four units would add 1,200 MWe of capacity to Ontario’s electricity grid.

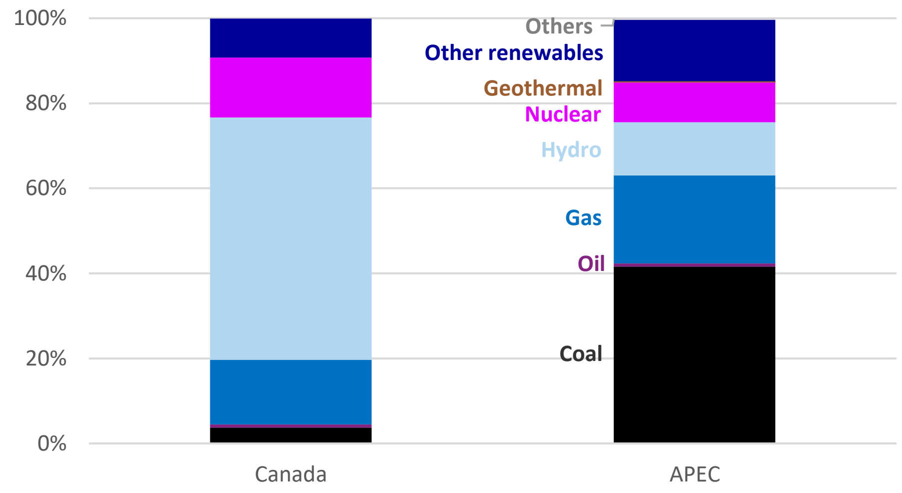
OPG received a licence to construct the first reactor in April 2025 from the Canadian Nuclear Safety Commission (CNSC) and subsequently received approval from the Ontario government in May 2025 to begin construction. This project will be the first new nuclear build in more than three decades and will be the first commercial SMR deployment in a G7 economy. In March 2026, OPG applied to the CNSC for a license to operate its first SMR.

Ontario is also considering large-scale nuclear energy deployment through Bruce Power’s “Bruce C” Nuclear Project and OPG’s Wesleyville Project, which would support the expansion of new nuclear capacity by 4,800 MWe and 10,000 MWe, respectively.

Other nuclear-interested provinces (namely New Brunswick, Saskatchewan and Alberta) are also exploring both SMR and large-scale nuclear deployment but are at varying stages of nuclear deployment readiness. These provinces are actively working with Ontario to achieve their nuclear objectives.

In addition, Canada’s variable renewable capacity continues to grow. As of 2025, Canada had approximately 150 GW of generation capacity, including approximately 19 GW of wind energy, 5 GW of solar energy, and nearly 1 GW of energy storage installed capacity (CanREA, 2026). Renewable energy deployment will continue to advance this decade, supported by policies such as the Clean Electricity Regulations and the Clean Electricity Investment Tax Credit, Clean Technology Investment Tax Credit, among other incentives and regulatory measures.

Figure 9: Electricity generation fuel share, Canada and APEC, 2023



Source: EGEDA (2025)

Refining

As of 2025, Canada had 16 operating crude oil refineries with a total capacity of approximately 1.9 million barrels per day (CER, 2026). In 2025, Canadian refineries operated on average at 90% capacity.

Canada’s Clean Fuel Regulations (CFR) will likely continue to drive an increase of renewable fuels production in Canada. Compliance obligations for the CFR began in July 2023, which require liquid fuel suppliers to gradually decrease carbon intensity. To that end, renewable fuel refineries have begun operating in recent years, producing fuels made from organic feedstocks. Domestic biofuel production will be supported through the Biofuel Production Incentive, which will provide financial support for eligible fuel produced during the 2026 and 2027 calendar years.

Energy Transition

In 2025, Canada published its 2035 greenhouse gas emissions reduction target of 45-50% below 2005 levels (ECCC, 2025). The target builds on the 2030 target of a 40%-45% reduction in CO_2 below 2005 levels. Canada has made progress in reducing its emissions over the last decade and continues to decouple its economy from its GHG emissions. However, Canada is not currently on track to meet its 2030 target.

Recent federal energy policy has increasingly focused on affordability and energy security. Reflecting this shift, the federal consumer carbon price was eliminated effective 1 April 2025. As a result, households and small businesses in provinces previously subject to the federal fuel charge on carbon no longer pay a carbon levy on fuels such as gasoline. With the removal of the fuel charge, the associated quarterly Canada Carbon Rebate payments have also come to an end. Although the consumer carbon price has been lifted, the Output-Based Pricing System (OBPS) remains in effect and continues to apply a carbon price to covered industrial facilities under existing legislation.

Several policies that had been implemented or were under development were signalled in Canada's Budget 2025 for review or reconsideration. The federal government had been advancing a greenhouse gas emissions cap for the oil and gas sector; however, it has since indicated that such a measure may be unnecessary if existing policies are strengthened and better aligned. In particular, strengthening the OBPS, the enhanced oil and gas methane regulations, and the large-scale deployment of technologies such as carbon capture, utilization, and storage (CCUS) could collectively achieve comparable emissions reductions. Under these conditions, an emissions cap would offer only limited additional value.

Canada has maintained its commitment to reduce methane emissions from the oil and gas sector to 72% below 2012 levels by 2030. To that end, Enhanced Methane Regulations were legislated and published in December 2025. These regulations expand the scope and increase the stringency of the 2018 methane regulations, with the aim of achieving additional reductions in oil and gas methane emissions consistent with the 72% target.

Canada continues to invest in zero-emission vehicle (ZEV) charging and refuelling infrastructure and in incentives to support ZEV adoption. However, the federal light-duty vehicle ZEV sales regulation was temporarily paused and subsequently updated. The current targets require 75% of new light-duty vehicle sales be ZEVs by 2035, with a 90% adoption target set for 2040.

Additionally, recent federal policy discussions in Canada have increasingly emphasised strengthening domestic supply chains and "Made in Canada" infrastructure, particularly in strategic sectors such as critical minerals. Budget 2025 advanced this agenda through initiatives like the expanding the eligible minerals under the Critical Mineral Exploration Tax Credit. At the G7 Summit in Alberta, the Critical Minerals Production Alliance was introduced as a Canadian-led initiative designed to work with partner economies to reinforce and diversify critical mineral supply chains, including for defence-related and advanced technology applications (Government of Canada, 2026). This focus is linked to broader efforts to enhance economic resilience, reduce reliance on external suppliers, and position Canada as a key partner in global energy transitions.

Energy efficiency is a central part of the Government of Canada's efforts to improve affordability and support industrial competitiveness. In the buildings sector, the Canada Greener Homes and Buildings Strategy (CGBS) includes measures to improve building energy performance and policies to reduce emissions from space heating, including oil use, and efforts to move towards net-zero–ready building codes. In November 2025, the Government also introduced Bill S-4, An Act to Amend the Energy Efficiency Act. The amendments will build on progress to date, ensuring the Act functions in modern online marketplaces, and enable it to keep pace with technological innovations in the ways energy is used and managed. Among other updates, amendments will:

- expand the legislation to include online sales and digital labels;
- bring tools in the Act in line with those in other modern legislation, like adding regulatory sandboxes and more nimble and targeted compliance options; and
- make the regulatory processes faster and more cost-effective by introducing new mechanisms that streamline government processes.

At both the federal and provincial levels, there has been a continued focus on decarbonising electricity systems through expanded generation capacity and grid modernisation. Federal measures, including investment tax credits and support for inter-provincial transmission, aim to facilitate the deployment of renewable and other low-emissions generation. Regulatory oversight by bodies such as the Canada Energy Regulator continues to shape federal infrastructure development, including designated inter-provincial transmission and energy exports. Provinces retain primary authority over intra-provincial electricity systems and have advanced their own plans for grid expansion and reliability. Federal-provincial collaboration has been reflected in agreements such as the Memorandum of Understanding between the Government of Canada and the Government of Alberta, which seeks to align energy sector economic development with emissions reduction objectives.

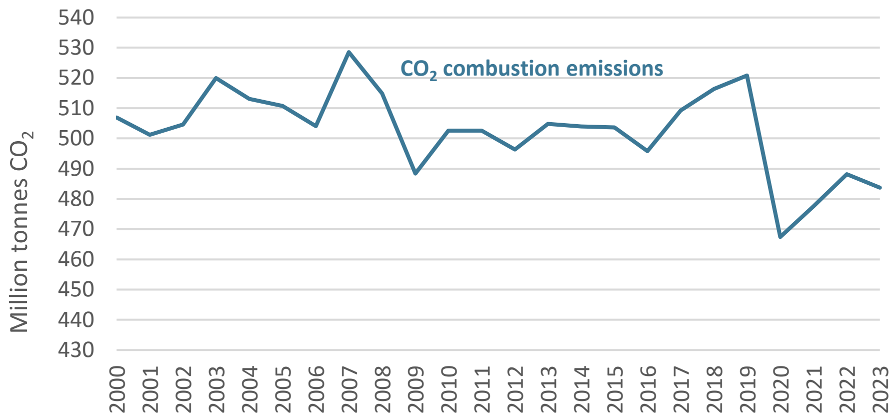
In parallel, Canada has been exploring the application of artificial intelligence (AI) across the energy sector and related industries. AI technologies are being deployed to improve operational efficiency and environmental performance, including early detection of methane leaks in oil and gas operations, as well as in geoscience applications to support critical mineral exploration.

Emissions

The expert group on energy data and analysis (EGEDA) falls under the umbrella of APEC's Energy Working Group (EWG). In addition to energy data compiled by EGEDA, CO_2 emissions from combustion activities in the energy sector are recorded. These emissions are a subset of total GHG emissions that are considered in the context of climate change, such as under the United Nations Framework Convention on Climate Change (UNFCCC).

Canada's CO_2 combustion emissions decreased sharply in 2020 due to reduced activity during the onset of COVID-19, before increasing in 2021 and 2022. However, emissions decreased in 2023 and remain lower than pre-2020 levels. Going forward, Canada's climate policies will likely provide downward pressure on emissions this decade.

Figure 10: Canada's CO_2 combustion emissions (million tonnes), 2000 to 2023



Source: EGEDA (2025)

Energy Security

Canada's energy security outlook is increasingly shaped by structural and system-level challenges, despite its role as a major energy producer and exporter. Canada's energy system is also closely integrated with that of the United States', which supports reliability but introduces exposure to external policy and trade developments. A key issue is the concentration of export markets, with most oil and natural gas exports still directed to the United States, prompting ongoing efforts to diversify through new pipeline capacity and liquefied natural gas infrastructure.

Domestically, energy security concerns are increasingly focused on electricity systems, where demand is expected to grow due to increasing electrification and growing digital industries, coupled with population and GDP growth. Meeting this rising demand while maintaining reliability is driving investment in generation, transmission, and storage, and raising questions about system adequacy and future costs.

Furthermore, infrastructure constraints and regulatory complexity continue to affect the pace of energy system development. Inter-provincial transmission remains limited, reducing the ability to share resources across regions, while differences in provincial market structures and policy priorities can delay project advancement. Despite growing investment, bottlenecks in the supply chains of energy system components are a significant hindrance for maintaining and expanding energy systems across Canada.

Overall, energy security policy is increasingly focused on balancing reliability, affordability, and emissions reduction, as governments navigate trade-offs between system resilience, investment requirements, and long-term decarbonisation objectives.

APEC Energy Goals

There are two energy-related objectives that APEC member economies have agreed to meet as a collective: to improve energy intensity and double the share of modern renewables.

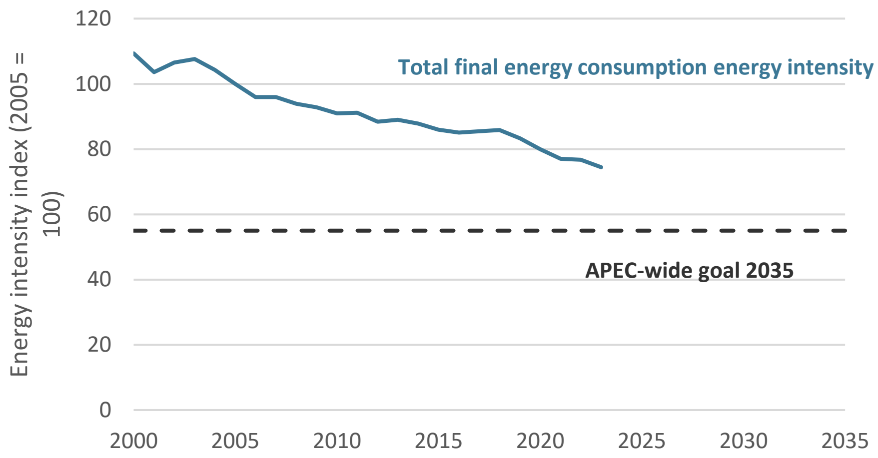
Energy Intensity Goal

In 2011, APEC member economies agreed to increase their ambition to reduce energy intensity by 45% in 2035, relative to a 2005 baseline. The original goal was a 25% improvement by 2030, relative to a 2005 baseline.

APEC is on track to achieve this energy intensity improvement. The goal does not impose individual economy targets, but it is possible to track the progress of individual APEC economies relative to the overarching proportional improvement.

Canada's energy efficiency policies, commitment to reducing GHG emissions, and other targeted regulations have historically reduced its energy intensity. Figure 11 illustrates this, showing a 26% reduction in energy intensity since 2005.

Figure 11: Canada's total final energy consumption intensity index, 2000 to 2023 (2005 = 100)



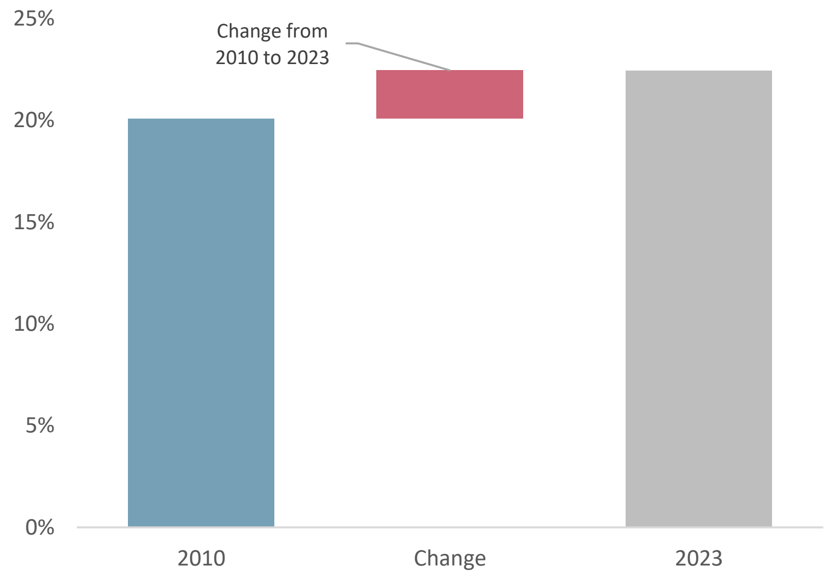
Source: EGEDA (2025)

Doubling of Renewables

The second energy goal involves doubling the share of modern renewables in the APEC energy mix for the period 2010 to 2030. There is no economy-level goal for individual member economies, but improvements by individual economies will contribute to the doubling goal.

Canada is hard-pressed to double its renewables share to 40%, particularly considering its already high share of renewable electricity, with more than two-thirds of its generation coming from renewable sources (Figure 13) and over 80% coming from non-emitting sources. The renewables share in the electricity mix declined by three percentage points between 2022 and 2023, primarily due to reduced hydrological inputs to the hydroelectric generation system and a corresponding increase in nuclear and natural gas output.

Figure 12: Canada's modern renewable energy share, 2010 and 2023



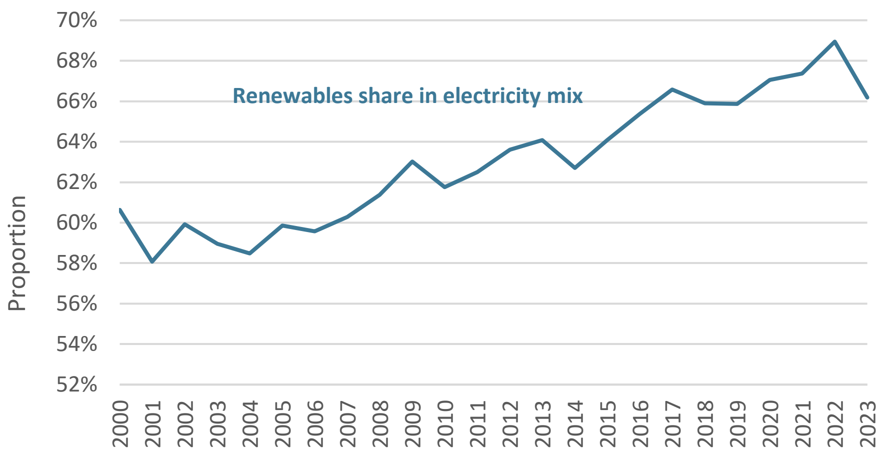
Source: EGEDA (2025)

Note: Biomass used in the residential and commercial sectors is assumed to be traditional biomass and is not included in the definition of modern renewables. All other renewables (biomass used by industry, hydro, geothermal, etc.) are considered modern renewables. Modern renewables also include the share of electricity that is generated from renewable sources.

However, Canada can still contribute to APEC achieving its aspirational goals. Several of Canada's climate policy announcements, including Clean Electricity Regulations, a 100% net-zero power system target by 2050, various investment tax credits, industrial carbon pricing, and grants and contributions programs such as the Smart Renewable and

Electrification Pathways programme, will continue to increase the share of renewables in the Canadian and APEC fuel mix.

Figure 13: Canada's renewable generation share, 2000 to 2023



Source: EGEDA (2025)

Energy Policy

Key federal energy and climate measures to date include the following:

- 2030 Emissions Reduction Plan: Canada's Next Steps for Clean Air and a Strong Economy (ECCC, 2022): A comprehensive roadmap that reflects levels of ambition to guide emissions reduction efforts in each sector.
    - Environment and Climate Change Canada has released two reports on progress towards the path laid out in the 2030 Emissions Reduction Plan (ECCC, 2023; ECCC, 2025a). The next progress report will be produced in 2027 in line with requirements under the *Canada Net Zero Emissions Accountability Act.*
    - In early 2025, Canada released its 2035 emissions reduction target (ECCC, 2025b). Additional targets and plans will be developed every five years through to 2050.
- Budget 2025 (Finance Canada, 2025): announced new and updated information on the federal toolkit for investing in the clean economy: a set of clear and predictable investment tax credits, low-cost strategic financing, and targeted investments and programming, where necessary, to respond to the unique needs of sectors or projects of economic significance to Canada.

Additionally, provincial and territorial climate policies and plans can be referenced for specific information about what each province and territory is doing to contribute to their respective climate goals and targets, as well as to Canada's as a whole.

The following table is not an exhaustive list of energy and climate policies in Canada. However, it is a list of recent policies that are expected to have a substantial impact on Canada's energy system going forward.

Energy Policy	Details	Reference
Canada’s 2035 Emissions Reduction Target	Canada released its 2035 emissions reduction target of 45%-50% below 2005 levels by 2035. This target builds on Canada’s 2030 target. Publishing interim targets is mandated under the Canadian Net-Zero Emissions Accountability Act.	Environment and Climate Change Canada
Canadian Net-Zero Emissions Accountability Act	Legislates on emissions reductions accountability to address climate change, by setting legal requirements on the Government of Canada to plan, report, and course correct on the path to net zero emissions by 2050.	Justice Canada
Canada Green Buildings Strategy (CGBS)	The CGBS was finalised in July 2024. It sets out an economy-wide approach to reducing emissions and improving energy efficiency in buildings, focusing on accelerating retrofits, advancing high-performance new construction, and supporting low-carbon technologies and materials, alongside measures such as enhanced building codes and energy labelling.	Natural Resources Canada
Clean Electricity Strategy	Canada’s Clean Electricity Strategy was released in August 2025. The strategy identifies a reliable, non-emitting electricity sector as the backbone of a low-carbon economy and serves as an industrial roadmap indicating federal energy policy direction. While grids are largely the purview of provinces and territories in Canada, the scope of building out the needed non-emitting electricity sector requires substantial federal support and coordination.	Natural Resources Canada
Clean Electricity Regulations	Canada’s Clean Electricity Regulations were finalised in December 2024. The regulations outline a set of rules for transitioning Canada's electricity grid to net zero by 2050 and will come into force in 2035. They are to set technology-neutral emissions performance standards and include flexibilities so that provinces and utilities can maintain reliable and affordable electricity.	Environment and Climate Change Canada
Clean Fuel Regulations	Budget 2025 proposed to make amendments to the Clean Fuel Regulations to strengthen the domestic supply of biofuels. These changes will be complemented by the creation of a Biofuels Production Incentive to support domestic biodiesel and renewable diesel production.	Environment and Climate Change Canada
Biofuels Production Incentive	A Biofuels Production Incentive will begin next year (2026-2027) to support domestic biodiesel and renewable diesel production. A total of CAD 372 million will be provided over two years (CAD 175.2 million will be repurposed from the Clean Fuels Fund).	Natural Resources Canada
Carbon Capture, Utilization, and Storage (CCUS) ITC	The CCUS ITC is a refundable tax credit that applies to eligible expenditures incurred for a qualified CCUS project, from 1 January 2022 to 31 December 2040. The ITC credit rates for qualified expenditures are up to 60% for carbon captured from ambient air, up to 50% for carbon captured other than directly from ambient air, and up to 37.5% for related transportation, use, and storage infrastructure.	Clean Economy Investment Tax Credits

Energy Policy	Details	Reference
Carbon Management Strategy	The strategy articulates the role of carbon management on the path to net zero and the federal actions that are being taken to accelerate innovation, advance policies, attract investment, scale up projects and build partnerships in developing carbon management solutions.	Natural Resources Canada
Clean Electricity Investment Tax Credit (ITC)	Budget 2025 committed to establishing the ITC of up to 15% for investments pre-2035 in non-emitting electricity generation systems, abated natural gas-fired electricity generation (subject to an emissions intensity threshold), electricity storage, and projects that transmit electricity between provinces and territories.	Budget 2025
Clean Hydrogen ITC	Investment tax credit of 15%-40% of eligible expenses on equipment for hydrogen projects. The rate of the credit depends on the carbon intensity of the hydrogen, calculated using the Government of Canada's Fuel Life Cycle Assessment model. Eligibility expanded to hydrogen produced from methane pyrolysis as of 16 December 2024.	Budget 2025
Clean Technology ITC	An ITC of up to 30% to encourage investment in the adoption and operation of clean technology property. Eligibility will be expanded to include systems producing electricity, heat or both from waste biomass, retroactive to 21 November 2023. Changing eligibility requirements for small nuclear energy property, retroactive to 28 March 2023.	Budget 2025
Clean Technology Manufacturing ITC	An investment tax credit of up to 30% for capital spending related to the manufacturing of specified clean technologies or the processing of critical minerals. The list of eligible critical minerals expanded to include antimony, indium, gallium, germanium, and scandium. It also includes equipment used in eligible polymetallic mining projects as of 1 January 2024.	Budget 2025
Critical Mineral Exploration Tax Credit	Budget 2025 expanded the tax credit to cover 12 additional critical minerals and apply to eligible exploration expenses renounced under flow-through share agreements signed on or before 31 March 2027.	Budget 2025
Energy Innovation Program	The program advances clean and low-carbon energy technologies that will help Canada meet its climate change targets while supporting the transition to a low-carbon economy. It funds research, development and demonstration projects, and other related scientific activities.	Natural Resources Canada
Enhanced Methane Regulations for the Oil and Gas Sector	The Enhanced Methane Regulations are estimated to reduce oil and gas methane by 72% below 2012 levels by 2030. They strengthen federal regulations that were put in place in 2018.	Environment and Climate Change Canada
Output Based Pricing System (OBPS)	The federal government is committed to maintaining annual price increases under the OBPS until 2030 and will develop a post-2030 carbon-pricing directory that targets net zero by 2050. The federal government will also work to ensure the provincial and territorial industrial pricing systems are harmonised.	Environment and Climate Change Canada

Energy Policy	Details	Reference
Public Transit Fund	The Government of Canada is investing CAD 14.9 billion over the next eight years in reliable, fast, affordable, and low-carbon public transit. This funding includes CAD 3 billion per year in permanent, predictable federal public transit funding which will be available to support transit solutions beginning in 2026/27.	Infrastructure Canada
Regulations on the Reduction of Carbon Dioxide Emissions from Coal-fired Generation of Electricity	Phase-out of traditional, unabated coal-fired electricity by 2030, with exceptions for coal power stations equipped with carbon capture and storage (CCS) units.	Justice Canada
Smart Renewables and Electrification Pathways Program	The program provides approximately CAD 4.5 billion until 2035 for smart renewable energy and electrical grid modernisation projects.	Natural Resources Canada

Notable Energy Developments

Energy Development	Details	Reference
Canada-Alberta Memorandum of Understanding	On 27 November 2025, Canada and Alberta signed a Memorandum of Understanding on energy development, emissions reduction, and economic growth. It includes support for both conventional and low carbon energy, including a proposed bitumen pipeline and carbon capture. The agreement also commits to aligning carbon pricing, streamlining assessments, and strengthening related supply chains.	Prime Minister of Canada
Canada Infrastructure Bank (CIB)	The federal government plans to increase CIB investment by CAD 10 billion (from CAD 35 billion to CAD 45 billion). The CIB will also be able to invest in any nation-building projects (those referred to the MPO). The CIB's target for Indigenous infrastructure investments will increase to at least CAD 3 billion (from at least CAD 1 billion).	Budget 2025
Cancellation of the federal fuel charge	Canada's consumer carbon pricing policy (also known as the federal fuel charge) was ended, effective 1 April 2025.	Removal of the fuel charge

Energy Development	**Details**	**Reference**
Climate Competitiveness Strategy	Released as part of Budget 2025, Canada's Climate Competitiveness Strategy (CCS) emphasises the economic necessity of climate action, and positions Canada to attract investment from markets that increasingly prioritise sustainability and low-carbon production. The CCS aims to boost Canada's competitive advantage and provide long-term investment certainty by strengthening industrial carbon pricing, providing clean economy investment tax credits and mobilising the capital needed to reach net-zero.	Budget 2025 (Section 1.3)
Establishment of the Major Projects Office (MPO)	The Major Projects Management Office (MPMO) is a federal body that coordinates the review of large natural resource and energy projects across multiple departments. It aims to improve efficiency, transparency, and predictability in the federal regulatory process by tracking timelines and aligning permitting requirements. The MPO's mandate is to fast-track nation-building projects.	Government of Canada
LDV sales mandate adjusted	The federal government committed to removing the 2026 target from the Electric Vehicle Availability Standard and will review the regulation. Canada will introduce stronger emissions standards for 2027-2032 model years, which it says will help achieve a goal of 75% EV sales by 2035 and 90% EV sales by 2040.	Innovation, Science and Economic Development Canada
LNG Canada inaugural shipment	On 30 June 2025, LNG Canada shipped its inaugural cargo of LNG to global markets.	LNG Canada
Oil and gas sector emissions cap removed	In Budget 2025, the Government of Canada signalled a shift away from implementing an oil and gas sector emissions cap. Instead, the focus will be on adding certainty to industrial carbon pricing, methane regulations, and deployment of technologies such as CCUS, which would achieve a similar impact on emissions.	Budget 2025
Wasoqonatl intertie between Nova Scotia and New Brunswick	The Wasoqonatl intertie is a 160-km, 345-kV electricity transmission line connecting Nova Scotia and New Brunswick, scheduled for completion in 2028. The project is through a Canada Infrastructure Bank and Mi'kmaw First Nations partnership.	Canada Infrastructure Bank

Useful Links

Atomic Energy of Canada Ltd – www.aecl.ca

Canada Gazette – www.gazette.gc.ca/

Canadian Centre for Energy Information – https://energy-information.canada.ca/en

Canada Energy Regulator – https://www.cer-rec.gc.ca/index-eng.html

Canadian Nuclear Laboratories – www.cnl.ca

Canadian Nuclear Safety Commission – http://nuclearsafety.gc.ca

Environment and Climate Change Canada – www.ec.gc.ca

Innovation, Science and Economic Development Canada – https://ised-isde.canada.ca/site/ised/en

Natural Resources Canada – https://natural-resources.canada.ca/home

Statistics Canada – www.statcan.ca

Transport Canada – www.tc.gc.ca

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Chile

Introduction

Chile has achieved a Gross Domestic Product (GDP) growth of 2.4% for 2025, with projections for GDP growth ranging from 2% to 3% for 2026 (Central Bank of Chile, 2025). During the first half of 2025, energy initiatives accounted for nearly 72% of Chile's foreign investment portfolio, an influx predominantly driven by green hydrogen planned ventures, clean energy infrastructure, and Battery Energy Storage Systems (BESS) (InvestChile, 2025).

Table 1: Chile's macroeconomic data and energy reserves

Key data [a, b]		Energy reserves [c, d]	
Area (million km²)	0.8	Oil (billion barrels)	-
Population (million)	20	Gas (trillion cubic feet)	-
GDP (2021 USD billion PPP)	596	Coal (million tonnes)	-
GDP per capita (2021 USD PPP)	30,183	Uranium (kilotonnes U < USD 130/kgU)	-

Source: a INE, CHL (2024); b World Bank (2025); c Ministerio de Energía (2024) Chile's Energy Balance; d Nuclear Energy Agency and International Atomic Energy Agency (2024)

Note: Reserves are total proved reserves and reasonably assured recoverable resources for uranium.

Chile continues to advance the transformation of its energy sector by leveraging its abundant domestic renewable resources to reduce its historical dependence on imported fossil fuels and to meet its ambitious carbon emissions reduction targets. In 2024, Chile's power capacity was 37 GW: 30% solar, 21% hydro, 14% wind, 15% gas, 8% diesel, 9% coal, 2% others (yearbook 2024 CNE, 2025). In 2025, the energy transition reached new milestones: Electricity generation from solar and wind sources set an all-time record, representing almost 38% of the total electricity injected into the system and covering up to 79% of demand at certain times (CEN, 2025).

In 2025, the structural fragility of Chile's electrical grid was severely exposed by a massive power outage that affected 14 of its 16 regions and approximately eight million households. This outage underscored a critical deficit in transmission infrastructure. To address this systemic emergency, the National Electric Coordinator (CEN) proposed a robust portfolio of 45 transmission expansion projects valued at over USD 700 million (CEN, 2026).

This lack of transmission lines is particularly critical given Chile's unique geography. Chile's extended length inherently increases the system's fragility – a vulnerability compounded by a stark geographical disparity between power generation and consumption centres. While the northern regions possess world-class solar radiation and generate massive amounts of renewable power, most of the economy's electrical demand is concentrated in the central zone. Without sufficient long-distance transmission infrastructure to efficiently transport this energy southward, the system experiences severe bottlenecks

To mitigate these grid constraints and manage escalating renewable energy curtailments (due to solar production), which reached six TWh during 2025, Chile underwent a profound structural shift towards the mass deployment of BESS. Regulatory certainty, supported by Law 21,505 and the recently enacted Law 21,721, has been instrumental in the success of BESS infrastructure. In 2025, BESS dispatched two TWh of energy, representing nearly a 200% increase in dispatchable capacity compared to 2024.

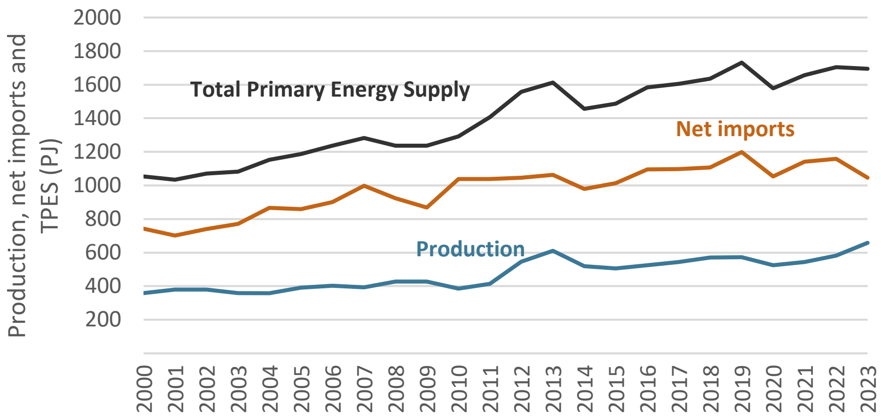
This regulatory and technological transformation has solidified energy storage as a fundamental pillar of the Chilean energy transition, the 2022 update of the National Energy Policy set storage targets of 2 GW by 2030 and 6 GW by 2050 (Ministry of Energy, 2022). The year 2025 was marked by the operation of 1,575 MW of BESS and the presence of over 6,770 MW in the construction phase. This progression is anticipated to considerably improve the flexibility of electrical grids and the effective incorporation of renewable energy sources. Projections estimate an operational storage capacity of nearly nine GW of BESS by the year 2027 (ACERA, 2026).

Energy Supply and Consumption

Total Primary Energy Supply

Chile's Total Primary Energy Supply (TPES) in 2023 was 1,685 PJ, a reduction of 0.56% from the previous year. Of this supply, 62% was met through imports of fossil fuels, while the remaining 38% was produced domestically. Chile remains heavily dependent on imported fuels, mainly fossil fuels to meet its transport energy needs. In 2023, the relatively low price of natural gas continued to impede progress toward Chile's net zero goals, as its cost competitiveness reinforced its role as a transition fuel while simultaneously slowing the shift toward renewable energy sources.

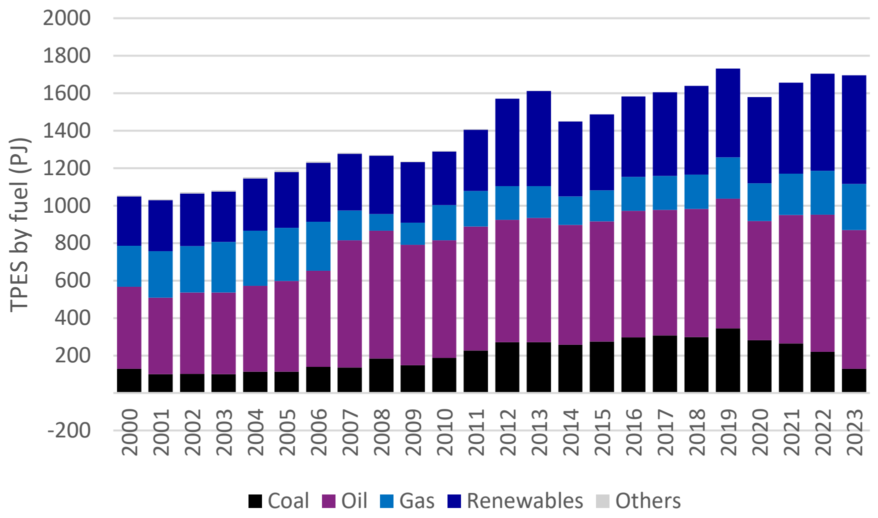
Figure 1: Chile's energy supply, production, and net imports (PJ), 2000 to 2023



Source: EGEDA (2025)

In 2023, Chile's total primary energy production increased by 13% compared to 2022, reaching 658 PJ, while net imports decreased by 10% to 1,045 PJ.

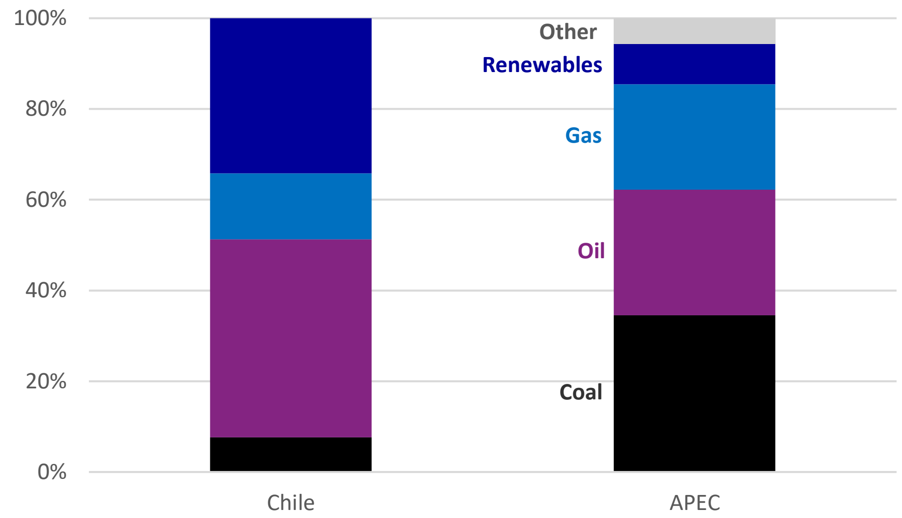
Figure 2: Chile's energy supply by fuel (PJ), 2000 to 2023



Source: EGEDA (2025)

In Chile, renewable energy continues to grow steadily. Compared to 2022, it increased by 12%, reaching 580 PJ. Meanwhile, natural gas, mainly imported, was the second fastest-growing energy source, increasing by 5% to reach 246 PJ. Oil remained stable, with a slight increase of 9 PJ. The total energy supply from coal, mainly for power generation, declined by 41% to 130 PJ in 2023. This was due to Chile's decarbonisation plan, which brought forward the closure/reconversion of coal-fired power plants from 2040 to 2035. Until 2024, the remaining coal-fired generating units accounted for 3.3 GW (CNE, 2025).

Figure 3: Energy supply mix – Chile and APEC, 2023



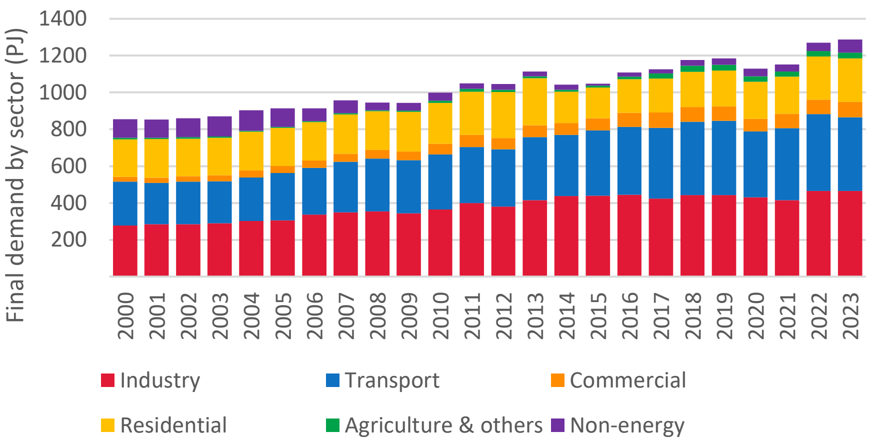
Source: EGEDA (2025)

In 2023, renewables accounted for 34% of Chile's total energy supply, significantly higher than APEC's average of 8.9%. Chile's reliance on oil (44%) also exceeded APEC's average (28%), due to industrial demand for heat processes and the transport sector; while coal made up 7.7% of Chile's energy supply compared to 35% in APEC.

Total Final Consumption

The residential and commercial sectors were the only ones to experience significant energy growth, at 1% and 5%, respectively. The industrial sector remained unchanged from last year. The transportation sector saw its consumption decrease by 17 PJ to pre-pandemic levels of 400 PJ, mainly due to the switch from diesel to electric buses (Ministry of Transport, 2025). The non-energy and agricultural sectors experienced a 38% increase in energy supply compared with the 2022. These trends align with the increase in economic activity. In Chile, the non-energy sector, which uses energy products as raw materials, represents 5.5% of final consumption while in APEC it represents 13%.

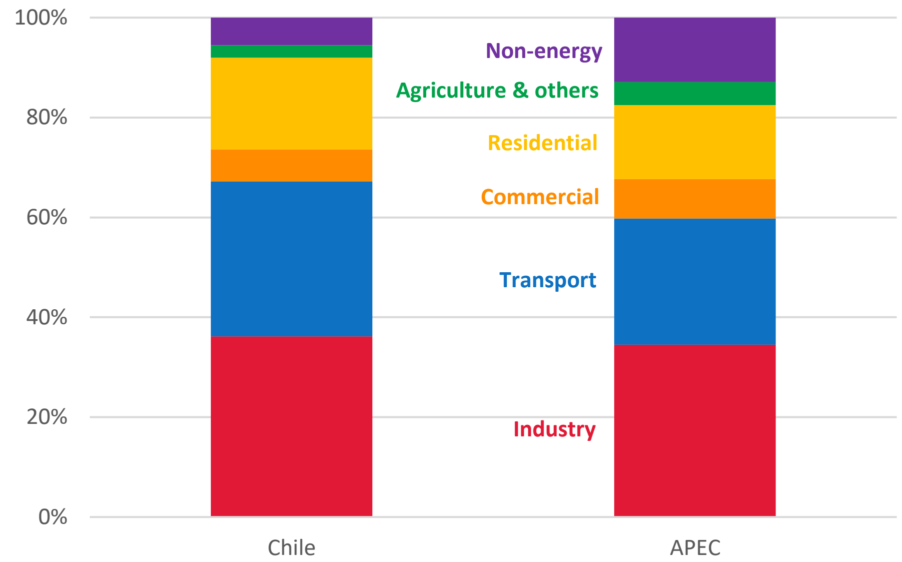
Figure 4: Chile's final consumption by sector (PJ), 2000 to 2023



Source: EGEDA (2025)

Compared with 2022, Chile's final energy demand did not change drastically, growing by only 1.4%, in line with pre-COVID energy trends. Some 36% of the total demand is associated with industry, which is similar to APEC's figure of nearly 35%. The transport sector saw a 4% reduction in energy demand, accounting for 31% of Chile's total energy demand. By comparison, APEC's transport sector accounted for a smaller proportion (25%). The residential and commercial sectors represent 25% of final consumption, which is similar to APEC's residential and commercial sectors (23%).

Figure 5: Final consumption by sector, Chile and APEC, 2023

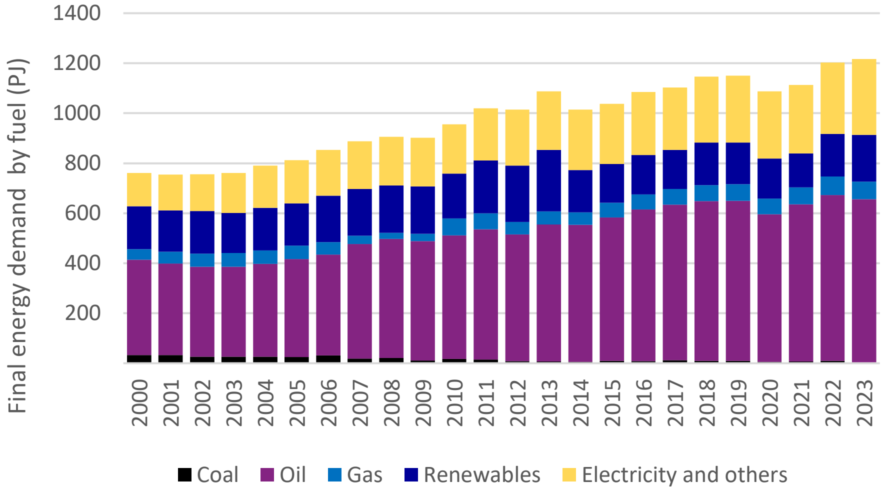


Source: EGEDA (2025)

Final Energy Demand

Chile's final energy demand grew by 1.1% to 1,217 PJ, maintaining the growth trend linked to the economy growth, but with a slight decoupling. Coal use has decreased by 67% from 2022, reaching 3 PJ in 2023. Oil consumption also decreased from 663 PJ to 652 PJ in 2023 (-1.6%). Natural gas consumption decreased by 4.4% to 71 PJ. Demand for renewable energy continued its upward trend, increasing by 9.4% in 2023 to 186 PJ, while electricity demand grew by 6.6%, also reaching 186 PJ.

Figure 6: Chile's final energy demand by fuel (PJ), 2000 to 2023



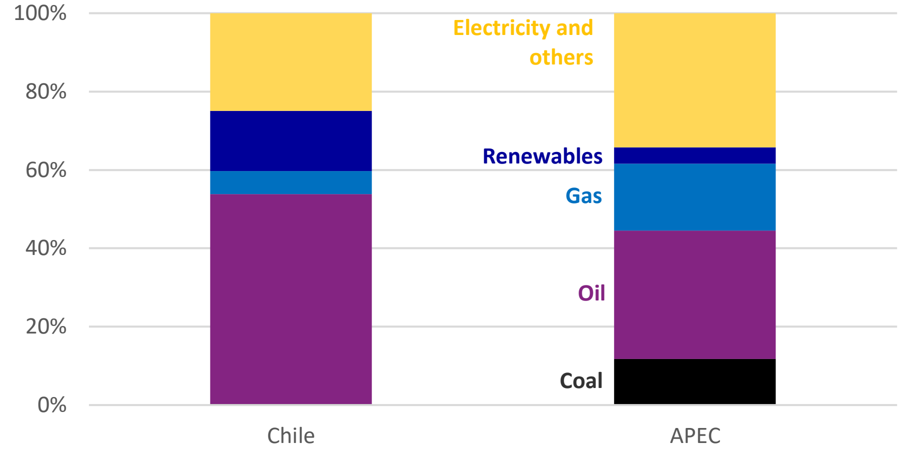
Source: EGEDA (2025)

Note: Figure 6 does not include non-energy sector consumption of energy products

Compared to APEC, Chile relies more heavily on oil to meet its energy needs, at around 54% compared to 33%. Similar to other APEC economies such as Australia; Canada; New Zealand; and United States, Chile's population is widely distributed with a long road network.

Another notable difference is gas demand, accounting for 5.9% of Chile's energy compared to 17% for APEC. Electricity accounts for 25% of Chile's energy demand, compared to 34% for APEC. Finally, renewable energy accounts for one of the largest shares of final energy demand at 15% in Chile compared to 4.2% in APEC.

Figure 7: Final energy demand fuel share, Chile and APEC, 2023



Source: EGEDA (2025)

These differences can be explained by Chile's commitment to increasing implementation of renewable energy, progressive reduction in coal consumption, and high dependence on fossil fuels in the transport sector.

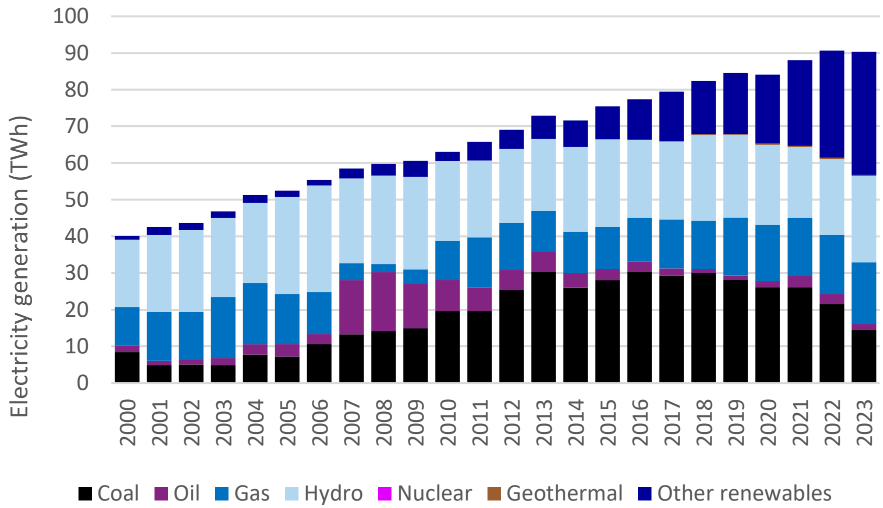
Transformation

Power Sector

Chile has increased its ambitious target for renewable energy in the electricity fuel mix from 70% to 80% since updating its energy policy in 2022. Total electricity generation, which includes power generation from main electricity producers and auto producers, has remained almost the same as the previous year at 90 TWh.

Chile's electricity generation fuel mix in 2023 consisted of coal (16%), gas (19%), oil (2%), hydropower (26%), geothermal energy (0.4%), and other renewables (37%).

Figure 8: Chile's electricity generation by fuel, 2000 to 2023

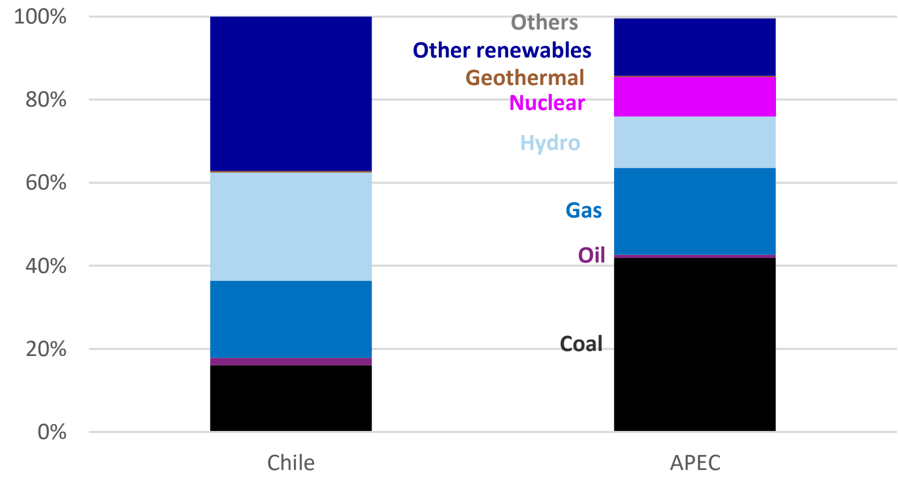


Source: EGEDA (2025)

Renewable energy generation in the electricity fuel mix is 64%. Due to improved weather conditions, particularly increased rainfall, hydroelectric generation has returned to 2018 levels, with an increase of 14% to 23 TWh in 2023. Other renewable energy power plant generation, which includes biomass, solar, wind, and other renewables, increased by 15%, going from 29 TWh in 2022 to 33 TWh in 2023.

Natural gas power generation also increased by 4.2%, reaching 16.8 TWh. In contrast, the largest reductions in fossil energy power generation were seen in oil, which decreased by 40% to reach 1.6 TWh, and in coal, which decreased by 33% to reach 14.5 TWh. Of the 28 coal-fired generating units (equivalent to about 5,500 MW) that were operating in the National Electric System at the beginning of 2019, there are currently 17 units in operation or in the process of closure/reconversion.

Figure 9: Electricity generation fuel share, Chile and APEC, 2023



Source: EGEDA (2025)

Chile's electricity generation profile is predominantly driven by renewable energy, comprising 64% of its total output. This is in clear contrast to the 27% average observed across APEC economies. This substantial difference is primarily driven by Chile's aggressive integration of solar PV and wind (37%), coupled with a robust hydroelectric foundation (26%). This positions Chile at the forefront of the region in displacing carbon-intensive power sources with clean energy alternatives.

Energy Transition

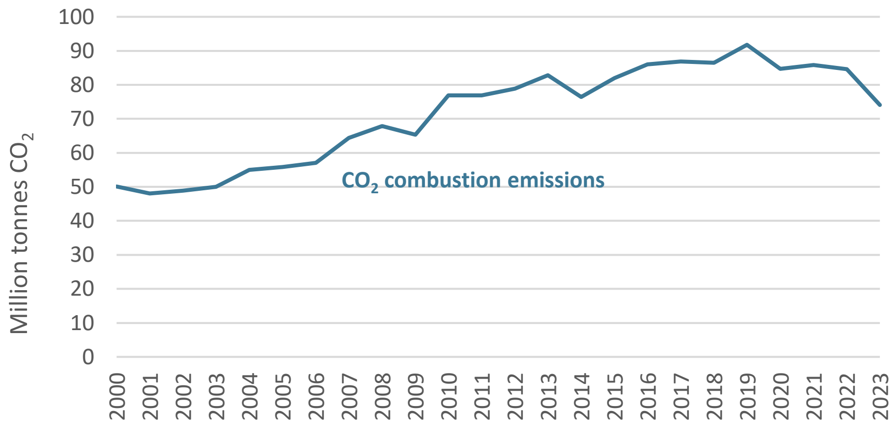
Chile's energy transition efforts are proscribed in the recently approved Energy Transition Law and the development of a decarbonisation roadmap, aiming for carbon neutrality by 2050 or earlier.

Emissions

Combustion emissions decreased by 13% in 2023, reaching 74,027 kt-CO_2, showing the first clear signs of a reduction in emissions due to a gradual change in the energy mix.

To sustain and accelerate this positive trajectory, Chile introduced its updated Nationally Determined Contribution (NDC) in 2025, representing a significant progression in its climate ambition. The updated 2025 NDC reinforces the economy's commitment to achieving carbon neutrality by 2050 by establishing a strict greenhouse gas (GHG) emissions target of not exceeding 1,100 $MtCO_2eq$ for the 2020-2030 period.

Figure 10: Chile's CO_2 combustion emissions (million tonnes), 2000 to 2023



Source: EGEDA (2025)

Energy Security

A blackout on 25 February 2025 that affected approximately eight million households highlighted the critical importance of energy security. This incident identified specific operational gaps within the National Electric System (SEN). In response, the National Electric Coordinator (CEN) implemented a comprehensive risk management and recovery plan focusing on prevention, strict continuous auditing of critical facilities, and enhanced technical requirements for renewables and storage. In order to structurally reinforce the grid and address these bottlenecks, the CEN proposed a robust portfolio of 45 transmission expansion projects (12 in all the territory and 33 in specific zones), requiring an estimated investment of over USD 700 million.

To further bolster system resilience and safely manage the variability of a high-renewable energy system, Chile has accelerated the implementation of BESS. By the end of 2025, Chile had 1,575 MW of BESS in operation and over 6,770 MW under construction. This technology has evolved from a supplementary asset to a structural pillar, providing flexibility and stability to the SEN.

Alongside these grid enhancements, Chile is actively advancing strategies to reduce its historical reliance on imported fossil fuels in the transport sector.

A cornerstone of this effort is accelerating electromobility. In line with the National Electromobility Strategy, which aims to achieve 100% sales of new zero-emission public transport and light vehicles by 2035. Chile has already reached several significant milestones: the Metropolitan Region has electrified 621% of its public transport fleet, making Santiago home to the world's second-largest electric bus fleet (Ministry of Transport, 2025). This shift towards electromobility, alongside the promotion of sustainable transition fuels, directly reduces dependence on fossil fuels while supporting the broader decarbonisation agenda.

APEC Energy Goals

There are two energy-related objectives that APEC member economies have agreed to meet as a collective: to improve energy intensity and double the share of modern renewables.

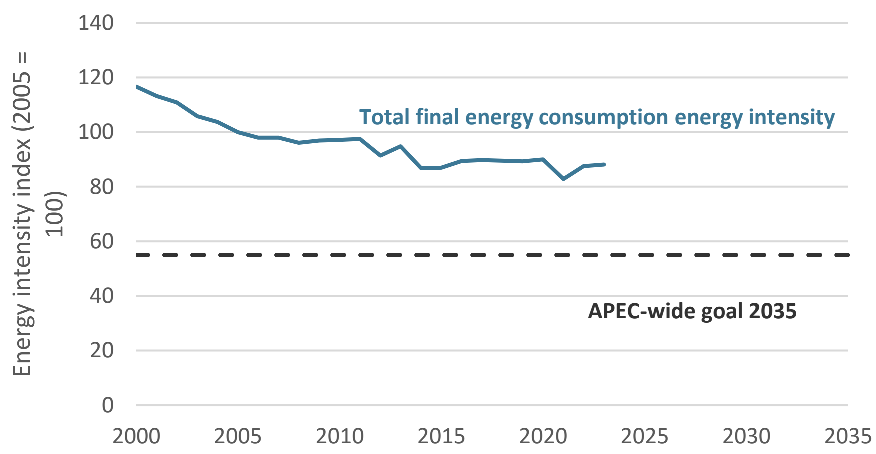
Energy Intensity Goal

In 2011, APEC member economies agreed to increase their ambition to reduce energy intensity by 45% in 2035, relative to a 2005 baseline. The original goal was a 25% improvement by 2030, relative to a 2005 baseline.

APEC is on track to achieve this energy intensity improvement. The goal does not impose individual economy targets, but it is possible to track the progress of individual APEC economies relative to the overarching proportional improvement.

In 2023, Chile's energy intensity remained stable, with a slight increase of 0.45%.

Figure 11: Chile's total final energy consumption intensity index, 2000 to 2023 (2005 = 100)

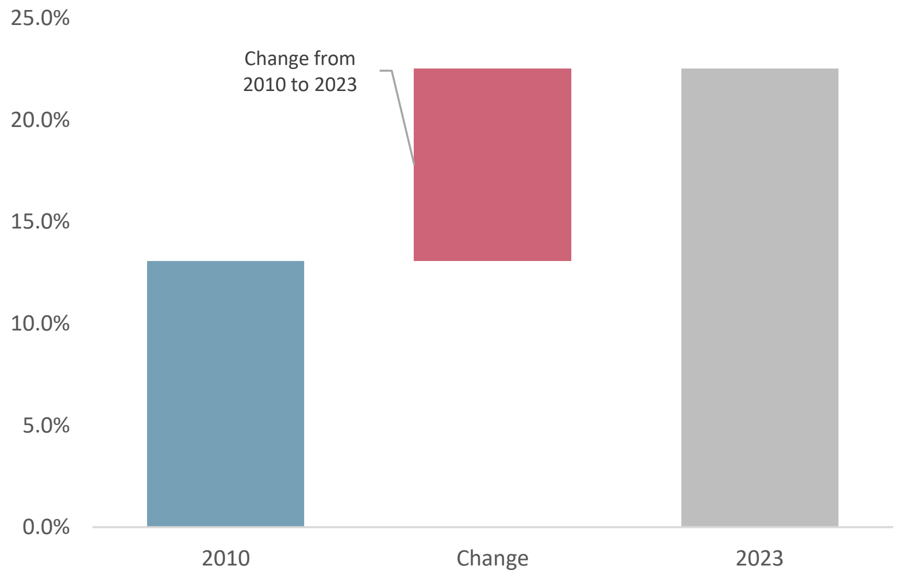


Source: EGEDA (2025)

Doubling of Renewables

The second energy goal involves doubling the share of modern renewables in the APEC energy mix for the period 2010 to 2030. There is no economy-level goal for individual member economies, but improvements by individual economies will contribute to the doubling goal.

Figure 12: Chile's modern renewable energy share, 2010 and 2023



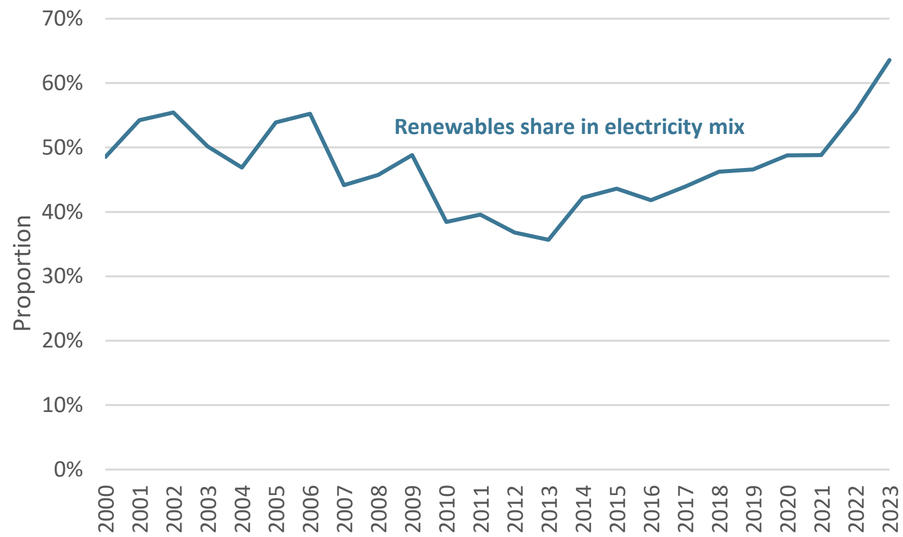
Source: EGEDA (2025)

Note: Biomass used in the residential and commercial sectors is assumed to be traditional biomass and is not included in the definition of modern renewables. All other renewables (biomass used by industry, hydro, geothermal, etc.) are considered modern renewables. Modern renewables also include the share of electricity that is generated from renewable sources.

Chile has increased its share of modern renewables in total final energy consumption (which does not include traditional biomass) from 13% in 2010 to 23% in 2023. As a result, Chile now ranks second among APEC economies for the share of modern renewables in its energy mix (EGEDA, 2025).

Chile has significantly increased the share of renewable energy in its power generation, rising from 56% in 2022 to 64% in 2023, thereby ranking second among APEC economies. The calculation of this indicator includes contributions from auto producers.

Figure 13: Chile's renewable generation share, 2000 to 2023



Source: EGEDA (2025)

Energy Policy

Energy policy	Details	Reference
Hydrogen Strategy for Chile (2026)	The design and implementation of a development policy for hydrogen would allow the displacement of fossil fuels on a large scale in the power generation, transport, and industry sectors.	Ministry of Energy
Energy Efficiency Law (2021)	Law 21,305 outlines a long-term energy efficiency plan, to be updated every five years. The new law regulates the management of energy by large consumers and delivers information to homebuyers regarding housing energy requirements.	Ministry of Energy
Framework Law on Climate Change (2022)	In June 2022, the Chilean Government published Law 21,455, the Framework Law on Climate Change, which establishes the goal of reaching carbon neutrality by 2050.	Ministry of Environment
Agreement on coal-fired power plant shutdown	A total of 1.679 GW of coal-fired power plants shut down by the end of 2024, which is equivalent to 30% of the total coal electricity capacity in place in 2018. Operation of coal power plants will cease or reconvert by 2040 at the latest.	Ministry of Energy
Electromobility strategy	This strategy outlines actions to be taken in the short and medium terms to meet the government's goal of reaching, by 2035, 100% sales of new zero-emission vehicles in the following types: light and medium, public transportation, and mobile machinery.	Ministry of Energy
Long-term energy planning (2023-2027)	The main objectives of this work are to present scenarios to estimate the future energy demand, to be used as input information for electric transmission planning and to function as a tool that helps policymakers develop energy policies. The last report that updated the background information for long-term energy planning was released in 2025.	Ministry of Energy
Energy Agenda 2022-2026	The new government of Chile launched this energy roadmap. The document emphasises equitable access to quality energy and the development of a clean, secure, and resilient energy system.	Ministry of Energy
Updated energy policy 2050 (2022)	This update increased the goal of renewable energy in electricity generation to 80% by 2030 and aims to achieve 100% zero-emission energy by 2050. Additionally, there is a goal of 100% access to electricity by 2030, goals for hydrogen and electromobility, with Chile positioned to be a green hydrogen and derivates exporter by 2030.	Ministry of Energy
Law 21,499 that regulates the production and trade of solid fuels (2022)	This law declares wood fuel, pellets, briquettes, charcoal, and agricultural waste as fuels and establishes requirements and standards for commercialisation. This law is intended to improve air quality and protect the health and safety of people who live in areas where these fuels are used.	Ministry of Energy
Law 21,505 to promote electricity storage and electromobility (2022)	This law will expand renewables in the electricity mix by promoting storage technologies, provide greater security to the grid, and help the process of	Ministry of Energy

	decarbonisation. The law also promotes electric mobility through economic incentives.	
Initial Agenda for a Second Phase of the Energy Transition (2023)	In April 2023, the Ministry of Energy launched the Initial Agenda for a Second Phase of the Energy Transition, with the aim of taking actions for an accelerated decarbonisation of the electricity sector.	Ministry of Energy
Green Hydrogen Action Plan (2024)	The Green Hydrogen Action Plan was published by the Ministry of Energy in April 2024, with the aim of defining a roadmap between 2023 and 2030 that will enable the deployment of a sustainable green hydrogen industry and its derivatives, through coordinated actions between different government ministries and related agencies.	Ministry de Energy
Law 21,721 Modification of the General Law on Electric Systems regarding Electricity Transmission	This law introduced energy storage systems as part of the electricity distribution and transmission networks, execution and operation guarantees for transmission projects associated with future electricity generation and energy storage projects, and other changes that affect the electricity transmission grid.	Ley Chile - Ley 21721 - Biblioteca del Congreso Nacional
Decarbonisation Plan	Following the agreement to fully retire or convert coal-fired power plants by 2040, this plan builds a roadmap that addresses the enabling conditions that will make it possible to dispense with coal and move rapidly towards a low-carbon electricity system.	Ministry of Energy
Work Plan of Enabling Regulations for the Development of the Hydrogen Industry in Chile 2024 - 2030	This plan presents a chronological planning until 2030 of the regulations under development and planned related to hydrogen and its value chain, considering the competences of both the Ministry of Energy and other State institutions.	Ministry of Energy

Notable Energy Developments

Energy Development	Details	Reference
Update in the Hydrogen strategy plan	The March 2026 update shifts the focus of the strategy towards consolidating domestic demand in competitive market segments, with the aim of leveraging this to boost future exports, promote sustainable economic development, and facilitate Chile's decarbonisation.	Ministry of Energy
Battery energy storage systems (BESS) in development	In 2025, Chile established BESS systems as a structural pillar, achieving 1,575 MW of operational capacity and 6,770 MW under construction, with projections of 9 GW by 2027. This has been demonstrated to mitigate renewable energy curtailments and to provide flexibility to Chile's electricity system.	ACERA

Useful Links

Government Institutions

Chilean National Energy Commission (CNE) – www.cne.cl

Energy Explorers – https://exploradores.minenergia.cl/

Renewable Energy National Register (RENOVA) – https://www.coordinador.cl/renova/

Energía Abierta Beta – www.energiaabierta.cl

Fuel Prices in Refuelling Stations Information System – http://www.bencinaenlinea.cl/web2/

Chilean Energy Sustainability Agency (ASE) – www.agenciaSE.org

National Electric Coordinator – www.coordinador.cl

Government of Chile – www.gobiernodechile.cl

Ministry of Economy, Development and Reconstruction – www.economia.cl

Ministry of Energy – www.energia.gob.cl

Ministry of the Environment – www.mma.gob.cl

Nuclear Energy Chilean Commission (CCHEN) – www.cchen.cl

National Institute of Statistics (INE) – www.ine.cl

National Oil Company (ENAP) – www.enap.cl

Superintendence of Electricity and Fuel (SEC) – www.sec.cl

Energy Associations

Chilean Association of Power Generators – www.generadoras.cl

Chilean Association for Renewable Energies and Storage ACERA AG – www.acera.cl

Chilean Association of Electric Companies – www.electricas.cl

Chilean Association of Solar Energy – www.acesol.cl

Chilean Association for Small and Mid-hydro Power Plants (APEMEC) – www.apemec.cl

Chilean Geothermal Energy Association A.G. (ACHEGEO A.G.) – www.achegeo.cl

Chilean Hydrogen Association (H2 Chile) – https://h2chile.cl/

Association of Producers of Green Hydrogen and its Derivatives in Magallanes – www.h2vmagallanes.cl/

Association of Chilean Transmitters – https://transmisoras.cl/

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InvestChile (2026) *Foreing investment grew 13% to US$14.2 billion in 2025.* https://www.investchile.gob.cl/fdi-2025/

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China

Introduction

As the largest energy producer and consumer in the world, China is committed to building a clean, low-carbon, safe, and efficient energy system, with a focus on high-quality development featuring innovative, coordinated, green, open, and shared development.

Table 1: China's macroeconomic data and energy reserves

Key data [a, b]		Energy reserves [c, d, e]	
Area (million km^2)	9.6	Oil (billion barrels)	28
Population (million)	1,408	Gas (trillion cubic feet)	297
GDP (2021 USD billion PPP)	32,005	Coal (million tonnes)	143,197
GDP per capita (2021 USD PPP)	22,687	Uranium (kilotonnes U < USD 130/kgU)	133

Source: a NBS (2025); b World Bank (2025); c OPEC (2025); d EI (2025); e OECD (2025)

Note: Reserves are total proved reserves and reasonably assured recoverable resources for uranium.

On 28 October 2025, the Recommendations for Formulating the 15th Five-Year Plan (2026-2030) for National Economic and Social Development were published. This document pledges to move faster to develop a new type of energy system, focusing on advancing the systematic transition from fossil fuels to safe, reliable alternatives, including wind, solar photovoltaic (PV), hydro, and nuclear energy, and building a new electric power system (The State Council (2025a)).

In pursuit of achieving its "dual carbon goals" (reaching peak carbon emissions by 2030 and achieving carbon neutrality by 2060), China has prioritised renewable energy in its power expansion. In 2025, over 430 GW of wind and solar capacity was commissioned, raising total installed capacity to 1,840 GW. As a result, combined wind and solar capacity surpassed thermal power for the first time, accounting for almost half of the economy's total capacity and contributing 22% of total electricity generation (NEA (2026a)). At the United Nations Climate Summit on 24 September 2025, China announced it would further increase the share of non-fossil fuels in total energy consumption to over 30% and to expand the installed capacity of wind and solar power to 3,600 GW by 2035 (CGTN (2025)).

China keeps a consistent pace in nuclear power construction. During the 14th Five-Year Plan (2021-2025), an average of nine new units were approved annually. A foundational legal milestone was reached with the adoption of the Atomic Energy Law on 12 September 2025, which entered into force on 15 January 2026. The legislation mandates the "active, safe, and orderly" development of nuclear energy (NPC (2025)).

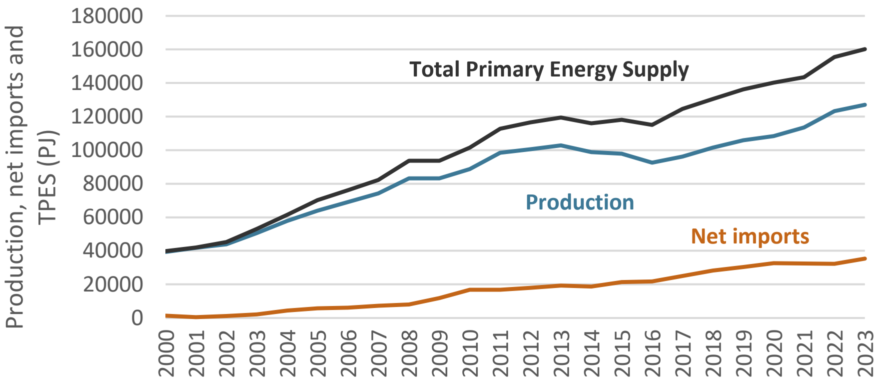
China's "new energy vehicle" (comprising battery electric vehicles (BEVs), hybrid electric vehicles (HEVs), fuel cell electric vehicles (FCEVs), etc.) output and sales in 2025 expanded by more than 28% to approximately 16.5 million (MIIT (2026)). "New type" energy storage capacity (excluding pumped hydro) reached 136 GW/351 GWh in 2025, up 84% from 2024. Furthermore, hydrogen production capacity from renewable sources doubled, reaching 250,000 tonnes a year.

Energy Supply and Consumption

Total Primary Energy Supply

In 2023, China's total primary energy supply increased by 3.0%, reaching ~160,200 PJ. Energy production also grew by approximately 3.0%. Following a three-year plateau, net energy imports surged by nearly 10% year-on-year, driven by a record influx of oil and gas (Figure 1).

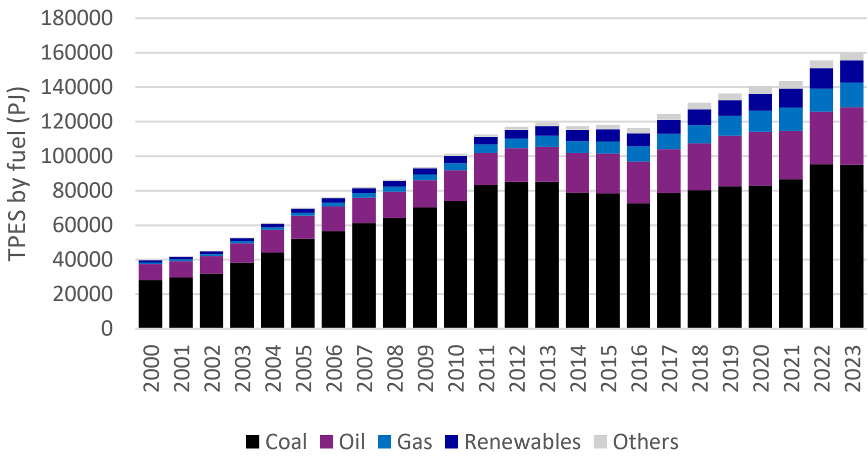
Figure 1: China's energy supply, production, and net imports (PJ), 2000 to 2023



Source: EGEDA (2025)

Coal remains the dominant fuel in China's energy supply. However, despite continued increases in total energy supply, coal supply decreased in 2023 for the first time since 2016, with its share in total supply dropping below 60%. In contrast, the oil and gas supply grew 10% and 6.9% respectively. Renewables grew rapidly and comprised 8.0% of the total supply. Overall, China's energy supply mix is seeing a steady transition from fossil fuels towards cleaner, low-carbon alternatives (Figure 2).

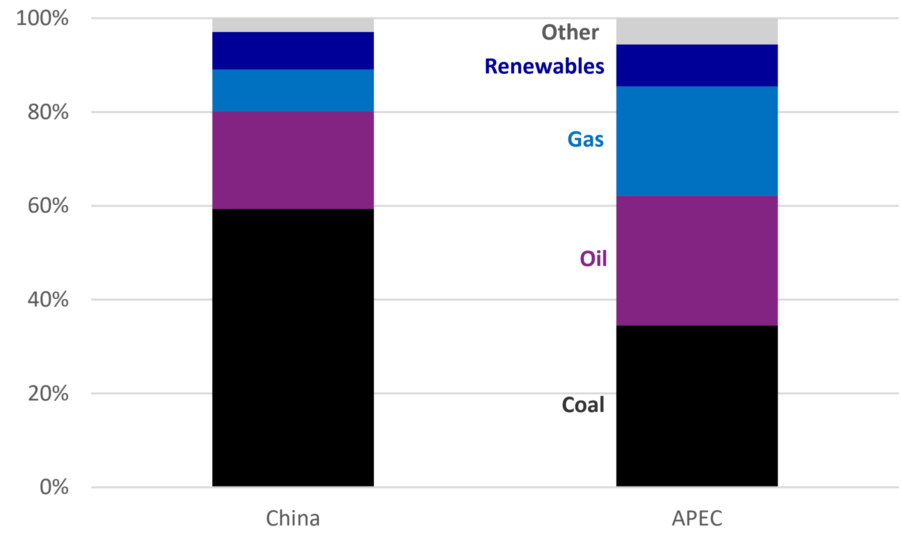
Figure 2: China's energy supply by fuel (PJ), 2000 to 2023



Source: EGEDA (2025)

China's rich coal reserves, price sensitivity on the demand side, and uncertainties in the oil and gas supply chain contributed to the fact that the share of coal in China's energy supply is much higher than that of other APEC members. Meanwhile, with the government vigorously pushing forward the expansion of renewables, the gap in renewable energy shares between China and APEC is narrowing (Figure 3).

Figure 3: Energy supply mix – China and APEC, 2023



Source: EGEDA (2025)

Total Final Consumption

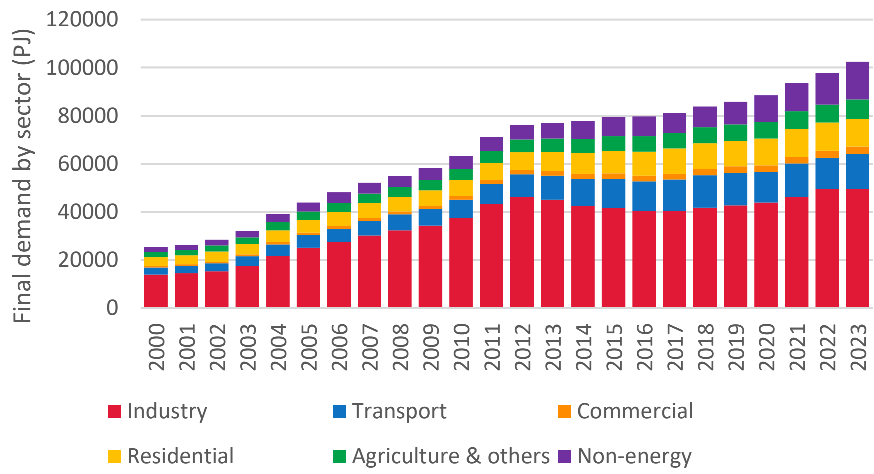
With the challenges posed by COVID-19, the growth rate of China's final energy consumption slowed from 5.6% in 2021 to 3.1% in 2022, with the transport sector experiencing the most significant contraction. However, consumption regained momentum in 2023, expanding by 6.4% to exceed 100,000 PJ (Figure 4).

China's industry has not only been the main driver of domestic economic growth but also played a crucial role in meeting global demand. The industry and non-energy sectors together accounted for more than 60% of the growth in total final consumption. In particular, non-energy consumption expanded 18% in 2023, reflecting strong demand for China's manufacturing products.

The transport sector recovered and increased 11%, with road and domestic air transport contributing around 40% and 50% of that growth, respectively.

Commercial energy consumption also showed a 7.6% recovery. In contrast, residential energy consumption slightly decreased. This may be related to the reduced time residents spend at home and the relatively high demand the previous year due to extreme weather events.

Figure 4: China's final consumption by sector (PJ), 2000 to 2023

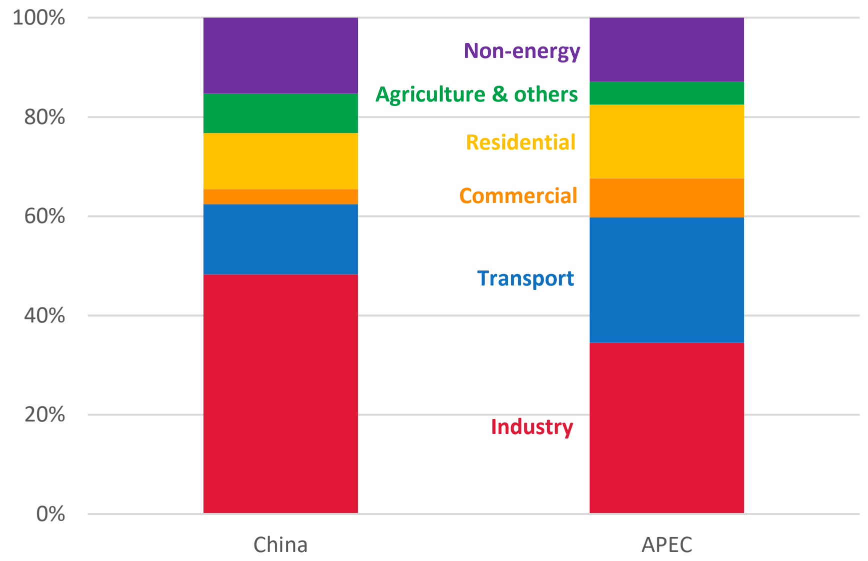


Source: EGEDA (2025)

China's industrial energy consumption accounts for 58% of that of the APEC region and 20% of APEC's total final consumption, making the industrial sector key focus for energy conservation measures.

According to the Action Plan on Boosting Industrial Energy Efficiency (The State Council (2022)) released in June 2022, China aims to cut the energy intensity of its large industrial enterprises with annual revenues of more than CNY 20 million (approximately USD 3.0 million) by 14% from the 2020 level by 2025. This will be achieved through various approaches, including improving energy efficiency, optimising the energy consumption structure, and improving the electrification level of end-use energy consumption. By 2022, a reduction in industry energy intensity of 6.8% had been achieved (The State Council (2024a)).

Figure 5: Final consumption by sector, China and APEC, 2023



Source: EGEDA (2025)

Final Energy Demand

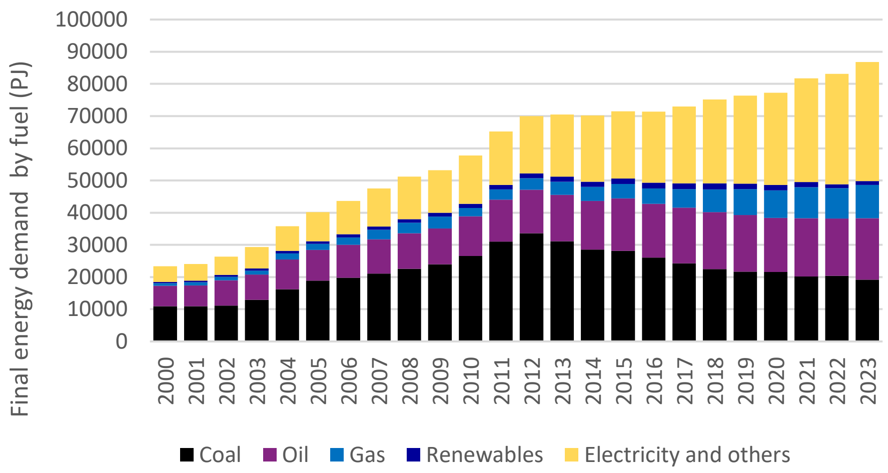
The fuel mix of China's energy demand has seen a dramatic change since 2000. From a proportional point of view, the most noticeable development was the decrease in coal and the increase in "electricity and others" (Figure 6).

In 2023, coal consumption in final energy demand declined by 6.0% from 2022, reducing its total share to 22%, while "electricity and others" expanded its share from 41% to 43%. The share of total renewable energy demand from primary and secondary sources rose to 11% from 10%.

Gas demand increased by more than 9.0% with expansion observed across all major sectors. Notably, the industry sector accounted for nearly 60% of final gas consumption as a lower carbon substitute for coal.

The transport sector drove a rebound in final oil demand due to increased post-pandemic activity. This contrasted with the industrial and residential sectors, where oil demand contracted by 3.0% and 8.9%, respectively. Despite EVs capturing over 30% of China's domestic market, the transport sector remained heavily reliant on petroleum. Oil accounted for 84% of this sector's final demand in 2023.

Figure 6: China's final energy demand by fuel (PJ), 2000 to 2023



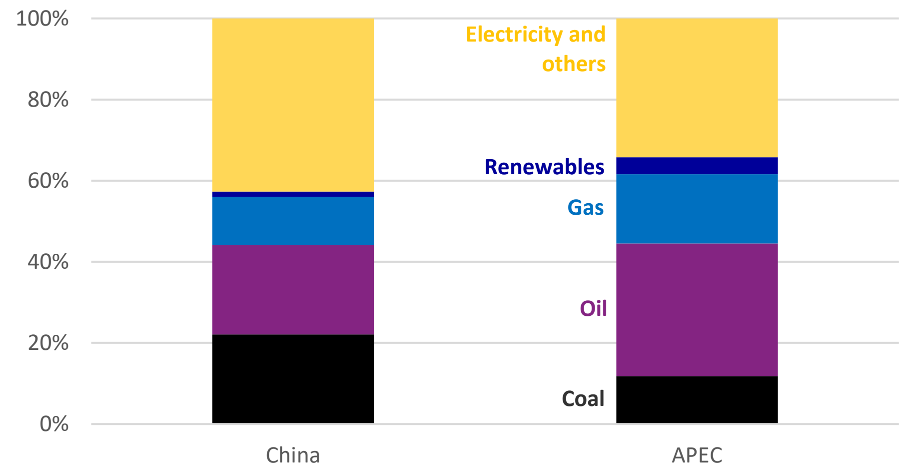
Source: EGEDA (2025)

Note: Figure 6 does not include non-energy sector consumption of energy products.

China consumed 40% of APEC's final energy demand and 75% of the APEC region's coal as a primary energy source. Meanwhile, China is vigorously advancing the electrification of final energy consumption. The

Guiding Opinions on Further Promoting Electricity Substitution (CN Energy News (2022)) issued in 2022 set a target for electricity to account for 30% of final energy consumption by 2025. That number had reached 29% in 2024 (Xinhuanet (2025)).

Figure 7: Final energy demand fuel share, China and APEC, 2023



Source: EGEDA (2025)

Transformation

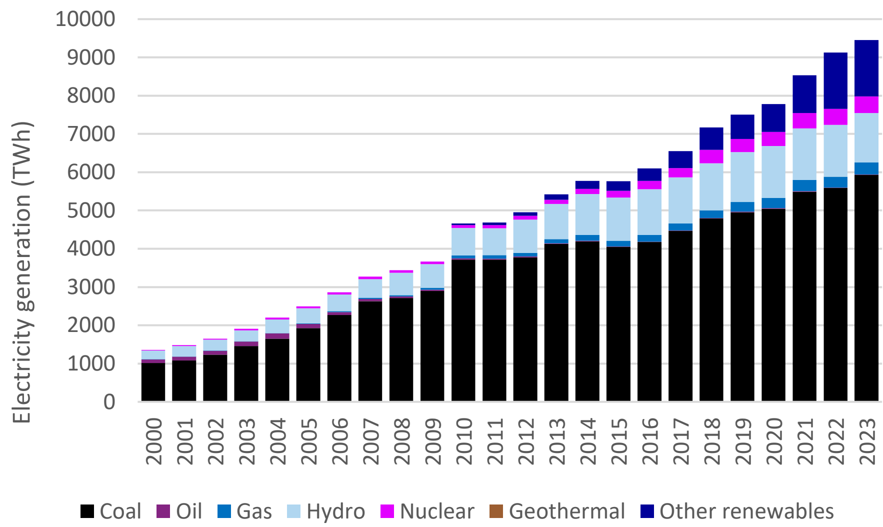
Power Sector

China's electricity generation continued its expansion in 2023, reaching ~9,500 TWh. Coal remains the primary power source, accounting for 63% of total generation due to its abundance and stability. However, despite a 1.8% increase in thermal capacity (The State Council (2024b)), the share of thermal power in the overall generation mix has declined for 12 consecutive years (Figure 8).

Hydropower remains China's largest renewable electricity source, with installed capacity growing by 1.8% in 2023 (The State Council (2024b)). However, actual hydroelectric output contracted by nearly 5.0%. Meanwhile, other renewables experienced rapid growth, with grid-connected wind and solar capacities increasing by 21% and 55%, respectively (The State Council (2024b)). Collectively, renewables contributed approximately 30% to China's total power generation.

Regarding nuclear, its share remained relatively stable at 4.6% in 2023.

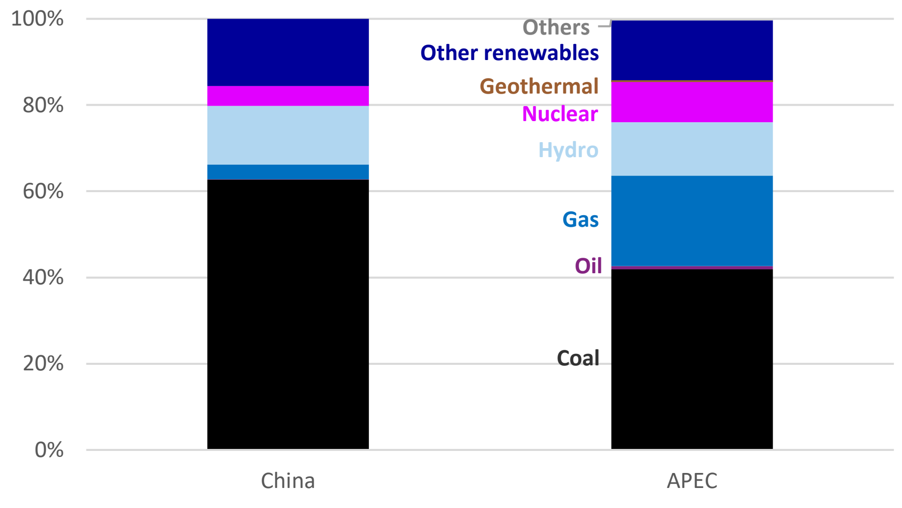
Figure 8: China's electricity generation by fuel, 2000 to 2023



Source: EGEDA (2025)

Through determined efforts to improve power diversification, China's thermal generation share has declined to a level (66%) compatible with APEC (64%) (Figure 9). Also, China is leading the world in both renewable and nuclear power capacity expansion. Statistics show that, in 2023, China commissioned as much solar PV as the entire world did in 2022 (IEA (2024)). With at least 10 new nuclear power units approved every year since 2022, China accounts for half of the nuclear power capacity under construction worldwide (IAEA (2026)).

Figure 9: Electricity generation fuel share, China and APEC, 2023



Source: EGEDA (2025)

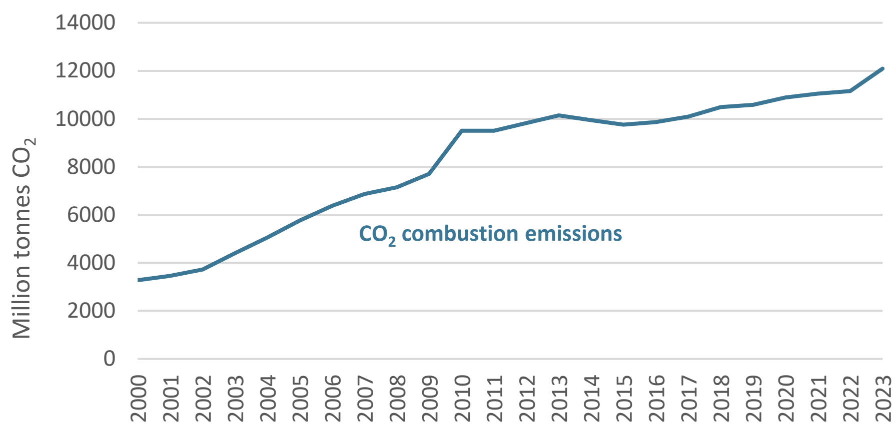
Energy Transition

As an economy heavily reliant on coal, China faces a prominent challenge in meeting growing energy demand while working within a tight timeframe to achieve its decarbonisation goals.

Emissions

For carbon dioxide peaking and carbon neutrality, China has put in place a "1+N" policy framework. "1" refers to the guiding idea and the top-level design for the above goals, outlined in two documents issued in 2021: the Working Guidance for Carbon Dioxide Peaking and Carbon Neutrality in Full and Faithful Implementation of the New Development Philosophy, and The Action Plan for Carbon Dioxide Peaking before 2030. These documents articulate the schedules, roadmaps, and working procedures. The "N" represents the implementation schemes in key areas and sectors, such as energy, industry, transport, agriculture, and rural areas. Additionally, local governments have also implemented detailed schemes within their respective jurisdictions.

Figure 10: China's CO_2 combustion emissions (million tonnes), 2000 to 2023



Source: EGEDA (2025)

On the supply end, China is striving to accelerate building its non-fossil fuel capacity, advancing thermal power plant modifications to upgrade their efficiency and flexibility, as well as modernising the power system to elevate long-distance transmission capacity and expand energy storage.

On the demand side, China is shifting from controlling the volume and intensity of energy use to controlling the volume and intensity of carbon emissions. Energy efficiency benchmarks and standards have been raised in key industrial sectors and buildings. During 2021-2023, the energy consumption per unit of added value in large industrial enterprises decreased by 6.5%. In the transportation sector, China is increasing the share of railways and waterways and promoting new energy vehicles. By the end of 2025, the number of registered new energy vehicles reached 44 million, accounting for 12% of total vehicle stock (MPS (2026)), and more than 20 million charging facilities were in place (NEA (2026b)).

Energy Security

In 2014, President Xi Jinping proposed the New Energy Security Strategy aimed at revolutionising consumption, supply, technology, and institutions, while strengthening all-around international cooperation. This has established the fundamental principles for China's energy development.

China is enhancing the stability and security of its energy supply chain in three key ways. The first is to strengthen strategic security, which involves improving the domestic oil and gas supply and advancing coal-to-liquid and coal-to-gas technologies, as well as biofuel technology.

The second is to raise operational safety standards for thermal power plants and other energy infrastructure. In the short term, coal will continue to provide the ballast for China's energy security. The policy priorities are to optimise coal production capacity distribution, eliminate obsolete capacity, and accelerate the transformation of coal from the main power supply to a power source that provides basic support and flexibility to the domestic power system.

The third is to enhance emergency response capabilities. The main approaches include improving emergency power supply and accident recovery capabilities, strengthening cybersecurity management and control, and improving forecasting, early warning, and response to hazards.

APEC Energy Goals

There are two energy-related objectives that APEC member economies have agreed to meet as a collective: to improve energy intensity and double the share of modern renewables.

Energy Intensity Goal

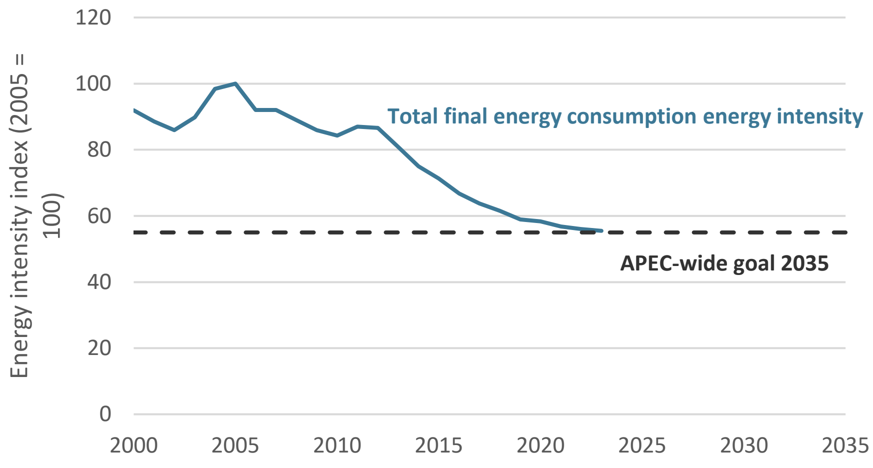
In 2011, APEC member economies agreed to increase their ambition to reduce energy intensity by 45% in 2035, relative to a 2005 baseline. The original goal was a 25% improvement by 2030, relative to a 2005 baseline.

APEC is on track to achieve this energy intensity improvement. The goal does not impose individual economy targets, but it is possible to track the progress of individual APEC economies relative to the overarching proportional improvement.

China has become one of the fastest economies to reduce energy intensity. The 14th Five-Year Plan aims to reduce China's energy intensity by 13.5% below 2020 levels by 2025. By 2024, an 11.6% reduction had been achieved (The State Council (2025b)).

In 2023, China's total final energy consumption intensity (excluding non-energy sources) declined by 45% from its 2005 peak, already reaching the APEC-wide goal for 2035 (Figure 11).

Figure 11: China's total final energy consumption intensity index, 2000 to 2023 (2005 = 100)

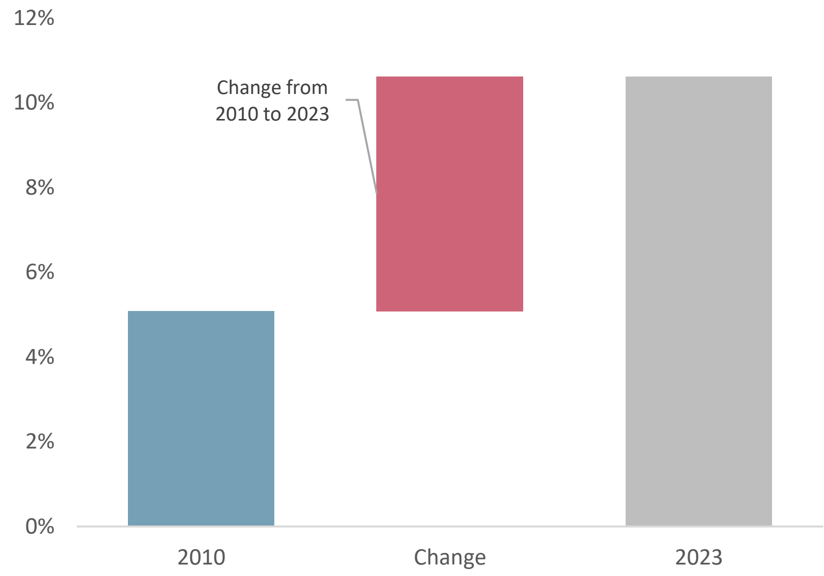


Source: EGEDA (2025)

Doubling of Renewables

The second energy goal involves doubling the share of modern renewables in the APEC energy mix for the period 2010 to 2030. There is no economy-level goal for individual member economies, but improvements by individual economies will contribute to the doubling goal.

Figure 12: China's modern renewable energy share, 2010 and 2023

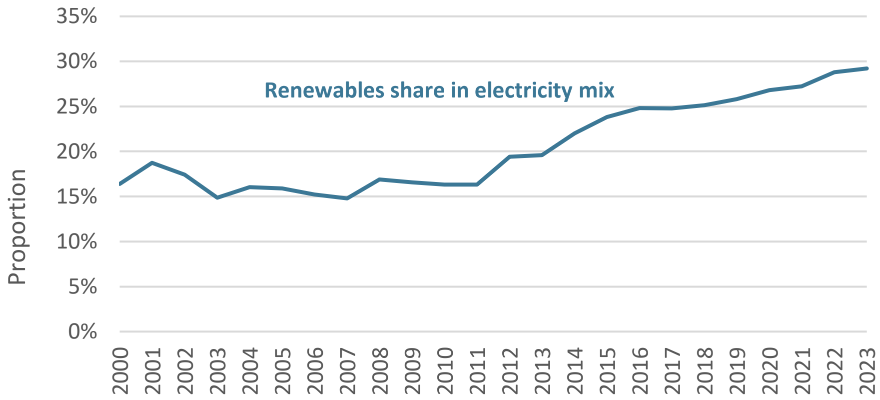


Source: EGEDA (2025)

Note: Biomass used in the residential and commercial sectors is assumed to be traditional biomass and is not included in the definition of modern renewables. All other renewables (biomass used by industry, hydro, geothermal, etc.) are considered modern renewables. Modern renewables also include the share of electricity that is generated from renewable sources.

China is leading the world in expanding wind and solar power, constructing both inland and offshore large-scale power bases, and promoting distributed power production. China's modern renewables' share in final energy consumption in 2023 was 11%, more than double that of 5.1% in 2010 (Figure 12).

Figure 13: China's renewable generation share, 2000 to 2023



Source: EGEDA (2025)

Energy Policy

Energy Policy	Details	Reference
The Energy Law	Aims to promote high-quality energy development, ensure the economy's energy security, accelerate the green transition, and support China's efforts to achieve carbon peak and carbon neutrality goals. It took effect on 1 January 2025.	The State Council
Working Guidance for Carbon Dioxide Peaking and Carbon Neutrality in Full and Faithful Implementation of the New Development Philosophy	The Working Guidance provides guiding principles, guidelines, main objectives, and measures to realise carbon dioxide peaking and neutrality.	The Economy Council of the People's Republic of China
Action Plan for Carbon Dioxide Peaking Before 2030	Outlines measures for gradually slowing the emission of carbon, transitioning to renewable energy, and reducing waste. Offers an overview of China's overall plan for reaching the 2030 goal.	The State Council
Recommendations for Formulating the 15th Five-Year Plan for National Economic and Social Development	This document pledges to move faster to develop a new type of energy system, focusing on advancing the systematic transition from fossil fuels to safe, reliable alternatives, including wind, solar photovoltaic (PV), hydro, and nuclear energy, and building a new electric power system.	The State Council
Guiding Opinions on Vigorously Implementing the Renewable Energy Substitution Initiative	Sets out a plan to accelerate renewable energy consumption to reach a goal of 5 billion tons of standard coal equivalent by 2030.	NDRC
Action Plan for Low-Carbon Transformation Construction of Coal-Fired Power (2024-2027)	Enhances financial support for coal-fired power low-carbon transformation projects and aims to cut the carbon emissions of related projects by 20% by 2025 and 50% by 2027 compared to the average carbon emissions level of similar coal-fired power units in 2023.	NDRC
Action Plan to Accelerate the Construction of a New Power System (2024-2027)	Outlines steps to be taken in nine areas to increase the transmission of clean electricity through the grid, upgrade coal-fired power plants, and expand charging infrastructure for electric vehicles.	The State Council
Updated Nationally Determined Commitment (NDC)	China announced it would further increase the share of non-fossil fuels in total energy consumption to over 30% and to expand the installed capacity of wind and solar power to 3,600 GW by 2035.	CGTN

Notable Energy Developments

Energy Development	Details	Reference
Steady growth in wind and solar generation capacity	By the end of 2025, China's combined wind and solar PV capacity reached 1,840 GW, surpassing thermal power for the first time and accounting for 47% of the total generation capacity.	NEA
Yarlung Zangbo River hydropower project	On 19 July 2025, China embarked on constructing a hydropower project on the Yarlung Zangbo River. The project will consist of five cascade hydropower stations, with a combined capacity of 60 GW and a total investment estimated at around CNY 1.2 trillion (about USD 167.8 billion).	The State Council
Ten nuclear power units approved for construction	On 27 April 2025, China's State Council approved five nuclear power projects with a total of ten reactors, representing a combined investment of over CNY 200 billion (USD 27.4 billion).	World Nuclear News
Power market reform	China aims to establish a unified electricity market by 2030. In 2025, power trade reached 6.6 trillion kWh, representing 64% of China's total electricity consumption.	The State Council

Useful Links

Central People's Government – https://www.gov.cn/

National Development and Reform Commission – https://www.ndrc.gov.cn/

National Energy Administration – https://www.nea.gov.cn/

National Bureau of Statistics of China – https://www.stats.gov.cn/english/

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Hong Kong, China

Introduction

Hong Kong, China (HKC) is located on the south-eastern tip of China and consists of three main regions: Hong Kong Island, the Kowloon Peninsula, and the New Territories, along with 261 outlying islands. Due to geographical constraints, HKC has limited indigenous energy resources, very small-scale biomass, solar, and wind power generation. HKC is heavily energy import dependent, sourcing oil, gas, and coal products, and transformed secondary energy such as electricity, externally to meet its energy demand. Currently, electricity accounts for approximately 60% of HKC's energy demand.

In October 2021, as part of its Climate Action Plan 2050 (CAP2050), HKC announced its goal to halve its carbon emissions by 2035 compared with 2005 levels and achieve carbon neutrality before 2050 through four major decarbonisation strategies: "net-zero electricity generation" and "energy saving and green buildings" that jointly reduce emissions from electricity generation, "green transport", and "waste reduction". According to statistics published by the government, HKC's total greenhouse gas emissions have reached a reduction of approximately 20% from 2005 to 2023 (EEB (2025)).

Up to 2024, some 260 government renewable energy projects had been approved, with an aggregated capacity to generate 26 GWh of electricity each year (GovHK (2026)). By June 2025, CLP Power Hong Kong Limited (CLP Power) had approved more than 420 MW of customer-side renewable generation capacity under its Feed-in Tariff Scheme (CLP (2025)). HK Electric also saw 42 new customer-side renewable installations connected to the grid and another 37 applications approved in the first half of 2025 (HKEI (2025)).

The Integrated Waste Management Facilities Phase I (I·PARK1) has commenced the first phase of trial operation in December 2025. This project is designed to process up to 3,000 tonnes of municipal solid waste per day and generate approximately 480 GWh of electricity annually.

Table 1: Hong Kong, China's macroeconomic data and energy reserves

Key data [a, b]		Energy reserves	
Area (million km^2)	1,114	Oil (billion barrels)	-
Population (million)	7.5	Gas (trillion cubic feet)	-
GDP (2021 USD billion PPP)	486	Coal (million tonnes)	-
GDP per capita (2021 USD PPP)	64,429	Uranium (kilotonnes U < USD 130/kgU)	-

Source: a C&SD (2025); b World Bank (2025)

Note: Reserves are total proved reserves and reasonably assured recoverable resources for uranium.

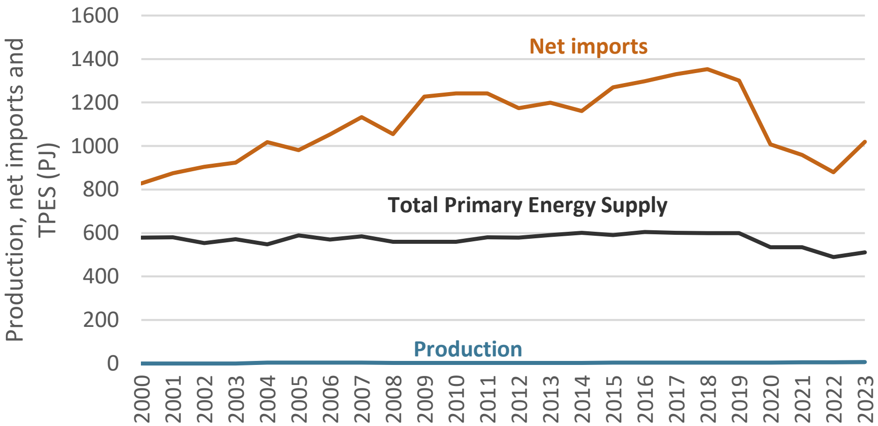
In the buildings sector, the implementation of multiple energy saving measures resulted in cumulative electricity savings of 3.7 billion kWh in 2024 compared with 2015 levels (EEB (2025)). In the transport sector, by the end of December 2025, the total number of electric vehicles (EVs) in HKC reached around 149,000, representing 16.3% of the vehicle stock. Some 16,435 EV public chargers were installed, including 72 fast chargers (EPD (2026)).

Energy Supply and Consumption

Total Primary Energy Supply

HKC's total primary energy supply (TPES) remained stable at about 600 Petajoules (PJ) after 2000, before dropping to under 550 PJ in 2020 and then further to approximately 491 PJ in 2022. In 2023, TPES increased to 513 PJ, 4.5% higher than the previous year. As international bunkers recovered, net imports increased after four consecutive years of decline, rising 14% compared to 2022. International aviation bunkers grew 73% from the previous year.

Figure 1: Hong Kong, China's energy supply, production, and net imports (PJ), 2000 to 2023



Source: EGEDA (2025)

The growth in TPES was mainly driven by fossil fuels. In 2023, the total supply of coal, oil, and gas combined increased by 5.5%, with its share in TPES elevating by 0.9 percentage points.

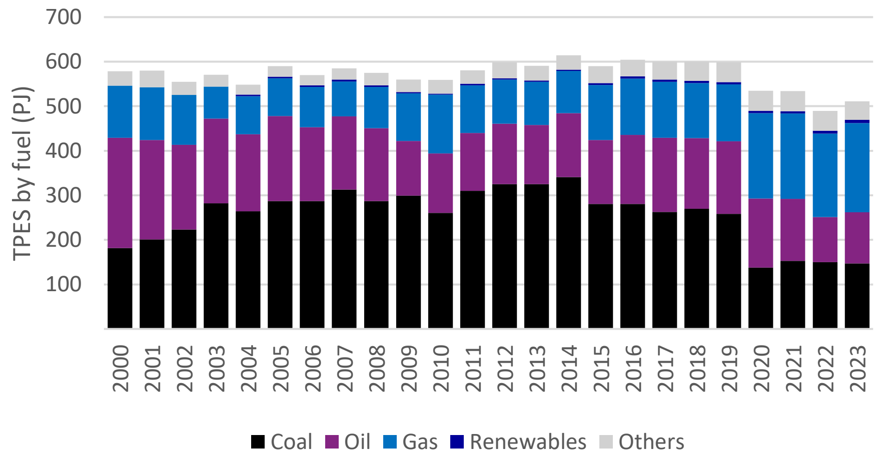
Oil supply experienced the most significant growth, rising by 13.7%, reflecting robust demand for petroleum products.

Gas supply increased by 7.3%. With the first offshore LNG terminal commencing operation in July 2023, around 10% of HKC's gas imports that year were in the form of LNG.

In contrast, coal supply decreased by 2.3% as HKC gradually phased out coal power generation.

Renewable energy supply continued to expand, from 6.4 PJ in 2022 to 7.0 PJ in 2023 (Figure 2).

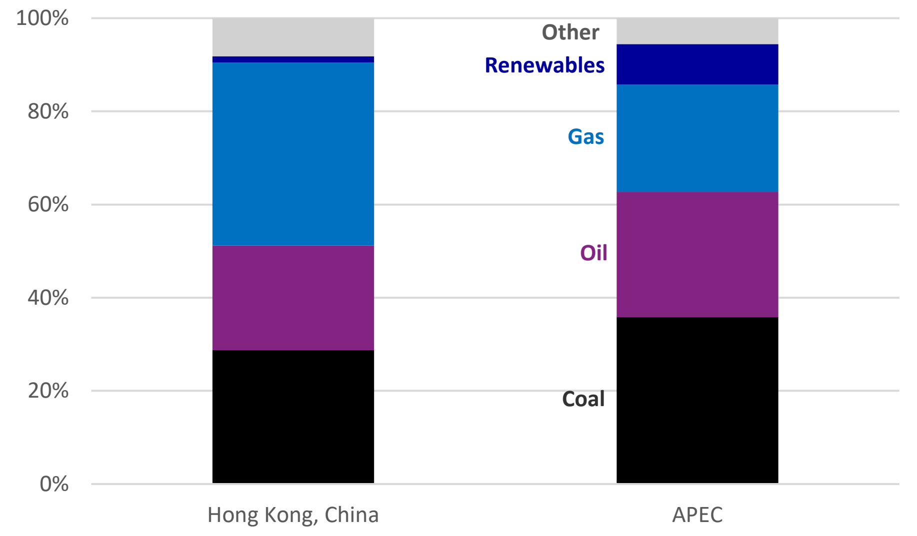
Figure 2: Hong Kong, China's energy supply by fuel (PJ), 2000 to 2023



Source: EGEDA (2025)

HKC's TPES structure shows a reliance on fossil fuels (90%), four percentage points higher than that of the entire APEC region (86%) in 2023 (Figure 3). Due to its geographical and environmental constraints, HKC's share of renewables remained lower than that of the APEC region.

Figure 3: Energy supply mix – Hong Kong, China and APEC, 2023

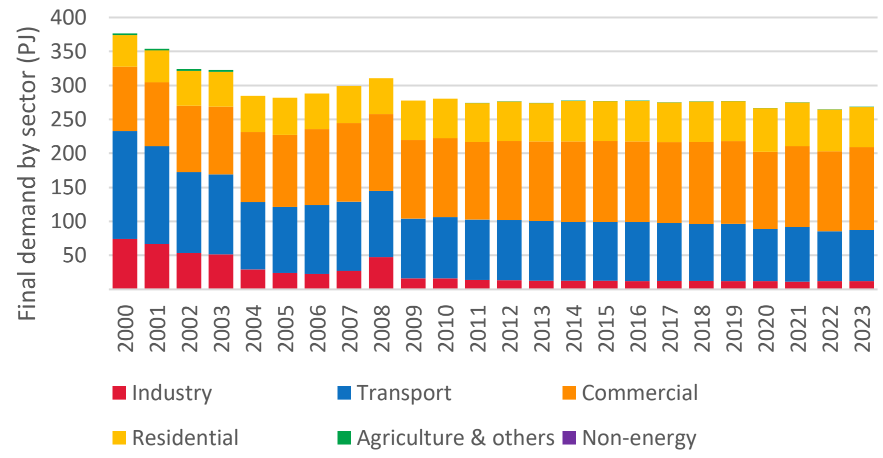


Source: EGEDA (2025)

Total Final Consumption

HKC's total final consumption (TFC) declined by about a quarter from 374 PJ in 2000 to 282 PJ in 2005, driven by falling demand from the industry sector. Economic growth in HKC led to a steady growth of final consumption until it was disrupted by the financial crisis in 2008. Since then, TFC in HKC has stabilised at an average of 275 PJ. HKC's energy consumption dropped by 4% in 2020 after the COVID-19 outbreak and then resumed in 2021 before dropping again by 4% in 2022. In 2023, TFC slightly recovered, reaching 269 PJ (Figure 4).

Figure 4: Hong Kong, China's final consumption by sector (PJ), 2000 to 2023

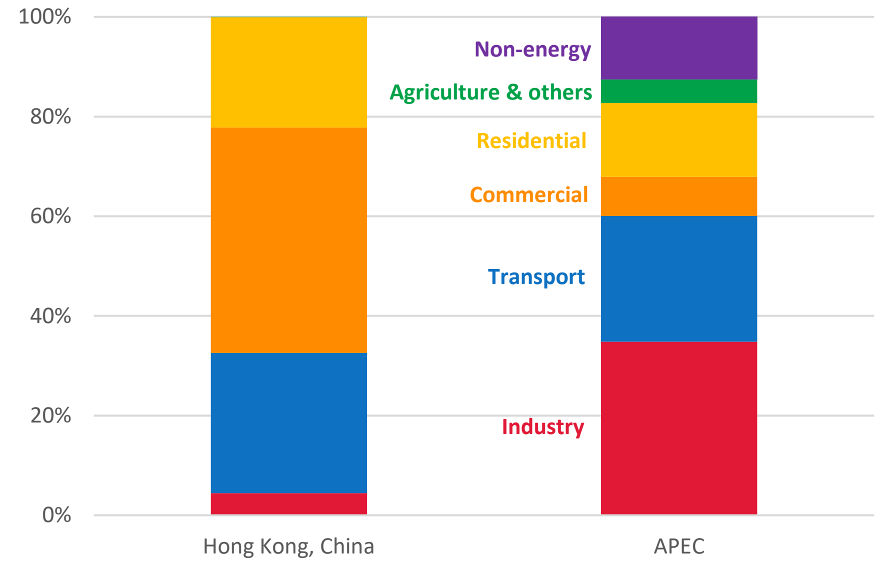


Source: EGEDA (2025)

As a service-based economy, the commercial sector accounted for 45% of HKC's energy consumption in 2023. The transport sector was the second largest consumer with a 28% share. In 2004, the former surpassed the latter for the first time, becoming the largest final consumer of energy. Since 2000, energy consumption in the commercial sector has shown steady growth, strengthened by HKC's important role in merchandise trade and commercial services (Figure 4).

HKC's commercial energy consumption share of TFC was 4.7 times larger than the APEC region (7.9%) in 2023, as HKC's service activities have been the largest contributor to economic output since the 2000s. The transport sector's share was slightly higher than that of the APEC region, while industry, agriculture, and other sectors' shares were much smaller (Figure 5).

Figure 5: Final consumption by sector, Hong Kong, China and APEC, 2023



Source: EGEDA (2025)

Final Energy Demand

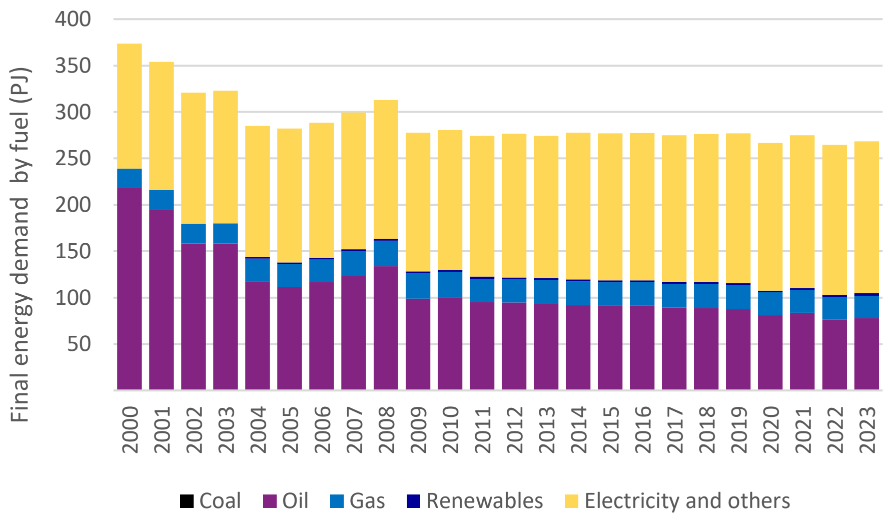
HKC's final energy demand has been dominated by the "electricity and others" category since the 2000s, with its share rising from 50% in 2004 to more than 60% in 2023. Since 2009, the share of oil has gradually decreased from 43% to under 30% in 2023. Gas and renewables accounted for 9.0% and 1.0%, respectively, in 2023.

Electricity consumption is concentrated within the commercial and residential sectors, which collectively account for more than 90% of total electricity demand. In 2023, the commercial sector achieved an electrification rate of nearly 90%. In contrast, 22% of residential energy consumption was still derived from gas, accounting for more than half of HKC's final gas demand across all sectors.

Road transport energy demand remained almost exclusively dependent on petroleum products, representing around 82% of total final oil demand of the territory.

Renewables in the final energy demand reached a historic peak of 2.7 PJ in 2023 (Figure 6). The primary driver of this growth was "biofuels and waste", which stands as the largest indigenous renewable energy source in HKC.

Figure 6: Hong Kong, China's final energy demand by fuel (PJ), 2000 to 2023

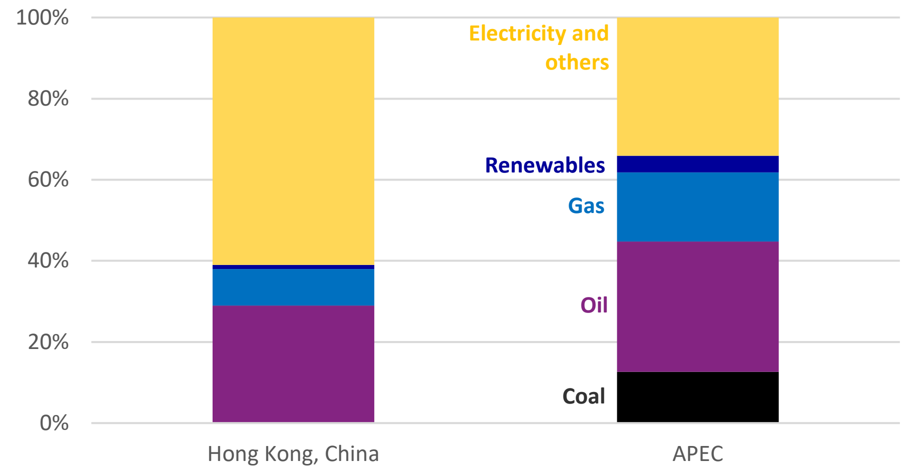


Source: EGEDA (2025)

Note: Figure 6 does not include non-energy sector consumption of energy products.

With a relatively high level of electrification, HKC's share of "electricity and others" was almost double that of the APEC region in 2023 (Figure 7). Resultingly, the shares of oil, gas, and renewables were smaller than those in the APEC region average. In addition, the consumption of coal by end-users in HKC was negligible.

Figure 7: Final energy demand fuel share, Hong Kong, China and APEC, 2023



Source: EGEDA (2025)

Transformation

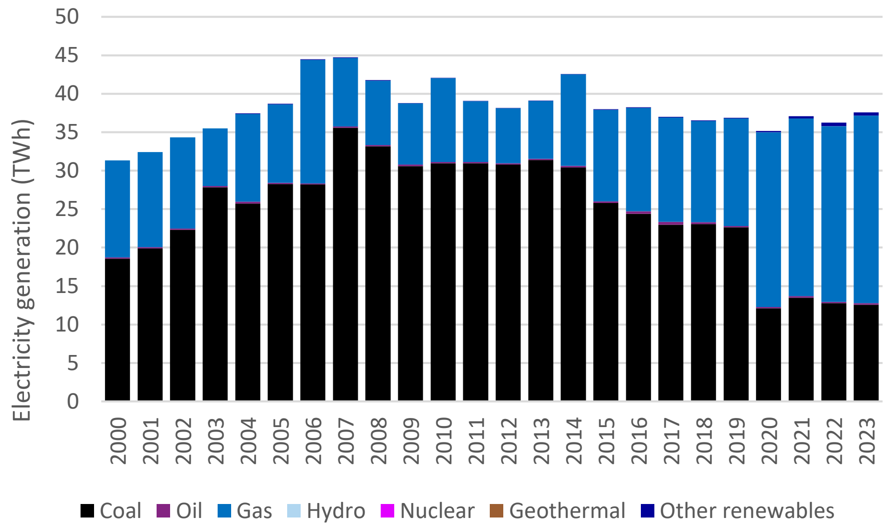
Power Sector

HKC's electricity generation relies heavily on fossil fuels, with coal and gas collectively accounting for over 98% of the mix. In alignment with CAP2050, HKC aims to gradually phase out coal-fired power generation by 2035. Over the past decade, the power sector has achieved a substantial transition from coal to gas. Between 2013 and 2023, the share of coal declined from around 80% to 33%, while the share of gas rose from 20% to 65% (Figure 8).

Currently, renewable power generation in HKC is primarily from solar, biogas, and biomass. In 2023, renewable generation reached 437 GW, up 21% from 2022. More than 95% of this growth was from solar.

To bolster renewable energy capacity and achieve its “zero landfill” waste management objective, HKC has commissioned several advanced waste treatment facilities. These include the T•PARK sludge treatment facility, the O•PARK1 and O•PARK2 organic waste treatment centres, and the I•PARK1 municipal waste management facility. By the end of 2024, T•PARK and O•PARK1 had collectively generated approximately 560 GWh of electricity, of which nearly 80 GWh was exported to the grid (GovHK (2025b)). The Government would seek funding approval in 2026 for the construction of I•PARK2, which will have a daily treatment capacity of 6,000 tonnes and an expected annual electricity generation of 960 GWh (LegCo (2024)).

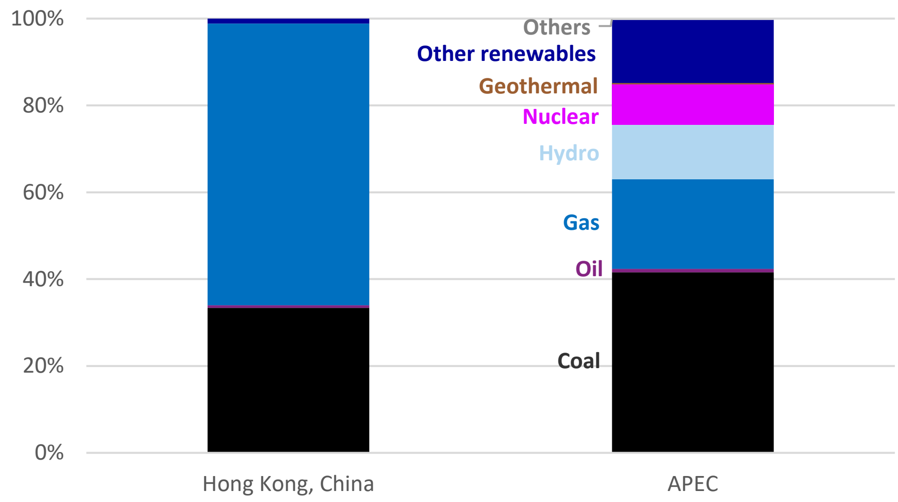
Figure 8: Hong Kong, China’s electricity generation by fuel, 2000 to 2023



Source: EGEDA (2025)

The dominance of gas in HKC's power sector is apparent compared to the APEC region's generation mix in 2023 (Figure 9).

Figure 9: Electricity generation fuel share, Hong Kong, China and APEC, 2023



Source: EGEDA (2025)

Energy Transition

HKC aims to raise the share of zero-carbon energy in its electricity generation fuel mix to 60%-70% by 2035. The Clean Energy Transmission System (CETS) enhancement project, scheduled to replace overhead lines by 2026 (CLP (2025)), will provide HKC with greater flexibility to import more clean energy and reach about 35% of the electricity generation fuel mix. Additionally, planned electricity facilities in the Tseung Kwan O Area 132 are projected to provide a 30% increase in electricity import capacity by 2035.

HKC has announced an ambitious plan to boost renewables despite the challenge of limited terrain and high population density. The government strives to increase the share of renewables in the electricity generation fuel mix to 7.5%-10% by 2035 and further increase this share to 15% subsequently through facilitating local renewable energy projects, regional cooperation, and joint ventures.

In 2018, the HKC government introduced the Feed-in Tariff Scheme to encourage the adoption of renewable energy. This initiative allows private sector entities to sell electricity generated from renewable sources to power companies at rates higher than standard electricity tariffs, thereby assisting in recovering the costs associated with renewable energy investments.

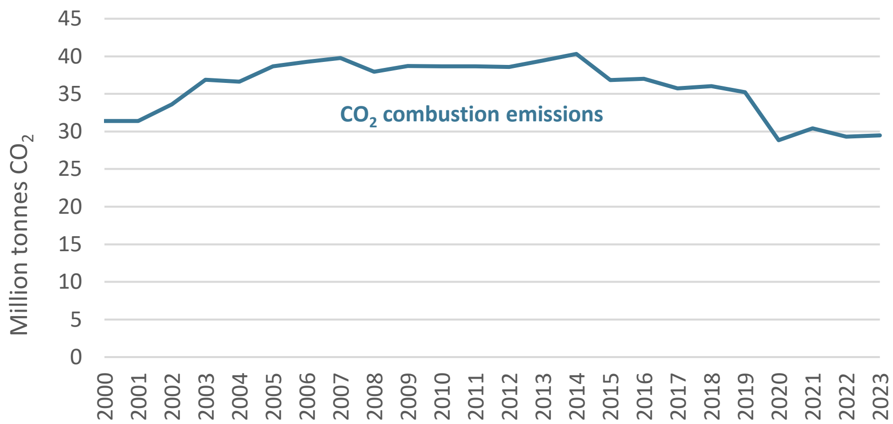
Vehicle electrification is a critical initiative for HKC's decarbonisation. As aforementioned, HKC has made positive progress in encouraging EV adoption. Meanwhile, hydrogen is also considered to have high potential in decarbonising the transport sector. The Chief Executive's 2025 Policy Address stated that, after the announcement of the Strategy of Hydrogen Development in 2024, 28 hydrogen energy trial projects were in the pipeline, covering hydrogen vehicles, hydrogen filling stations, etc.

As a major international shipping hub, HKC aims to develop a green maritime fuel bunkering centre, providing liquefied natural gas (LNG), green methanol, and other low-carbon fuel bunkering services. On 20 June 2025, HKC completed the largest single LNG bunkering operation at the Kwai Tsing Container Terminals, supplying 4,300 tons of LNG. HKC is also committed to developing a sustainable aviation fuel (SAF) industry supply chain and plans to achieve an SAF consumption ratio of 1% to 2% for flights departing from Hong Kong International Airport by 2030 (GovHK (2025a)).

Emissions

HKC is on course to reduce its carbon emissions by 50% before 2035 relative to 2005 levels. CO_2 emissions increased by approximately one-third after 2000, peaking at 40 million tonnes in 2014. Since then, CO_2 emissions have declined to 29 million tonnes in 2023 (Figure 10). This reduction was achieved through various decarbonisation measures from both the supply and demand sides, including promoting EVs and energy-saving measures, constructing innovative waste-to-energy and waste-to-resources facilities, and reducing coal use in electricity generation.

Figure 10: Hong Kong, China's CO_2 combustion emissions (million tonnes), 2000 to 2023



Source: EGEDA (2025)

Energy Security

Ensuring a stable supply of fuel and electricity is at the heart of HKC's energy security measures. In mid-2023, HKC started diversifying its gas sources by importing LNG through its first offshore LNG receiving terminal.

HKC continues to explore avenues to enhance regional cooperation in order to increase its supply of zero-carbon electricity. More than a quarter of HKC's electricity demand is secured through imported zero-carbon energy from the nuclear power station located in Guangdong, China via an electrical grid interconnection with the China Southern Power Grid. Additionally, a pumped storage power station with 600 MW capacity located in Guangdong supports the operation and security of HKC's electricity supply system.

APEC Energy Goals

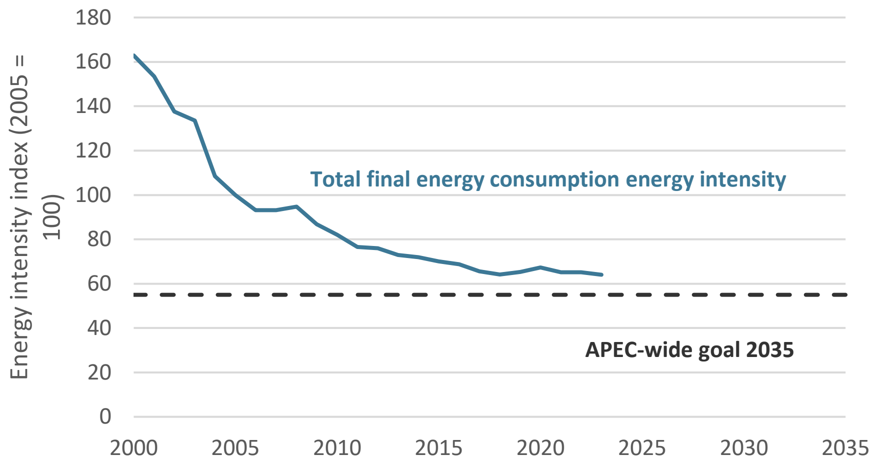
There are two energy-related objectives that APEC member economies have agreed to meet as a collective: to improve energy intensity and double the share of modern renewables.

Energy Intensity Goal

In 2011, APEC member economies agreed to increase their ambition to reduce energy intensity by 45% in 2035, relative to a 2005 baseline. The original goal was a 25% improvement by 2030, relative to a 2005 baseline.

APEC is on track to achieve this energy intensity improvement. The goal does not impose individual economy targets, but it is possible to track the progress of individual APEC economies relative to the overarching proportional improvement.

Figure 11: Hong Kong, China's total final energy consumption intensity index, 2000 to 2023 (2005 = 100)



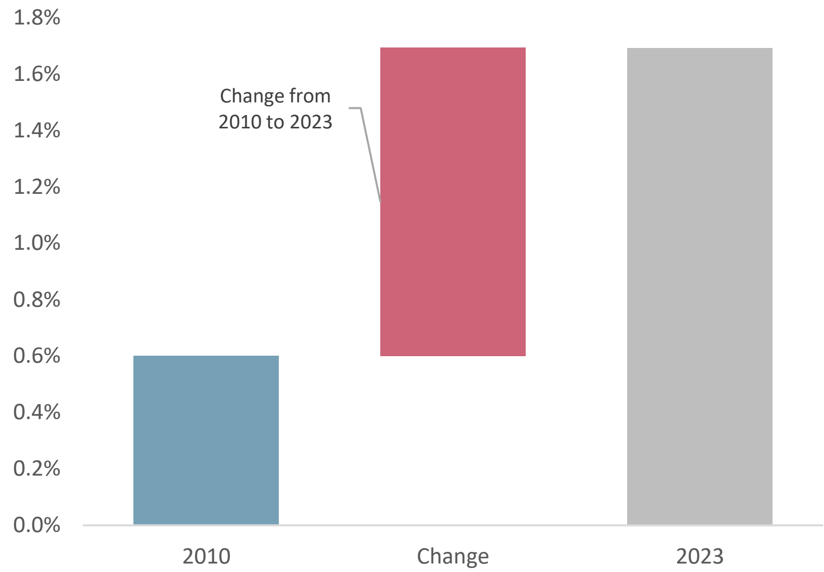
Source: EGEDA (2025)

Relative to the 2005 baseline, HKC's final energy consumption intensity declined by 36% from 2005 to 2023. The energy intensity reduction in HKC has also contributed to the positive progress towards achieving APEC's energy intensity goal.

Doubling of Renewables

The second energy goal involves doubling the share of modern renewables in the APEC energy mix for the period 2010 to 2030. There is no economy-level goal for individual member economies, but improvements by individual economies will contribute to the doubling goal.

Figure 12: Hong Kong, China's modern renewable energy share, 2010 and 2023

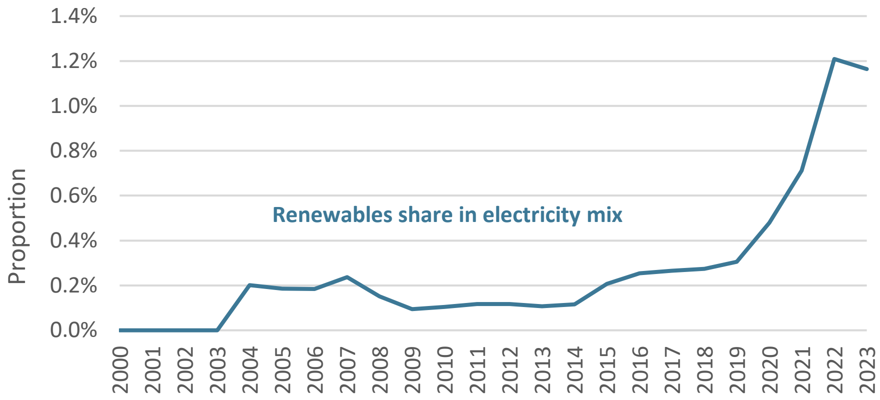


Source: EGEDA (2025)

Note: Biomass used in the residential and commercial sectors is assumed to be traditional biomass and is not included in the definition of modern renewables. All other renewables (biomass used by industry, hydro, geothermal, etc.) are considered modern renewables. Modern renewables also include the share of electricity that is generated from renewable sources.

HKC's share of modern renewables in final energy consumption reached 1.7% in 2023, up from 0.6% in 2010 (Figure 12). While the share of renewables in indigenous electricity generation is relatively low, there was a rise from 0.11% to 1.2% over the same period (Figure 13).

Figure 13: Hong Kong, China's renewable generation share, 2000 to 2023



Source: EGEDA (2025)

Energy Policy

Energy Policy	Details	Reference
Green Tech Fund (GTF)	HKD 400 million has been allocated for setting up the GTF to provide better and more focused funding support for environmental protection.	GTF
New Energy Transport Fund (NTF)	The government has allocated a total of HKD 3 billion to subsidise transport trade and charitable/non-profit organisations to test out innovative green transport technologies and to procure products using these technologies.	Environment and Ecology Bureau
Energy Efficiency Initiatives	Energy efficiency initiatives in HKC include the Mandatory Energy Efficiency Labelling Scheme (MEELS), the Voluntary Energy Efficiency Labelling Scheme (VEELS), the Building Energy Efficiency Ordinance (BEEO), the District Cooling System (DCS), and Retro-Commissioning.	Environment and Ecology Bureau
Renewable Energy Initiatives	Renewable energy initiatives in HKC include the Feed-in Tariff and the Renewable Energy Certificate, the installation of a number of large-scale renewable energy systems at government premises, and the planning of many other major projects.	GOVHK
Scheme of Control Agreements (SCAs)	The SCAs promote the development of quality service by power companies and improve energy efficiency and energy conservation.	Environment and Ecology Bureau
A Memorandum of Understanding (MoU) Between the National Energy Administration and HKC	This is the MoU that details that China provides HKC with a stable supply of natural gas and nuclear electricity.	Environment and Ecology Bureau
Energy-Saving Plan for Hong Kong's Built Environment 2015-2025+	This plan comprises energy-saving policy and strategies to achieve an energy intensity reduction of 40% from the 2005 level by 2025.	Environment and Ecology Bureau
Climate Action Plan 2030+ Report	Plans and measures across sectors to reduce carbon intensity by 65%-70% from 2005 levels by 2030, equivalent to a 26%-36% absolute reduction and a reduction to 3.3-3.8 tonnes on a per capita basis.	Environment and Ecology Bureau
Climate Action Plan 2050	This includes comprehensive plans and measures across sectors to achieve carbon neutrality before 2050.	Environment and Ecology Bureau
Hong Kong Roadmap on Popularisation of Electrical Vehicles	This roadmap includes measures related to electric vehicles to achieve zero vehicular emissions before 2050.	Environment and Ecology Bureau
Clean Air Plan for Hong Kong 2035	This plan includes comprehensive policies, measures, and long-term decarbonisation strategies to improve air quality.	Environment and Ecology Bureau
Fast Charger Incentive Scheme	The government launched this scheme on 25 July 2025 to earmark HKD 300 million to provide 3,000 fast chargers to support 160,000 more EVs. It is expected that all fast chargers will be put into service gradually from 2026 to the end of 2028.	Environment and Ecology Bureau

The Strategy of Hydrogen Development in Hong Kong	Hong Kong, China's hydrogen development strategy focuses on advancing clean energy adoption through pilot projects, infrastructure planning, and regional collaboration to support decarbonisation and sustainable growth.	Environment and Ecology Bureau

Notable Energy Developments

Energy Development	Details	Reference
The Chief Executive's 2025 Policy Address	The government is committed to promoting the development of the New Energy Industry by developing a sustainable aviation fuel industry chain, advancing hydrogen energy trial projects, and pushing forward the construction of Hong Kong, China's first large-scale EV battery recycling facility.	GOVHK
Building Energy Efficiency (Amendment) Ordinance 2025	The Ordinance was published in June 2025 and will be fully implemented on 20 September 2026. Major amendments involve extending the scope of energy efficiency regulation to more types of buildings, including data centres, and shortening the intervals of energy audits.	The Electrical and Mechanical Services Department
The Gas Safety (Amendment) Ordinance 2025	The Ordinance, published in July 2025, brought hydrogen used or intended to be used as fuel to propel vehicles, trains, or machinery, etc. ("regulated hydrogen") under HKC's regulatory framework.	GOVHK
GTF Fifth Application Round	In the fifth application round, the GTF Assessment Committee approved six projects from 129 applications with a total grant of around HKD 24 million. Together with the first four rounds of applications, the GTF has so far approved 39 projects, involving a total grant of around HKD 171 million.	GOVHK
Hydrogen Energy Trial Projects	As of 15 December 2025, the government has given an agreement-in-principle in stages to a total of 32 applications of hydrogen energy trial projects.	GOVHK
Fast Charger Incentive Scheme	As of December 2025, Acknowledgement Notices have been issued to 35 applications after vetting, concerning 426 fast chargers. Some 20 of these fast chargers have been put into service.	Environment and Ecology Bureau
Integrated Waste Management Facilities Phase I (I·PARK1)	The first large-scale waste-to-energy facility, I·PARK1, commenced the first phase of trial operation in December 2025. This facility has a designed daily municipal solid waste treatment capacity of 3,000 tonnes and a power output of 480 million kWh.	GOVHK

Useful Links

GovHK of the Hong Kong Special Administrative Region Government – www.gov.hk/en

Electrical and Mechanical Services Department – www.emsd.gov.hk

Environment and Ecology Bureau – www.eeb.gov.hk

Environmental Protection Department – www.epd.gov.hk

Council for Sustainable Development – www.eeb.gov.hk/en/susdev/council/pastreports.htm

Climate Ready – cnsd.gov.hk/en/climate-ready/

Information on New and Renewable Energy (RE) – www.emsd.gov.hk/en/energy_efficiency/new_renewable_energy/index.html

Low Carbon Living Calculator – www.carboncalculator.gov.hk

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Indonesia

Introduction

Indonesia is the largest energy consumer in Southeast Asia, consistent with its position as the region's most populous economy and largest economy. It also hosts the largest mining sector and the largest installed power generation capacity in the region. With this scale and intensive industrial mix, it remains Southeast Asia's highest emissions-emitting economy.

Although the economy continued to rely heavily on fossil fuel resource production as a major contributor to revenue, Indonesia achieved several milestones in its energy transition. The government implemented the B40 biodiesel mandate, increasing the blending requirement from B35 in the previous year. In parallel, the share of renewable energy in the energy mix rose from 14.6% in 2024 to 15.7% in 2025 (MEMR, 2026a).

On the international stage, Indonesia reaffirmed its long-term commitment to achieving net zero emissions at COP30 in Brazil. This was followed by the submission of its Second Nationally Determined Contribution (NDC) to the UNFCCC in October 2025, which introduced a more ambitious emissions reduction target for 2030 (UNFCC, 2025).

At the same time, the United States' withdrawal from the Just Energy Transition Partnership (JETP) significantly weakened the momentum of Indonesia's net-zero agenda, as USAID support was terminated and several energy transition projects and research initiatives were halted.

These challenges were further compounded by delays in the development of the new capital city, which was initially envisioned as a model of green and sustainable urban development. The government budget has shifted toward more immediate priorities, like the defence budget and the Nutritious Meals Program. A series of major natural disasters linked to deforestation for palm oil expansion and excessive mining activities have also created substantial financial burden for the government and significantly hindered the progress of the capital city development and energy transition.

Table 1: Indonesia's macroeconomic data and energy reserves

Key data [a, b]		Energy reserves [c, d]	
Area (million km^2)	1.9	Oil (billion barrels)	2.4
Population (million)	281.2	Gas (trillion cubic feet)	44
GDP (2021 USD billion PPP)	3,905.7	Coal (million tonnes)	34,869
GDP per capita (2021 USD PPP)	13,890	Uranium (kilotonnes U < USD 130/kgU)	5,500

Source: a BPS (2025); b EGEDA (2025); c Energy Institute (2024); d NEA (2025)

Note: Reserves are total proved reserves and reasonably assured recoverable resources for uranium.

Energy Supply and Consumption

Energy Production

In 2025, Indonesia's energy sector underwent several significant developments. Crude oil production reached approximately 605,000 barrels per day, representing a 3.8% increase compared to 2024 (SKK Migas, 2026a).

Indonesia remains dependent on imports of crude oil and refined petroleum products due to limited domestic refining capacity and rising demand. In 2023, domestic crude production increased slightly, but due to constraints in domestic refinery capacity and technology, exports resultingly increased. Additionally, with international oil prices fluctuating between USD 70 and 90 per barrel in 2023, far lower than the peaks above USD 120 per barrel seen in 2022, crude oil imports in 2023 also increased by 15%.

Coal production in 2025 reached approximately 790 million tonnnes, reflecting a 5.5% decline from 2024. Despite this decrease, Indonesia remained the world's largest coal exporter, accounting for approximately 43% of global coal utilisation (MEMR, 2026a).

Indonesia's coal companies benefited from the exceptionally high coal prices in 2022. However, international prices fell sharply in 2023, from around USD 400 to USD 150 per metric tonnes, which limited incentives for further production expansion.

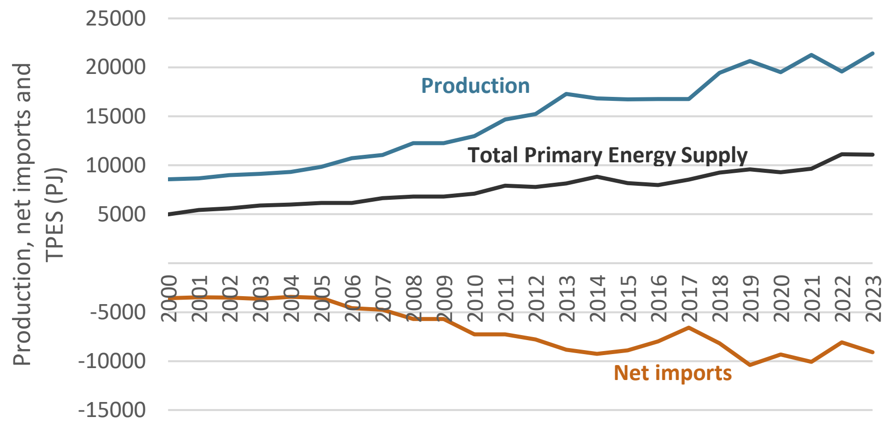
Natural gas production rose to 6,867 million standard cubic feet per day (MMSCFD), an increase of 6.4% year-on-year (SKK Migas, 2026b). Indonesia successfully avoided natural gas imports while fully satisfying domestic consumption and maintaining its export contract commitments.

Indonesia maintained its natural gas export cap at around 30% as part of its policy to prioritise domestic utilisation. This policy was reinforced by declining international gas prices, which dropped from about USD 7-9 per million British Thermal Units (MMBTU) in 2022 to below USD 4 per MMBTU in 2023. As a result, natural gas exports decreased by approximately 17% compared to 2022.

Total Primary Energy Supply

Total Primary Energy Supply (TPES) in 2023 remained stable compared to 2022, declining slightly by 0.3%. This modest change was mainly driven by the easing of international commodity prices in 2023 for coal, natural gas, and crude oil following the sharp price surge in 2022 during the post-pandemic recovery period (IEA, 2025a).

Figure 1: Indonesia energy supply, production, and net imports (PJ), 2000 to 2023

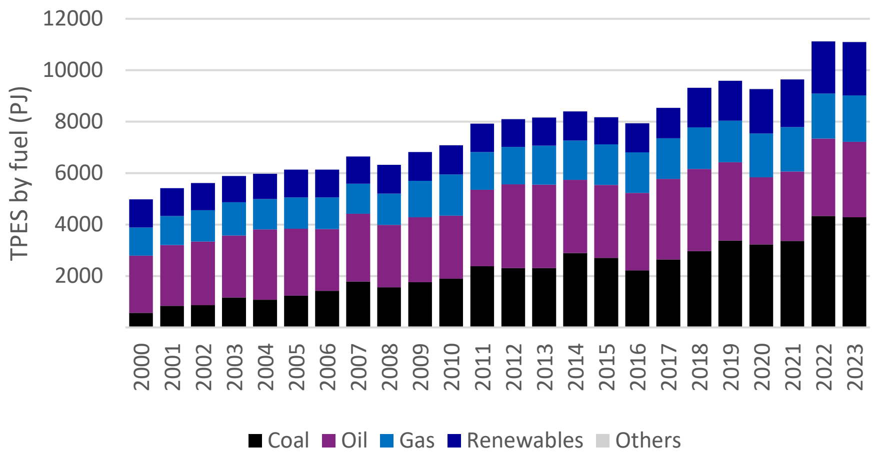


Source: EGEDA (2025)

Indonesia's TPES remains heavily reliant on fossil fuels, particularly coal, as the primary energy source for its economy. In 2023, coal accounted for approximately 38% of total energy supply, while renewable energy sources contributed 19%.

Over the past decade, the share of coal has gradually increased by 1% per year, overtaking oil as the dominant energy source. In contrast, the share of renewable energy has grown only marginally and remains below 20%. This is despite significant government efforts, such as providing incentives and offering higher tariffs for electricity from renewables. In Indonesia, growth in overall energy demand is outpacing the rate of renewable energy development. This also indicates that the economy is still in a transitional phase of developing industrial capacity and shifting away from expensive crude oil toward cheaper coal, but not yet able to prioritise the acceleration of renewable energy.

Figure 2: Indonesia's energy supply by fuel (PJ), 2000 to 2023



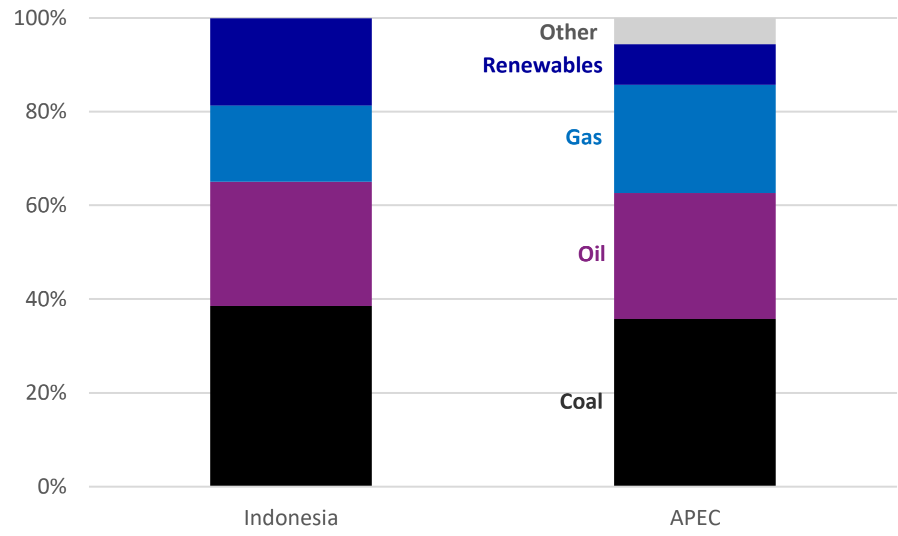
Source: EGEDA (2025)

Compared to APEC regional averages, Indonesia's energy mix has a higher share of coal compared to the APEC average. The energy supply mix of Indonesia also shows larger portion of renewables and smaller portion of gas (Figure 3).

This reflects Indonesia's reliance on its large endowment of coal reserves. Coal is a cost competitive and reliable baseload fuel for Indonesia. But this natural advantage in coal also means that Indonesia's energy system remains more carbon intensive than the regional average, and increases future exposure to global carbon policies, environmental regulations, and transition financial burden.

Indonesia's higher share of renewables (19%) than the APEC average (10%), places Indonesia ahead of this regional benchmark. APEC economies' average fuel mix has a larger share of oil and gas than Indonesia. Asia-Pacific economies rely more heavily on liquid fuels and natural gas, often having more diversified industrial structures, higher transport energy demand, and a stronger use of gas as a transition fuel. For Indonesia, the comparatively lower gas yet higher renewables, may also indicate a more effective gas utilisation to enable integration of renewable energy.

Figure 3: Energy supply mix – Indonesia and APEC, 2023



Source: EGEDA (2025)

Total Final Consumption

Total Final Energy Consumption (TFEC) increased by only 0.7% compared to 2022. The growth was driven mainly by the commercial, residential, and transport sectors, The industrial sector, although it remains the largest energy consumer, showed no energy consumption growth compared to the previous year, while the agriculture sector experienced a decline.

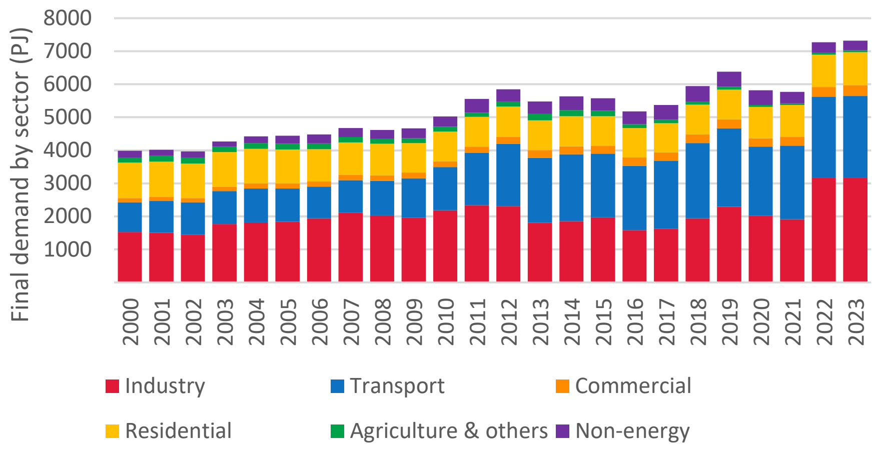
These trends suggest continued urbanisation from rural and remote areas to larger cities, which is driving higher energy demand in residential buildings. Rising energy use in commercial buildings reflects the expanding capacity of the services sector, data centres, and digital infrastructure.

The relatively modest increase in transport sector energy consumption (only 0.8% compared to 2022) indicates growing transport activity due to population growth 0.8%, partially offset by the increasing share of electric vehicles, which are more efficient than internal combustion engine (ICE) vehicles. Sales of four-wheeler electric vehicles reached 10,327 units in 2022 and 17,051 units in 2023, a sharp increase compared to 687 units in 2021 (Bisnis, 2026). In contrast, the limited adoption of modern machinery and farming technologies continues to keep energy intensity relatively low in the agricultural sector in 2023.

The stagnant energy demand in industry sector highlights the challenges for Indonesia to further accelerate economic growth. Industry sector expansion and its associated energy use remains part of the economic strategy of Indonesia. As the economy is in good shape in terms of its demographic situation, where the majority of the population is in productive working age, more energy use in industry is expected as it indicates expansion of industry capacity and also more absorption of human resources, which in the end will lead to more economic growth.

Overall, economic growth remained largely unchanged, holding steady at around 5% (BPS, 2025b), and industrial energy consumption in 2023 did not increase compared to 2022.

Figure 4: Indonesia final consumption by sector (PJ), 2000 to 2023



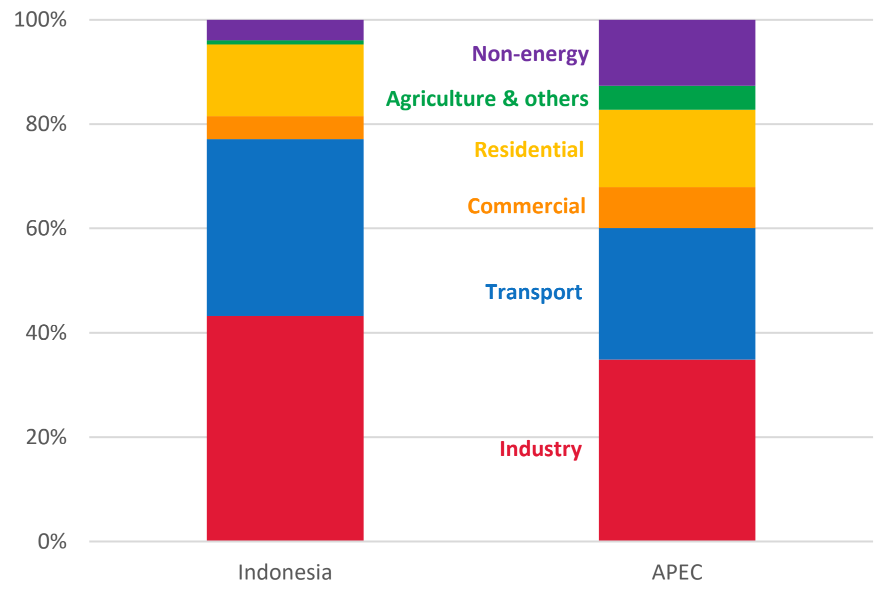
Source: EGEDA (2025)

Compared with the APEC total final energy consumption (TFC), Indonesia shows a higher share of energy use in the industry and transport sectors, while the share attributed to agriculture is significantly lower. The relatively large energy consumption in industry and transport reflects Indonesia’s demographic profile, which includes a higher proportion of productive-age population compared with many other APEC economies. This productive-age population continues to grow, driving increased demand for mobility and transport energy, and serving as a key driver of industrial expansion and its associated energy demand.

In contrast, the smaller share of energy consumption in the agricultural sector suggests that agriculture in Indonesia remains relatively less developed, a structural condition that has persisted for decades. Low farm-gate commodity prices and high transportation costs for agricultural products (Higgins, 2023) have reduced the sector’s attractiveness to the productive younger generation, accelerating urbanisation and limiting technological and productivity improvements in rural farming activities.

The residential and commercial sectors together make up a smaller share of total energy consumption in Indonesia than in the APEC average. This is consistent with relatively lower per-capita energy use in buildings, which may be associated with lower average income levels, less energy-intensive building stock, and limited penetration of appliances and space-conditioning compared with more developed APEC economies.

Figure 5: Final consumption by sector, Indonesia and APEC, 2023



Source: EGEDA (2025)

Final Energy Demand

Total final energy demand (TFED) increased by 1.1% from 2022. Oil remains the dominant fuel, accounting for 39% of total demand, even though its absolute consumption declined slightly by 0.87%. This reflects Indonesia's structural reliance on oil products in the transport and industry sectors. After a temporary decline around 2020, oil demand has grown steadily, with a pronounced increase in 2022-2023, indicating a recovery in mobility and logistics, despite the increasing penetration of electric passenger vehicles and the implementation of B35 biodiesel blending in 2023.

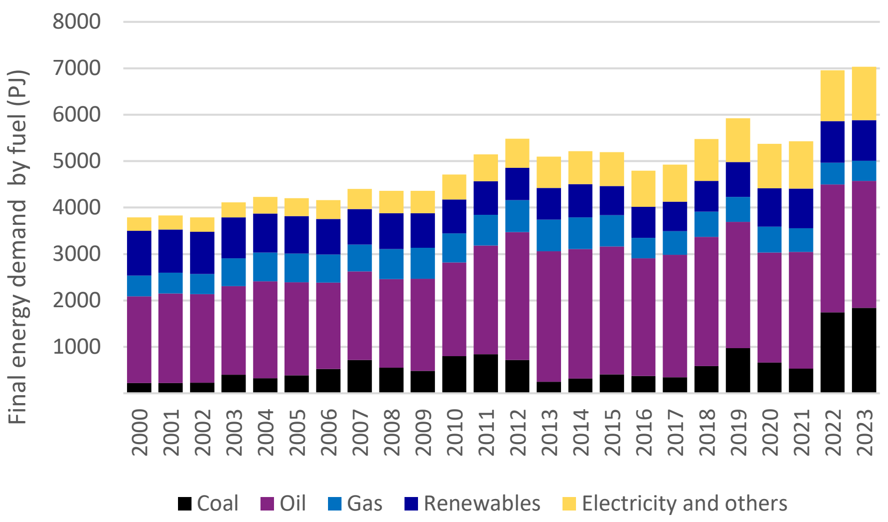
The coal share in final energy demand increased by 5.9%, suggesting growing use in energy intensive industries such as cement, metals, and manufacturing, as well as possible fuel substitution driven by cost advantages. The sharp rise between 2022 and 2023 highlights coal's continued role in supporting industrial expansion.

Meanwhile, "electricity and others" increased by 5.4% and became the fastest growing fuel, particularly since 2015. This trend reflects the ongoing electrification of households, commercial buildings, and services, alongside the expansion of digital infrastructure and the penetration of appliances. The increase indicates a gradual shift toward electricity as a key final energy carrier, even though much of this electricity is still generated upstream from fossil fuels.

In contrast, the shares of gas and renewables declined by 8.1% and 2.4%, respectively. This trend suggests that growing industrial demand continues to favour coal, while structural and technical challenges limit the adoption of renewables in some end-use sectors. It also reflected stagnant natural gas production while the government prioritised domestic gas allocation for highly strategic uses such as power and fertilizer industries.

Despite the implementation of B35 biodiesel blend in 2023, the contribution of renewables to final energy demand remains constrained, as biodiesel deployment is still limited by the availability of funds derived from palm oil export levies.

Figure 6: Indonesia's final energy demand by fuel (PJ), 2000 to 2023



Source: EGEDA (2025)

Note: Figure 6 does not include non-energy sector consumption of energy products.

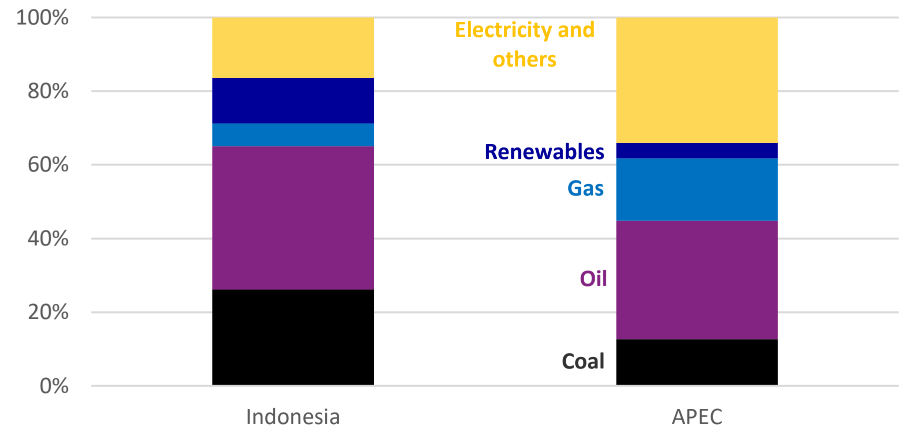
Indonesia exhibits a higher reliance on coal in end-use sectors when compared to the APEC economies averages. Accounting for around a quarter of total demand in Indonesia, coal plays a much smaller role in final consumption of most APEC economies. This reflects the high availability of cheap, low-rank domestic coal, which is one of the key factors underlying industrial expansion. It also highlights Indonesia's strong concentration of energy-intensive industries, such as cement, metals, and mineral processing, which frequently rely on direct coal combustion and off-grid captive coal energy systems. In contrast, most APEC economies have largely confined coal use to the power generation sector, with industrial energy needs primarily met through on-grid electricity, thereby reducing coal's role in direct final consumption.

Oil remains the largest fuel component in both Indonesia and the APEC region, but its share is higher in Indonesia, indicating continued dependence on road-based transport, logistics, and fossil-fuelled mobility. The comparison also underscores the underutilisation of large-scale maritime and rail transport in Indonesia, which could otherwise reduce reliance on less efficient road freight transport.

Indonesia's gas share is notably lower than the APEC average, pointing to structural constraints in domestic gas infrastructure, particularly in pipeline networks and LNG regasification capacity. By contrast, many APEC economies have developed extensive pipeline systems and mature LNG markets, enabling natural gas to function as a key transition fuel across industry, buildings, and power generation.

The share of renewables in Indonesia's final energy demand remains modest, though slightly above the APEC average. This largely reflects Indonesia's continued reliance on traditional bioenergy and biodiesel blending as the main renewable sources on the end-use side. In contrast, within the APEC region, the greater use of modern bioenergy and electricity in end-use sectors results in a comparatively smaller share of renewables in final energy demand.

Figure 7: Final energy demand fuel share, Indonesia and APEC, 2023



Source: EGEDA (2025)

Transformation

Power Sector

Indonesian electricity generation in 2023 increased by 4.4% compared with 2022. This growth remains below the estimated 8-9% annual increase in electricity demand typically associated with supporting the targeted economic growth of over 6% (MEMR, 2026c). To achieve this economic growth, the government has intensified efforts to promote electrification across the industrial, transport, and residential building sectors from previous years.

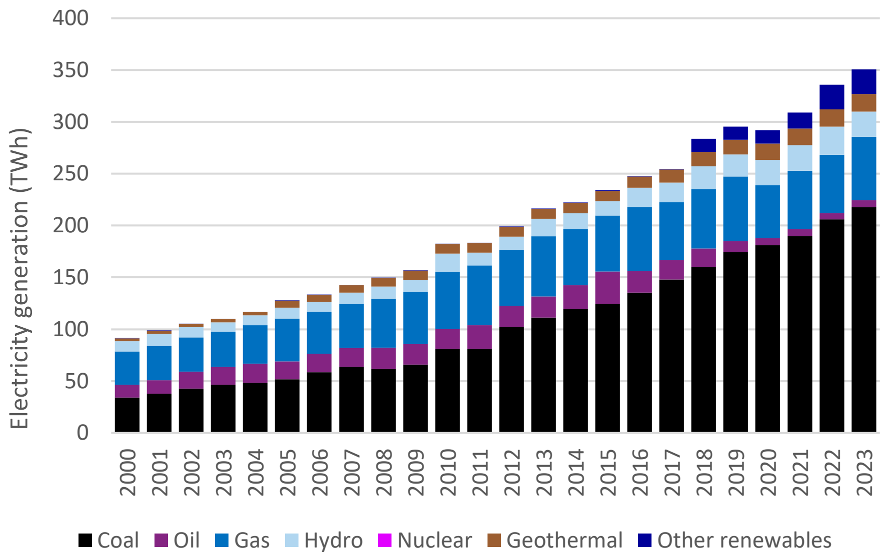
Electricity production from coal, gas, oil, and non-hydro renewables such as solar and wind, continued to increase. In contrast, hydropower generation declined by 9.9% in 2023, which is likely linked to climate variability and changing hydrological conditions, including prolonged dry periods that reduced water availability in rivers and reservoirs. Land use change in upstream areas, especially deforestation associated with agricultural (palm oil) expansion, exacerbated watershed degradation and reduced storage capacity.

The 2023 power generation mix continues to be dominated by coal with coal power plants totalling 50 GW capacity (MEMR, 2024a). Although the government has formally banned the development of new coal-fired power plants under Presidential Regulation No. 112/2022, most of the capacity commissioned in 2023 reflects on going contracts, young coal fleets, and independent power producer (IPP) projects operating under long-term Power Purchase Agreements (PPAs). The regulation also includes exemptions for certain coal plants, particularly captive power facilities serving strategic industries and plants associated with mineral processing and downstream industrialisation, such as the rapidly expanding nickel sector. In addition, the continued application of the Domestic Market Obligation (DMO) policy for coal in the power sector sustains coal's position as the lowest-cost marginal generation source.

Gas-fired electricity generation in 2023 increased by 8.7%, while oil-based generation remained marginal and largely stable. The strong growth of gas-fired electricity generation highlights its continued importance, despite tight domestic supply in certain regions and infrastructure bottlenecks, especially constraints in pipeline connectivity and inter-island LNG distribution.

Driven by commissioning of some projects that have been under negotiations for a long time, renewable sources, including geothermal and "other renewables" such as wind and solar, recorded incremental gains. However, renewables contribution remains insufficient to influence marginal generation, as "other renewables" deployment continues to face grid integration challenges, particularly in remote and islanded power systems.

Figure 8: Indonesia's electricity generation by fuel, 2000 to 2023



Source: EGEDA (2025)

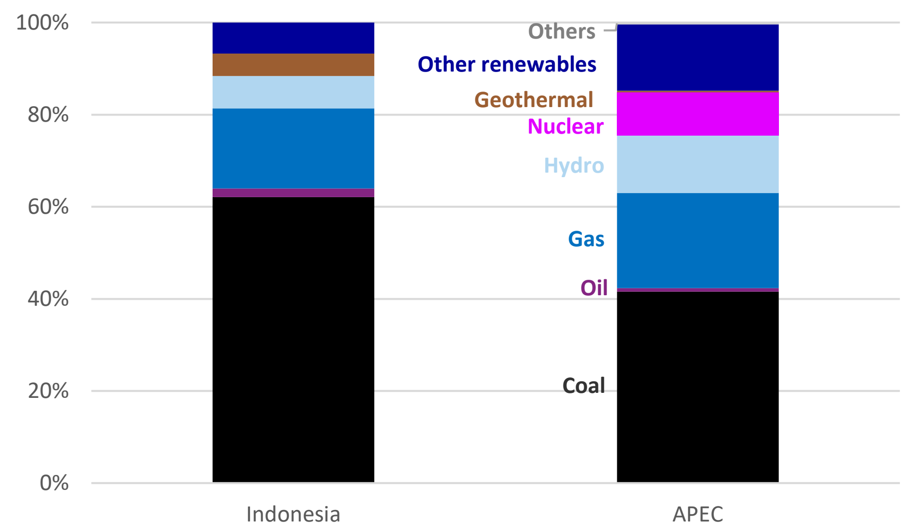
Compared with the APEC economy average, Indonesia's 2023 power generation mix is characterised by high carbon intensity and a heavy dependence on a single baseload fuel, with coal accounting for around 60% or more of total electricity production, and limited contribution from flexible and low-carbon resources. In contrast, the APEC average reflects a more diversified power mix, in which electricity supply is distributed across natural gas, nuclear, and multiple renewable technologies. This results in Indonesia having a more carbon-intensive power sector relative to the regional benchmark.

Indonesia's coal-dominated mix reflects the availability of abundant domestic coal resources and the prevalence of long-term independent power producer (IPP) contracts that continue to anchor coal's role in baseload generation. By comparison, the APEC regional average exhibits a much lower coal share (approximately 40%), as many member economies have progressively shifted from coal toward gas, nuclear, and renewable energy, often supported by carbon pricing mechanisms and stricter emissions standards.

Natural gas plays a secondary role in Indonesia's power mix, significantly below the APEC average. This disparity reflects infrastructure constraints, including limited pipeline connectivity and limited LNG regasification capacity close to the power demand centre. For the APEC region, despite exposure to volatile gas prices, natural gas frequently serves as a key transition and balancing fuel, enhancing grid flexibility and enabling higher penetration of variable renewable energy.

Indonesia's renewable energy share remains significantly lower than the APEC average, a notable outcome given the economy's substantial renewables potential. The slower uptake of renewables is driven by long project development timelines, complex financial negotiations and closures, land acquisition and permitting challenges, as well as persistent grid integration limitations. In contrast, the APEC region's higher renewable shares reflect large-scale solar and wind deployment, alongside stronger grid interconnections and market frameworks that facilitate renewable integration.

Figure 9: Electricity generation fuel share, Indonesia and APEC, 2023



Source: EGEDA (2025)

Refining

Under the Refinery Development Master Plan (RDMP), Indonesia aims to expand domestic refining capacity to approximately 1,900 kb/d by 2030. Although there were some delays and cancellations in the list of the refinery projects, in 2026, the programme has successfully increased the Balikpapan refinery capacity by 100 kb/d, bringing total domestic capacity to 1,276 kb/d by 2026. This expansion is expected to enable Indonesia to eliminate imports of diesel fuel products, and rely on the domestic refinery production (MEMR, 2026b).

Energy Transition

Indonesia has reaffirmed its commitment to the energy transition and emission reduction, as stated during COP30 in Brazil. At the conference, the Indonesian government reiterated its long-term objective of achieving net zero emissions and outlined medium-term emission reduction targets through 2035, aiming to cut between 1.2 and 1.5 gigatons of CO_2 relative to projected baseline levels. Afterward, Indonesia submitted its Second Nationally Determined Contribution (NDC) to the UNFCCC in October 2025, strengthening its climate commitments by targeting an emissions reduction of 17.5% below the business-as-usual (BAU) scenario by 2030, under specified conditions.

Indonesia's New National Energy Policy, established through Government Regulation No. 40 of 2025 (BPK, 2025a), reinforces long-term energy transition efforts. The policy updates domestic targets for energy intensity, energy efficiency, and renewable energy development, replacing those set under the previous National Energy Policy (Government Regulation No. 79 of 2014).

In 2026, the government took decisive enforcement action by suspending the operations of several mining and palm oil companies found to have contributed to illegal deforestation, which were linked to severe flooding in North Sumatra. This marked a significant step toward strengthening environmental governance and land-use oversight. (General Attorney, 2026).

The year 2026 also represented progress in energy security policy, as the government moved to stop diesel fuel imports and reduce coal production, signalling an effort to transition toward a more sustainable and self-reliant energy system (Setkab, 2025).

Indonesia has also advanced its biofuel policy framework, implementing a mandatory B40 biodiesel blend in 2025 for all sectors and preparing for the rollout of B50. However, full implementation of B50 has been delayed until 2027 due to constraints related to palm oil production capacity and limitations in the collection of export levy revenues that fund the biodiesel subsidy mechanism (MEMR, 2025b).

Emissions

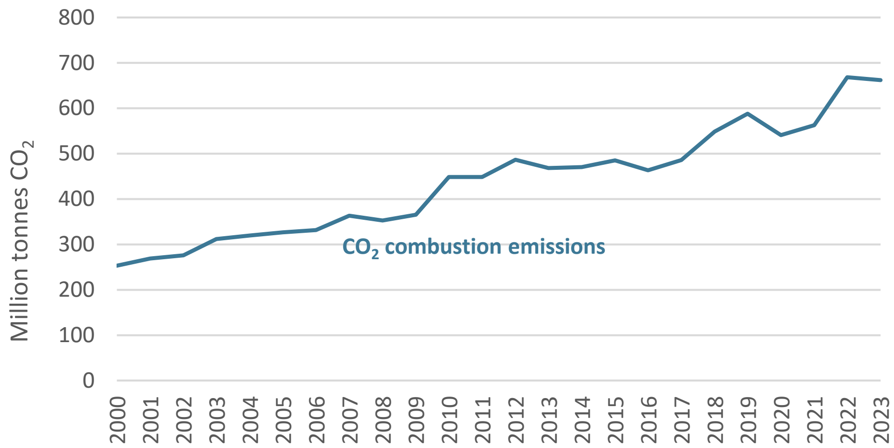
CO_2 emissions from fuel combustion showed slight moderation in 2023 following a new peak in 2022, when emissions reached the high 660 $MtCO_2$ range. While emissions remain historically elevated, the 2023 data suggest a short-term decoupling between economic activity and emissions growth, as economic and electricity demand continued to expand without a corresponding increase in CO_2 output.

This can be partly attributed to diesel-to-gas substitution in power generation in several regions, as well as the implementation of mandatory B35 biodiesel blending beginning in February 2023, which reduced the carbon intensity of the transport fuel mix.

Beyond direct mitigation measures, the government strengthened the policy framework by issuing Presidential Regulation Number 110 of 2025 (BPK, 2025b), which establishes a new domestic scheme for emissions trading and emissions reduction governance. The regulation mandates the creation of a dedicated authority to coordinate the implementation of emissions reduction and carbon trading mechanisms. This is expected to enhance the attractiveness, credibility, and enforceability of emissions trading, particularly for high-emitting entities, by introducing clearer procedures for emissions accounting, certification, and credit issuance.

However, Indonesia's registry and verification system remains challenging. Although Indonesia has developed domestic standards for emissions calculations and trading, institutional capacity constraints persist, particularly among accredited validators and verifiers, limiting the accurate measurement, reporting, and registration of emissions and tradable credits across regulated entities.

Figure 10: Indonesia CO_2 combustion emissions (million tonnes), 2000 to 2023



Source: EGEDA (2025)

Energy Security

Indonesia's energy security strategy emphasises tighter coal production control, the elimination of diesel fuel imports, and the gradual increase of biodiesel blending levels, with B50 targeted by 2026. At the same time, policies are being directed toward curbing natural gas exports to ensure adequate domestic supply, as natural gas plays a vital role in supporting both electricity generation and industrial activities. As the share of renewable energy in the power mix expands, additional gas capacity will be required to provide system flexibility and reliability, prompting the development of new gas-fired power plants in the coming years, as reflected in the latest power development plan, the RUPTL 2025-2034 (MEMR, 2025a). In parallel, Indonesia is evaluating the introduction of nuclear power to supply electricity in remote regions and to reduce dependence on diesel-based generation, with Small Modular Reactors (SMRs) currently considered the most viable option.

APEC Energy Goals

There are two energy-related objectives that APEC member economies have agreed to meet as a collective: to improve energy intensity and double the share of modern renewables.

Energy Intensity Goal

In 2011, APEC member economies agreed to increase their ambition to reduce energy intensity by 45% in 2035, relative to a 2005 baseline. The original goal was a 25% improvement by 2030, relative to a 2005 baseline.

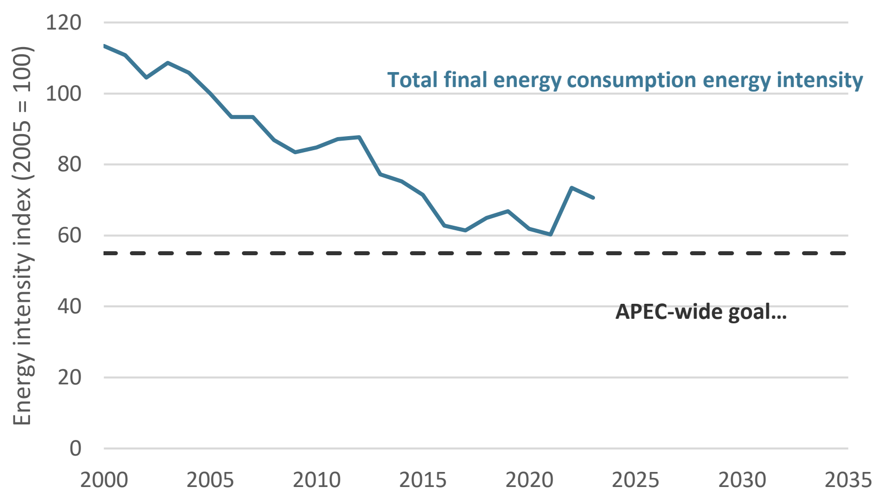
APEC is on track to achieve this energy intensity improvement. The goal does not impose individual economy targets, but it is possible to track the progress of individual APEC economies relative to the overarching proportional improvement.

EGEDA data (Figure 11) indicate that Indonesia's energy intensity has decreased by nearly 30% compared with its 2005 level. The Government of Indonesia has also implemented an energy-intensity improvement programme under Government Regulation No. 79/2014 on the National Energy Policy [BPK, 2014], which sets a target of reducing energy intensity by 1% per year. In a Press Release statement in 2024, the Ministry of Energy and Mineral Resources announced that average energy intensity declined by approximately 3% annually over the 2014-2024 period (MEMR, 2024b).

Both EGEDA and MEMR data therefore show a positive trend in energy-intensity improvement over the past two decades. Nevertheless, there remains significant room for further optimisation. For instance, the share of renewable energy in the energy mix remains below 20%, despite a target of 23% by 2025. In addition, the rapid growth in private vehicle ownership, limited expansion of public transportation and supporting infrastructure, and increasing industrial energy demand, largely dependent on relatively inefficient coal-based fuels, have driven substantial energy consumption growth without a commensurate increase in economic output (IEA, 2023).

The New National Energy Policy of Indonesia, (Government Regulation No. 40 of 2025) introduces continuous improvement for the longer term for energy intensity. Under this policy, energy intensity is projected to decline from 306.3-351 toe per million USD in 2030 to 96.1-114 toe per million USD in 2060, equivalent to an average annual reduction of approximately 2.2% over the period. To achieve these targets, the policy outlines enhanced measures for improving energy efficiency and expanding renewable energy utilisation, which are expected to support more effective energy use and generate greater economic benefits.

Figure 11: Indonesia total final energy consumption intensity index, 2000 to 2023 (2005 = 100)

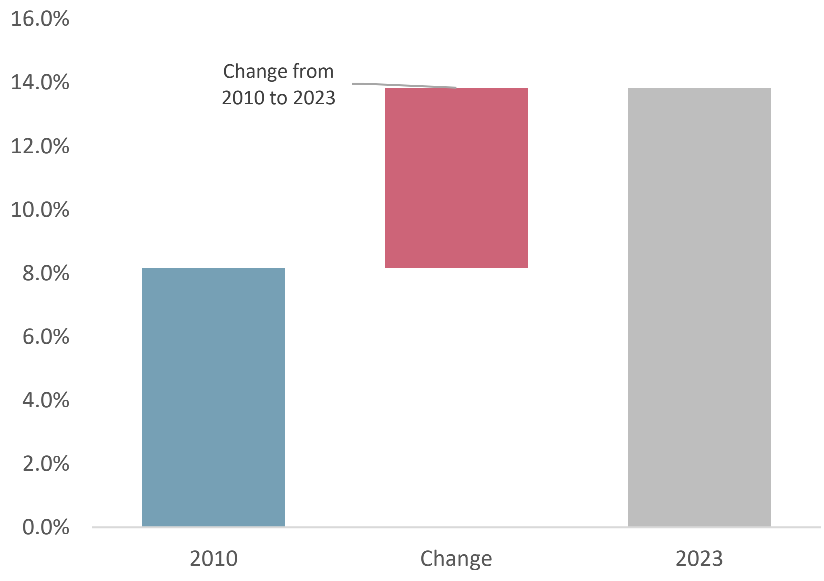


Source: EGEDA (2025)

Doubling of Renewables

The second energy goal involves doubling the share of modern renewables in the APEC energy mix for the period 2010 to 2030. There is no economy-level goal for individual member economies, but improvements by individual economies will contribute to the doubling goal.

Figure 12: Indonesia modern renewable energy share, 2010 and 2023



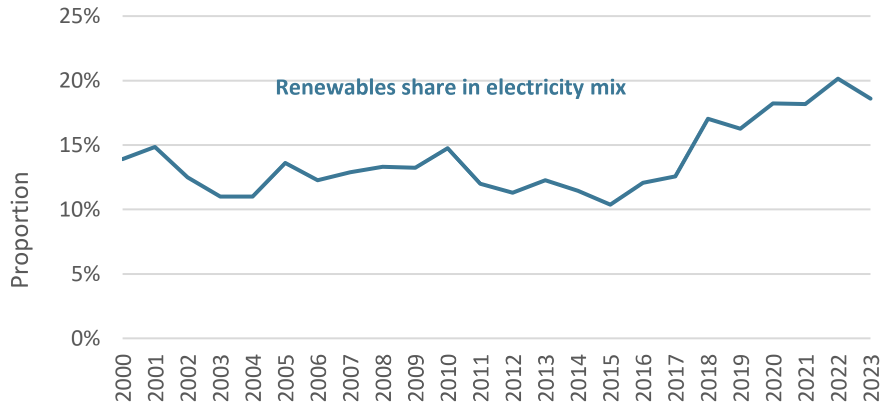
Source: EGEDA (2025)

Note: Biomass used in the residential and commercial sectors is assumed to be traditional biomass and is not included in the definition of modern renewables. All other renewables (biomass used by industry, hydro, geothermal, etc.) are considered modern renewables. Modern renewables also include the share of electricity that is generated from renewable sources.

Indonesia's renewable electricity generation share declined in 2023 compared to 2022. The need to meet rapidly increasing energy demand from the industrial and mining sectors in the post-2020 period has accelerated the development and utilisation of fossil fuel-based energy. Nevertheless, the share of new and renewable energy has increased substantially compared with the previous decade. Under the National Energy Policy established by Government Regulation No. 79 of 2014, the share of new and renewable energy was targeted to reach 23% by 2025.

Under the updated National Energy Policy (Government Regulation No. 40 of 2025) (BPK, 2025a), renewable energy utilisation is projected to reach 53%-55% by 2050 and 70%-72% by 2060. To meet these targets, development will extend beyond conventional sources such as hydropower, solar, and geothermal to include newer energy pathways, including coal-derived dimethyl ether and biofuels produced from biological resources.

Figure 13: Indonesia's renewable generation share, 2000 to 2023



Source: EGEDA (2025)

Energy Policy

Energy Policy	Details	Reference
National Energy Policy	Government Regulation Number 40 Year 2025 was issued as an updated version of previous National Energy Policy, Government Regulation Number 79 Year 2014. Indonesia is aiming to utilise every domestic energy resource potential to achieve energy self-sufficiency, as well as committing to achieve net zero emissions by 2050.	Ministry of Energy and Mineral Resources
Second NDC of Indonesia	In October 2025, Indonesia has recently submitted its new Nationally Determined Contribution (NDC), projecting that emissions will peak by 2030 and then decline to 1.26 and 1.49 gigatonnes of carbon dioxide equivalent ($GtCO_2e$) by 2035 under two economic growth scenarios.	UNFCC
Carbon Emission Trading Regulation	Presidential Regulation Number 110 Year 2025 regulates a new scheme for carbon emission trading.	Coordinating Ministry of Infrastructure and Spatial Development
Implementation of B40	Minister of Energy and Mineral Resources decree number 341.K/EK.01/MEM.E/2024 concerning the Implementation of Biodiesel Mix 40% by 1 January 2025.	Ministry of Energy and Mineral Resources
Discontinuation of Diesel Fuel Import	President of Republic of Indonesia and Minister of Energy and Mineral Resources of Indonesia announced that Indonesia will stop importing diesel fuel.	Presidential Cabinet Secretariat
Reducing Gas Export	The Indonesian government is strongly committed to increasing domestic gas utilisation and gradually reducing exports to enhance energy security and support economic growth.	Ministry of Energy and Mineral Resources
Reducing Coal Production	The Indonesian government will reduce coal production capacity in 2026 to support the sustainability of coal reserves and stabilise international coal prices.	Antara News Office
National Electricity Planning RUKN	Strategic Directives for Indonesia’s Electricity Infrastructure Development, 2025-2060.	Ministry of Energy and Mineral Resources

Notable Energy Developments

Energy Development	Details	Reference
Renewable Energy Target	Indonesia aims to add 69.5 GW of renewable energy and new energy capacities over 2025-2034, based on its electricity supply business plan (RUPTL).	Ministry of Energy and Mineral Resources
Biofuel Development	Indonesia also plans to implement a mandatory bioavtur (sustainable aviation fuel) share of 3% in the future, with SAF made from used cooking oil (UCO).	Ministry of Energy and Mineral Resources
Hydrogen Development	Indonesia has launched a National Hydrogen and Ammonia Roadmap (2025–2060).	Ministry of Energy and Mineral Resources
Nuclear Development	In terms of nuclear power, Indonesia plans to have 250 MW and 35 GW of installed capacities by 2032 and 2050, respectively.	Ministry of Energy and Mineral Resources
CCS/CCUS in Oil and Gas	Indonesia has conducted about 19 CCUS-related projects/studies within its oil and gas sector.	Ministry of Energy and Mineral Resources
Development of Dimethyl Ether in Indonesia	Coal gasification into Dimethyl Ether (DME) is being developed by the government as an alternative energy source to replace Liquefied Petroleum Gas (LPG) in meeting public energy needs. The use of DME is also expected to help reduce LPG imports.	Antara News Office
New capital city of Indonesia development progress	Press release Number: 277/sipers/hms-oikn/12/2025 date 05 December 2025 from the Otorita IKN regarding several subprojects for Indonesia's new capital, Nusantara, which are not scheduled for completion until 2028.	Ibu Kota Nusantara
Development of waste to energy development	As many as 33 municipal waste-to-energy power plants are planned in Indonesia, of which 7 are scheduled to begin construction in 2026.	PT PLN (Persero)
Development of geothermal power plant	Geothermal power plant projects Muara Laboh Unit 2 (80 MW) and Unit 3 (60 MW) have reached financial close stages, under the financing programme of Asia Zero Emission Community (AZEC).	Ministry of Energy and Mineral Resources
Oil refinery capacity Upgrading	Press Release Ministry of Energy and Mineral Resources Number 003.Pers/04/SJI/2025 12 January 2026, Project of Capacity Expansion RDMP Balikpapan oil refinery, has officially finished.	Ministry of Energy and Mineral Resources

Useful Links

Ministry of Energy and Mineral Resources – https://www.esdm.go.id/

Directorate General of Electricity – https://www.gatrik.esdm.go.id/

Directorate General of Oil and Gas – https://www.migas.esdm.go.id/

Directorate General of Mineral and Coal – https://www.minerba.esdm.go.id/

Directorate General of New Renewable Energy and Energy Conservation – https://www.ebtke.esdm.go.id

SKK Migas (Oil and Gas Special Taskforce) – https://www.skkmigas.go.id/

PT PLN (Persero) – https://www.pln.co.id/

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Japan

Introduction

Japan’s energy system is entering a new phase shaped by evolving energy security risks, rising electricity demand, and the implementation of long-term decarbonisation strategies. Recent geopolitical tensions affecting global energy markets and key energy supply routes have highlighted Japan’s continued reliance on imported fuels, while growing demand from digital infrastructure and advanced manufacturing is beginning to reverse the long-standing decline in electricity consumption. This creates an inherent policy challenge, as efforts to strengthen energy security, maintain system reliability and reduce emissions do not always align, requiring careful trade-offs in Japan’s energy strategy.

The government’s Green Transformation (GX) strategy aims to mobilise large-scale investment in low-carbon technologies and energy infrastructure while supporting industrial decarbonisation. The 7th Strategic Energy Plan outlines Japan’s policy direction, emphasising the expansion of renewable energy, the continued utilisation of nuclear power where safety is ensured, and the development of hydrogen and ammonia supply chains.

Japan is a highly industrialised economy with limited domestic energy resources, resulting in a strong dependence on imported fuels (as can been seen in Table 1 where key macroeconomic indicators and energy resource endowments are summarised). At the same time, rising electricity demand and structural changes in energy consumption are shifting policy attention towards electrification and the evolving role of the power system.

Table 1: Japan macroeconomic data and energy reserves

Key data [a, b]		Energy reserves [c, d]	
Area (thousand km^2)	378	Oil (million barrels)	44
Population (million)	124	Gas (billion cubic feet)	738
GDP (2021 USD billion PPP)	5,716	Coal (million tonnes)	350
GDP per capita (2021 USD PPP)	46,107	Uranium (kilotonnes U < USD 130/kgU)	6.6

Source: a GIS (2022); b World Bank (2025); c OGJ (2024); d EI (2025)

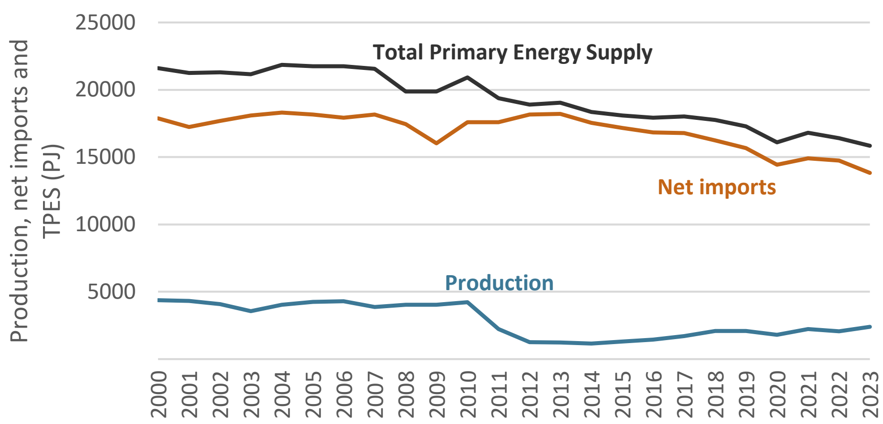
Note: Reserves are total proved reserves and reasonably assured recoverable resources for uranium.

Energy Supply and Consumption

Total Primary Energy Supply

Japan’s total primary energy supply (TPES) has generally declined over the past two decades, reflecting improvements in energy efficiency, structural changes in the economy, and demographic trends. As shown in Figure 1, TPES peaked in the mid-2000s and has gradually decreased since then, with further declines following the global financial crisis and the COVID-19 pandemic. In 2023, Japan’s TPES stood at approximately 15,800 PJ, a decline of 3.4% from 2022.

Figure 1: Japan energy supply, production, and net imports (PJ), 2000 to 2023



Source: EGEDA (2025)

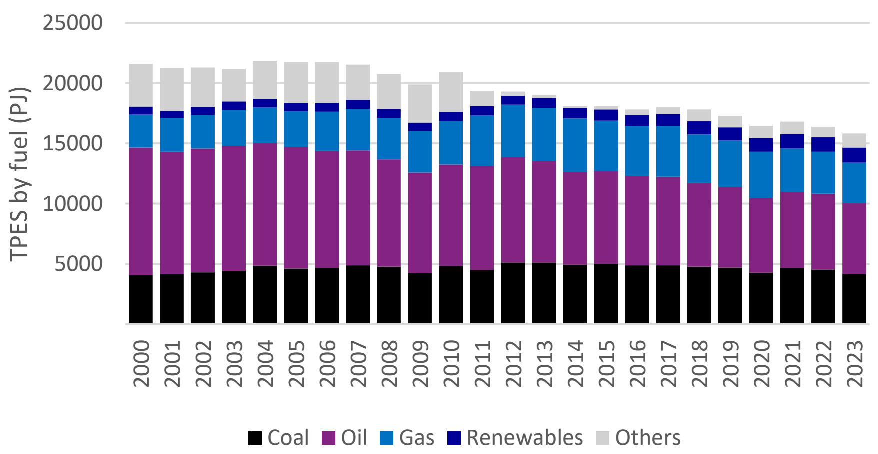
Domestic energy production remains limited, highlighting Japan's strong dependence on imported energy. As illustrated in Figure 1, domestic production accounts for only a small share of total supply and declined sharply after the Fukushima Daiichi accident in 2011, when nuclear power generation was largely suspended. Although domestic production has partly recovered through the expansion of renewable energy and the gradual return of nuclear power, imported fuels continue to dominate Japan's primary energy supply. Japan's energy self-sufficiency rate remained low at 15% in FY2023 (METI, 2025a).

Japan's heavy reliance on imported crude oil continues to expose the energy system to geopolitical risk. Japan's Ministry of Economy, Trade and Industry (METI) reports that 95% of Japan's crude oil imports came from the Middle East in FY2023 (METI, 2025a). Given this concentration, disruptions affecting global energy markets and key supply routes could pose significant risks to Japan's supply stability. To enhance resilience against potential supply disruptions, Japan maintains substantial strategic oil reserves, equivalent to roughly 254 days of domestic demand (FT, 2026).

These developments highlight the continued importance of oil in Japan's energy system and the potential economy-wide implications of supply disruptions. As shown in Figure 2, oil remains the largest component of TPES. This partly reflects its central role in the transport sector, but also its importance as a feedstock for petrochemical production. Petroleum products derived from crude oil are widely used in the production of plastics, synthetic materials, and other chemical products, meaning that oil supply disruptions can affect not only transport fuels but also a wide range of industrial and manufacturing activities, including sectors such as healthcare that rely heavily on plastic-based materials.

Coal and natural gas continue to play structurally important roles in Japan's energy supply. Coal plays a major role in electricity generation and steel production, while natural gas expanded strongly after 2011 as LNG-fired generation substituted for lost nuclear output. Unlike crude oil, Japan's LNG supply is relatively more diversified. The Middle East accounted for 9.4% of Japan's LNG imports in FY2023, while Australia alone supplied 41% (METI, 2025a). However, LNG remains critical for Japan's power system, accounting for around 30%-40% of electricity generation and requiring continuous imports with limited storage. This means that disruptions to LNG supply chains can pose challenges for maintaining stable electricity supply, particularly as electricity demand increases due to digitalisation and electrification, while reductions in coal-fired generation capacity limit the availability of alternative thermal supply options (JT, 2026). Policy efforts therefore focus on securing long-term LNG supply and reducing emissions from thermal power through the use of hydrogen, ammonia, and carbon capture, utilisation and storage (CCUS). At the same time, electricity generation from inefficient coal-fired power plants is expected to decline, while maintaining sufficient capacity to ensure system reliability.

Figure 2: Japan's energy supply by fuel (PJ), 2000 to 2023



Source: EGEDA (2025)

Renewable energy has expanded steadily, although recent developments have highlighted growing constraints related to grid integration, land use, and local acceptance. Solar deployment grew rapidly after the introduction of the feed-in tariff (FIT), but increasing penetration has led to system integration challenges. In regions such as Kyushu, solar generation has at times exceeded 80% of hourly electricity demand, resulting in sharp declines in residual demand during the daytime and steep increases in the evening, raising the need for system flexibility. As solar capacity has increased, output curtailment has expanded to multiple regions, reflecting the increasing difficulty of balancing variable renewable generation across the system within existing grid constraints (METI, 2025a). In addition, concerns related to landscape impacts, disaster risks, and coordination with local communities have contributed to growing opposition to some large-scale "mega-solar" projects. In FY2025, the government signalled plans to strengthen regulations on large ground-mounted solar developments and increase support for next-generation technologies such as perovskite solar cells (Reuters, 2025a).

Wind power deployment has also faced structural constraints. Japan accounts for less than 1% of global installed wind capacity, reflecting geographical limitations, complex terrain, and grid capacity constraints. Although policy efforts are underway to expand grid access and accelerate project development, these structural challenges continue to limit the pace of expansion (METI, 2025a).

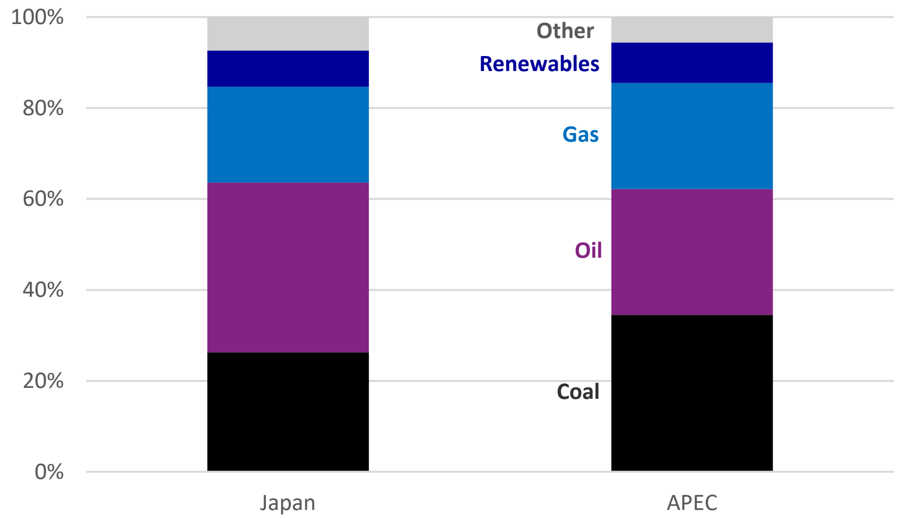
Geothermal energy represents a significant domestic resource, with Japan holding one of the largest geothermal potentials globally. However, deployment has been limited by high upfront risks, long development timelines, and the need to secure local acceptance, particularly in environmentally protected areas (METI, 2025a).

Hydropower, particularly pumped storage, plays an important role in providing system flexibility to balance variable renewable generation. However, new large-scale development is increasingly constrained by higher costs and limited suitable sites, with future expansion expected to focus on smaller-scale projects (METI, 2025a).

Nuclear power has played a key role in the gradual recovery of domestic energy supply. As of 2025, 14 reactors had restarted under the post-Fukushima regulatory framework (JAIF, 2026). Nevertheless, nuclear generation remains well below pre-2011 levels, and the pace of further recovery continues to depend on regulatory reviews, safety upgrades, and local consent processes. The government is accelerating efforts to restart nuclear power plants on the premise of strict safety standards, while also advancing back-end processes and supporting the development of next-generation reactor technologies, including advanced light water reactors, small modular reactors, and other emerging designs.

A comparison of the energy supply mix between Japan and the APEC region is presented in Figure 3. Despite efforts to diversify the energy mix and expand low-carbon energy sources, fossil fuels still account for more than 80% of Japan's total primary energy supply. Japan's supply mix shows a relatively higher share of oil and a lower share of coal than the APEC average. One reason is that the broader APEC region includes major coal-producing and coal consuming economies, whereas Japan imports almost all of its fossil fuels and uses oil more intensively in transport and non-energy applications. Japan's relatively high gas share also reflects the post-Fukushima expansion of LNG use in power generation, while the gradual increase in renewables and nuclear reflects efforts to improve energy security and reduce emissions despite severe domestic resource constraints.

Figure 3: Energy supply mix – Japan and APEC, 2023

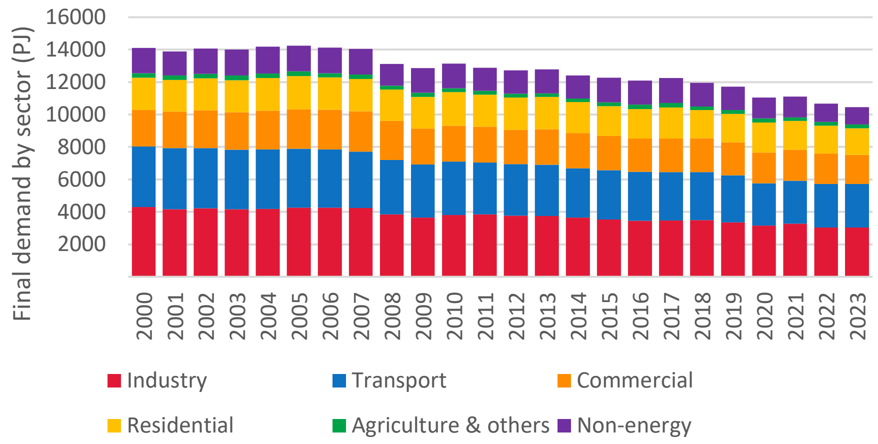


Source: EGEDA (2025)

Total Final Consumption

The trend in total final consumption (TFC) broadly mirrors the decline observed in TPES. As shown in Figure 4, Japan's final energy consumption increased through the early 2000s before reaching a peak around 2005, after which it declined steadily, with two notable downturns around 2008 during the global financial crisis and 2020 during the COVID-19 pandemic. By 2023, final energy consumption had fallen to its lowest level since the peak, at just below 10,500 PJ, representing a 3.1% decline from the previous year. This decline reflects longer-term improvements in energy efficiency, with FY2023 showing real GDP increasing by 0.7% while final energy consumption declined by 2.7% (METI, 2025b), alongside structural changes in the economy and demographic factors such as a declining population and ageing society.

Figure 4: Japan's final consumption by sector (PJ), 2000 to 2023

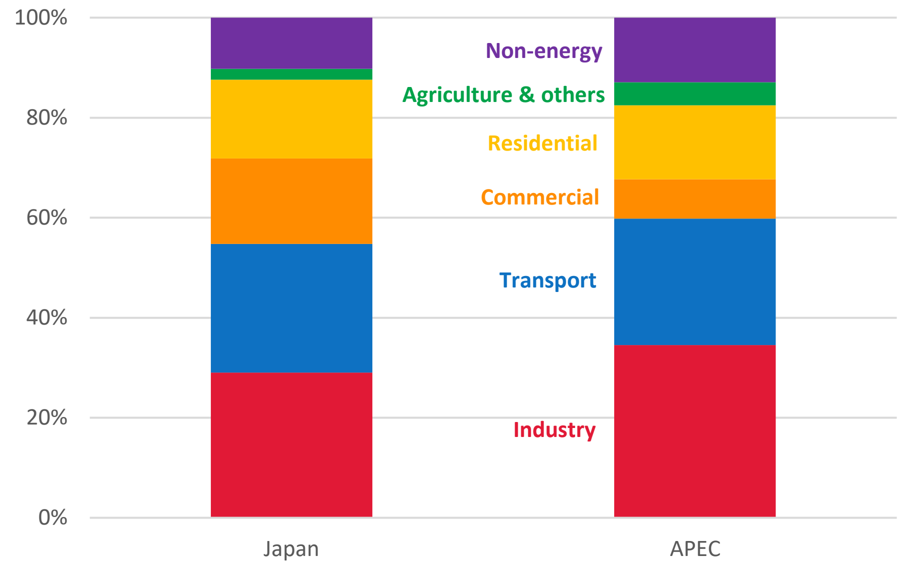


Source: EGEDA (2025)

The reduction in final energy demand since the mid-2000s has occurred across most sectors, with industry accounting for the largest share of the decline, falling by roughly 30% from its mid-2000s peak due to efficiency improvements and structural changes in energy-intensive manufacturing. Transport energy demand has also declined by around a quarter over the same period, while demand in the commercial and residential sectors has decreased more gradually as electricity use for appliances, air conditioning, and information technologies has become more widespread. Heat pump technologies are widely deployed in Japan, particularly in air conditioning and water heating applications, contributing to improved energy efficiency in the buildings sector by transferring heat rather than generating it directly (METI, 2025a).

The sectoral composition of final energy consumption in 2023 is shown in Figure 5, which also compares Japan with the APEC region. Industry accounts for about 29% of final energy demand in Japan compared with around 35% across APEC, while commercial buildings account for about 17% in Japan compared with roughly 8% across the region. These differences reflect structural characteristics of Japan's economy, including a relatively large service sector and extensive electricity use in buildings for lighting, cooling, and digital equipment.

Figure 5: Final consumption by sector, Japan and APEC, 2023



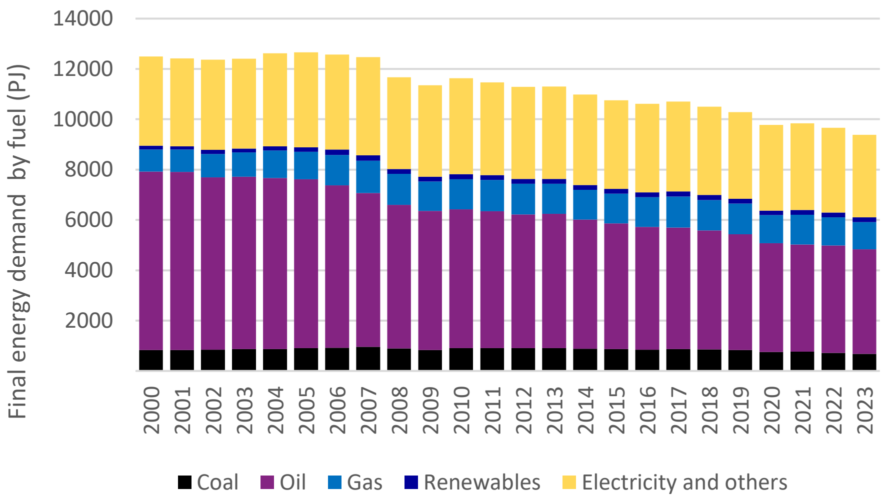
Source: EGEDA (2025)

Final Energy Demand

The composition of final energy demand by fuel is shown in Figure 6, which indicates that Japan's fuel mix has gradually shifted over the past two decades as demand for several fuels declined while electricity demand remained relatively stable. Oil consumption has fallen by roughly 40% since the early 2000s, representing the largest reduction among fuels. This decline reflects ongoing efforts to reduce oil dependence in the transport sector, with electrified vehicles, including hybrid, plug-in hybrid, battery electric, and fuel cell vehicles, accounting for 57% of new passenger vehicle sales in 2024, supported by subsidies and tax incentives (METI, 2025a). Additionally, the buildings sector is decreasing consumption of heating oil, as electricity and gas increasingly replace oil-based heating (METI, 2025b).

Natural gas consumption increased during the 2000s before stabilising, while coal plays a relatively small role in final energy demand and has gradually declined.

Figure 6: Japan's final energy demand by fuel (PJ), 2000 to 2023

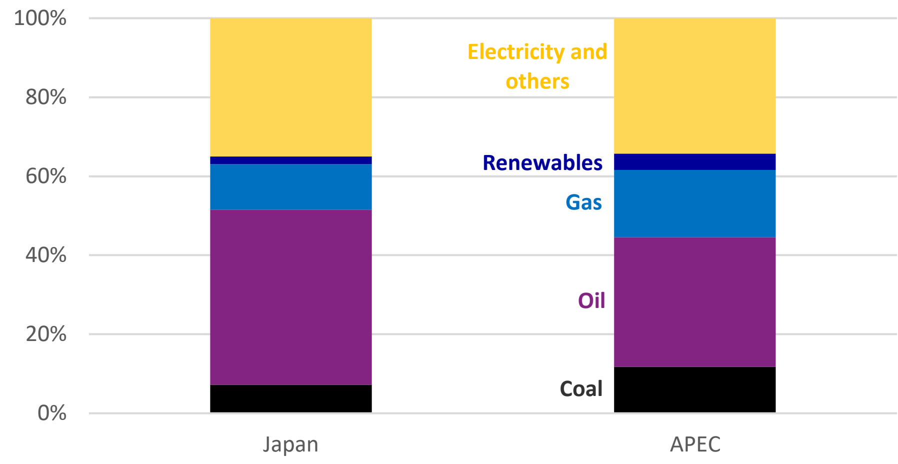


Source: EGEDA (2025)

Note: Figure 6 does not include non-energy sector consumption of energy products

The fuel composition of final energy demand in 2023, shown in Figure 7, highlights differences between Japan and the APEC region. Oil accounts for about 44% of final energy demand in Japan compared with roughly 33% across APEC, indicating a heavier reliance on petroleum fuels in Japan's end-use sectors, while coal represents only about 7% in Japan compared with nearly 12% across the region, reflecting the relatively limited direct use of coal outside specific industrial applications. Electricity accounts for around 35% of final energy demand in Japan, broadly similar to the APEC average.

Figure 7: Final energy demand fuel share, Japan and APEC, 2023



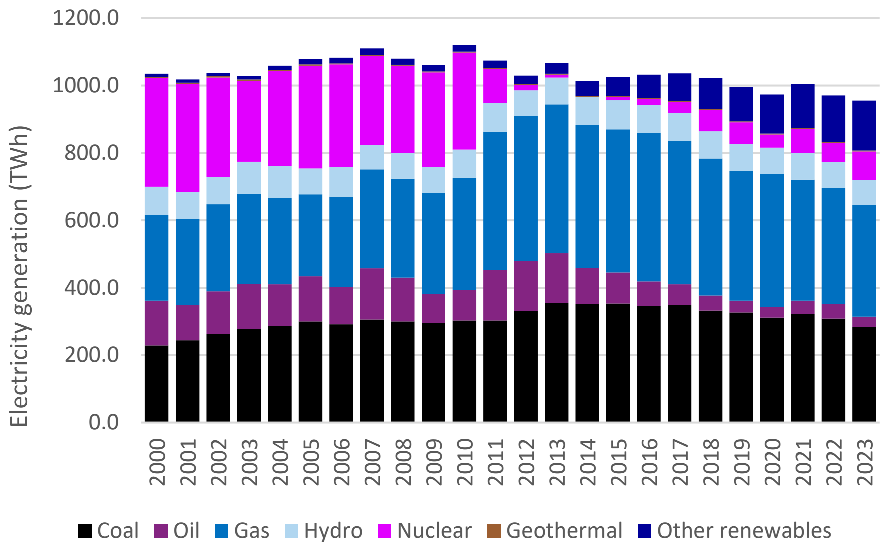
Source: EGEDA (2025)

Transformation

Power Sector

The evolution of Japan's electricity generation mix over the past two decades is shown in Figure 8. While total electricity generation remained broadly stable at around 1,000 to 1,100 TWh, the composition of generation changed significantly. Nuclear generation declined sharply after the Fukushima accident, falling from around 300 TWh to zero, before gradually recovering to over 80 TWh in 2023 as reactors restarted.

Figure 8: Japan's electricity generation by fuel, 2000 to 2023



Source: EGEDA (2025)

As nuclear output declined, gas-fired generation increased substantially, becoming the largest source of electricity in Japan. LNG plants expanded rapidly after 2011, as they could be deployed quickly and operate flexibly, allowing them to compensate for lost nuclear capacity. Coal generation also increased slightly during the post-Fukushima period, providing stable baseload generation, although its output has moderated somewhat in recent years.

In contrast, oil-fired generation declined sharply over the long term, reflecting its relatively high cost, its increasing role as backup or peak supply, and policy-driven efforts to reduce dependence on oil. Following the oil crises of the 1970s, international and domestic policy efforts promoted a shift away from oil dependence. In particular, decisions taken at the International Energy Agency (IEA) in 1979 called for a ban on the construction of new oil-fired power plants (Shimazaki, 1990). Japan subsequently reoriented its energy policy toward alternative sources such as LNG, coal, and nuclear. This structural shift has had a lasting impact on the power sector, with new oil-fired capacity no longer being developed and oil use continuing to decline over time.

Looking ahead, Japan's power sector may face rising electricity demand after a prolonged period of stagnation. The 7th Strategic Energy Plan notes that electricity consumption is expected to increase due to the expansion of data centres, semiconductor manufacturing, and broader electrification associated with digital and green transitions. In response, the government emphasises that both renewable energy and nuclear power should be utilised to the maximum extent possible to ensure stable supplies of decarbonised electricity (METI, 2025c).

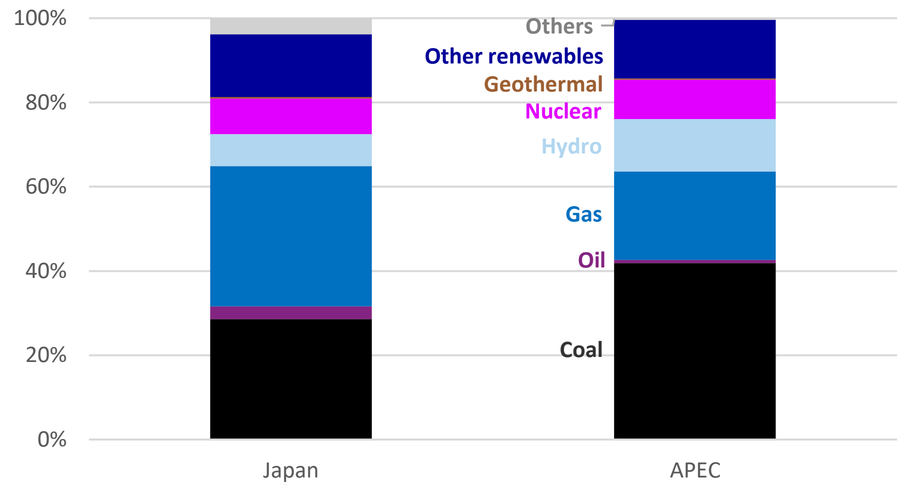
However, recent developments illustrate the challenges associated with expanding both sources. The pace of nuclear restarts remains uncertain due to continued local opposition and lengthy regulatory procedures. At the same time, renewable energy development is facing growing constraints. Rising construction costs and supply-chain pressures have affected offshore wind projects, while tighter regulation of large-scale ground-mounted solar installations reflects increasing local resistance to mega-solar developments and concerns over land use and environmental impacts (Reuters, 2025a; Reuters, 2025b). Policy attention has therefore increasingly shifted toward next-generation technologies such as perovskite solar cells, which Japan sees as a potential advantage because they can be deployed on building surfaces and urban infrastructure (METI, 2025c).

In parallel, Japan is exploring new approaches to reducing emissions from existing thermal power plants. Several utilities are testing ammonia co-firing at coal-fired power stations, while demonstration projects for hydrogen-fired generation are also under development. These technologies are intended to lower emissions while maintaining system reliability, although uncertainties remain regarding their long-term costs and scalability (METI, 2025c).

Another emerging feature of the power sector is the evolving relationship between electricity demand and renewable supply. As electricity consumption from data centres and advanced manufacturing facilities increases, the government and industry are exploring ways to locate new electricity demand closer to regions with abundant renewable resources. At the same time, the market for corporate power purchase agreements (PPAs), long-term contracts through which companies procure renewable electricity directly from generators, has expanded as large electricity consumers seek stable supplies of low-carbon electricity. In Japan, PPA adoption has increased significantly in recent years, with both on-site and off-site arrangements expanding and contract structures becoming more diverse, including growing use of virtual PPAs (REI, 2026).

The structure of electricity generation in 2023 is shown in Figure 9, which also compares Japan with the APEC region. Fossil fuels accounted for roughly two-thirds of total electricity generation in Japan, with gas providing the largest share and coal contributing slightly under one-third. Renewable energy including hydro accounted for around one-quarter of generation, while nuclear contributed slightly under 10%. Compared with the broader APEC region, Japan's power mix remains more reliant on gas-fired generation and imported fuels, reflecting its limited domestic energy resources and the gradual pace of nuclear restarts.

Figure 9: Electricity generation fuel share, Japan and APEC, 2023



Source: EGEDA (2025)

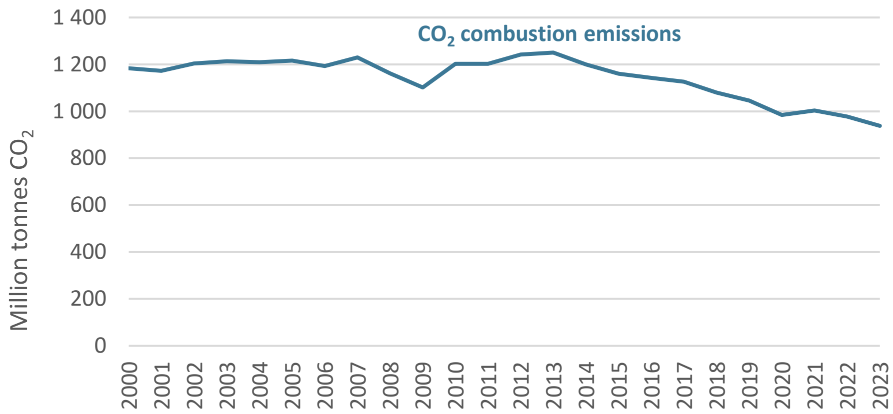
Energy Transition

Japan's energy transition is shaped by the need to reduce greenhouse gas emissions while maintaining secure and reliable energy supplies. This reflects Japan's policy framework of S+3E, which places safety as the foundation alongside energy security, economic efficiency, and environmental sustainability.

Emissions

Trends in energy-related carbon dioxide (CO_2) emissions from fuel combustion are shown in Figure 10. Japan's CO_2 emissions fluctuated during the 2000s before reaching a peak of around 1.25 billion tonnes in 2013, largely reflecting increased fossil fuel use in the power sector following the shutdown of nuclear reactors after the Fukushima accident.

Figure 10: Japan's CO_2 combustion emissions (million tonnes), 2000 to 2023



Source: EGEDA (2025)

Since then, emissions have gradually declined as energy efficiency improvements, renewable energy deployment, and the gradual restart of nuclear reactors reduced fossil fuel use in electricity generation. By 2023, CO_2 emissions had fallen to around 938 million tonnes, representing a decline of roughly 25% from the 2013 levels and 4.1% from the previous year.

Japan's decarbonisation strategy aims to achieve carbon neutrality by 2050. As part of this pathway, Japan has committed to reducing greenhouse gas emissions by 46% by 2030, with further indicative targets of 60% by 2035 and 73% by 2040, compared with FY2013 levels (METI, 2025c). Achieving these targets will require continued progress in energy efficiency, the expansion of renewable energy, the utilisation of nuclear power, and the development of emerging technologies such as hydrogen, ammonia, and carbon capture (METI, 2025d).

Energy Security

Japan's energy system remains highly dependent on imported fuels due to its limited domestic energy resources. Ensuring stable access to primary energy supplies therefore remains a central policy priority, particularly given Japan's reliance on imported oil, LNG, and coal.

Recent developments in global energy markets have highlighted these vulnerabilities. Periods of tight supply in international LNG markets have increased competition for LNG cargoes across Asia, raising concerns about the availability of flexible supply during periods of strong demand. At the same time, geopolitical tensions affecting key maritime transport routes underscore the risks associated with disruptions to physical fuel supply chains.

Energy security considerations also extend to the reliability of the electricity system. Maintaining sufficient generation capacity is essential to ensure stable power supply, particularly as electricity demand is expected to increase due to digitalisation, data centres, and broader electrification. In this context, Japan's energy policy emphasises the role of renewable energy and nuclear power as domestic sources that can strengthen both decarbonisation efforts and energy security by reducing reliance on imported fossil fuels (METI, 2025d).

APEC Energy Goals

There are two energy-related objectives that APEC member economies have agreed to meet as a collective: to improve energy intensity and double the share of modern renewables.

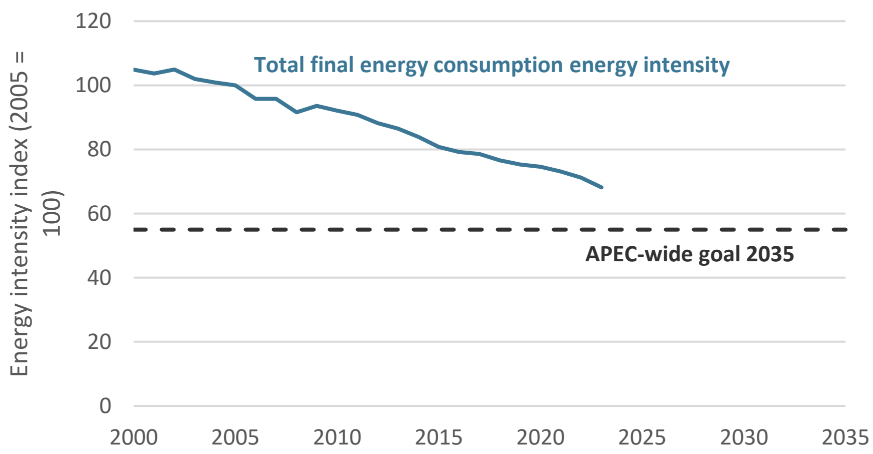
Energy Intensity Goal

In 2011, APEC member economies agreed to increase their ambition to reduce energy intensity by 45% in 2035, relative to a 2005 baseline. The original goal was a 25% improvement by 2030, relative to a 2005 baseline.

APEC is on track to achieve this energy intensity improvement. The goal does not impose individual economy targets, but it is possible to track the progress of individual APEC economies relative to the overarching proportional improvement.

Japan has made steady progress in improving energy intensity over time. As shown in Figure 11, final energy consumption intensity declined by approximately 32% from the 2005 baseline to 2023, reflecting sustained reductions in energy use relative to economic activity. This improvement has been supported by a range of efficiency measures, including the increasing adoption of cogeneration systems, which simultaneously produce electricity and useful heat and improve overall energy efficiency in both industrial and commercial sectors (METI, 2025a).

Figure 11: Japan's total final energy consumption intensity index, 2000 to 2023 (2005 = 100)



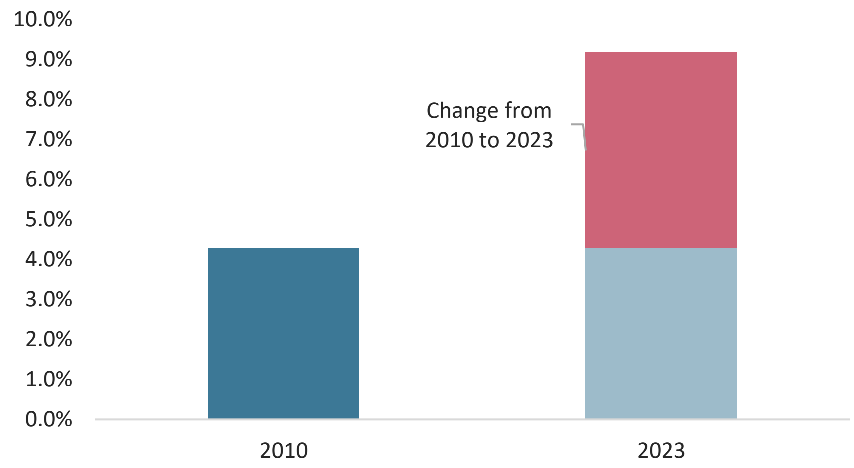
Source: EGEDA (2025)

Doubling of Renewables

The second energy goal involves doubling the share of modern renewables in the APEC energy mix for the period 2010 to 2030. There is no economy-level goal for individual member economies, but improvements by individual economies will contribute to the doubling goal.

Japan's progress toward the APEC modern renewables goal is shown in Figure 12. The share of modern renewables increased from 4.3% in 2010 to 9.2% in 2023, indicating that Japan has already doubled its renewable share over this period.

Figure 12: Japan's modern renewable energy share, 2010 and 2023

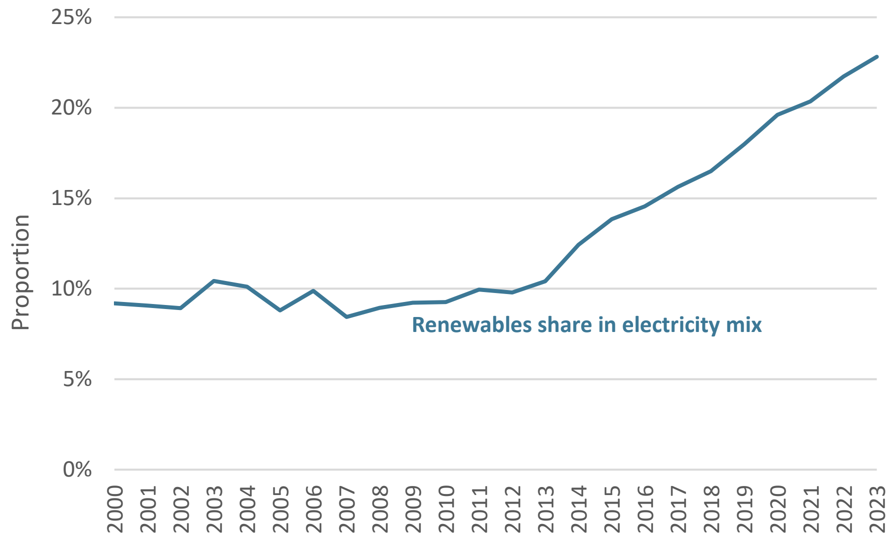


Source: EGEDA (2025)

Note: Biomass used in the residential and commercial sectors is assumed to be traditional biomass and is not included in the definition of modern renewables. All other renewables (biomass used by industry, hydro, geothermal, etc.) are considered modern renewables. Modern renewables also include the share of electricity that is generated from renewable sources.

The increase has been driven primarily by the expansion of solar power following the introduction of FIT policies in 2012, along with steady growth in other renewable sources. As shown in Figure 13, the share of renewables in electricity generation rose from around 9% in the 2000s to 23% in 2023, highlighting the central role of the power sector in renewable deployment.

Figure 13: Japan's renewable generation share, 2000 to 2023



Source: EGEDA (2025)

The 7th Strategic Energy Plan positions renewable energy as a central pillar of Japan's decarbonisation strategy. It emphasises the need to maximise the deployment of renewable energy as a major power source, while balancing system stability, local acceptance, and overall system costs. In particular, METI highlights the development of next-generation technologies such as perovskite solar cells, with a target of around 20 GW by 2040, as well as floating offshore wind in the exclusive economic zone and next-generation geothermal power (METI, 2025c). Renewable energy is expected to account for around 40%-50% of electricity generation by 2040 under this policy framework.

In addition, Japan's renewable energy potential remains substantial relative to current levels of deployment. Assessments by the Ministry of the Environment indicate that solar photovoltaics represent the largest resource, with combined technical potential of around 1,876 TWh per year, including 598 TWh from building-based installations and 1,277 TWh from land-based systems (MOE, 2025).

Wind power also offers significant potential. Onshore wind resources are estimated at approximately 1,262 TWh per year, while offshore wind potential is considerably larger, with around 1,009 TWh from fixed-bottom installations and up to 2,452 TWh from floating offshore wind (MOE, 2025).

In terms of deployment levels, solar generation reached around 150 TWh in 2023, while wind generation remained relatively limited. This suggests that significant potential for further expansion remains, particularly for wind power, although deployment remains constrained by grid limitations, regulatory processes, and local acceptance.

Energy Policy

Energy Policy	Details	Reference
7th Strategic Energy Plan	Approved by Cabinet in February 2025, the 7th Strategic Energy Plan sets Japan's energy policy direction toward FY2040, including renewable energy at 40–50% of power generation, nuclear around 20%, and reduced dependence on thermal power, aligned with the 2050 carbon neutrality goal.	METI
Nationally Determined Contribution (NDC)	Japan's updated NDC commits to reducing greenhouse gas emissions by 46% by FY2030, 60% by FY2035, and 73% by FY2040 compared to FY2013 levels under the Paris Agreement.	MOE
GX Basic Policy and GX Promotion Act	Establishes the Green Transformation framework to achieve carbon neutrality, introducing phased carbon pricing and GX transition bonds to mobilise over JPY 150 trillion in public and private investment over the next decade.	METI
GX Decarbonised Power Supply Reform	Legal reform package revising the Electricity Business Act and related laws to support decarbonised power supply, including amendments to nuclear operating period rules and measures to promote low-carbon power sources.	METI
Electricity System Reform	Comprehensive reform of Japan's electricity sector, including full retail liberalisation, legal unbundling of transmission and distribution operators, and wholesale market restructuring to enhance competition and system efficiency.	METI
Feed-in Tariff (FIT) and Feed-in Premium (FIP) Scheme	Renewable energy support framework providing fixed purchase prices (FIT) and market-linked premiums (FIP) to promote renewable energy deployment and integration into wholesale electricity markets.	METI
Energy Conservation Act (Act on Rationalising Energy Use)	Comprehensive legal framework governing energy efficiency in industry, buildings, and transport, forming the basis of Japan's energy conservation policy.	METI
Hydrogen Basic Strategy (Revised)	Targets hydrogen supply of 3 million tonnes by 2030 and 30 million tonnes by 2050, with cost reduction goals and support for ammonia co-firing and international supply chains.	METI
CCS Long-Term Roadmap	Aims for commercial-scale CCS deployment 6–12 million tonnes CO_2 storage by 2030 by 2030 and expansion toward 2040-2050 to support industrial decarbonisation.	METI
Offshore Wind Promotion Framework	Establishes competitive auction system to support offshore wind deployment toward 30-45 GW by 2040.	METI
J-Credit Scheme	Japan's domestic carbon credit system that certifies greenhouse gas emission reductions and removals from energy efficiency improvements, renewable energy deployment, and forest management, allowing organisations to offset emissions and support decarbonisation initiatives.	J-Credit Scheme Secretariat

Global Warming Countermeasures Plan	Japan's climate policy framework outlining measures to achieve its NDC targets, including energy efficiency improvements, electrification and emissions reductions across sectors.	MOE

Notable Energy Developments

Energy Development	Details	Reference
Clean energy investment subsidy programme	Japan announced a JPY 210 billion subsidy programme to support companies using decarbonised electricity, including energy-intensive facilities such as data centres and manufacturing plants.	Reuters
Designation of new offshore wind "promising zones"	Japan designated offshore areas in Akita and Hibikinada (Fukuoka) as "promising zones" from "preparatory zones" for offshore wind development, moving them toward future auction eligibility as "promotion zones".	Reuters
Identification of additional "preparatory zones" for offshore wind projects	Three areas (Chiba, Nagasaki, Kagoshima) were classified as "preparatory zones" to accelerate offshore wind project development.	Reuters
Withdrawal of a consortium from major offshore wind projects	A consortium withdrew from 1.7 GW of offshore wind projects due to rising construction costs, prompting policy review of Japan's offshore wind framework.	FT
Government consideration of re-auctioning abandoned offshore wind sites	Japan began examining re-auctioning three offshore wind sites following developer withdrawal.	Reuters
Offshore wind supply chain partnership with global turbine manufacturers	METI initiated cooperation with Siemens Gamesa and Japanese companies to develop a domestic offshore wind supply chain.	Reuters
Selection of first projects under Japan's large hydrogen subsidy scheme	Hydrogen price-gap subsidy projects selected. Japan selected the first projects under its JPY 3 trillion hydrogen price-gap subsidy scheme providing 15-year CfD support. Projects include a Toyota Tsusho-led consortium producing green hydrogen for steelmaking and a Resonac project producing hydrogen-derived ammonia.	FCW
New subsidies for hydrogen-powered transport	METI introduced incentives supporting hydrogen fuel use in commercial trucks and buses to expand fuel-cell mobility.	NHA
Hydrogen Energy Ministerial Meeting commitments	Japan reaffirmed its international leadership in hydrogen demand creation and supply chain development during the 2025 Hydrogen Energy Ministerial Meeting.	METI
LNG Producer-Consumer Conference 2025	Japan hosted its annual LNG conference, focusing on stable LNG supply chains and energy security.	METI

Growing battery storage investment linked to renewable curtailment	Rising renewable curtailment in regions such as Kyushu has driven rapid growth in battery energy storage projects to improve grid flexibility.	Titan
Expansion of floating offshore wind policy discussion	Japan continued development of floating offshore wind policy and industrial strategies to unlock large offshore potential.	ETA
Publication of the Energy White Paper 2025	Japan's Energy White Paper highlighted low energy self-sufficiency and continued reliance on fossil fuels, emphasising energy security challenges.	METI
Deep-sea rare earth extraction test near Minamitorishima	Japan successfully retrieved rare-earth-rich seabed mud from around 6,000m depth near Minamitorishima using the JAMSTEC research vessel Chikyū in early 2026. The world-first trial recovered sediment containing elements such as neodymium and dysprosium used in EV motors and high-tech manufacturing. The project aims to reduce reliance on Chinese rare earth supplies, with plans for a larger trial capable of recovering around 350 tonnes of seabed mud per day by 2027 and possible commercial production later in the decade.	AP

Useful Links

Agency for Natural Resources and Energy – https://www.enecho.meti.go.jp/en/

Ministry of Economy, Trade and Industry – https://www.meti.go.jp/english/index.html

Ministry of the Environment – https://www.env.go.jp/en/index.html

Ministry of Land, Infrastructure, Transport and Tourism – https://www.mlit.go.jp/en/index.html

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Republic of Korea

Introduction

The Republic of Korea (Korea) is located on the southern part of the Korean peninsula and is surrounded by three seas. Its geography is characterised by mountainous terrain in the east and relatively flat coastal plains in the west and south. Korea has a temperate climate with four distinct seasons, and seasonal weather patterns influence energy consumption with higher demand for cooling in summer and heating in winter.

Korea has a high population density, averaging about 516 people per km^2. The capital city, Seoul, accounts for around 20% of the total population and has a population density exceeding 15,000 people per km^2. Resultingly, the Seoul metropolitan area accounts for a significant concentration of Korea's economic activity and industrial base. In addition, there are several energy-intensive industrial clusters that are located outside the capital region. This spatial structure results in concentrated metropolitan electricity demand alongside substantial industrial loads.

Over recent decades, Korea has developed into one of Asia's most dynamic economies, driven by rapid industrialisation and export-oriented manufacturing. In 2024, Korea's real gross domestic product (GDP) reached USD 2.85 trillion (2021 USD purchasing power parity [PPP]), according to the World Bank. With an estimated population of 52 million, GDP per capita stood at USD 55,071 (2021 USD PPP), nearly triple 1990 values. Manufacturing accounted for approximately 24% of GDP in 2023, underscoring the continued importance of the energy-intensive industry sector as a driver of economic growth and energy demand.

Against this backdrop, the Korean Government places strong emphasis on advancing the energy transition and achieving carbon neutrality by 2050. Institutional reforms, including the establishment of the Ministry of Climate, Energy and Environment, aim to strengthen coordination between climate and energy policy. Policy efforts focus on expanding low-carbon energy sources, improving energy efficiency, and reinforcing transmission infrastructure to accommodate rising electricity demand from advanced industries, artificial intelligence, and data centres.

Table 1: Korea's macroeconomic data and energy reserves

Key data [a, b]		Energy reserves [c, d]	
Area (km^2) [a]	100,413	Oil (billion barrels)	-
Population (million) [a]	51.8	Gas (trillion cubic feet)	-
GDP (2021 USD billion PPP) [b]	2,850	Coal (million tonnes) [c]	359
GDP per capita (2021 USD PPP) [b]	55,071	Uranium (kilotonnes U < USD 130/kgU)	-

Source: a KOSIS (2025); b World Bank (2025); c US EIA (2025)

Note: Reserves are total proved reserves and reasonably assured recoverable resources for uranium.

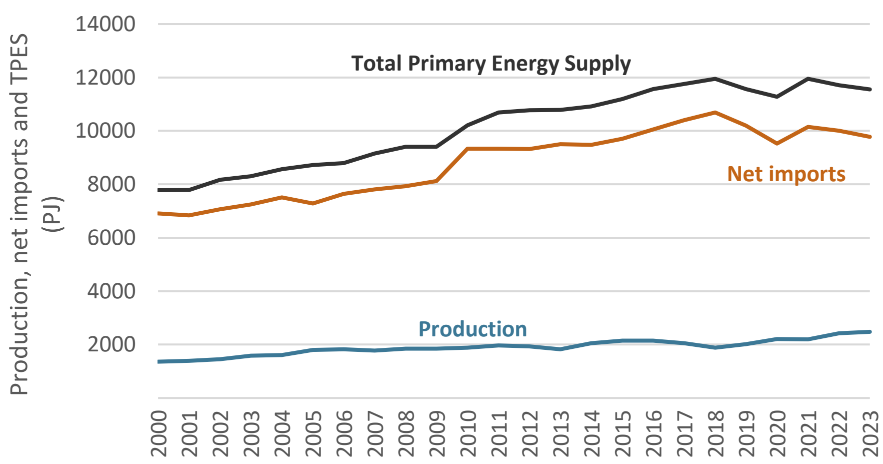
Korea has limited domestic energy resources and relies heavily on imported energy to support its economy (Table 1). In the context of the energy transition, this import dependence highlights the importance of managing transition pathways that reduce exposure to external shocks while maintaining power system reliability, affordability, and infrastructure readiness.

Energy Supply and Consumption

Total Primary Energy Supply

Korea's total primary energy supply (TPES) expanded rapidly in the 2000s, reaching 11,555 petajoules (PJ) in 2023, an increase of 48% from 7,779 PJ in 2000 (EGEDA, 2025) (Figure 1). In recent years, however, TPES has shown greater fluctuation. Between 2018 and 2020, TPES declined by 5.6% due to the COVID-19 pandemic and the associated global economic slowdown. After two consecutive years of decline, TPES rebounded by 5.9% in 2021 as domestic economic activity and exports recovered. This rebound was followed by modest declines in 2022 and 2023, reflecting weaker manufacturing activity, fuel switching toward renewables and nuclear, and continued improvements in energy efficiency.

Figure 1: Korea's energy supply, production, and net imports (PJ), 2000 to 2023



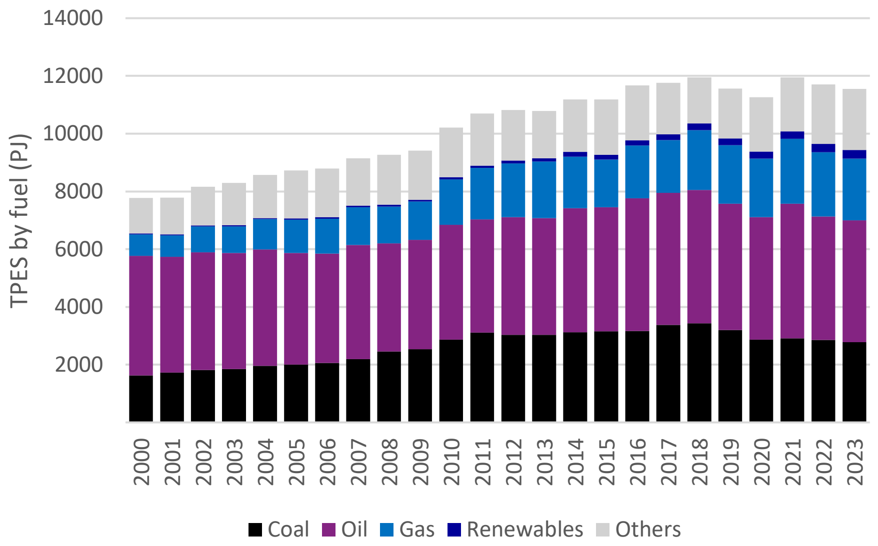
Source: EGEDA (2025)

Korea's energy supply remains highly dependent on imports due to its limited domestic energy resources. Although the net import share of TPES declined slightly from 88% a decade ago to nearly 85% in 2023 (Figure 1), Korea remains among the world's largest importers of fossil fuels. To mitigate import supply disruption risks, Korea has strengthened crude oil and LNG supply security through strategic stockpiling, long-term import contracts, and efforts to enhance the flexibility of its import portfolio.

Despite TPES peaking in 2018, fossil fuels continue to dominate Korea's energy mix. While both the absolute volume and share of fossil fuels in TPES have declined since then, they still accounted for around 80% of TPES in both 2022 and 2023 (EGEDA, 2025) (Figure 2), underscoring the structural reliance on fossil energy. By fuel type, oil remained the largest energy source in 2023 at 4,223 PJ (37% of TPES), followed by coal at around 24%. Natural gas increased its share from 9.6% in 2000 to 18% in 2023, supported by steady growth in LNG supply (EGEDA, 2025) (Figure 2).

Against this backdrop, Korea is accelerating efforts to diversify its energy supply and reduce import dependence as part of its broader energy transition. These efforts reflect heightened awareness of import supply risks and a strategic push to expand low-carbon energy sources. Renewable energy supply increased from 32 PJ in 2000 to 301 PJ in 2023, raising its share of TPES from 0.4% to 3% (EGEDA, 2025) (Figure 2). Averaging around 10% annual growth since 2000, this expansion highlights the gradually increasing role of renewables in diversifying Korea's energy mix, even as fossil fuels remain dominant.

Figure 2: Korea's energy supply by fuel (PJ), 2000 to 2023



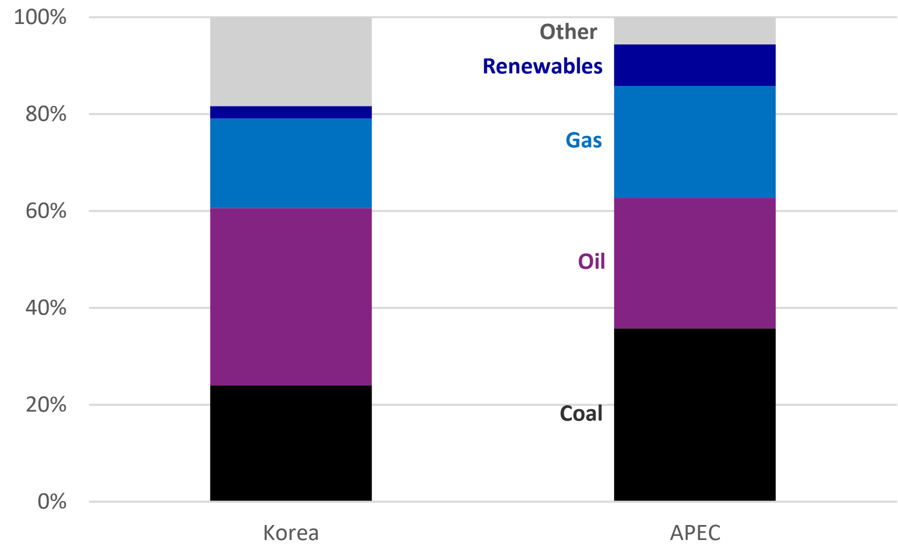
Source: EGEDA (2025)

Overall, fossil fuels accounted for around 80% of Korea's total primary energy supply (TPES) in 2023, slightly below the APEC average (EGEDA, 2025) (Figure 3). Within this fossil-fuel-dominant structure, however, Korea's energy supply mix differs from the APEC average in several important respects, reflecting its distinct structural characteristics and policy initiatives.

Korea relies more heavily on oil than the APEC average, with a share 9.6 percentage points higher, underscoring oil's continued role in transport as well as in refinery and petrochemical activities. By contrast, Korea's shares of coal and natural gas are lower than the APEC average, by 11.8 percentage points for coal and 4.6 percentage points for natural gas. This pattern is consistent with efforts to reduce coal use and balance gas with other low-carbon options (Figure 3).

Renewables account for a smaller share of Korea's TPES than in APEC, with a gap of around 6 percentage points in 2023. Nonetheless, renewables have expanded steadily in line with Korea's long-term energy transition strategy, supported by continued investment in transmission infrastructure. A notable feature of Korea's supply mix is the higher share of "other" energy sources, 12.7 percentage points above the APEC average, largely reflecting the classification of nuclear energy within this category. Taken together, these differences highlight Korea's distinct transition pathway toward a lower carbon, yet still import dependent, energy structure.

Figure 3: Energy supply mix – Korea and APEC, 2023

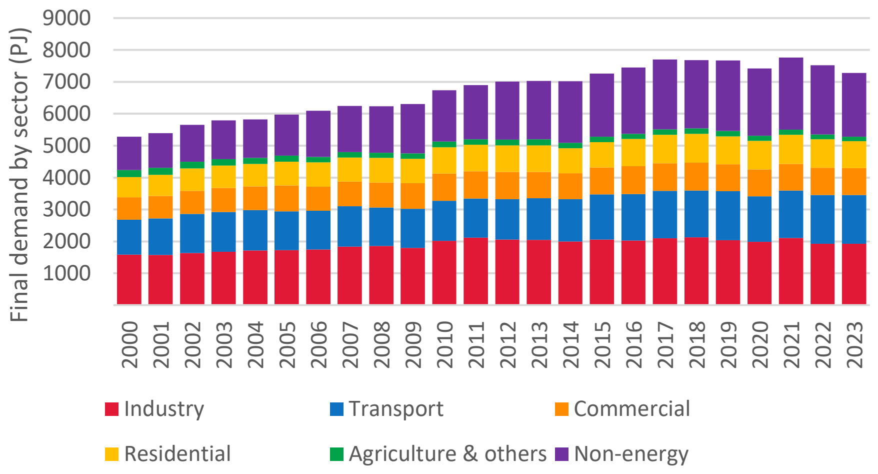


Source: EGEDA (2025)

Total Final Consumption

Korea's total final consumption (TFC) declined across most end-use sectors in 2023, with a particularly sharp contraction in non-energy use. Nonetheless, non-energy use and industry remained the largest components of TFC, accounting for 26% and 29%, respectively. Including non-energy use, TFC fell by 3.1% year-on-year to 7,285 PJ, while final energy consumption excluding non-energy use declined more moderately, by 1.2% to 5,283 PJ. Transport, residential, and commercial demand decreased, while industrial energy consumption remained broadly stable (EGEDA, 2025) (Figure 4). The recent overall decline was driven primarily by reduced demand for non-energy feedstocks, reflecting both structural adjustments and cyclical factors in energy-intensive industries. By contrast, the relative stability of industrial energy consumption suggests that efficiency improvements and electrification have helped moderate energy demand despite continued industrial activity.

Figure 4: Korea's final consumption by sector (PJ), 2000 to 2023

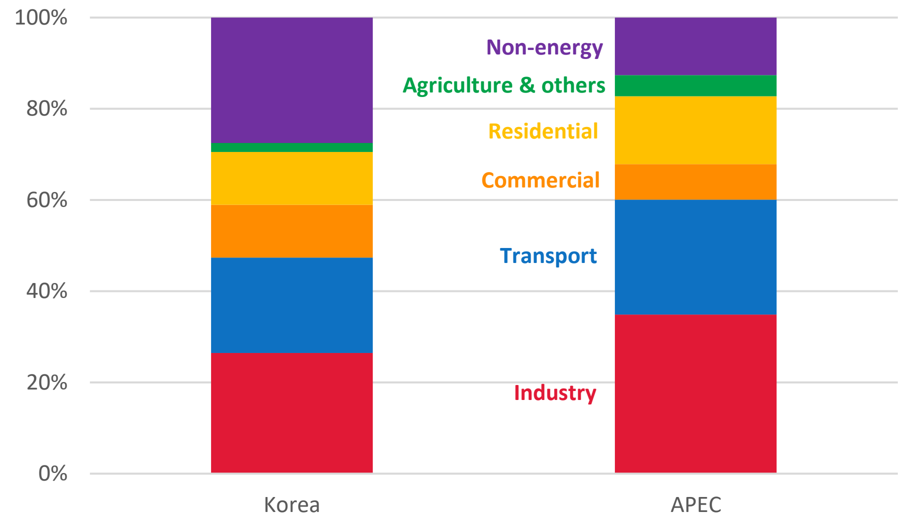


Source: EGEDA (2025)

Korea's final energy consumption structure in 2023 differed from the APEC average, characterised by a substantially higher share of non-energy use and lower shares in industry and transport. Non-energy use accounted for 27.5% of Korea's final energy consumption, more than double the APEC average of 12%, while industry and transport represented 26% and 21%, respectively, compared with APEC averages of 35% and 25% (EGEDA, 2025) (Figure 5).

This structure reflects Korea's strong refinery and petrochemical base, where petroleum products are used extensively as feedstocks as well as fuels. Residential and commercial consumption each accounted for 11.6%. Compared with APEC, commercial demand was higher and residential demand lower, consistent with Korea's highly urbanised and service-oriented economic structure.

Figure 5: Final consumption by sector, Korea and APEC, 2023



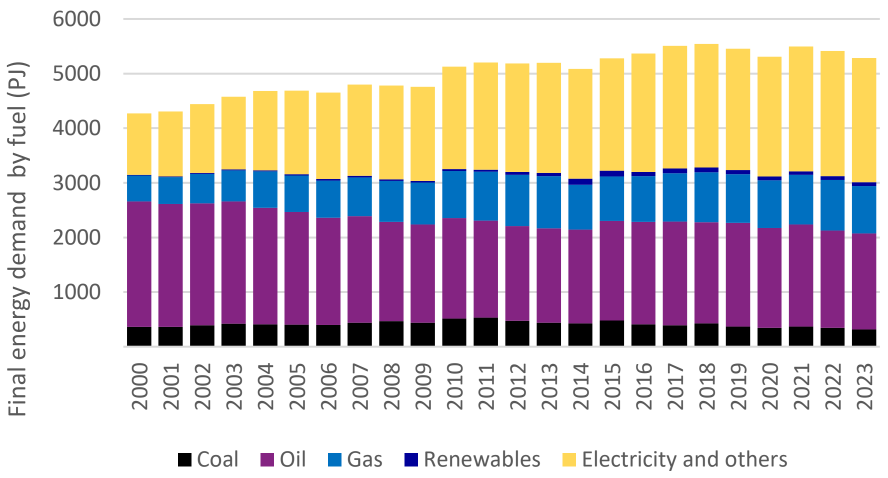
Source: EGEDA (2025)

Final Energy Demand

In 2023, Korea's final energy demand declined across all fuels except renewables compared with 2022 levels (EGEDA, 2025) (Figure 6), reflecting weaker demand from energy-intensive industries alongside efficiency gains and fuel switching. In terms of fuel composition, electricity and other fuels accounted for the largest share at 43%, followed by oil at 1,759 PJ, or 33%.

Over the past two decades, the role of fossil fuels has gradually diminished, with the combined share of coal and oil declining from 61% in 2001 to 39% in 2023. In 2023, natural gas consumption fell to 863 (PJ) (–7.1%), yet it continued to play an important role as a transition fuel, accounting for 16% of final energy demand. Renewables were the only fuel category to maintain consumption at 71 PJ, although their overall share remained relatively small.

Figure 6: Korea's final energy demand by fuel (PJ), 2000 to 2023



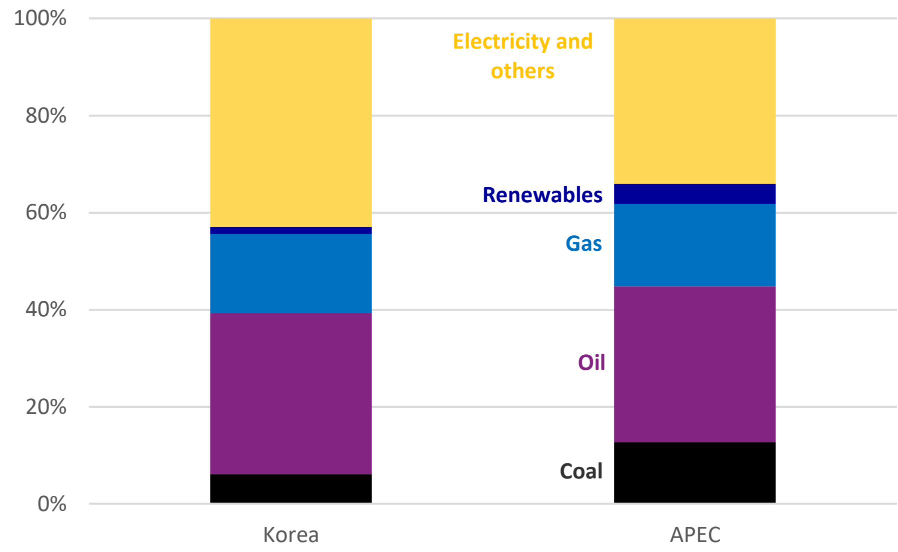
Source: EGEDA (2025)

Note: Figure 6 does not include non-energy sector consumption of energy products.

Compared with the APEC average, Korea's final energy demand by fuel in 2023 was characterised by a notably higher share of electricity and other fuels and a significantly lower share of coal. Electricity and other fuels accounted for 43% of Korea's final energy demand, around 9 percentage points higher than the APEC average, reflecting Korea's electricity-intensive industrial structure (EGEDA, 2025) (Figure 7).

By contrast, Korea's shares of oil (33.3%) and natural gas (16.3%) were broadly in line with APEC averages of around 32.7% and 17%, respectively. Coal accounted for just 6% of Korea's final energy demand, less than half the APEC average of 12.7%. Despite progress in fuel switching and electrification, the share of renewables in Korea remained 2.8 percentage points below the APEC average in 2023.

Figure 7: Final energy demand fuel share, Korea and APEC, 2023



Source: EGEDA (2025)

Transformation

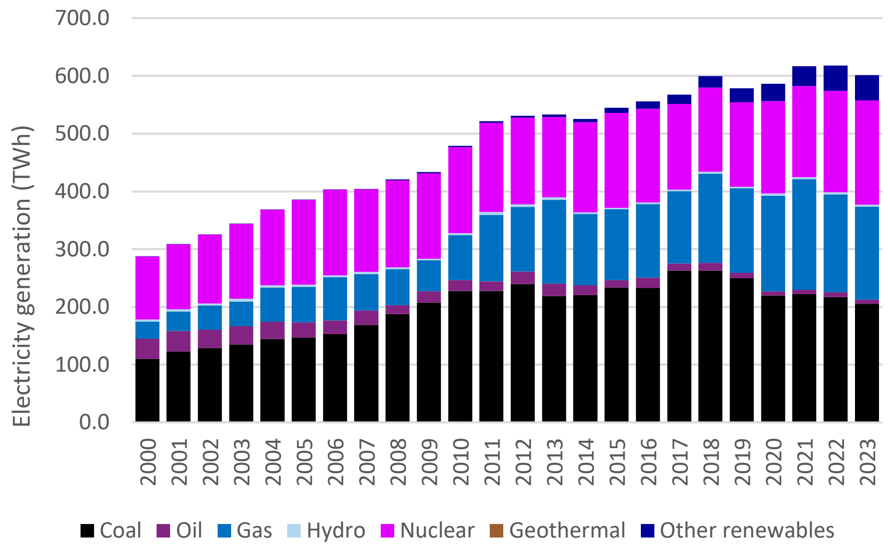
Power Sector

Energy consumption in Korea's transformation sector has increased markedly since 2000, driven by the expansion of electricity generation capacity. Total power generation more than doubled from 287.5 TWh in 2000 to 607 TWh in 2023 (EGEDA, 2025) (Figure 8). Coal remained a major source of electricity, accounting for 34% of generation in 2023, although its share declined from a peak of 46% in 2017. Total renewable energy contributed around 8% of total generation in 2023, reflecting gradual but still limited penetration.

Against this backdrop, Korea has recently strengthened its power sector decarbonisation strategy under the newly established Ministry of Climate, Energy and Environment (MCEE). At COP30 in November 2025, the government announced a mid-term pathway to retire 40 of the existing 61 coal-fired power plants by 2040, signalling an accelerated coal phase-down. In parallel, Korea set a target to expand solar and wind capacity to 100 GW by 2030, up from the current 34 GW currently installed. This large-scale deployment of variable renewables is expected to be supported by expanded transmission infrastructure, named the "Energy Expressway" initiative, to enhance grid reliability and system resilience.

Korea's power sector is operating under the 11th Basic Plan for Electricity Demand and Supply, announced in February 2025. The plan projects sustained growth in electricity demand, driven by electricity-intensive industries such as artificial intelligence (AI) and semiconductors. In response, it envisages expanding nuclear and renewable generation while gradually reducing coal- and LNG-fired power. By 2038, nuclear and renewables are projected to account for 35% and 29% of total electricity generation, respectively. Electricity consumption is expected to grow at an average annual rate of 1.8% from 2024 to 2038.

Figure 8: Korea's electricity generation by fuel, 2000 to 2023



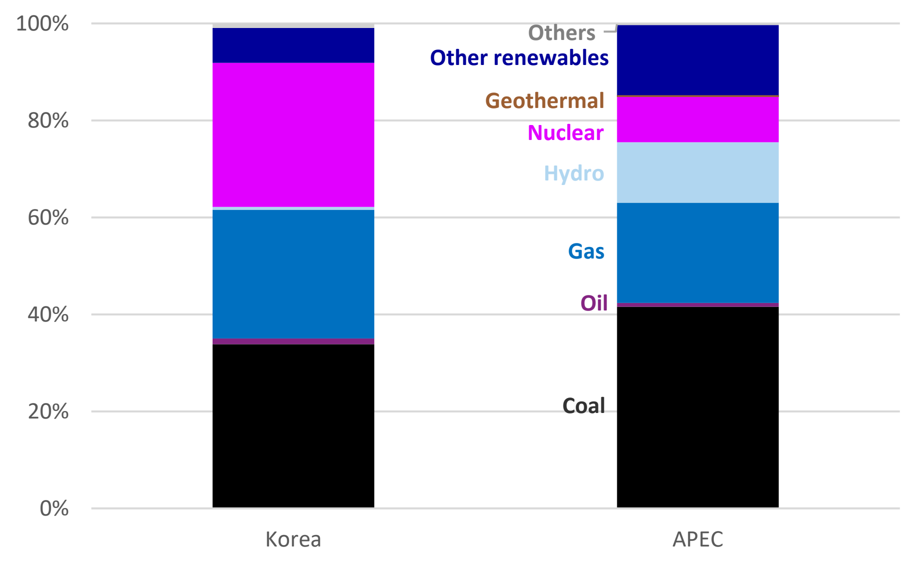
Source: EGEDA (2025)

In 2023, Korea's electricity generation mix was slightly less fossil-fuel-intensive than the APEC average. Fossil fuels accounted for 61% of total generation in Korea, compared with 63% across APEC (EGEDA, 2025) (Figure 9). Within this total, coal generation in Korea stood at 34%, 7.8 percentage points lower than the APEC average of 42%, while natural gas played a more prominent role, accounting for 26.5% of generation, around 6 percentage points higher than APEC's 20.6%.

More pronounced differences emerge in non-fossil sources. Nuclear power contributed 29.7% of Korea's electricity generation, nearly three times the APEC average of 9.4%, highlighting Korea's reliance on nuclear for low-carbon baseload supply. By contrast, other renewables (excluding hydro) accounted for only 7.2% of Korea's generation mix, roughly half of APEC's 13.9% share. Hydropower played a particularly limited role, at just 0.6%, compared with 12.5% across APEC.

Overall, Korea's power generation structure remains fossil- and nuclear-centric. While coal dependence is lower than the APEC average, coal remains the single largest source of electricity generation, and electricity security continues to rely heavily on coal, natural gas, and nuclear power. The shares of renewables and hydropower remain comparatively low. Over time, this structure is expected to evolve gradually toward a more diversified and lower-carbon generation mix, in line with Korea's long-term energy transition objectives.

Figure 9: Electricity generation fuel share, Korea and APEC, 2023



Source: EGEDA (2025)

Refining

Korea has a highly developed, export-oriented oil refining sector supported by large-scale integrated refinery capacity. Through sustained investment in expansion and upgrading, Korea's crude distillation capacity reached 3,363 thousand barrels per day in 2023, accounting for around 3.3% of global capacity and ranking fifth worldwide (Energy Institute, 2024). Five large integrated refineries underpin this scale, enabling Korea to export significant volumes of gasoline, diesel, and jet fuel to regional and global markets.

Despite strong historical export performance, the refining sector faces declining domestic demand and growing structural challenges associated with decarbonisation. Following the COVID-19 pandemic, exports of refined products rebounded, with outbound shipments reaching around 497 million barrels in 2023. However, Korea's commitment to carbon neutrality by 2050 presents longer-term challenges for the sector. In response, refiners are strengthening integration with petrochemical operations and exploring low carbon transition pathways, rather than relying solely on traditional transport fuel exports.

Energy Transition

Recognising climate change risks and global commitments under the Paris Agreement, the Korean Government continues to advance its clean energy transition. In November 2025, Korea finalised its updated 2035 Nationally Determined Contribution (NDC), committing to reduce net greenhouse gas (GHG) emissions by 53%-61% from 2018 levels of 742.3 $MtCO_2eq$. This strengthens ambition beyond the existing 2030 target of a 40% reduction.

To achieve the 2035 NDC, Korea plans to implement sector-specific mitigation measures across the economy. These include expanding renewable energy deployment in the power sector; promoting fuel and feedstock decarbonisation and increasing low-carbon product output in industry through innovation support; scaling up zero-energy buildings, green remodelling, and electrification of heat supply in buildings; and accelerating the uptake of electric and hydrogen vehicles in transport.

Building on the 2035 NDC, the government plans to advance the Korea Green Transformation (K-GX), which will outline concrete action plans to foster green industries. These include solar and wind power, power grids, energy storage systems, electric vehicles, batteries, and heat pumps, supported by close coordination among relevant ministries and industry stakeholders.

Institutionally, Korea has strengthened its governance framework. The 2050 Carbon Neutrality and Green Growth Committee, established in 2021 as a presidential advisory body, was renamed the Presidential Commission on Climate Crisis Response (PCCCR) in January 2026, reflecting an expanded mandate that integrates carbon neutrality with climate risk management and disaster response.

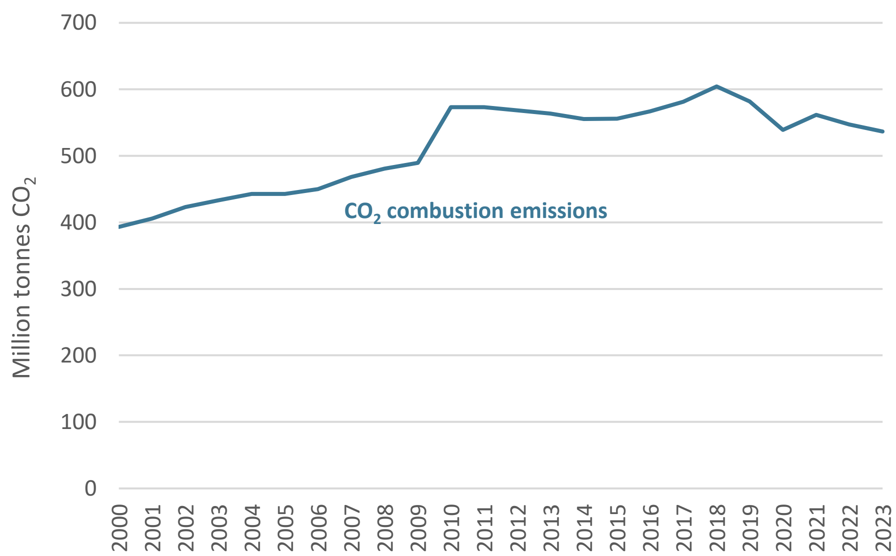
Emissions

Korea's CO_2 combustion emissions have shown a recent declining trend. However, total CO_2 emissions increased steadily between 2000 and 2018, peaking in 2018 (EGEDA, 2025) (Figure 10). This divergence highlights that achieving sustained emissions reductions will require economy-wide policy coherence and effective implementation beyond sector-specific measures, in line with Korea's 2030 and 2035 NDC targets.

To provide an overarching framework for emissions reduction, the Presidential Commission on Carbon Neutrality and Green Growth presented its vision in October 2022 and adopted the 1st Basic Plan for Carbon Neutrality and Green Growth in April 2023. The plan sets out core policy initiatives, including deploying cost-effective GHG mitigation measures such as expanded use of renewables and other low-carbon energy; mobilising private-sector participation through technological innovation and green investment; improving energy efficiency across major sectors; and strengthening international cooperation on climate action and green growth.

Building on this framework, the government has designated 2026 as the first full year of NDC implementation and is formulating policy measures aligned with its 2030 and 2035 targets. These will be reflected in the forthcoming 2nd Basic Plan for Carbon Neutrality and Green Growth (2026-2045) and the Korea Green Transformation (K-GX) strategy. Together, these initiatives are expected to translate economy targets into sectoral emissions reduction pathways and green industry support measures, complemented by emissions trading scheme reforms, strengthened green finance, accelerated coal phase-down, and expanded investment in renewables and power grids.

Figure 10: Korea's CO_2 combustion emissions (million tonnes), 2000 to 2023



Source: EGEDA (2025)

Energy Security

Energy security remains a core policy priority for Korea, reflecting its high dependence on imported fuels and the need to balance decarbonisation with system reliability and affordability. As one of the world's largest importers of oil, LNG, and coal, Korea is structurally exposed to geopolitical risks and global market volatility, shaping its approach to supply diversification, risk management, and power mix planning.

As electrification accelerates and variable renewable energy expands, Korea's energy security considerations are evolving beyond import dependence alone. Greater emphasis is being placed on broader system resilience, including preparedness for supply disruptions, management of renewable variability, and reinforcement of power system stability. In this context, energy security is increasingly framed as a multidimensional challenge spanning the entire energy value chain.

To address risks associated with imported primary energy, Korea has strengthened its institutional and legal frameworks. Key measures include maintaining strategic fuel stockpiles, diversifying import portfolios by fuel and supplier, and securing long-term contracts to mitigate exposure to supply shocks and price volatility.

As of December 2025, Korea's strategic oil stockpile stood at nearly 200 million barrels, split between government and private reserves, equivalent to around 210 days of net imports. This level of stockholding provides a substantial buffer against short-term disruptions. In parallel, the government maintains gas storage capacity and promotes long-term LNG contracting and portfolio diversification to manage seasonal and geopolitical risks in gas supply.

The establishment of a high-level Resource Security Council under the Special Act on National Resource Security, which held its inaugural meeting in December 2025, further institutionalises early warning mechanisms, strategic stockpiling, and public-private crisis coordination across oil, gas, and critical mineral supply chains.

APEC Energy Goals

There are two energy-related objectives that APEC member economies have agreed to meet as a collective: to improve energy intensity and double the share of modern renewables.

Energy Intensity Goal

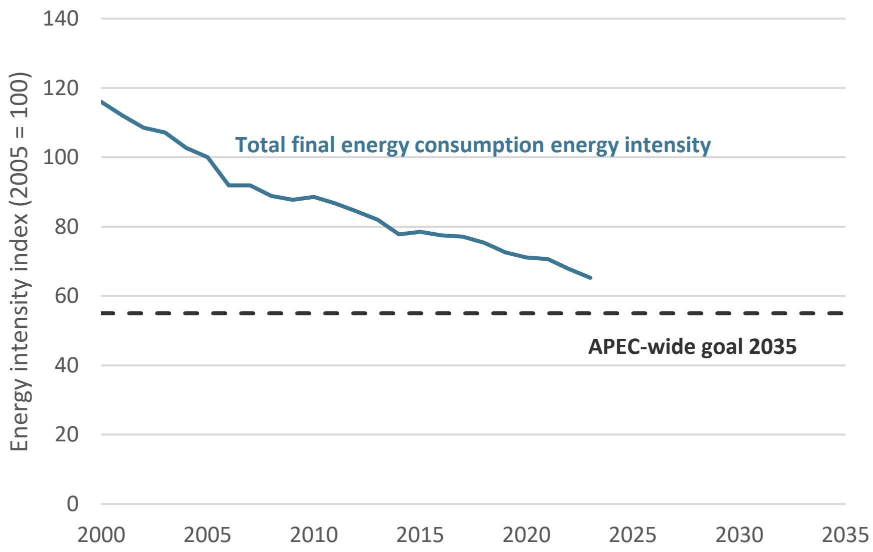
In 2011, APEC member economies agreed to increase their ambition to reduce energy intensity by 45% in 2035, relative to a 2005 baseline. The original goal was a 25% improvement by 2030, relative to a 2005 baseline.

APEC is on track to achieve this energy intensity improvement. The goal does not impose individual economy targets, but it is possible to track the progress of individual APEC economies relative to the overarching proportional improvement.

Korea's total final energy intensity has improved significantly since 2005, declining by 35% by 2023 (2005=100, index at 65) (EGEDA, 2025) (Figure 11). Despite a temporary setback in 2010, the overall trend has remained downward, including a 3% year-on-year improvement in 2023 and a 10% reduction over 2018-2023. This progress reflects sustained efficiency gains driven by technological advancement and sector-specific policies across the industry, buildings, and transport sectors. Overall, Korea's trajectory is broadly consistent with the APEC goal of reducing energy intensity by 45% by 2035 relative to 2005 levels.

In Korea, energy efficiency policy is anchored in the Energy Use Rationalisation Act, under which the government formulates a five-year demand-side strategy. The 7th Basic Plan for Energy Use Rationalisation (2025-2029) targets an additional 8.7% improvement in final energy intensity by 2029, supported by strengthened efficiency standards, sectoral measures, and enhanced demand management, including data- and AI-based approaches.

Figure 11: Korea's total final energy consumption intensity index, 2000 to 2023 (2005 = 100)

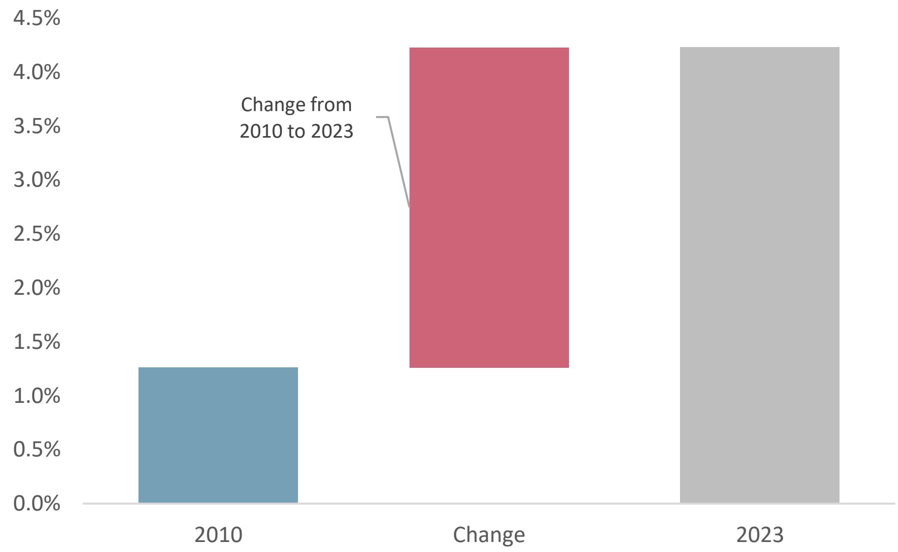


Source: EGEDA (2025)

Doubling of Renewables

The second energy goal involves doubling the share of modern renewables in the APEC energy mix for the period 2010 to 2030. There is no economy-level goal for individual member economies, but improvements by individual economies will contribute to the doubling goal.

Figure 12: Korea's modern renewable energy share, 2010 and 2023



Source: EGEDA (2025)

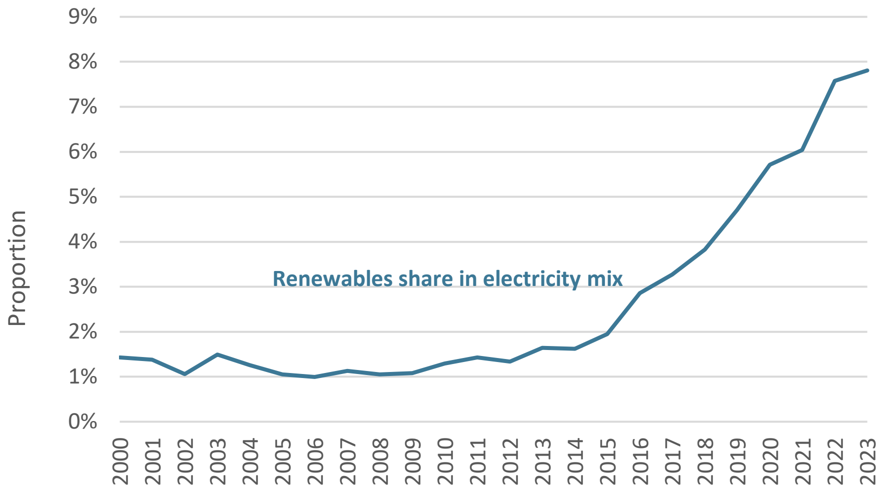
Note: Biomass used in the residential and commercial sectors is assumed to be traditional biomass and is not included in the definition of modern renewables. All other renewables (biomass used by industry, hydro, geothermal, etc.) are considered modern renewables. Modern renewables also include the share of electricity that is generated from renewable sources.

Korea has more than doubled its share of modern renewable energy over the past decade, rising from 1.3% in 2010 to 4.2% in 2023 (EGEDA, 2025) (Figure 12). Renewable electricity generation has also expanded, with its share in total power generation increasing from 2% in 2014 to 8% in 2023 (EGEDA, 2025) (Figure 13), reflecting continued policy support and the gradual expansion of low-carbon energy sources.

The Ministry of Climate, Energy and Environment has announced a target to expand installed renewable capacity to 100 GW by 2030, up from around 34 GW currently installed, in support of Korea's NDC implementation and long-term carbon neutrality goals. This underscores the government’s policy emphasis on scaling up renewables as a central pillar of Korea’s energy transition pathway.

To facilitate large-scale integration, the government plans to strengthen transmission infrastructure through the development of an economy-wide “Energy Expressway” based on expanded high-voltage direct current (HVDC) networks by the 2040s. In parallel, it aims to progressively deploy AI-enabled smart grids, battery energy storage systems (BESS), and virtual power plants (VPPs) to enhance system flexibility and reliability while accommodating geographically dispersed renewable resources.

Figure 13: Korea’s renewable generation share, 2000 to 2023



Source: EGEDA (2025)

Energy Policy

Energy Policy	Details	Reference
2035 NDC (Nationally Determined Contribution)	Finalised in November 2025, committing to a 53%-61% reduction in net GHG emissions from 2018 levels by 2035, strengthening ambition beyond the 2030 target. Implementation relies on accelerated renewable deployment, power grid expansion, industrial decarbonisation, and electrification of buildings and transport.	Presidential Commission on Climate Crisis Response
1st National Basic Plan for Carbon Neutrality and Green Growth (2023-2042)	Adopted in April 2023 under the Framework Act on Carbon Neutrality, covering 2023-2042 with five-year updates. It refines sectoral pathways toward the 2030 NDC and includes expansion of renewables and nuclear, enhancement of the Korea's Emissions Trading Scheme (ETS), low-emission transport promotion, CCUS deployment, green industry support, climate adaptation, and international cooperation.	Presidential Commission on Climate Crisis Response
11th Basic Plan for Electricity Demand and Supply (2024-2038)	Released in February 2025 under the Electricity Business Act. Provides mid- to long-term electricity demand projections for 2024-2038 and outlines measures to ensure supply stability while expanding renewable and nuclear generation in line with carbon neutrality objectives.	Ministry of Climate, Energy and Environment
15th Long-term Natural Gas Demand and Supply Plan (2023-2036)	Published in April 2023 under the Gas Business Act. Sets out demand projections and policy measures to maintain supply stability and demand–supply balance for the period 2023-2036.	Ministry of Trade, Industry and Resources
Strategy for Expanding Supply and Strengthening the Supply Chain for Renewable Energy	Announced in May 2024, positioning renewables as central to carbon neutrality and energy security. Targets annual deployment exceeding six GW, with emphasis on offshore wind ecosystem development, solar supply-chain stabilisation, and improvements to RPS and PPA market frameworks.	Presidential Commission on Climate Crisis Response
5th Basic Plan for Renewable Energy (2020-2034)	Adopted in December 2020, targeting a 25.8% renewable share in power generation by 2034 (22.2% renewables and 3.6% new energy). Focuses on expanding deployment, strengthening grid integration (including hydrogen linkages), enhancing RPS obligations, competitive procurement, R&D, and industrial innovation.	Korea Policy Briefing

Special Act on Resource Security	Implemented in February 2025, establishing a comprehensive legal framework to strengthen energy and resource security. Covers oil, gas, uranium, and critical minerals, and provides the basis for strategic stockholding, early warning systems, and coordinated crisis response mechanisms.	Ministry of Trade, Industry and Resources
New Hydrogen Economy Policy Directions	Announced in November 2022, structured around a "3UP" strategy (Scale-Up, Build-Up, Level-Up). Focuses on expanding the clean hydrogen ecosystem, infrastructure and certification systems, and technological innovation. Targets include 30,000 hydrogen vehicles and 70 refuelling stations by 2030, and a 7.1% hydrogen share by 2036.	Ministry of Climate, Energy and Environment
1st Basic Plan for Hydrogen Economy Implementation	Adopted in November 2021 as the first statutory hydrogen master plan. Sets a long-term objective of supplying 100% of domestic hydrogen demand with clean hydrogen by 2050, supported by infrastructure development, sectoral deployment (power, transport, industry), safety standards, certification, and international cooperation.	Korea Policy Briefing
3rd Energy Master Plan	Released in June 2019, providing the overarching mid- to long-term energy strategy framework covering all major energy sectors.	Korea Policy Briefing
Strategy for Securing Reliable Critical Minerals Supply	Announced in February 2023, designating 33 critical minerals. Aims to strengthen supply-chain resilience through stockpiling, diversification (reducing single-economy dependence to around 50% by 2030), recycling expansion, overseas resource development, and international cooperation.	Ministry of Trade, Industry and Resources

Notable Energy Developments

Energy Development	Details	Reference
2026 Policy Agenda of the Ministry of Climate, Energy and Environment	In December 2025, the Ministry of Climate, Energy and Environment (MCEE) articulated a vision to expand Korea's installed renewable power capacity from around 34 GW to 100 GW by 2030, positioning renewables as the backbone of the power sector transition. To support this expansion, the government plans large-scale grid investments, including the phased development of an economy-wide "Energy Expressway" and the gradual rollout of AI-enabled smart grids, energy storage systems, and virtual power plants (VPPs) to enhance system flexibility and grid reliability.	Ministry of Climate, Energy and Environment

1st Resource Security Council	In December 2025, the Korean government convened the 1st Resource Security Council, launching a policy control tower under the Special Act on Resource Security as part of its efforts to strengthen energy and resource security. Chaired by the Ministry of Trade, Industry and Energy, the council discussed key measures, including the designation of critical entities and the 5th Strategic Petroleum Stockpiling Plan, and agreed to establish a preventive supply-chain risk management framework based on early warning systems and public–private crisis response mechanisms.	Ministry of Trade, Industry and Resources
5th Strategic Petroleum Stockpiling Plan (2026-2030)	In December 2025, the Ministry of Trade, Industry and Resources (MOTIR) adopted the 5th Strategic Petroleum Stockpiling Plan (2026-2030) to further strengthen energy security. The plan shifts government oil stockpiling from a focus on volume expansion toward improving stock quality aligned with domestic demand, while adding around 2.5 million barrels to existing reserves to maintain emergency response capacity at over 210 days, in line with IEA standards. It also reinforces oil supply security through a multi-layered stockpiling framework and the modernisation of ageing facilities and disaster-response systems.	Ministry of Trade, Industry and Resources
7th Basic Plan for Energy Use Rationalisation (2025-2029)	In accordance with the Energy Use Rationalisation Act, the Korean government formulates a mid- to long-term demand-side energy strategy every five years. The 7th Basic Plan for Energy Use Rationalisation (2025–2029), announced in November 2025, aims to support carbon neutrality by transitioning toward a low-carbon, high-efficiency energy consumption structure. It targets a reduction in final energy demand from 212 million toe in 2024 to 211 million toe in 2029, alongside an 8.7% improvement in energy intensity. The plan focuses on sector-specific efficiency measures across industry, buildings, transport, and the public sector, supported by strengthened efficiency standards, heat-sector innovation, and data- and AI-based demand management.	Korea Development Institute

Useful Links

Ministry of Climate, Energy and Environment – https://www.mcee.go.kr/home/web/main.do

Ministry of Trade, Industry and Resources – https://www.motir.go.kr/

Presidential Commission on Climate Crisis Response – https://www.pcccr.go.kr/base/main/view

Statistics Korea – http://kostat.go.kr/portal/eng/index.action

Korea Electric Power Corporation – https://home.kepco.co.kr/kepco/main.do

Korea Energy Agency – www.energy.or.kr/web/kem_home_new/new_main.asp

Korea Energy Economics Institute – www.keei.re.kr/main.nsf/index.html

Korea Energy Information Culture Agency – https://www.e-policy.or.kr/web/index.do

Korea Energy Statistics Information System – https://kesis.keei.re.kr/

Korea Gas Corporation – https://www.kogas.or.kr:9450/portal/index.do
Korea Hydro and Nuclear Power – https://www.khnp.co.kr/eng/index.do
Korea National Oil Corporation – https://www.knoc.co.kr/

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Presidential Commission on Climate Crisis Response (PCCCR)

– (2025), *2035 NDC (Nationally Determined Contribution),* Press Release, 10 November 2025
https://www.pcccr.go.kr/base/board/read?boardManagementNo=3&boardNo=7125&searchCategory=&page=2&searchType=&searchWord=&menuLevel=3&menuNo=9

– (2023), *1st Basic Plan for Carbon Neutrality and Green Growth,* April 2023
https://www.pcccr.go.kr/base/board/read?boardManagementNo=60&boardNo=2343&searchCategory=100&page=1&searchType=title&searchWord=&menuLevel=2&menuNo=96

Malaysia

Introduction

Malaysia prioritises the strategic importance of the energy sector in sustaining economic stability and advancing regional integration within APEC. Key frameworks include the Twelfth Malaysia Plan (2021-2025), National Energy Policy 2022-2040, and National Energy Transition Roadmap (NETR, 2023), which outline a shift to a low-carbon economy guided by energy security, affordability, and sustainability.

NETR details ten flagship projects across six levers: energy efficiency, renewable energy, hydrogen, bioenergy, green mobility, and carbon capture, utilisation, and storage (CCUS), targeting improved energy mix and greenhouse gas (GHG) reductions. Supporting plans like the Hydrogen Economy Roadmap (HETR) and New Industrial Master Plan (NIMP) align with net-zero goals by 2050. Targets include a 45% GHG intensity cut by 2030 (vs. 2005), a ~32% reduction in energy-sector emissions by 2050 (vs. 2019), and 70% renewable energy (RE) capacity by 2050. The 2023 Energy Efficiency and Conservation Act mandates efficiency for large consumers, with carbon pricing planned post-2026.

Through 2026, the focus remains on renewable energy expansion, energy efficiency enforcement, and private finance mobilisation, per government roadmaps.

On nuclear energy, the Thirteenth Malaysia Plan (2026-2030) officially incorporates it as a clean baseload option to support net zero by 2050, following a 2024-2025 pre-feasibility study by MyPOWER Corp that identified Peninsular Malaysia and Sabah as potential sites. Implementation could occur in 10-15 years via small modular reactors, pending regulatory amendments, public engagement, IAEA collaboration, and human capital development.

Regarding climate legislation, Malaysia is advancing a Climate Change Act to formalise net-zero commitments, emissions reduction mechanisms, and adaptation strategies, building on NETR and NDC updates, with drafting underway as of early 2026 to align with APEC and ASEAN low-carbon goals.

Table 1: Malaysia’s macroeconomic data and energy reserves

Key data [a, b]		Energy reserves [c]	
Area (million km^2)	0.33	Oil (billion barrels)	2.7
Population (million)	33.4	Gas (trillion cubic feet)	32
GDP (2021 USD billion PPP)	1152.6	Coal (million tonnes)	249
GDP per capita (2021 USD PPP)	32,812	Uranium (kilotonnes U < USD 130/kgU)	0

Source: a DOSM, EPU (2025); b World Bank (2025); c EC (2025)

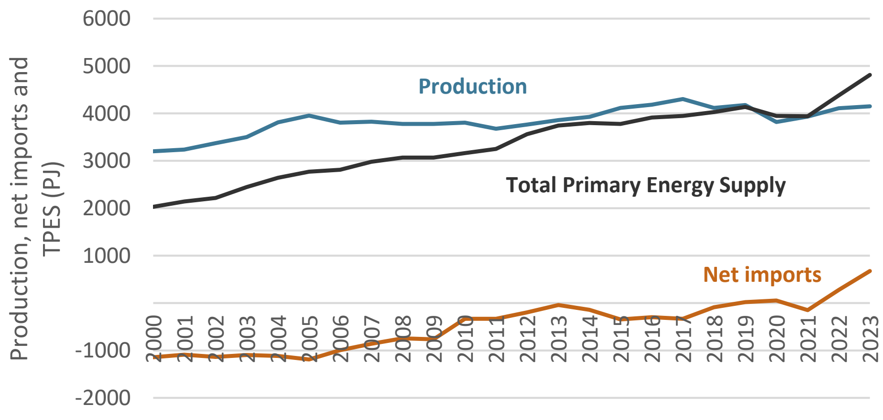
Note: Reserves are total proved reserves and reasonably assured recoverable resources for uranium.

Energy Supply and Consumption

Total Primary Energy Supply

Malaysia's total energy supply increased steadily from 2000 to 2012, then stabilised and diverged from domestic production, reaching 4,813 PJ in 2023 (Figure 1), reflecting rising import dependence. Following post-pandemic recovery in 2021, Malaysia has reinforced the strategic role of the energy sector through an integrated policy framework supporting its net-zero ambition, including the Thirteenth Malaysia Plan (2026–2030), the National Energy Policy (2022-2040), and the National Energy Transition Roadmap (NETR) 2023. Together, these policies guide the transition towards a secure, affordable, and sustainable energy system by scaling renewable energy, improving energy efficiency, enabling electrification and the adoption of low-carbon technologies, and supporting the shift from a fossil fuel-based economy to a high-value, low-carbon economy.

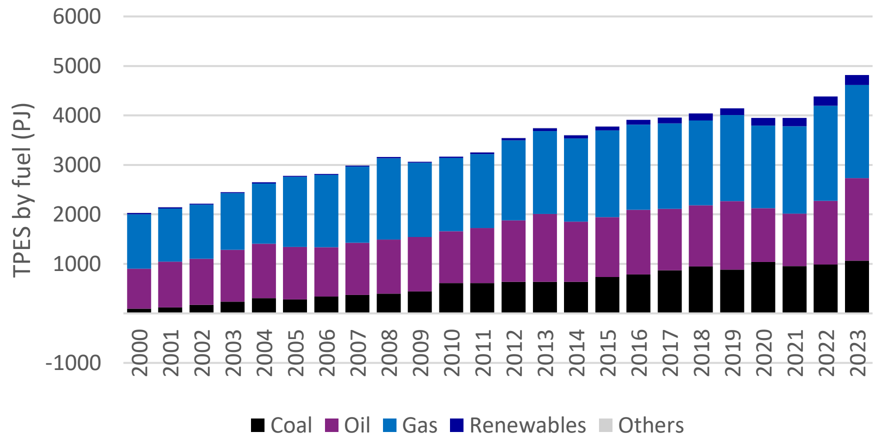
Figure 1: Malaysia's energy supply, production, and net imports (PJ), 2000 to 2023



Source: EGEDA (2025)

Malaysia's total primary energy supply (TPES) has expanded significantly since 2000 in line with industrialisation and economic growth, with fossil fuels remaining the backbone of the energy system. Natural gas is the dominant energy source, supported by domestic reserves, long-standing price regulation, and extensive infrastructure, while coal continues to play a major role in electricity generation. In recent years, Malaysia has accelerated solar deployment, expanded corporate green power programmes, and advanced grid modernisation initiatives; however, renewable energy still contributes only a limited share to TPES. The Malaysia Renewable Energy Roadmap (MyRER) sets clear targets of 31% renewable energy in installed capacity by 2025 and 40% by 2035 but achieving these goals will require addressing structural reliance on gas and coal while balancing energy security, affordability, and investment sustainability.

Figure 2: Malaysia's energy supply by fuel (PJ), 2000 to 2023

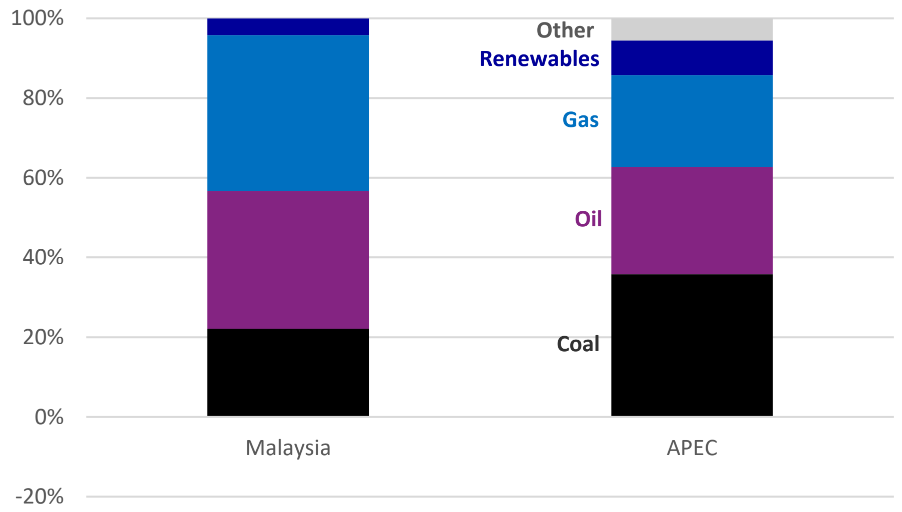


Source: EGEDA (2025)

Malaysia's energy supply mix remains heavily shaped by its abundant natural gas resources, resulting in a significantly higher reliance on gas compared with the APEC average (Figure 3). Gas accounts for a share that is around 75% higher than APEC, underscoring its central role in power generation and industrial use. Malaysia's oil share is also slightly higher than the APEC average, largely reflecting the transport sector's continued dependence on petroleum fuels.

In contrast, the share of renewable energy in Malaysia's TPES is around 50% lower than the APEC average, highlighting a structural gap in clean energy deployment. However, this gap is increasingly being addressed through recent domestic initiatives. Under the NETR and the National Renewable Energy Policy, Malaysia has set clearer pathways to scale up solar PV, accelerate grid modernisation, and expand corporate renewable energy procurement.

Figure 3: Energy supply mix – Malaysia and APEC, 2023



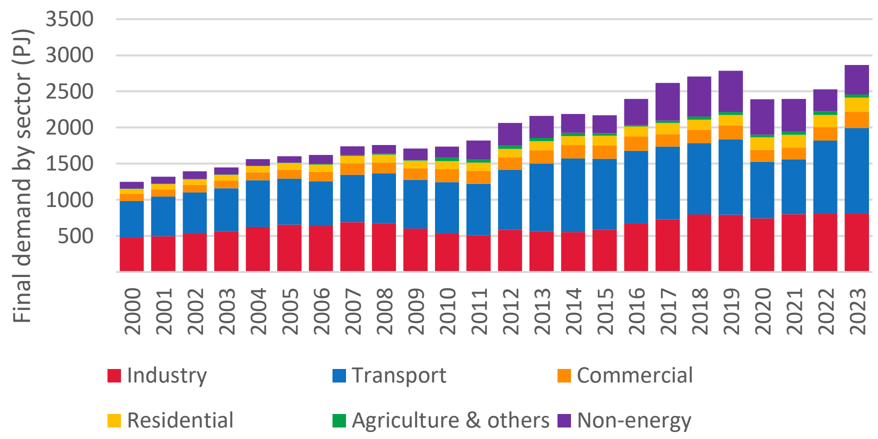
Source: EGEDA (2025)

Total Final Consumption

The transport sector accounted for the largest share of Malaysia's total final energy consumption in 2023 at 41%. The industry sector followed at 28%, non-energy at 14%, commercial and residential at 8% each, and agriculture at 2%. As shown in Figure 4, total final consumption increased by 130% from 2000 to 2023. This was due to increasing energy consumption, especially in the transport and industry sectors.

Malaysia remains highly dependent on road transport, with private vehicles dominating passenger mobility and diesel trucks serving as the backbone of freight movement. High vehicle ownership, supported by affordable domestic car production and limited public transport coverage outside major urban centres, continues to drive strong fuel demand.

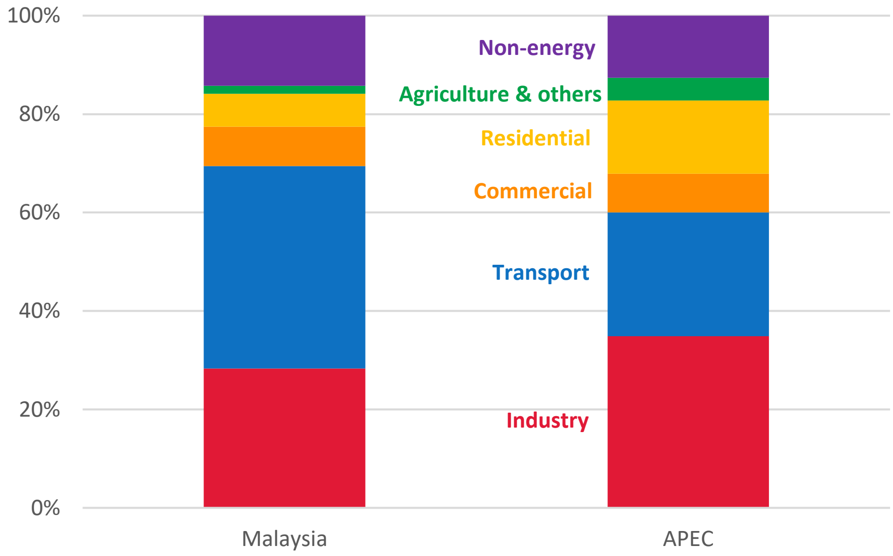
Figure 4: Malaysia's final consumption by sector (PJ), 2000 to 2023



Source: EGEDA (2025)

With respect to the APEC region (Figure 5) in 2023, Malaysia's total final energy consumption exhibits a markedly different sectoral structure compared with the APEC average. Transport accounts for the largest share in Malaysia, significantly higher than the APEC average, reflecting Malaysia's strong reliance on road-based passenger and freight transport, high vehicle ownership, and relatively limited modal shift to public and rail transport. In contrast, industry accounts for 35% of energy use in APEC economies, while its share in Malaysia is lower at 28%, indicating a less energy-intensive industrial structure and ongoing efficiency improvements. Malaysia's residential energy share is substantially smaller than the APEC average, largely due to its tropical climate and lower space-conditioning demand, while commercial energy use is broadly comparable across both cases. Non-energy use in Malaysia is slightly higher, consistent with its petrochemical and refining activities.

Figure 5: Final consumption by sector, Malaysia and APEC, 2023



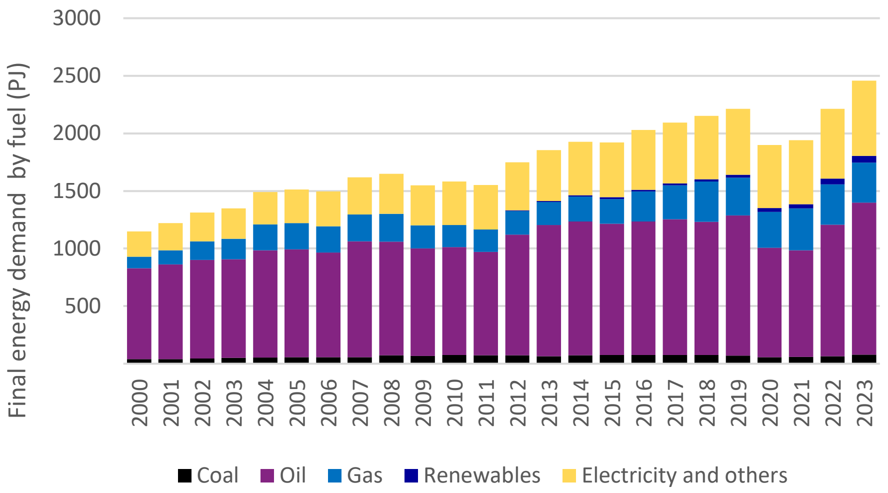
Source: EGEDA (2025)

Final Energy Demand

Malaysia's final energy demand continued to rise steadily, increasing at an average rate of about 4% per year from approximately 1,149 PJ in 2000 to around 2,459 PJ in 2023. Fossil fuels remained the backbone of end-use consumption, accounting for nearly 70% of total final energy demand in 2023, with petroleum products alone contributing over half, driven predominantly by the transport sector, which absorbed about three-quarters of total oil demand. Electricity remained the second-largest energy carrier, maintaining a stable share of around 29% since 2020. In 2023, electricity demand grew modestly, supported mainly by increased residential consumption, partly offset by softer demand from other sectors. Government tariff reliefs and targeted support measures helped moderate household electricity cost pressures.

By 2023, renewable energy accounted for around 4%-5% of Malaysia's final energy demand, with growth driven mainly by bioenergy use and renewable electricity consumption supported by government programmes. Despite this progress, renewables remain marginal in end-use sectors, particularly transport and industry, highlighting future requirements to accelerate electrification and direct renewable fuel deployment to align with the NETR and long-term decarbonisation targets.

Figure 6: Malaysia's final energy demand by fuel (PJ), 2000 to 2023



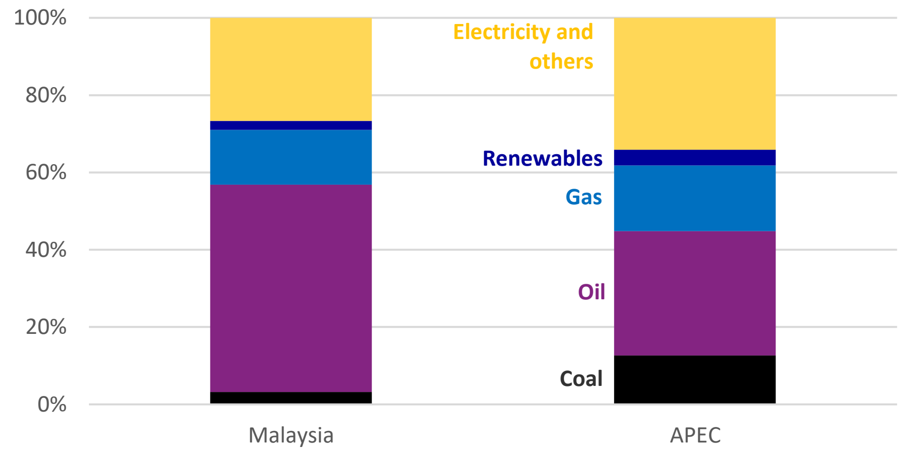
Source: EGEDA (2025)

Note: Figure 6 does not include non-energy sector consumption of energy products.

In 2023, Malaysia's final energy demand fuel mix remained dominated by oil, accounting for about half of total demand, reflecting the transport sector's heavy reliance on petroleum products. This dependence remains structurally high due to widespread private vehicle use and limited public transport penetration outside major urban centres, despite ongoing policy efforts under the Twelfth Malaysia Plan and the National Transport Policy 2019-2030 to expand public transport and reduce oil dependency. As a result, Malaysia's oil share in final energy demand remains significantly higher than the APEC average.

In contrast, Malaysia's reliance on coal in final energy demand is markedly lower than that of APEC, as coal is used predominantly for electricity generation rather than direct end-use consumption in industry or buildings. Gas plays a moderate but important role in Malaysia's demand mix, supported by relatively competitive domestic gas prices and a gradual recovery in industrial activity. Malaysia's share of renewable energy in final energy demand remained slightly below the APEC average in 2023, reflecting slower deployment of renewables in end-use sectors. Renewable consumption is mainly driven by hydro-generated electricity, alongside growing but still modest contributions from solar and biomass. Malaysia's geographic and climatic conditions constrain its wind energy potential.

Figure 7: Final energy demand fuel share, Malaysia and APEC, 2023



Source: EGEDA (2025)

Transformation

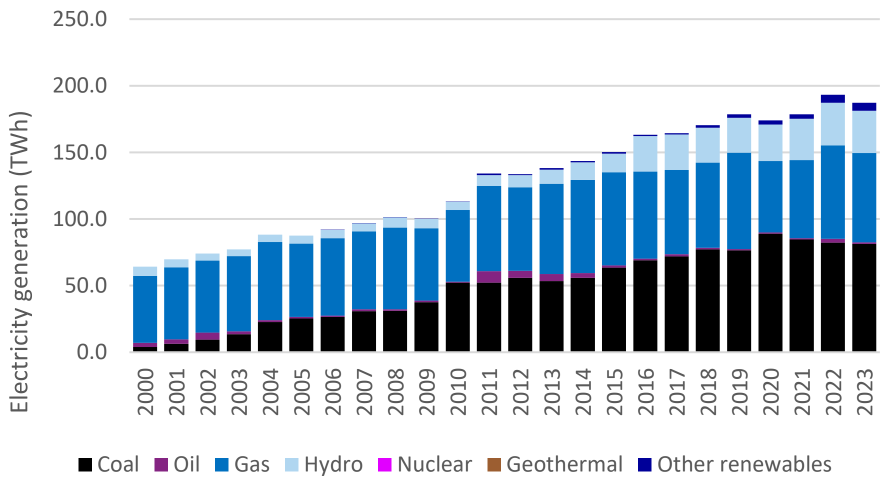
Power Sector

Since 2000 (Figure 8), Malaysia's electricity generation has remained heavily dominated by fossil fuels, particularly coal and natural gas. In 2000, gas was the primary fuel, while coal played a relatively minor role; together, fossil fuels accounted for nearly 90% of total generation. Rapid coal capacity expansion from the mid-2000s onwards due to higher electricity demand led to coal overtaking gas as the single largest generation source by the early 2010s, contributing close to half of total electricity generation at its peak.

By 2010, fossil fuel's share rose to about 94%, before gradually declining as renewable generation expanded. Between 2015 and 2023, total electricity generation continued to grow steadily, with coal and gas remaining dominant, but their combined share eased to around 80%-82% by 2023. Hydropower remains the largest renewable source, while solar and other renewables have increased modestly in recent years, reflecting policy efforts under domestic renewable energy targets.

Despite this progress, the pace of diversification remains gradual, and Malaysia's power sector continues to rely more on coal than several other APEC economies.

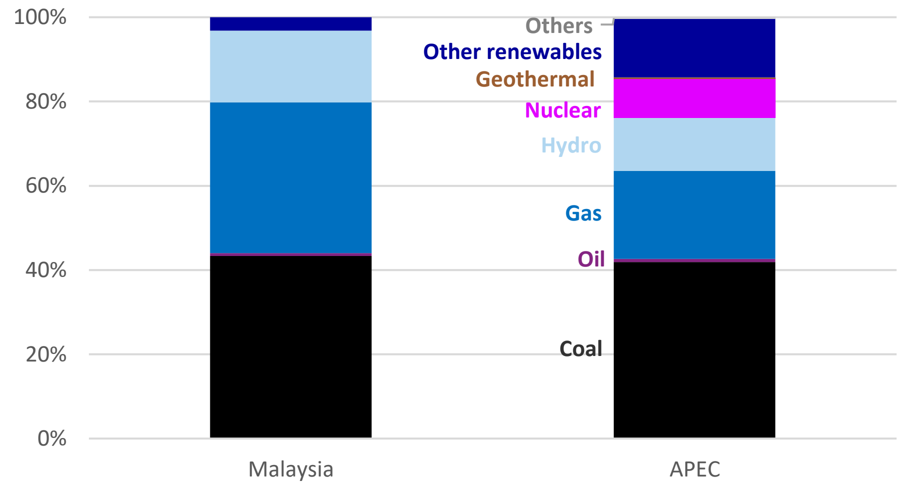
Figure 8: Malaysia's electricity generation by fuel, 2000 to 2023



Source: EGEDA (2025)

By 2023, Malaysia's electricity generation was dominated by coal and natural gas, with a combined share higher than the APEC average, reflecting a long-term shift since 2000 to support rapid economic growth and energy security. Hydropower provides a modest but stable contribution, while oil plays only a minor role and non-hydro renewables remain relatively small despite recent growth in solar capacity. Malaysia has no nuclear power plants as of 2023, although nuclear options have been periodically assessed. Policy priorities, public concerns, and limited infrastructure have kept nuclear power outside the generation mix.

Figure 9: Electricity generation fuel share, Malaysia and APEC, 2023



Source: EGEDA (2025)

Refining

Malaysia's refinery sector has been a key pillar of the energy system from 2000 to 2023, supporting industrial growth and fuel security. Refining capacity expanded steadily after 2012 and increased significantly with the Pengerang Integrated Complex, rising from about 625 thousand barrels per day in 2020-2021 to approximately 955 thousand barrels per day in 2023. This expansion strengthened domestic supply, with the petroleum product import-export gap remaining at about 20%. Looking ahead, the sector is diversifying into sustainable aviation fuel and renewable products, targeting production by 2028, using around 650,000 tonnes of raw materials annually, in line with Malaysia's energy transition goals.

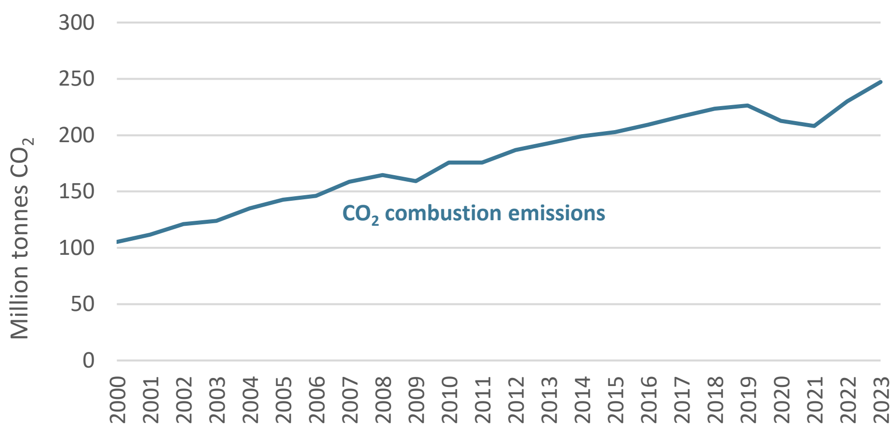
Energy Transition

Emissions

Malaysia's CO_2 emissions show a near-continuous rise from 2000 to around 2018, with a noticeable decline in 2020 during the COVID-19 lockdowns, followed by a strong rebound in 2021-2023 as economic activity normalised, reaching a record high in 2023. Since 2000, carbon emissions have risen in line with rapid industrialisation, urbanisation, motorisation, and population and GDP growth, with CO_2 emissions nearly doubling between 2000 and 2023.

A shift in the energy mix toward higher coal use in power generation, alongside sustained oil and gas consumption, has reinforced the upward trend in emissions despite improvements in energy efficiency. The government has nevertheless reaffirmed its commitment to achieve net zero emissions around 2050 and to cut the GHG emissions intensity of GDP by 45% by 2030 relative to 2005 levels under its updated NDC and long-term low-emissions strategy.

Figure 10: Malaysia CO_2 combustion emissions (million tonnes), 2000 to 2023



Source: EGEDA (2025)

Energy Security

Malaysia prioritises energy security to ensure reliable, affordable, and sustainable energy for economic growth and societal needs, while balancing the energy trilemma of security, equity, and environmental sustainability. Since the early 2000s, its strategy has evolved from a fuel diversification policy centred on oil, gas, coal, and large hydro to one that increasingly emphasises low-carbon development, grid reliability, and demand-side efficiency. The government has progressively expanded renewable energy policies and targets, including raising the installed renewable energy capacity target to 31% by 2025, 40% by 2035, and 70% by 2050 in the electricity generation mix. Malaysia has shifted to include renewables more prominently in its energy portfolio, which has historically relied heavily on fossil fuels, thereby reducing long-term dependency on conventional fuels.

Key measures include large-scale solar programmes, hybrid hydro-floating solar projects, biomass and biogas development, and the scaling up of rooftop solar for government, commercial, and residential users. Energy efficiency has been elevated as a core "first fuel", with the forthcoming Energy Efficiency and Conservation Act (EECA) targeting energy-intensive facilities, buildings, and appliances, alongside audits and minimum performance standards to curb demand growth.

Malaysia is also enhancing regional energy cooperation and grid connectivity through active participation in the ASEAN Power Grid (APG), building on existing interconnections with Singapore and Thailand and planning further links with Indonesia and within East Malaysia to strengthen supply reliability and enable greater trade between economies in renewable electricity. This regional integration supports both domestic energy security and ASEAN's long-term vision.

APEC Energy Goals

There are two energy-related objectives that APEC member economies have agreed to meet as a collective: to improve energy intensity and double the share of modern renewables.

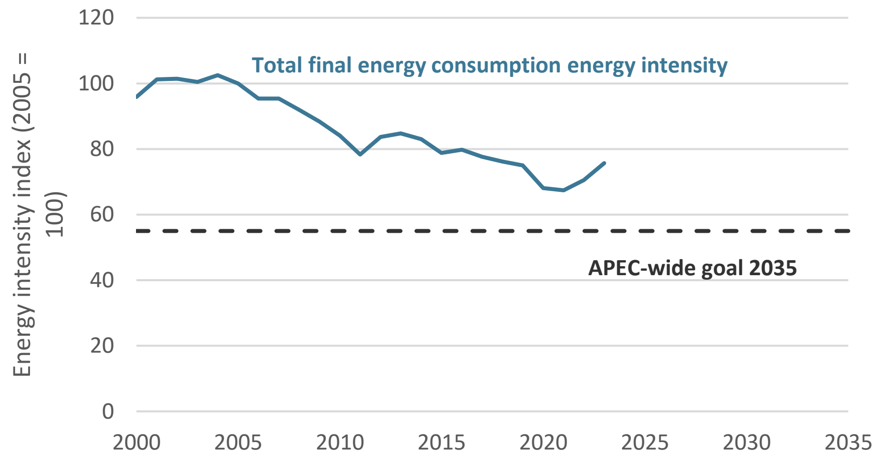
Energy Intensity Goal

In 2011, APEC member economies agreed to increase their ambition to reduce energy intensity by 45% in 2035, relative to a 2005 baseline. The original goal was a 25% improvement by 2030, relative to a 2005 baseline.

APEC is on track to achieve this energy intensity improvement. The goal does not impose individual economy targets, but it is possible to track the progress of individual APEC economies relative to the overarching proportional improvement.

Malaysia's total final energy consumption energy intensity (excluding non-energy) declined steadily from 2005 to 2020, dropping by approximately 20%-25%. However, the current trend shows that while progress has been made, further reductions are needed to reach the APEC-wide energy intensity goal for 2035, which is represented by the dashed horizontal line at around 60% of the 2005 baseline. (Figure 11).

Figure 11: Malaysia's total final energy consumption intensity index, 2000 to 2023 (2005 = 100)



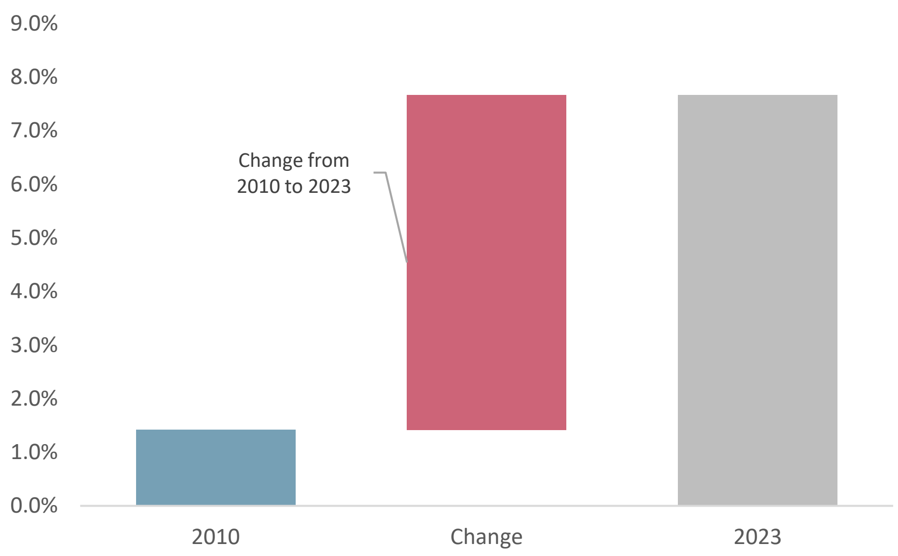
Source: EGEDA (2025)

Doubling of Renewables

The second energy goal involves doubling the share of modern renewables in the APEC energy mix for the period 2010 to 2030. There is no economy-level goal for individual member economies, but improvements by individual economies will contribute to the doubling goal.

Malaysia's modern renewable energy share from 2010 to 2023 increased from approximately 1% in 2010 to around 7%-8% in 2023. By 2021, the proportional share had surged more than 7.5%, indicating a more than fourfold increase in modern renewables compared to 2010 (Figure 12).

Figure 12: Malaysia's modern renewable energy share, 2010 and 2023

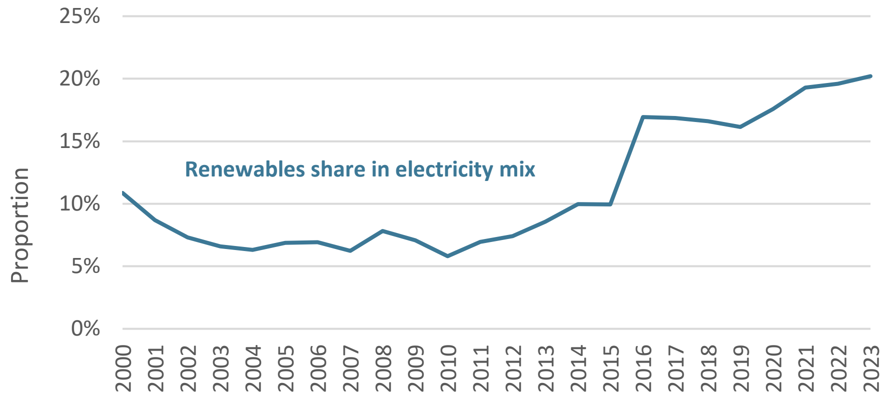


Source: EGEDA (2025)

Note: Biomass used in the residential and commercial sectors is assumed to be traditional biomass and is not included in the definition of modern renewables. All other renewables (biomass used by industry, hydro, geothermal, etc.) are considered modern renewables. Modern renewables also include the share of electricity that is generated from renewable sources.

Malaysia's renewable share in the electricity mix rose from around 10% in 2000 to about 20% in 2023, with most of the increase occurring after the mid-2010s, as reflected in Figure 13. In 2023, renewables accounted for roughly one-fifth of Malaysia's electricity generation, compared with only about 7%-8% in the early 2010s, and renewable generation reached about 38 TWh, up from around 7 TWh in 2010.

Figure 13: Malaysia's renewable generation share, 2000 to 2023



Source: EGEDA (2025)

Energy Policy

Energy Policy	Details	Reference
Nationally Determined Contribution to the UNFCCC 2021	To unconditionally decrease GHG emission intensity of the GDP by 45% in 2030 compared to the 2005 level.	Ministry of Natural Resources and Environmental Sustainability
Malaysia Renewable Energy Roadmap 2022-2035	To support further decarbonisation of the electricity sector in Malaysia through the 2035 milestone, from 2022 to 2035.	Ministry of Energy Transition and Water Transformation
Third Industrial Master Plan (IMP3) 2030	Manufacturing: to grow at 5.6% annually, contributing 29% to GDP in 2020, and total investments of MYR 412 billion (MYR 28 billion annually). Non-government services: to grow at 7.5% annually and contribute 60% to GDP in 2020, and total investments of MYR 688 billion (MYR 46 billion annually).	Ministry of International Trade and Industry
National Energy Policy 2022-2040	To enhance macroeconomic resilience and energy security, achieve social equitability and affordability, and ensure environmental sustainability. The document is subject to periodic reviews every three years to ensure that the targets are achievable and to keep in line with international development in the energy transition pace.	Ministry of Economy
National Energy Transition Roadmap 2050	To accelerate energy transition efforts. This roadmap is vital for steering Malaysia's shift from a traditional fossil fuels-based economy to a high-value green economy. The NETR requires a whole economy approach, encompassing federal and state governments, industry, the public, and the international community.	Ministry of Economy
Energy Efficiency and Conservation Act (EECA) 2024	A comprehensive energy efficiency law enforced from 1 January 2025 to regulate and improve energy efficiency and conservation in Malaysia. It replaces the older Efficient Management of Electrical Energy Regulations 2008 (EMEER).	Energy Commission
Hydrogen Economy and Technology Roadmap 2050	To guide the development of Malaysia's hydrogen economy. This roadmap is a supporting document to the National Energy Policy 2022-2040 (NEP), which will pave the way to achieving environmentally sustainable, long-term energy security for Malaysia, driven by technological innovation.	Ministry of Science, Technology, and Innovation
Thirteenth Malaysia Plan (13MP) 2026-2030	The thirteenth Malaysia Plan (RMK13) 2026-2030 is Malaysia's development roadmap to drive inclusive, sustainable, high-income growth under Ekonomi MADANI, with a strong focus on energy transition, clean energy deployment, energy security, and efficiency, alongside economic transformation, talent and innovation, wellbeing, and governance.	Ministry of Economy

Notable Energy Developments

Energy Development	Details	Reference
Large-Scale Solar Programme (LSS 6)	New round of the Large-Scale Solar programme to add nearly 2 GW capacity with substantial private investment starting in early 2026.	Energy Commission
Solar ATAP (Accelerated Transition Action Programme)	Expanded to allow more consumers to generate their own solar power and feed surplus to the grid.	Sustainable Energy Development Authority (SEDA) Malaysia
Community Renewable Energy Aggregation Mechanism (CREAM)	Allows communities to aggregate rooftop solar systems for collective generation and supply.	Energy Commission
Low Carbon Energy Generation Programme (LCEGP)	Programme to diversify renewable sources beyond solar (e.g., biogas, biomass, small hydropower).	Single Buyer
2026 Renewable Energy Scheme Updates	Regulatory updates expanding CRESS, Solar ATAP, SELCO (self-consumption PV), and dispatch mechanisms to support market access for clean energy projects.	Energy Commission
Green Technology Financing Scheme (GTFS 5.0)	Continued financing support with government guarantees for renewable and clean tech projects as part of the energy transition framework.	Malaysian Green Technology and Climate Change Corporation
Carbon Tax Introduction (aligned with National Carbon Market)	New carbon tax planned to start (initial focus on steel, iron and energy sectors), part of broader climate-policy integration.	Ministry of Finance
Biodiesel Blend Expansion (B10 to B20 pilot)	Expanded B20 biodiesel use in ground transport vehicles to reduce fossil fuel dependence and support emissions goals toward net zero by 2050.	Ministry of Plantation and Commodities
Strengthened Nuclear Regulation	Amendments to atomic energy law to enhance safety oversight – supportive of potential future nuclear energy development.	Ministry of Science, Technology and Innovation (MOSTI)

Useful Links

Bank Negara Malaysia – www.bnm.gov.my

Department of Statistics Malaysia – www.dosm.gov.my

Energy Commission – www.st.gov.my

Grid System Operator – www.gso.org.my

Malaysia Energy Information Hub – https://myenergystats.st.gov.my/

Malaysia Green Technology Corporation – www.mgtc.gov.my

Malaysian Palm Oil Board – www.mpob.gov.my

Ministry of Economy – https://ekonomi.gov.my/

Ministry of Energy Transition and Water Transformation – Ministry of Energy Transition and Water Transformation

Ministry of Natural Resources and Environmental Sustainability – Ministry of Natural Resources and Environmental Sustainability

Ministry of Finance – www.mof.gov.my

Ministry of Investment, Trade, and Industry – www.miti.gov.my

Ministry of Plantation and Commodities – https://www.kpk.gov.my

Ministry of Science, Technology, and Innovation – www.mosti.gov.my

PETRONAS – www.petronas.com

Prime Minister's Office – www.pmo.gov.my

Sustainable Energy Development Authority (SEDA) Malaysia – www.seda.gov.my

Single Buyer Department – www.singlebuyer.com.my

Mexico

Introduction

Mexico's economy remains closely integrated with North American supply chains, with nearshoring trends supporting manufacturing and industrial activity. These developments, together with population growth, and an increasing presence of electricity in different sectors, have increased demand for reliable electricity supply and natural gas imports, highlighting the need to expand generation capacity and strengthen transmission networks. Energy policy has focused on security and sovereignty in the energy sector strengthening the role of publicly owned companies while allowing private participation in strategic projects of generation and commercialisation.

Mexico possesses abundant fossil fuel resources and favourable natural conditions for solar and wind power. Despite this resource base, oil and gas production has struggled for more than a decade to keep pace with growing energy demand. This challenge is particularly pronounced for natural gas, as Mexico now depends heavily on imports. Mexico has also faced challenges to produce sufficient refined petroleum products.

Mexico's proximity to the United States enables access to energy imports at competitive prices through a highly interconnected pipeline system, particularly for natural gas.

Natural gas production remained relatively stable between 2017 and 2023 but declined in the past two years on record. In 2024, output fell to 4,586 million cubic feet per day, an 8% decrease compared with 2023. Crude oil production also declined, reaching 1.5 million barrels per day in 2024, 6% lower than the previous year, largely due to declining productivity in mature fields that represent the largest share of Pemex's producing assets.

Mexico's current energy strategy emphasises increasing energy security and sovereignty by strengthening publicly owned companies, particularly Pemex and the Comisión Federal de Electricidad (CFE). The government aims to increase crude oil production to around 1.8 million barrels per day and stabilise natural gas output at approximately 5,000 million cubic feet per day. Investments have also been directed toward revitalising the refining system to reduce reliance on refined product imports, alongside efforts to expand power generation and transmission capacity.

In March 2025, a new energy reform was approved to reinforce the leadership role of Pemex and CFE while allowing additional private investment under revised regulatory frameworks. Together, these factors shape the evolution of Mexico's energy system, influencing energy supply dynamics and demand trends.

Table 1: Mexico's macroeconomic data and energy reserves

Key data [a, b]		Energy reserves [c, d]	
Area (million km^2)	2.0	Oil (billion barrels)	6.1
Population (million)	126	Gas (trillion cubic feet)	6.3
GDP (2021 USD billion PPP)	2,838	Coal (million tonnes)	1,211
GDP per capita (2021 USD PPP)	21,874	Uranium (kilotonnes U < USD 130/kgU)	2,500

Source: a INEGI (2025); b World Bank (2024); c Energy Institute (2025); d NEA (2024)
Note: Reserves are tot7al proved reserves and reasonably assured recoverable resources for uranium.

Energy Supply and Consumption

Total Primary Energy Supply

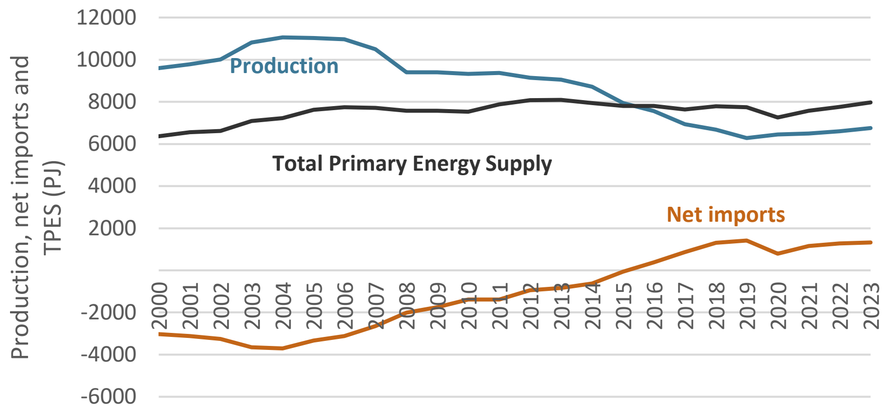
Mexico's energy production has declined by 40% since oil production peaked at 3,380 Mbd in 2004. Total primary energy supply (TPES), which includes imports, exceeded domestic production for the first time in 2016, and it is expected that this trend will continue unless the decline in crude oil and gas production is reversed.

The partial recovery in Mexico's crude oil and gas production observed after 2019 was driven mainly by accelerated development of onshore and shallow-water fields in the Sureste Basin, which temporarily offset declines in mature offshore assets.

Until 2015, Mexico was a net energy exporter, with crude oil making up the bulk of its energy exports. However, rising natural gas imports from the United States outpaced these exports. Declining domestic gas production further increased reliance on U.S. gas, while declining oil production widened the energy import gap. Net energy imports in 2023 are almost triple the 2016 levels.

Over the next decade, natural gas imports are expected to continue rising to meet growing domestic demand and could be re-exported to international markets. Several liquefied natural gas (LNG) projects are being considered in Mexico, with two already completed, leveraging its geographic location and logistical advantages to expand the trade of US LNG, primarily targeting Asian and European markets. The New Fortress Altamira FLNG (floating LNG terminal) is already in operation, while the Energia Costa Azul LNG project is set to begin operations by spring 2026.

Figure 1: Mexico's energy supply, production, and net imports (PJ), 2000 to 2023

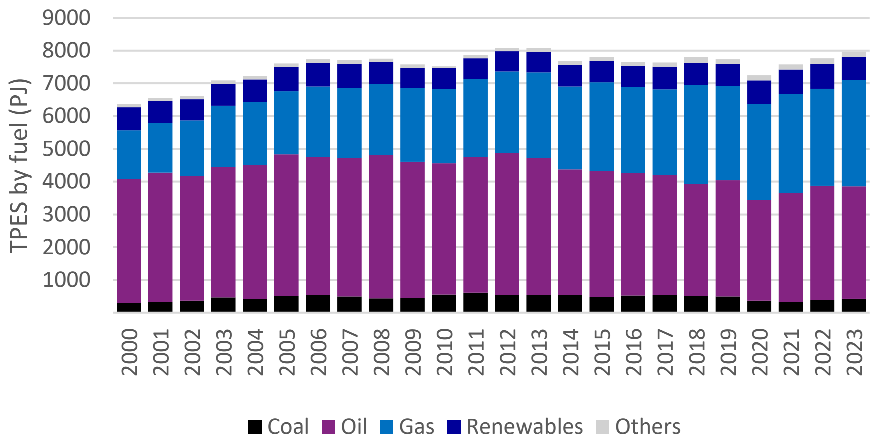


Source: EGEDA (2025)

From 2020 to 2023, TPES grew by 2.6% year-on-year driven by growth in economic activity, mainly in the industry and commercial sectors. The largest absolute growth in energy supply came from natural gas imports. Growing electricity demand and a decrease in hydropower supply, due to drought that constrained reservoir levels in major hydroelectric plants, were the major drivers in the increase of natural gas supply.

Relatively high prices for refined fuels resulted in a slight contraction in activity in the transport sector, which reduced the needed supply of refined fuels. Further substitution of marginal power generators, like diesel and fuel oil, by natural gas also weighed down on refined fuel demand.

Figure 2: Mexico's energy supply by fuel (PJ), 2000 to 2023

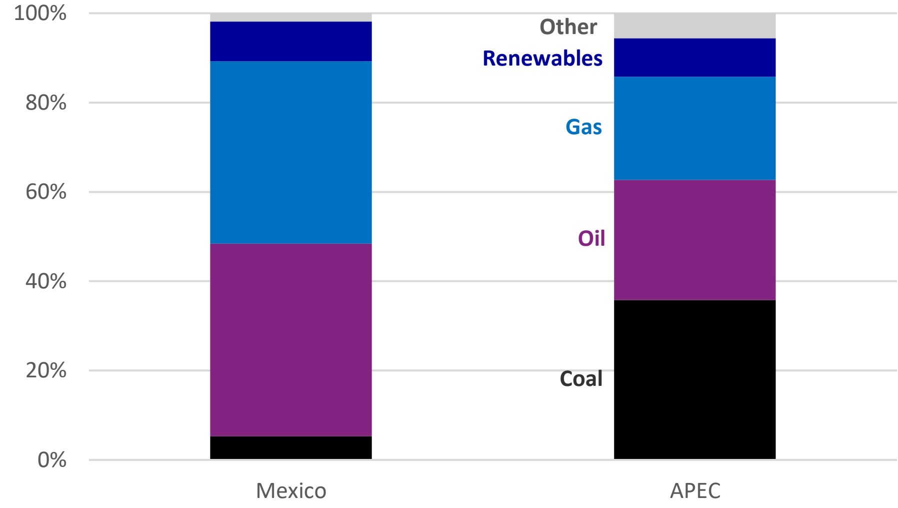


Source: EGEDA (2025)

Natural gas' share of TPES increased in 2023 to reach 40%, challenging oil's role as the main primary energy source. From 2010 to 2023, oil's share in TPES fell from 53% to 43%, while natural gas increased from 30% to 41%. Since the mid-2000s, factors such as abundant and affordable U.S. natural gas and expanded infrastructure have enabled Mexico to increase its gas supply despite a decline in domestic production. An extensive and integrated pipeline network ensures gas reaches demand centres, supplying the industrial, building, and power sectors.

Mexico has significant potential for renewable energy generation. The technical potential has been assessed at 5,759 TWh for wind and 50,196 TWh for PV, per annum (NLR, 2022). Wind and PV penetration increased rapidly over the last decade; however, renewables still lag fossil fuels. In 2023, renewable energy accounted for 706 PJ, or 8.8% of TPES, while modern renewables (including wind, solar and modern biomass energy) accounted for just 463 PJ, or 5.8% of TPES.

Figure 3: Energy supply mix – Mexico and APEC, 2023



Source: EGEDA (2025)

One of the main differences between Mexico's energy supply mix and APEC's is the lower share of coal. Compared to the APEC region, Mexico has access to abundant, and competitively priced, domestic and imported gas, making it a more competitive fuel than coal, particularly for power generation.

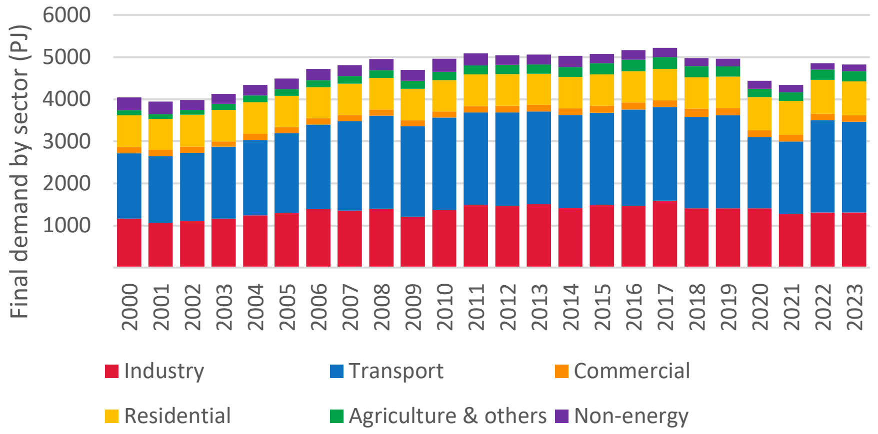
In Mexico, oil's share of the energy supply mix is higher (43%) compared to APEC average (27%), due to the relatively high transport sector energy demand, domestic oil production and sizeable refining industry. Mexico operates seven oil refineries, with the most recent, Dos Bocas, located in the state of Tabasco in the southern region, beginning operations in the second half of 2024.

Total Final Consumption

In 2023, total final consumption (TFC) in Mexico declined slightly compared to the previous year. Even though economic activities continued to rebound after the COVID-19 impact on the economy, less energy consumption in the transport sector drove a small decrease in TFC.

TFC in the commercial sector grew slightly in 2023, as social distancing policies were phased out in public and open spaces. In the agriculture sector, TFC rebounded to pre-pandemic levels as activity in this sector increased sharply. Drought conditions were also a driver in energy demand growth for water procurement for agriculture.

Figure 4: Mexico's final consumption by sector (PJ), 2000 to 2023

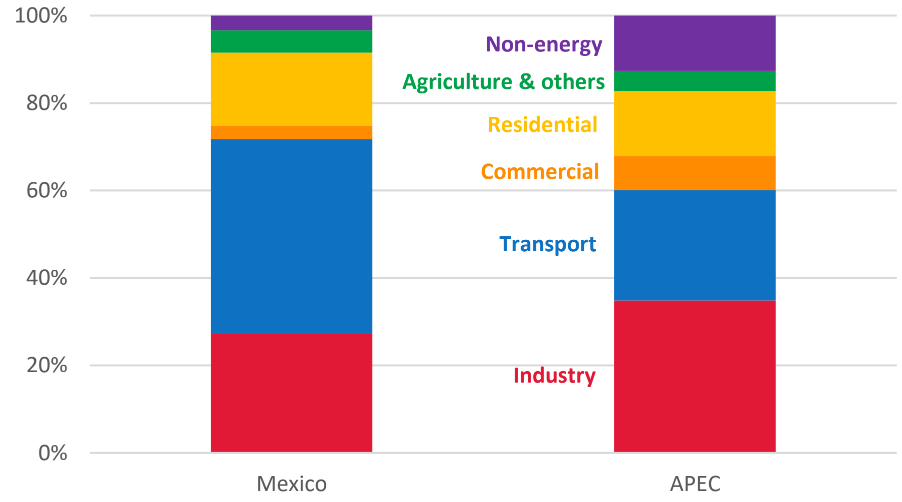


Source: EGEDA (2025)

Mexico's TFC has been largely driven by the transport sector, which accounted for 45% of TFC in 2023. The mountainous geography found in Mexico, extensive trade with the United States, and high vehicle ownership contribute to making this sector the dominant energy consumer. The transport sector is primarily dependent on oil-refined products such as diesel and gasoline.

The industry sector is the second-largest consumer, accounting for 27% of TFC. This sector relies heavily on electricity, natural gas, oil byproducts and, to a lesser extent, coal.

Figure 5: Final consumption by sector, Mexico and APEC, 2023



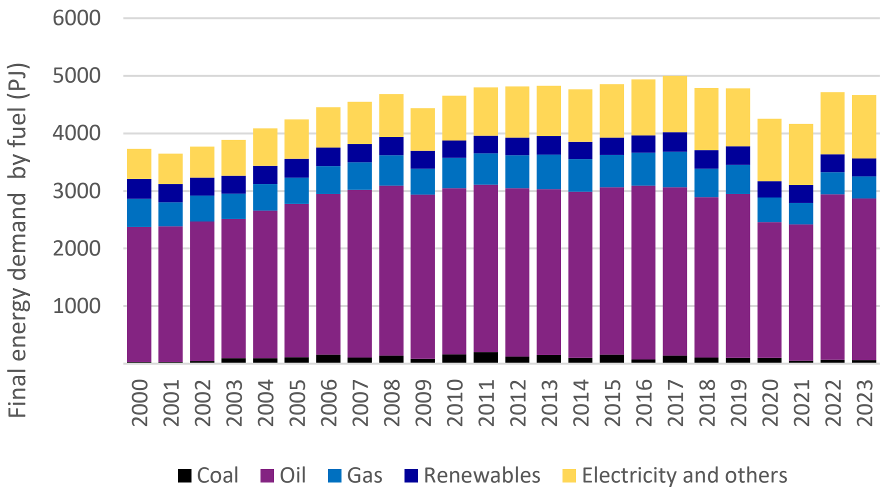
Source: EGEDA (2025)

Final Energy Demand

In 2023, final energy demand (FED) in Mexico decreased slightly – by 1% compared to the previous year. The decrease was mainly caused by less consumption of refined oil products in the transport sector.

FED for natural gas recorded modest growth in 2023, mainly due to subdued residential demand growth. Electricity consumption followed a similar trend, with limited expansion concentrated in households. The observed changes were largely driven by ongoing fuel substitution, particularly the replacement of LPG with electricity and natural gas.

Figure 6: Mexico's final energy demand by fuel (PJ), 2000 to 2023



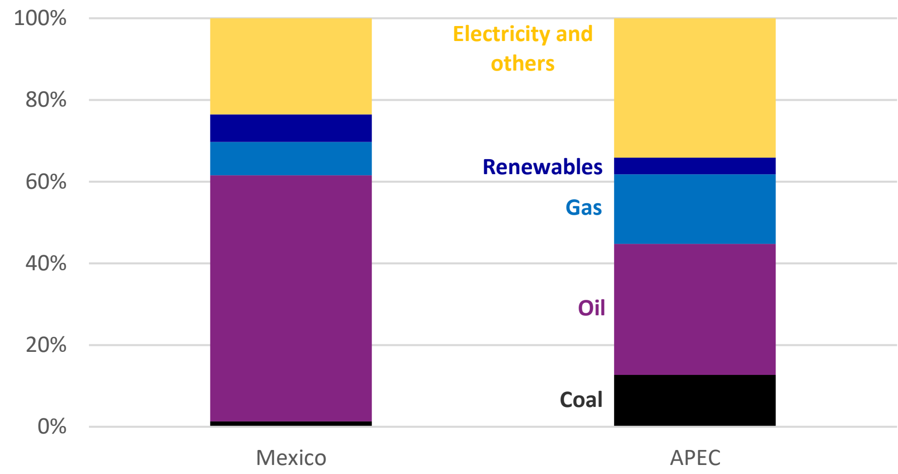
Source: EGEDA (2025)

Note: Figure 6 does not include non-energy sector consumption of energy products.

Mexico is heavily reliant on fossil fuels to meet its final energy demand. In 2023, refined oil products accounted for the largest share of FED at 60%. This high reliance on oil, compared to the APEC region, is explained by Mexico's domestic oil production and refining industry, access to refined product imports from the United States, and strong energy demand in the transport sector.

Although Mexico has a sizeable gas supply, most of it is used for electricity generation, with some use in the industry. Natural gas is not a major source of energy in the buildings and transport sectors. The natural gas share of FED stands at 8.2%, about half of the share for the APEC region. The coal share in Mexico's FED mix is notably low at 1.3%, reflecting its limited role beyond the industry sector.

Figure 7: Final energy demand fuel share, Mexico and APEC, 2023



Source: EGEDA (2025)

Renewable energy in Mexico, accounting for 6.7% of FED, is significantly higher than the share observed in the APEC region. Most of the final energy demand for renewables comes from the use of solid biomass for domestic activities such as cooking and water heating; in addition, solar water heating has a considerable contribution.

Electricity comprises 24% of the final energy demand in Mexico, below the APEC total share of 34%. The current reliance on hydrocarbons in transport, industry, and in commercial buildings, as well as the use of solid biomass for domestic activities, has prevented electricity from playing a larger role in Mexico's energy mix.

Transformation

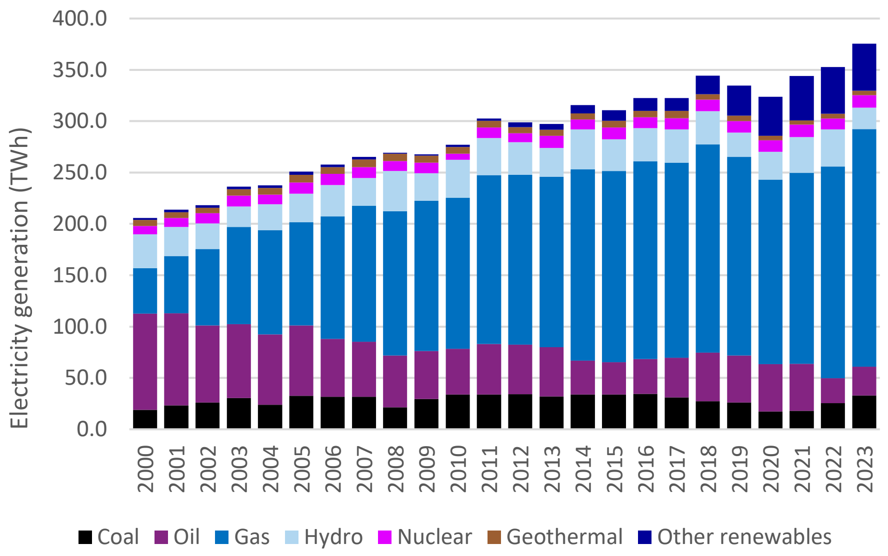
Power Sector

Electricity policy is driven by binding state planning, consolidating the

Comisión Federal de Electricidad (CFE) as a State Public Company (Empresa Pública del Estado) and guaranteeing its 54% minimum prevalence in electricity generation, while allowing private capital strictly through Mixed Development Schemes or Distributed Generation. Transmission and distribution are exclusive activities for the state company.

In 2023, total electricity generation in Mexico increased by 3% compared to the previous year. This growth was mainly driven by increasing demand in industry, large commercial buildings (hotels, offices, supermarkets), and in residential buildings where electricity continues to replace the use of LPG.

Figure 8: Mexico's electricity generation by fuel, 2000 to 2023



Source: EGEDA (2025)

In 2023, natural gas accounted for 56% of total electricity generated in Mexico making natural gas, by far the main source of power generation. Its share has steadily increased over the past two decades, supported by domestic supply and affordable gas imports from the United States. This growth has reduced the role of fuel oil and coal in power generation.

Hydropower generation, with majority public ownership by CFE, continues to be the second largest source of electricity accounting for 10% of total electricity generated in Mexico. At the same time, the amount of electricity generated from wind and solar has grown significantly, especially in the past five years, increasing the share of low emissions generation.

Coal-fired power generation in Mexico has not followed a clear downward trajectory, reflecting its role as a balancing fuel when natural gas supply tightens or hydropower generation declines. In 2023, severe drought conditions significantly reduced hydropower availability, leading to a notable rebound in coal generation.

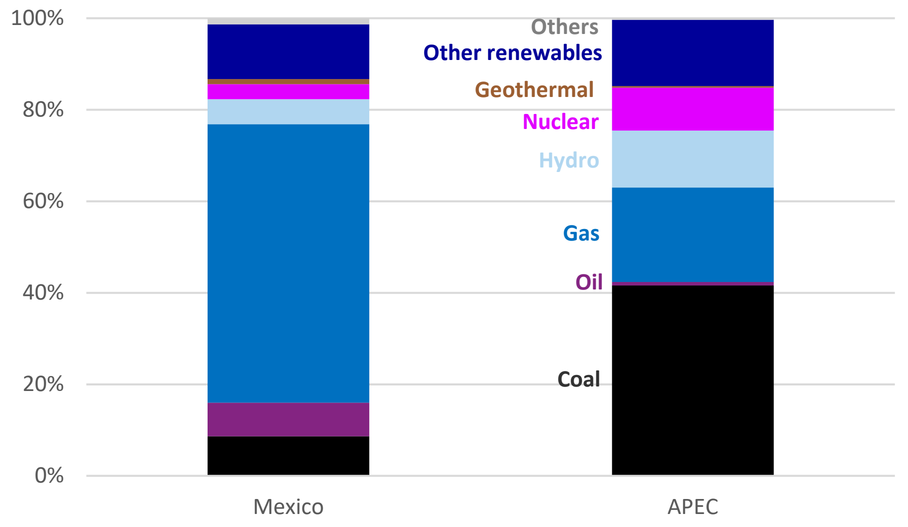
In 2023, the composition of electricity generation by fuel in Mexico differed significantly from that of the APEC region. In APEC, coal was the primary source of electricity, accounting for 42% of total generation, largely due to its dominant role in China's power sector.

Gas is the second-largest source of electricity in the APEC region, accounting for 21% of total generation. Its share is driven by the availability of domestic production or competitively priced imports in several APEC economies.

In 2023, renewable electricity had a smaller share in Mexico than in the APEC region. Hydro, geothermal, and other renewables (mainly solar and wind) accounted for 17.5% of total generation in Mexico, compared to 27% in APEC. However, Mexico's latest Power Sector Development Plan (PLADESE) 2025-39 projects that wind and solar power will be the fastest growing power generation capacity in the short-to-medium term.

The share of nuclear generation in Mexico is significantly lower than the APEC region average, as high upfront capital costs and long construction times discourage expansion and hinder its economic efficiency when compared to the abundant renewable energy sources and competitively priced natural gas that Mexico has access to.

Figure 9: Electricity generation fuel share, Mexico and APEC, 2023



Source: EGEDA (2025)

Refining

Mexico prioritises increasing the utilisation of its domestic refining system. The seventh refinery, Dos Bocas, located in Tabasco with a capacity of 340,000 barrels per day, began operations in the second half of 2024. Additionally, since 2019, significant investments have been made to maintain and modernise the six existing refineries, aiming to enhance capacity and reliability for processing heavy crude oil. In 2022, PEMEX acquired full ownership of the Texas Deer Park refinery to strengthen control over refined product imports from the United States.

Energy Transition

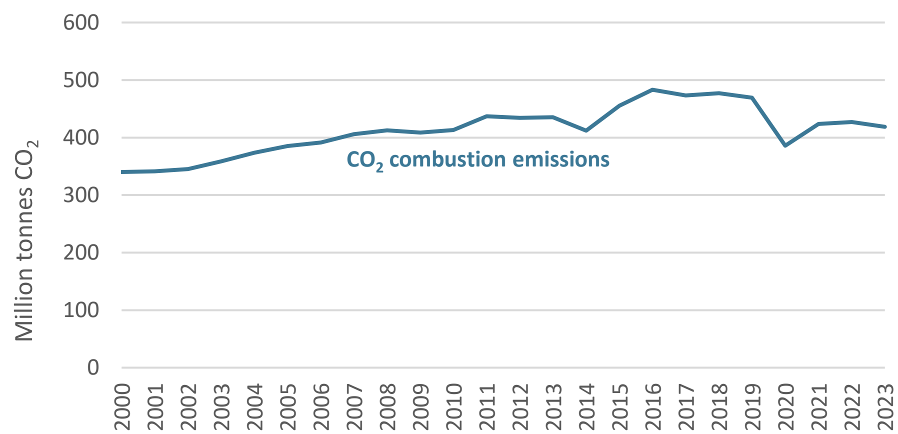
In 2025, Mexico revised its Nationally Determined Contribution (NDC), reinstating its pledge to reduce greenhouse gas emissions by 35% by 2030 compared with the 2013 business as usual baseline. The updated framework further introduces a 2035 emissions range of 364 to 404 $MtCO_2e$ for total economy wide emissions and formally adopts a net zero target for 2050.

Emissions

Mexico's CO_2 combustion emissions have remained close to 450 million tonnes since the early 2010s. Energy demand has not grown significantly over this period, which has helped keep overall emissions broadly stable. At the same time, improvements in energy intensity and lower emissions from the power sector have led to a gradual decline in emissions intensity. Further integration of renewables in the power sector is expected to contribute to a clearer reduction in CO_2 emissions going forward.

The shift away from fuel oil in the power sector has been the primary driver of CO_2 emissions reduction efforts in Mexico. Between 2000 and 2010, electricity generation from fuel oil was cut in half, while gas-fired generation more than tripled. From 2010 to 2023, the growth in electricity generation came increasingly from lower carbon sources compared to the previous decade. Gas-fired generation increased by 26%, fuel oil use continued to decline, and wind and solar emerged as the second-largest electricity source after gas.

Figure 10: Mexico's CO_2 combustion emissions (million tonnes), 2000 to 2023



Source: Mexico's Inventory of Greenhouse Gases and Compounds (2025)

Energy Security

Mexico has abundant hydrocarbon resources and significant renewable energy potential. However, oil and gas production has declined over the past decade due to limited investment in upstream activities and the natural depletion of major fields. Long-term underinvestment in the refining system has also constrained the production of refined oil products.

The combination of falling domestic fossil energy production and slightly rising energy consumption has increased reliance on imports. Over the past decade, imports of gas and refined oil products have grown substantially.

The current development plan prioritises energy security by expanding domestic oil and gas production and strengthening refining infrastructure. While hydrocarbon output has stabilised, further efforts are needed to sustain upstream operations and foster collaboration with the private sector.

The full impact of the rehabilitation of the refining system is yet to materialise but it is expected to greatly improve refined oil products self-sufficiency.

The renewed interest for renewable energy integration in the power system has the potential to reduce the reliance on natural gas imports.

APEC Energy Goals

There are two energy-related objectives that APEC member economies have agreed to meet as a collective: to improve energy intensity and double the share of modern renewables.

Energy Intensity Goal

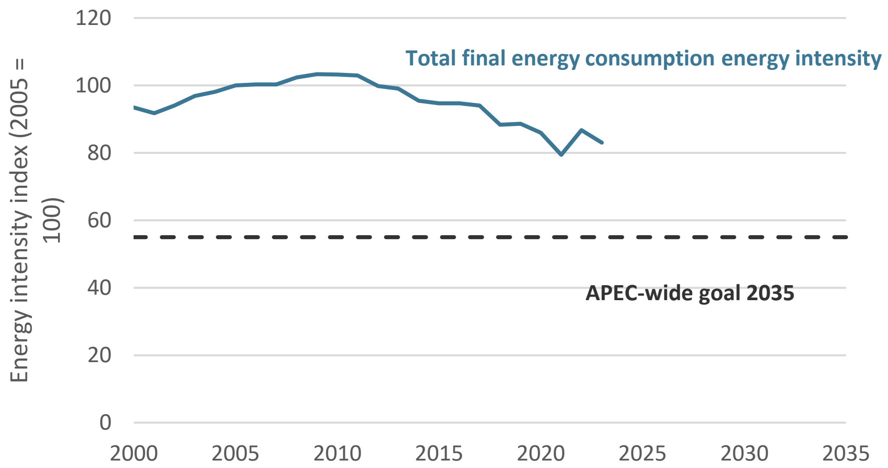
In 2011, APEC member economies agreed to increase their ambition to reduce energy intensity by 45% in 2035, relative to a 2005 baseline. The original goal was a 25% improvement by 2030, relative to a 2005 baseline.

APEC is on track to achieve this energy intensity improvement. The goal does not impose individual economy targets, but it is possible to track the progress of individual APEC economies relative to the overarching proportional improvement.

Total final energy consumption intensity in Mexico has decreased by 17% from the 2005 baseline. Energy consumption intensity has shown a decreasing trend since 2010; this trend was momentarily reversed in 2022 as final energy demand growth in the transport sector outpaced GDP growth.

Structural changes in Mexico's economy, such as growth in services and a reduction in the share of manufacturing, has helped reduce final energy intensity. To a lesser extent, energy efficiency gains in the industry and buildings sector (residential and commercial) has also resulted in a decrease in final energy intensity. Mexico has focused on enhancing energy efficiency in construction, appliances, and lighting (CEPAL, 2025). However, the transport sector presents the greatest challenge in reducing final energy intensity.

Figure 11: Mexico's total final energy consumption intensity index, 2000 to 2023 (2005 = 100)

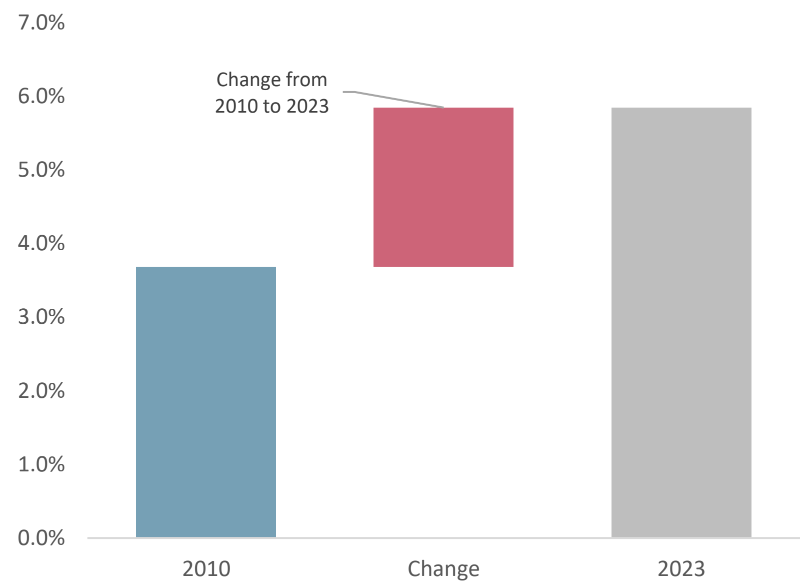


Source: EGEDA (2025)

Doubling of Renewables

The second energy goal involves doubling the share of modern renewables in the APEC energy mix for the period 2010 to 2030. There is no economy-level goal for individual member economies, but improvements by individual economies will contribute to the doubling goal.

Figure 12: Mexico's modern renewable energy share, 2010 and 2023



Source: EGEDA (2025)

Note: Biomass used in the residential and commercial sectors is assumed to be traditional biomass and is not included in the definition of modern renewables. All other renewables (biomass used by industry, hydro, geothermal, etc.) are considered modern renewables. Modern renewables also include the share of electricity that is generated from renewable sources.

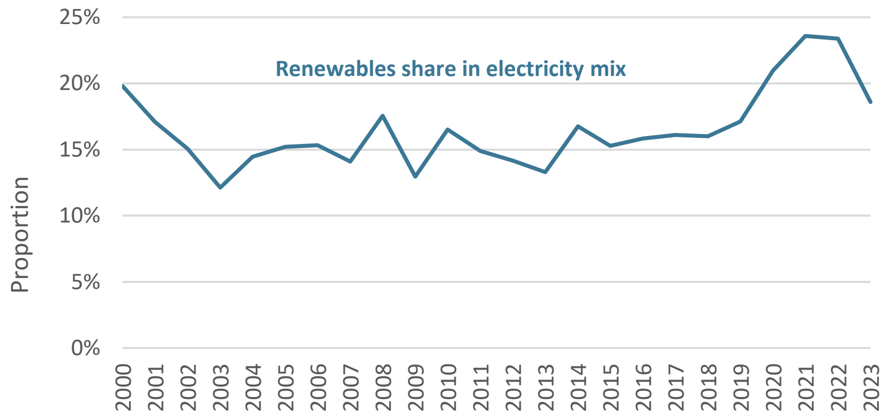
According to analysis by NLR, Mexico has a technical potential of 50,196 TWh per year for solar PV and 5,759 TWh per year for wind power. An economic and feasibility assessment is needed to determine how much of this potential can realistically be developed. In comparison, Mexico's total electricity generation amounted to 380 TWh in 2023, highlighting the large gap between current generation and the estimated technical potential.

Mexico has gradually expanded renewable electricity generation over the past decade. Overall renewable electricity generation reached 19% of total electricity generation in 2023, up from 17% in 2010. Growth has been moderate, as gas-fired generation expanded faster to meet rising electricity demand.

Within renewable electricity generation, modern renewables have expanded more rapidly. From 2010 to 2023, the share of modern renewables in electricity generation increased from 3.7% to 5.9%. Increased private sector participation in utility scale projects helped accelerate wind and solar capacity growth during this period. Future renewable capacity will be strictly linked to the “Plan de Desarrollo del Sector Eléctrico” (PLADESE) ensuring state prevalence, grid reliability, and attending to the demand side.

Despite the large renewable resource potential, the government of Mexico has taken a cautious approach to expanding renewable energy, partly due to grid reliability concerns. Nevertheless, Mexico has the potential to become one of the most competitive producers of wind and solar energy globally. New investments are expected from independent projects and public-private partnerships, in specific through mixed schemes, while maintaining CFE’s leading role in the electricity sector. Mexico’s Power Sector Development Plan (PLADESE) 2025 to 2039 highlights a growing focus on solar and wind projects to meet rising electricity demand, and CFE is expected to take on a greater role in the development of modern renewable energy projects. The goal for 2030 is for renewable energy to represent 38% of total generation.

Figure 13: Mexico’s renewable generation share, 2000 to 2023



Source: EGEDA (2025)

Energy Policy

< Energy Policy	Details	Reference
National Development Plan 2025-2030	Outlines the main policy objectives and priorities of the current five-year period (2025-2030) Presidential administration.	Office of the President
Energy Sector Program 2025-2030 (PROSENER)	Planning instrument that sets the current administration's strategies and actions to achieve its six priority objectives: energy self-sufficiency, strengthening state-owned companies, organising research and development, attaining energy efficiency and sustainability, assuring universal energy access, and making the energy sector a lever of development.	Official Federal Gazette
Power Sector Development Plan 2025-2039 (PLADESE)	This programme details the annual planning for the power sector with a 15-year horizon. It includes key elements for generation capacity additions and retirements, as well as plans for grid extensions and modernisation.	Ministry of Energy (SENER)
Energy Planning and Transition Law (2025)	This new legal framework regulates the provisions of the Law on Planning and Energy Transition that establish binding planning for the domesticise energy sector. It aims to strengthen the shift toward clean energy, promote the sustainable use of energy resources, reduce emissions, and advance energy justice and sovereignty, through technical instruments and programmes that guide public policy, investment, and regulatory decisions.	Official Federal Gazette
Crude Oil and Oil Products Perspectives 2023-37	This report includes information regarding the current state of production of crude oil and oil products in Mexico. The document outlines the efforts to integrate new infrastructure projects.	Ministry of Energy
Natural Gas Perspectives 2023-37	This report includes information regarding the current state of natural gas production in Mexico. The document outlines the efforts to integrate new infrastructure projects.	Ministry of Energy
Electric System Perspectives 2023-37	This report includes information regarding the current state of the electricity system in Mexico. The document outlines the efforts to integrate new infrastructure projects.	Ministry of Energy
Paris Agreement Nationally Determined Contribution 3.0 (2025)	Mexico’s NDC 3.0 is Mexico’s updated climate action plan submitted under the Paris Agreement and presented at COP30 in late 2025. It sets Mexico’s climate commitments through 2035 and aligns with a longer-term goal of reaching net-zero greenhouse gas emissions by 2050.	UNFCCC

Notable Energy Developments

Energy Development	Details	Reference
Energy Reform 2025	The reforms sought to modify the energy framework established by previous administrations, particularly the 2013 energy reform. The decree establishes new laws governing PEMEX, CFE, the electricity and hydrocarbons sectors, energy planning and transition, biofuels, geothermal energy, and the National Energy Commission. It also amends various provisions of the Mexican Petroleum Fund Law and the Federal Public Administration Law.	Ministry of Energy (SENER)
Pemex purchase of the Deer Park refinery	Pemex, the state-owned oil company, agreed to a USD 596 million deal to buy Shell's majority interest in the joint venture of 340,000 b/d refinery in Deer Park, Texas. Pemex has acquired full ownership of the refinery, increasing the share of gasoline and diesel coming from Pemex-controlled refineries.	Pemex
Energía Costa Azul LNG Terminal	Phase 1 of this export facility (about 3.25 mtpa) is under construction and expected to begin commercial exports in spring 2026 (slightly delayed from earlier 2025 timelines).	SEMPRA INFRAESTRUCTURE
Puerto Peñasco Solar Expansion (Sonora)	CFE is expanding what will become Latin America’s largest solar plant. The first two phases include 580 MW plus battery storage. Construction for two additional phases began late 2025 and are expected to expand total capacity to 1 GW by early 2028.	CFE
Commissioning of the Dos Bocas refinery	A key element of Mexico’s oil policy is boosting domestic refining. The construction of the emblematic Dos Bocas refinery is one of the landmark infrastructure projects of this administration. The 340,000 b/d refinery will increase refining capacity by 25%, with a wholly government-funded investment of over USD 8 billion. The refinery started operations in 2024, but it is not expected to fully ramp up production until 2028.	Dos Bocas Refinery

Useful Links

Banco de México (Banxico) – www.banxico.org.mx

Presidencia de la República – www.gob.mx/presidencia

Secretaría de Energía (SENER) – www.gob.mx/sener

Comisión Nacional para el Uso Eficiente de la Energía (CONUEE) – www.conuee.gob.mx

Centro Nacional de Control de Energía (CENACE) – www.cenace.gob.mx

Sistema de Información Energética (SIE) – http://sie.energia.gob.mx

Centro Nacional de Control del Gas Natural (CENAGAS) – www.cenagas.gob.mx

Comisión Federal de Electricidad (CFE) – www.cfe.gob.mx

Petróleos Mexicanos (PEMEX) – www.pemex.com

Instituto Mexicano del Petróleo (IMP) – www.imp.mx

Instituto de Investigaciones Eléctricas (IIE) – www.iie.org.mx

Instituto Nacional de Investigaciones Nucleares – www.inin.gob.mx

Instituto Nacional de Estadística y Geografía (INEGI) – www.inegi.org.mx

Secretaría del Medio Ambiente y Recursos Naturales (SEMARNAT) – https://www.gob.mx/semarnat

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New Zealand

Introduction

Despite geographic isolation, New Zealand benefits from trade and financial integration, abundant natural resources, strong demand for agricultural exports, and a large services sector.

New Zealand's energy economy is anchored by a high-renewables power system: renewables supplied 88% of electricity generation in 2023, led by hydro and geothermal. However, hydro variability and tightening domestic gas supply have periodically increased reliance on coal and diesel generation, sharpening the need for flexibility across generation, networks and demand. This reliability challenge is becoming more material as electrification increases electricity demand for transport and process heat, and as new wind and solar capacity requires grid investment to connect and firm variable output.

Outside electricity, New Zealand is highly dependent on imported petroleum products for transport; since Marsden Point stopped refining on 31 March 2022, importers have shifted to importing refined fuels rather than crude, increasing exposure to international supply disruptions and price volatility. Natural gas remains important for industrial heat and feedstocks, with chemicals industries (fertiliser and methanol production) accounting for a large share of use. However, declining reserves have increased uncertainty over future availability and cost.

Policy is focused on scaling electrification while keeping the system reliable. The second Emissions Reduction Plan (ERP2, December 2024) launched Electrify NZ, including reforms intended to accelerate consenting for renewable generation and networks and increase the default consent duration to 35 years for most renewable energy consents. New Zealand's long-term direction is framed by the Climate Change Response (Zero Carbon) Amendment Act, which sets a net-zero target (excluding biogenic methane) by 2050 and emissions budgets as stepping stones, while the government has introduced legislation to reverse the 2018 ban on new offshore oil and gas exploration permits.

Recent measures have targeted dry-year resilience and short-term flexibility. The government has confirmed procurement of an LNG import facility in Taranaki to underpin gas-fired backup during prolonged renewable shortfalls, alongside new arrangements to procure emergency reserve and expand the role of demand response as system backstops.

Table 1: New Zealand's macroeconomic data and energy reserves

Key data [a, b]		Energy reserves [c, d]	
Area (million km^2)	0.268	Oil (billion barrels)	0.07
Population (million)	5.2	Gas (trillion cubic feet)	1.5
GDP (2021 USD billion PPP)	257	Coal (million tonnes)	16,000
GDP per capita (2021 USD PPP)	49,083	Uranium (kilotonnes U < USD 130/kgU)	-

Source: a World Bank (2022); b Ministry of Business, Innovation and Employment (2023);

Note: Oil and gas reserves are total 2P reserves, and coal is in-ground resources.

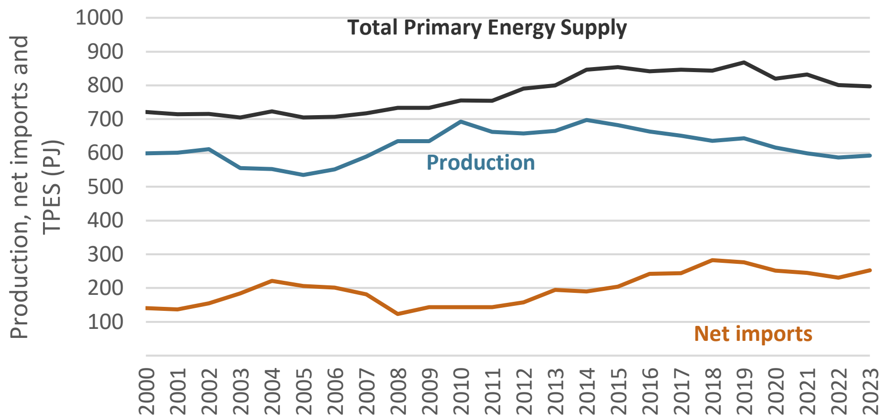
Energy Supply and Consumption

Total Primary Energy Supply

Total primary energy supply (TPES) in New Zealand remained relatively stable in 2023 at 797 PJ following a modest decline in 2022. The year-on-year change reflected high hydro inflows, reduced coal imports and a slight recovery in gas production. Coal imports to fuel Huntly power station fell markedly in 2023 (15 PJ to 5.1 PJ, −66%). This coincided with stronger hydro and wind output, while solar generation continued to grow.

Domestic production of fossil fuels continues to decline as gas reserves deplete and onshore oil fields mature. In 2023, total fossil-fuel production was around 237.0 PJ, up slightly from 229.9 PJ in 2022 because of higher natural gas (+4.4 PJ) and crude oil (+3.6 PJ) output.

Figure 1: New Zealand's energy supply, production, and net imports (PJ), 2000 to 2023



Source: EGEDA (2025)

New Zealand no longer imports crude oil for refining following the 2022 closure of its sole refinery at Marsden Point. Transport-fuel imports rose sharply in 2023 mainly because 2023 was the first full year after Marsden Point stopped, and jet-fuel imports surged with the international aviation recovery, with stock movements playing a smaller supporting role.

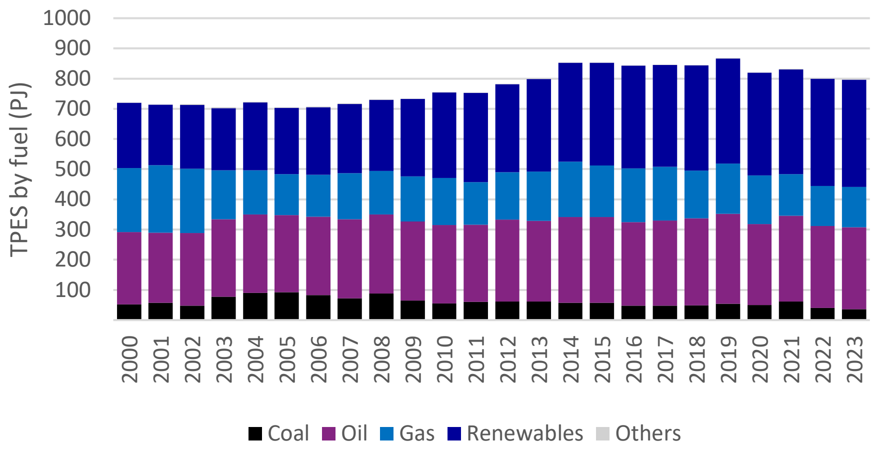
Besides imports of low-grade coal for the Huntly coal power plant, New Zealand produces about 30 PJ (1 million tonnes) of metallurgical-grade coal each year, almost all of which is exported, as the domestic market has little need for such high-quality coal.

New Zealand maintains a high share of renewables in its energy mix. In 2023 renewable energy accounted for approximately 45% of TPES, supported by a renewable-electricity generation share of around 88%.

The principal renewable sources are hydro (electricity), biomass (manufacturing process heat and cogeneration) and geothermal (electricity and some direct use). Although geothermal makes up a large portion of TPES, its conversion efficiency is low (around 15%), so roughly 206 PJ of geothermal input yields only 8,172 GWh of generation (about 19% of total electricity generation). A modest share is also used directly for industrial heat and district heating.

Natural gas production continued to decline over the longer term due to maturing fields but recovered slightly in 2023. Total output rose to 133 PJ, underscoring growing scarcity. Proved plus probable (2P) reserves were revised downward again in 2025 to 948 PJ (as at 1 January 2025), implying only a limited number of years of supply at recent consumption rates. Options to manage the shortfall (demand fuel-switching, LNG imports, and new upstream development) are explored in the New Zealand chapter of the APERC 9th Energy Outlook.

Figure 2: New Zealand's energy supply by fuel (PJ), 2000 to 2023



Source: EGEDA (2025)

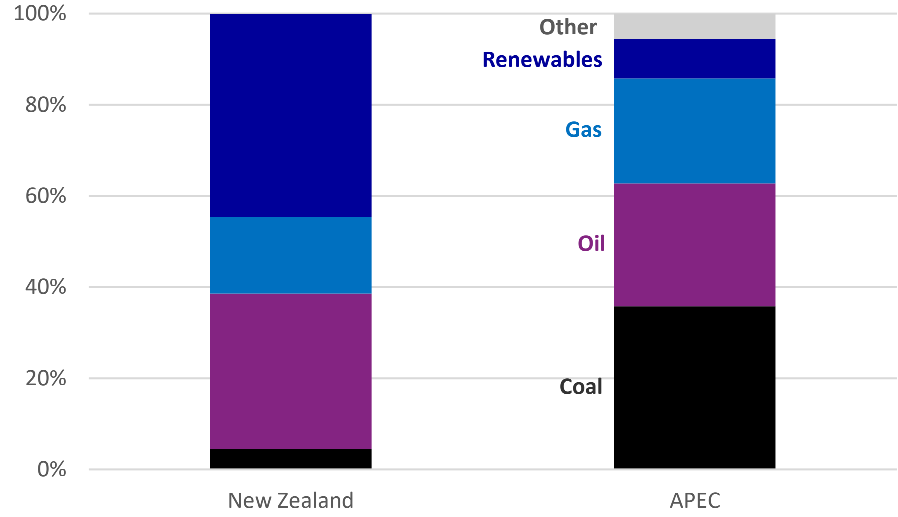
Natural gas production of 133 PJ is distributed among transformation (electricity generation), end-use sectors and non-energy use. Electricity generation accounts for most of the gas consumed by the transformation sector, while industrial process heat (food processing, pulp and paper, chemicals) dominates end-use consumption. A large portion of gas is used as feedstock for chemicals, making the industrial chemicals sector indirectly responsible for a significant share of total gas use.

Figure 3 shows that New Zealand's energy supply is much more renewable than the APEC average. Even though geothermal exaggerates it, New Zealand still has a much larger share of hydro and other renewables than most APEC economies.

The supply share of coal in New Zealand is lower than for APEC, due to a greater reliance on renewable energy sources for electricity generation.

The oil supply share for New Zealand is much higher than for APEC. Around 80% of the oil is used in transport, a result of New Zealand's low population density and high rate of car ownership, which is among the highest in the world (around 0.7 cars per person).

Figure 3: Energy supply mix – New Zealand and APEC, 2023



Source: EGEDA (2025)

Total Final Consumption

In 2023, total final energy consumption (TFC) remained broadly unchanged from 2022 at 510 PJ. Transport continued to dominate demand, accounting for more than one-third of TFC, while industry, residential and commercial sectors each made smaller contributions.

Domestic road transport dominates New Zealand's transport energy use, and in 2023, road fuel use was essentially flat at 191 PJ. This was still slightly below 2019 (196 PJ). Within that total, diesel edged up while petrol was flat, and electricity use in road transport increased from 0.48 PJ to 0.78 PJ. This was consistent with efficiency gains and gradual electrification moderating growth in liquid-fuel demand.

Aviation and marine fuels moved in different directions. Domestic aviation rebounded to 15 PJ in 2023 (up 6% from 14 PJ in 2022) and was broadly around its pre-pandemic level (14 PJ in 2019), while domestic coastal shipping remained low at 0.59 PJ (down 16% from 0.7 PJ in 2022 and far below 4.4 PJ in 2019).

International activity rose sharply as travel and freight normalised: international aviation bunkers (jet fuel) increased from 23 PJ in 2022 to 40 PJ in 2023, and international marine bunkers from 5.9 PJ to 7.8 PJ, reinforcing that post-COVID recovery has been concentrated in international movements while domestic road demand remains broadly stable.

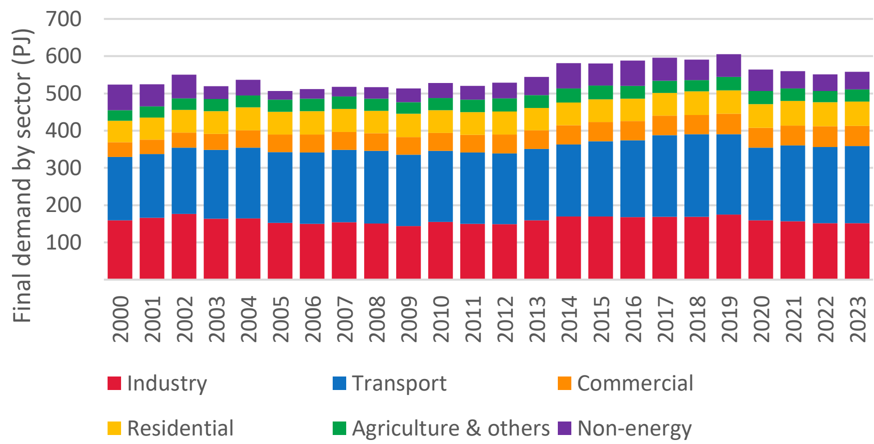
Industrial energy demand eased by 7 PJ (−4.4%) in 2023, with a sharp decline in pulp, paper and printing (−0.39 PJ; −12.8%) and smaller falls in iron & steel (−0.37 PJ; −4.6%) and non-ferrous metals (−0.27 PJ; −1.5%), partly offset by higher food, beverages and tobacco (+1.7 PJ; +4.2%). Despite the modest overall decline, gas supply constraints and longer-term tightness remained a key concern, particularly because several large industrial users rely heavily on gas. At the same time, process-heat decarbonisation continued to advance, with biomass and electrification projects progressing and some commissioned during the year.

Chemicals and non-energy use are closely related in NZ because most of the non-energy use (as feedstock) is from natural gas in the Methanol (Methanex) and Fertiliser (Ballance) production plants. These saw increased energy use in 2023 with industry-chemicals use rising 3.3% (0.74 PJ, of which 0.8 PJ was in gas), and non-energy use rising 3.70 PJ (+8.4%).

In later years (2024-2025), chemicals and non-energy use fell significantly because of Methanex reducing operations in response to low gas deliverability, including idling its Motunui plant between August and October 2024, and again from mid-May to early July 2025 to free up gas for the power generation market.

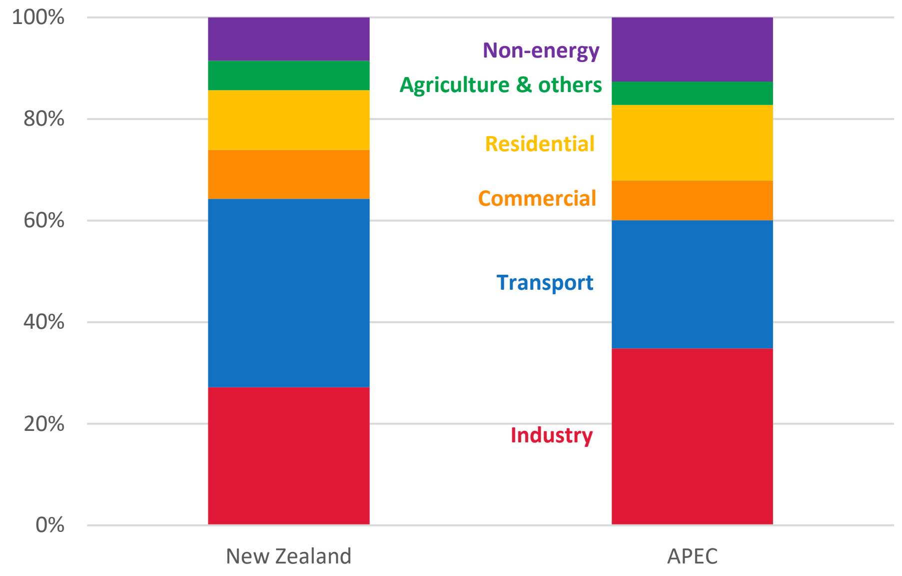
By contrast, buildings sector energy consumption was essentially flat: Residential energy use rose +1.2 PJ (+1.8%) while commercial/public services fell −1. PJ (−1.9%), leaving the combined total up just +0.12 PJ (+0.10%) and still dominated by electricity use (~82 PJ in 2023 across residential & commercial) with smaller contributions from natural gas (~13 PJ).

Figure 4: New Zealand's final consumption by sector (PJ), 2000 to 2023



Source: EGEDA (2025)

Figure 5: Final consumption by sector, New Zealand and APEC, 2023

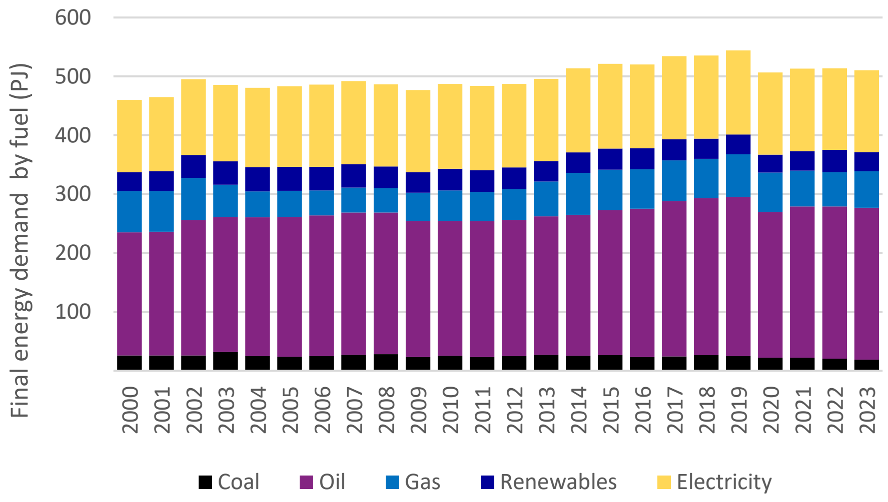


Source: EGEDA (2025)

Final Energy Demand

Almost all direct use of coal in New Zealand (excluding coal used in power generation and for non-energy purposes) occurs in the industrial sector for process heat. Food and beverage manufacturers, particularly dairy processors, account for the bulk of this demand.

Figure 6: New Zealand's final energy demand by fuel (PJ), 2000 to 2023



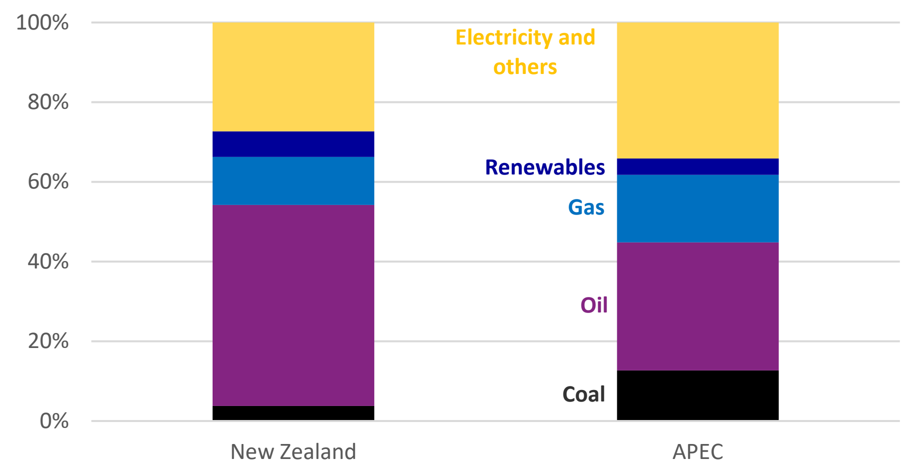
Source: EGEDA (2025)

Note: Figure 6 does not include non-energy sector consumption of energy products.

Almost all direct use of coal in New Zealand (excluding coal used in power generation and for non-energy purposes) occurs in the industrial sector for process heat. Food and beverage manufacturers, particularly dairy processors, account for the bulk of this demand.

Direct use of renewable energy (biomass, geothermal heat, solar thermal, biogas, renewable waste and biofuels) is also concentrated in industry. Biomass supplies most of the renewable process heat in the pulp and paper and some of the dairy sector.

Figure 7: Final energy demand fuel share, New Zealand and APEC, 2023



Source: EGEDA (2025)

New Zealand's final energy demand is heavily weighted toward oil products, reflecting the low population density and high demand for freight for primary and processed products in end-use consumption.

Electricity and biomass contribute smaller shares, while coal and natural gas play minor roles compared with the APEC average. The decarbonisation of transport and industrial process heat are expected to gradually shift the balance away from fossil fuels over coming years.

Transformation

Power Sector

Hydropower remained New Zealand's dominant source of electricity in 2023, supplying 61% of net generation and the highest hydro output since 2004, as heavy rainfall in key hydro catchments supported strong inflows and limited the need for coal- and gas-fired generation. This continued the improvement seen in 2022 (also favourable hydro conditions), and contrasted with the dry hydrological year in 2021, when low inflows contributed to greater reliance on thermal generation.

Thermal peaking capacity at Huntly and other stations was used sparingly in 2023 due to strong hydro and wind output. Coal generation fell to a 1.3% share of total generation (540 GWh, down 25% y/y), while gas-fired output declined 0.7% to 3,712 GWh (8.7% share), reducing pressure on domestic gas supply for industrial users.

Geothermal energy continues to provide reliable baseload generation. Installed geothermal capacity was 1,042 MW in 2023 (with recent additions in the sector including Ngāwhā OEC4, 32MW). Geothermal plants supplied about 19% of electricity in 2023 (8,172 GWh), playing a key role in balancing intermittent renewables.

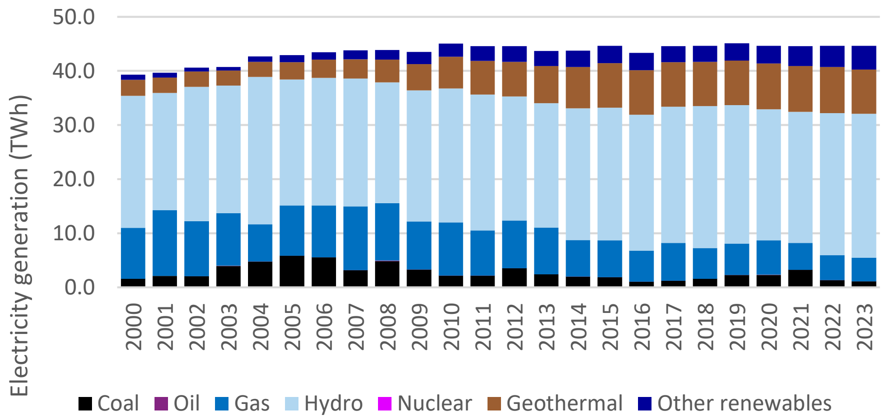
Wind's contribution expanded markedly with the commissioning of the Harapaki wind farm (176 MW) in 2023 and new capacity coming online at Kaiwera Downs Stage 1 (43 MW). Wind capacity reached 1,045 MW in 2023, and wind generation accounted for about 7.6% of total electricity in 2023 (3,238 GWh), up from 6.7% (2,865 GWh) in 2022. In 2023, wind generation was 87% of gas generation. Wind had a 35% capacity factor.

Utility-scale solar remains a small but fast-growing contributor; total solar PV capacity reached 372 MW in 2023 (including distributed PV), and solar generation increased to 370 GWh in 2023 (about 0.9% of total generation). Major projects planned or underway (beyond Harapaki) include Kaiwaikawe (77 MW) and other wind developments, alongside a growing pipeline of solar proposals.

The Offshore Renewable Energy Bill, which had not yet been enacted as of March 2026, would establish a permitting framework for offshore wind, wave, and tidal projects, built around a two-stage regime: feasibility permits (with exclusivity to progress development in an area) followed by commercial permits (to enable project delivery alongside the necessary environmental/resource consents), with additional safeguards such as Ministerial consideration of security risks. MBIE's indicative timeline shows the first feasibility round initiated by late-2025 and the first feasibility permits granted in 2026. This aligns with 'one-stop shop' fast-track consenting reforms by separating seabed access/permitting from the consenting pathway, while enabling eligible projects to use fast-track processes to accelerate required approvals.

Natural gas provides flexible peaking and reserve capacity. Gas generation supplied 3,712 GWh in 2023 (8.7% share), and with high renewable output gas plants are increasingly operated for peaking and system support rather than sustained baseload generation. Tightening domestic gas supply has sharpened the focus on dry-year fuel, with the planned LNG import facility intended to underpin gas-fired backup during extended renewable shortfalls and reduce reliance on coal and diesel generation.

Figure 8: New Zealand's electricity generation by fuel, 2000 to 2023



Source: EGEDA (2025)

One of the most important structural challenges for New Zealand is dry-year risk. New Zealand's hydro lakes are relatively shallow and hold limited seasonal storage (around 4.5 TWh, equivalent to roughly six weeks of total electricity demand, or around three months at typical hydro shares), so the system is highly reliant on consistent inflows. As more wind and solar are added, hydro will be used less for average supply and more to cover low-wind/low-solar periods. That makes low-storage periods more consequential: price spikes become more extreme, and the cost of conserving (or running short of) water rises because there is less dispatchable backup per unit of demand that must be met. Options to help alleviate these issues include storage, demand-side response and peaking capability.

New Zealand is small enough that its only aluminium smelter (Tiwai Point) is influential enough to account for a significant proportion of electricity consumption (around 13%). Plans for the smelter are a significant component in the economy's electricity generation planning.

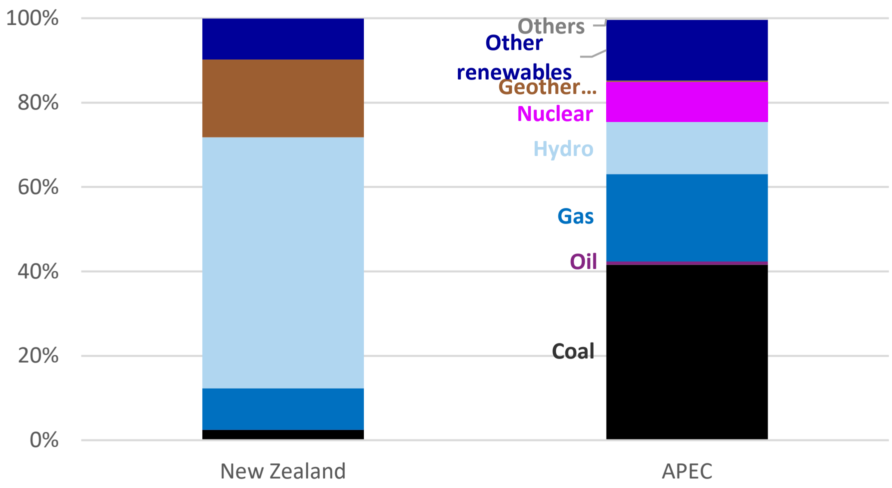
Before 2023, the Tiwai Point aluminium smelter had exclusive access to approximately 400 MW of the Manapouri dam hydroelectric plant (total capacity of 854 MW). Recent transmission network upgrades mean that the Manapouri dam can now provide all its power to New Zealand's main grid.

As of May 2024, the Tiwai Point aluminium smelter entered into a series of 20-year electricity supply agreements with New Zealand's major energy generators: Meridian Energy, Contact Energy, and Mercury NZ.

These contracts, extend until at least 2044, and continue to provide the smelter with a combined 572 MW of electricity, predominantly sourced from the Manapouri dam. This provides the different generators with long-term demand certainty, and without it there can be a risk of oversupply of electricity.

A key feature of these agreements is demand response: the smelter can reduce load by up to 185 MW during periods of grid stress, providing New Zealand's largest contracted curtailment block and improving system reliability.

Figure 9: Electricity generation fuel share, New Zealand and APEC, 2023



Source: EGEDA (2025)

Refining

Marsden Point, New Zealand's only refinery, ceased refining on 31 March 2022. Before closure, it supplied roughly half of domestic gasoline and diesel and most jet fuel, but it depended on imported crude because local crude streams were not well suited to the plant's configuration. Since the shutdown, the sector has shifted from importing crude for local processing to importing transport fuels as finished products, reducing exposure to refinery outage risk but increasing dependence on international product markets and shipping logistics. The government's post-closure resilience response has focused on mandated minimum importer stocks (from 1 January 2025) and consideration of a strategic diesel reserve (~70 million litres) to provide an additional buffer during supply interruptions.

Energy Transition

New Zealand Steel has been building an electric-arc furnace at its Glenbrook plant, replacing half of the coal-fired iron smelting capacity with increased steel recycling capacity. Called Project Electron, construction completed in late-2025 and operations are expected to ramp up during 2026. Once operational the furnace will cut coal use by almost 8 PJ and slash emissions by 800 kt, per year.

Dairy process-heat decarbonisation is advancing, led by Fonterra's programme to exit coal by 2037. Fonterra is replacing coal boilers with electrode boilers and switching some sites to wood pellets, with its last North Island coal boiler turned off in November 2024. Key milestones include the Waitoa 30 MWth biomass boiler reaching full operation in 2024, commissioning of the first electrode boiler at Edendale in October 2024, and the Clandeboye conversion of two coal boilers to wood pellets scheduled to be operational by September 2025.

Light plug-in vehicles (BEV+PHEV) reached 113,715 in 2024 (about 2.6% of the light fleet), comprising 70% BEVs and 30% PHEVs. EVs' share of new light-vehicle registrations rose rapidly under the Clean Car Discount, peaking at just over 20% in the December 2023 quarter, before dropping in March 2024 and recovering to 8% in the June 2025 quarter. The Clean Car Discount ended on 31 December 2023 and Road User Charges began for light BEVs and PHEVs on 1 April 2024; the Clean Vehicle (CO_2 emissions) Standard remains in place, with charges temporarily reduced for 2026-27 and a full review due to Cabinet by June 2026.

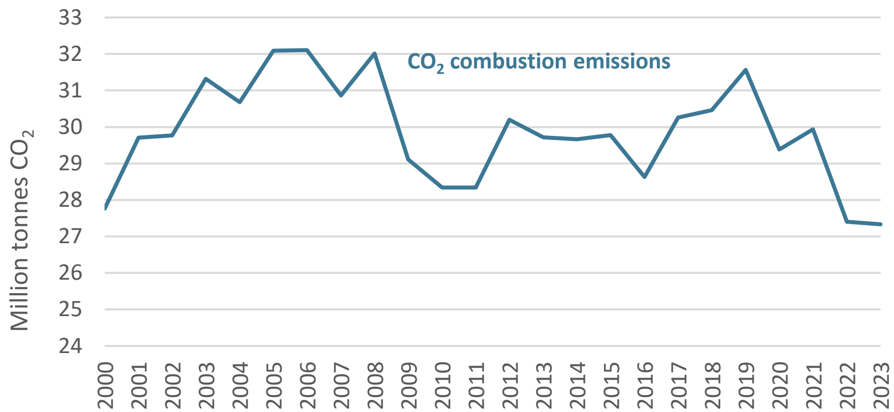
The Government aims for around 10,000 public EV charge points by 2030 (roughly a seven-fold increase from end-2024 levels). In April 2025, it refreshed the public-charging support approach, shifting from grants toward concessional loans to speed up deployment, typically covering up to 50% of capital costs, at 0% interest and over long terms (up to ~13 years). As of 31 December 2024, New Zealand had 1,378 public charge points. EECA's Public EV Charger Dashboard is the best ongoing reference for tracking the late-2025 total and the near-term pipeline, noting that rollout can be slowed by consenting and grid connection/upgrade requirements.

Emissions

Energy-sector CO_2 emissions have continued to decline since their 10-year peak in 2019, due to drops in coal, oil and gas use. Emissions in 2023 however, only decreased very slightly compared to 2022.

New Zealand operates under legislated carbon budgets to guide its pathway to net zero by 2050. The second Emissions Reduction Plan (ERP2), released in December 2024, sets out measures for the 2026-30 period, including the Electrify NZ flagship, expanded EV-charger co-investment, industrial decarbonisation funds, accelerated forestry planting and agricultural methane initiatives. ERP2 confirms that New Zealand is on track to meet the first emissions budget (2022-25) and outlines actions needed to stay within the second budget (2026-30).

Figure 10: New Zealand's CO_2 combustion emissions (million tonnes), 2000 to 2023



Source: EGEDA (2025)

Energy Security

The Energy and Electricity Security Bill 2025 was enacted in late 2025 to strengthen security of supply amid gas shortages and dry-year hydro conditions. Key provisions include removal of the 50 MW/250 MW generation caps on lines companies, allowing them to invest directly in solar, wind and geothermal projects; creation of fast-track consenting powers for critical fuel infrastructure such as floating LNG import terminals; and emergency powers to draw down hydro lakes and dispatch reserve generation. These reforms aim to unlock private investment, enhance regional resilience and mitigate wholesale-price spikes.

New Zealand's electricity system is increasingly challenged by winter evening peaks (when solar output is low) and, in dry years, reduced hydro inflows. Meeting these conditions requires flexible resources such as demand response, batteries, and peaking plants supported by the planned LNG fuel backstop for prolonged shortfalls. The Tiwai Point arrangements add a large, contracted demand-response block, and additional battery projects (e.g., Ruakākā and Wairakei) are under development to provide fast reserve, alongside the Electricity Authority's Emergency Reserve Scheme.

With Marsden Point no longer operating as a refinery, New Zealand's oil stocks are now held almost entirely as finished petroleum products rather than crude. This shifts resilience planning away from refinery continuity and toward the robustness of import supply chains, coastal shipping, and domestic storage/distribution. To strengthen cover against short-term disruptions, minimum stockholding obligations for fuel importers began on 1 January 2025 (28 days of gasoline, 24 days of jet fuel, and 21 days of diesel), and the government is assessing a dedicated strategic diesel reserve of around 70 million litres (2.6 PJ).

APEC Energy Goals

There are two energy-related objectives that APEC member economies have agreed to meet as a collective: to improve energy intensity and double the share of modern renewables.

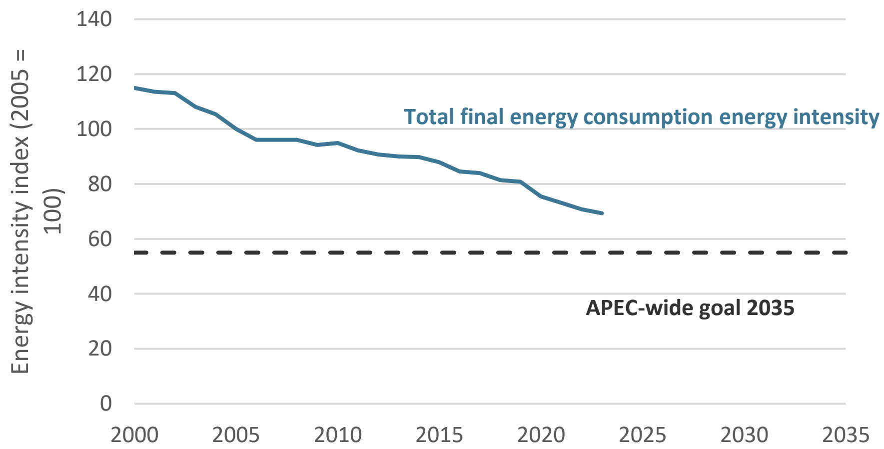
Energy Intensity Goal

In 2011, APEC member economies agreed to increase their ambition to reduce energy intensity by 45% in 2035, relative to a 2005 baseline. The original goal was a 25% improvement by 2030, relative to a 2005 baseline.

APEC is on track to achieve this energy intensity improvement. The goal does not impose individual economy targets, but it is possible to track the progress of individual APEC economies relative to the overarching proportional improvement.

New Zealand has made steady gains in energy intensity since 2005. Final-energy consumption per unit of GDP has fallen by around 30% relative to the 2005 baseline, outpacing the APEC average. This reflects shifts toward higher-value services, improved vehicle fuel economy, and more efficient homes and industrial plants.

Figure 11: New Zealand's total final energy consumption intensity index, 2000 to 2023 (2005 = 100)

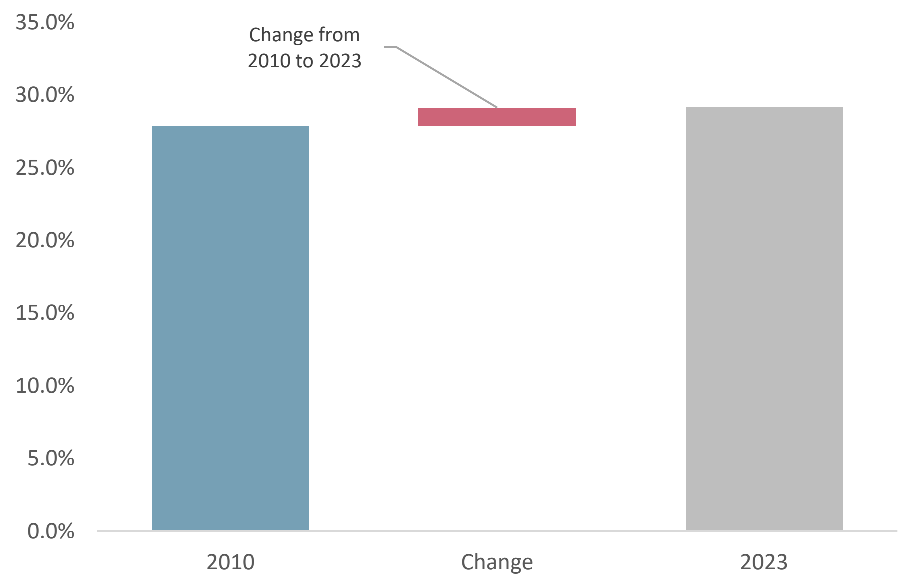


Source: EGEDA (2025)

Doubling of Renewables

The second energy goal involves doubling the share of modern renewables in the APEC energy mix for the period 2010 to 2030. There is no economy-level goal for individual member economies, but improvements by individual economies will contribute to the doubling goal.

Figure 12: New Zealand's modern renewable energy share, 2010 and 2023

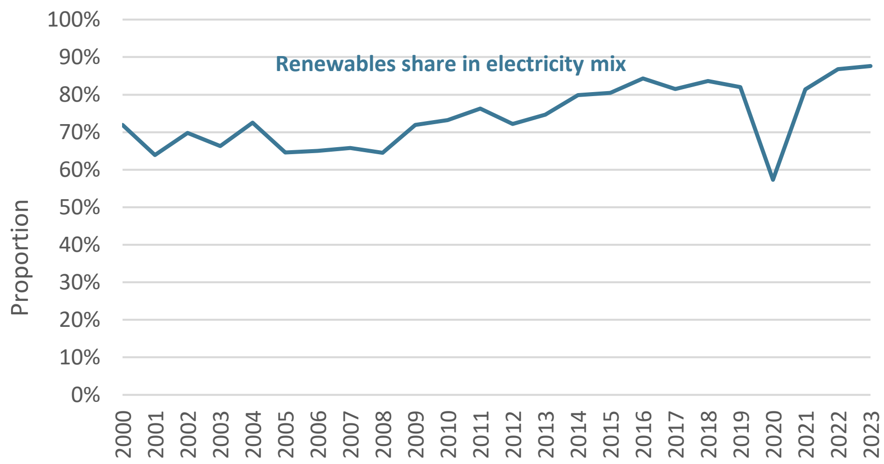


Source: EGEDA (2025)

Note: Biomass used in the residential and commercial sectors is assumed to be traditional biomass and is not included in the definition of modern renewables. All other renewables (biomass used by industry, hydro, geothermal, etc.) are considered modern renewables. Modern renewables also include the share of electricity that is generated from renewable sources.

New Zealand has the highest proportion of modern renewables in its energy mix of all APEC economies. In 2023 modern renewables accounted for about 29.1% of total final energy consumption, compared with an APEC average of 10.6 %. On top of that, the renewable share of electricity generation was 87.6 %. Extra gains in electricity generation's renewable share are increasingly difficult due to the variability of hydro inflows and wind output, and the role of gas/coal as last-resort backup during low-storage periods.

Figure 13: New Zealand's renewable generation share, 2000 to 2023



Source: EGEDA (2025)

Energy Policy

Energy Policy	Details	Reference
Climate Change Response (Zero Carbon) Amendment Act 2019	Provides the core climate-policy framework: a 2050 net-zero target for long-lived gases (excluding biogenic methane), methane reduction targets, five-yearly emissions budgets, and an independent Climate Change Commission.	Ministry for the Environment – Zero Carbon Amendment Act
Nationally Determined Contributions (NDC1 2030, NDC2 2035)	International Paris Agreement targets. NDC1 (2021-30) is a 50% reduction below gross 2005 emissions by 2030; NDC2 (2031-35) was announced in January 2025 as a 51-55% reduction below gross 2005 emissions by 2035.	Ministry for the Environment – Nationally Determined Contribution
Emissions budgets and Emissions Reduction Plans (ERP1, ERP2)	Whole-of-economy plans that set policy actions to meet emissions budgets. ERP1 covers 2022-25; ERP2 covers 2026-30 and sets out a policy package across energy, transport, industry, waste and land use.	Ministry for the Environment – Second Emissions Reduction Plan (2026-30)
New Zealand Emissions Trading Scheme (NZ ETS)	Market-based mechanism covering major sources of emissions, with unit auctions and price-control settings (e.g., auction reserve price and cost containment reserve). Agriculture remains outside the NZ ETS.	Ministry for the Environment – New Zealand Emissions Trading Scheme
Energy strategies (New Zealand Energy Strategy; NZEECS review)	MBIE is developing the New Zealand Energy Strategy and reviewing the New Zealand Energy Efficiency and Conservation Strategy (NZEECS) to guide policy on affordability, security, renewables and energy efficiency.	MBIE – Energy strategies for New Zealand
Gas market transparency and penalties (Gas Amendment Act 2021)	Gas (Information Disclosure and Penalties) Amendment Act 2021 strengthened information disclosure requirements and increased maximum financial penalties for breaches of gas regulations.	New Zealand Legislation – Gas (Information Disclosure and Penalties) Amendment Act 2021
Offshore renewable energy regulatory framework (Offshore Renewable Energy Bill)	Establishes a permitting regime for offshore wind and other marine energy, including feasibility permits (exclusive development rights for site investigation) and long-term commercial permits, with decommissioning obligations.	MBIE – Offshore renewable energy
Fuel resilience (minimum stockholding obligation; diesel resilience work)	Liquid-fuel importers must meet minimum average stockholding levels from 1 January 2025 (28 days petrol, 24 days jet fuel, 21 days diesel). Government is also consulting on improving diesel resilience (e.g., strategic reserve options).	MBIE – Fuel security in New Zealand
Warmer Kiwi Homes (insulation and heating grants)	Residential energy-efficiency programme providing grants for insulation and efficient heating for eligible households to reduce energy hardship and improve health outcomes.	EECA – Warmer Kiwi Homes

Public sector decarbonisation (Carbon Neutral Government Programme; State Sector Decarbonisation Fund)	Programme and funding to reduce emissions from public sector operations and assets (eg., replacing fossil-fuel boilers and improving energy efficiency) to support carbon-neutral operations.	EECA – State Sector Decarbonisation Fund
Māori and Public Housing Renewable Energy Fund	NZD 28 million fund trialling small-scale renewable energy solutions (eg., rooftop solar and storage) for Māori and public housing to lower bills and improve heating/health outcomes.	MBIE – Māori and Public Housing Renewable Energy Fund
Oil and gas exploration policy change (Crown Minerals Amendment Act 2025)	The Crown Minerals Amendment Act 2025 removed the ban on new oil and gas exploration beyond onshore Taranaki, reopening the possibility of new offshore exploration permits.	MBIE – Crown Minerals Amendment Act 2025

Notable Energy Developments

Energy Development	Details	Reference
NZ Battery Project (Lake Onslow pumped-hydro option) discontinued	In December 2023, the NZ Battery Project was formally discontinued after assessing options to address dry-year electricity security, including a large pumped-hydro scheme at Lake Onslow.	MBIE – New Zealand Battery Project update
Utility-scale batteries move from pilots to system assets	Commissioning of New Zealand's first large utility-scale BESS (Rotohiko/Ohinewai, Waikato) began in 2023, and larger grid batteries (eg., Meridian's Ruakākā Energy Park) followed in 2025 to support peak capacity and firming.	Electricity Networks Association – Rotohiko BESS launch (2023)
Ruakākā Energy Park battery completed (100 MW/200 MWh)	Meridian's Ruakākā Energy Park (BESS) was completed in May 2025, adding fast-response storage to support security of supply and integration of variable renewables.	Meridian – Ruakākā Energy Park
Minimum fuel stockholding obligations commenced	From 1 January 2025, fuel importers must meet minimum average stockholding levels (28 days petrol, 24 days jet fuel, 21 days diesel) to strengthen fuel resilience following increased reliance on imported refined products.	MBIE – Fuel security in New Zealand
EV public-charging programme refocused to concessionary loans	In April 2025, government updated its co-investment approach to public EV charging, shifting toward concessionary loans (including 0% interest and up to 50% of project costs) to accelerate deployment toward the ~10,000 chargers-by-2030 target.	Ministry of Transport – EV charging co-investment update (27 April 2025)
Offshore renewable energy regime advanced	The Offshore Renewable Energy Bill and supporting design work progressed during 2024-25, setting up feasibility and commercial permits; government documents anticipate first feasibility permits being awarded in 2026.	New Zealand Legislation – Offshore Renewable Energy Bill (2024)
NZ ETS settings tightened after auction failures	In 2024, the government announced reduced NZU auction volumes/availability for 2025-29 to address oversupply and improve confidence after repeated unsuccessful auctions.	Reuters – NZ to reduce availability of emission credits from 2025 (19 August 2024)

Crown Minerals Amendment Act 2025 enacted	The Act was enacted on 5 August 2025, reversing the 2018 ban on new offshore oil and gas exploration permits and signalling a renewed focus on upstream investment amid tightening gas supply.	MBIE – Crown Minerals Amendment Act 2025
LNG import facility procurement advanced (Taranaki)	In February 2026, the government confirmed it will contract for an LNG import facility in Taranaki, targeting contract award by mid-2026 and operations from 2027 or early 2028. Reporting describes the dry-year sizing as ~12 PJ over the winter period (also reported as ~12 PJ/yr import capacity), with infrastructure funded via an indicative NZD 2–4/MWh electricity levy.	Beehive - Delivering LNG to support energy security (9 February 2026)

Useful Links

Emissions Reduction Plan – https://environment.govt.nz/what-government-is-doing/areas-of-work/climate-change/emissions-reduction-plan/

Energy statistics and modelling (Ministry of Business Innovation and Employment [MBIE]) – https://www.mbie.govt.nz/building-and-energy/energy-and-natural-resources/energy-statistics-and-modelling/energy-statistics/

Energy and Natural Resources homepage (MBIE) – https://www.mbie.govt.nz/building-and-energy/energy-and-natural-resources/

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Climate Change Commission – Advice on emissions budgets and policies: https://www.climatecommission.govt.nz/

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Papua New Guinea

Introduction

Papua New Guinea (PNG) occupies the eastern half of New Guinea and about 600 smaller islands. Its capital, Port Moresby, is on the south-eastern coast. Approximately 13% of PNG's population lives in urban areas, with the majority of the population in rural regions.

While PNG possesses abundant resources (minerals, forests, marine life, and agricultural land), its rugged terrain and dispersed islands complicate infrastructure development. Customary land titles, alongside law-and-order concerns, can constrain investment; however, they also play a critical role in preserving cultural integrity and promoting equitable development outcomes.

Significant development challenges persist in Papua New Guinea, including limited infrastructure and low electricity access – approximately 20% – alongside continued reliance on fuelwood for household energy needs. The National Energy Authority's (NEA) Corporate Plan (2023-27) aims to raise electricity access to 70% by 2030 while reducing diesel usage. Institutional reforms have also strengthened sector governance: the NEA now oversees energy policy, regulation, and data management functions that were previously housed within the state-owned utility, PNG Power, enabling the utility to concentrate on core operational and service delivery responsibilities.

Agriculture employs nearly 80% of the population and contributes about 30% of GDP. The mining sector dominates exports, with gold, silver, oil, gas, nickel, cobalt, and copper driving revenue; notably, nickel and cobalt are important inputs for the global energy transition.

PNG exports liquefied natural gas (LNG), primarily to China and Japan, in volumes more than double its domestic energy consumption. Maximising returns from gas and mineral resources remains a priority. The government has signalled its intention to establish a domestic gas reservation requiring producers to supply a share of gas domestically; the proposed share and timetable were under consultation as of 2025.

To date, official reporting remains incomplete for several fuels and end uses, particularly traditional biomass and off-grid generation. As a result, APERC's energy balance tables rely on proxy indicators and internal estimation methods. While estimates improve comparability, they introduce uncertainty and may obscure short-term fluctuations.

Table 1: Papua New Guinea's macroeconomic data and energy reserves

Key data [a, b]		Energy reserves [c, d]	
Area (million km^2)	0.462	Oil (billion barrels)	0.16
Population (million)	10.4	Gas (trillion cubic feet)	5.8
GDP (2021 USD billion PPP)	44	Coal (million tonnes)	-
GDP per capita (2021 USD PPP)	4,206	Uranium (kilotonnes U < USD 130/kgU)	-

Source: a World Bank (2022); b BP (2022); c UN (2022)

Note: Reserves are total proved reserves and reasonably assured recoverable resources for uranium.

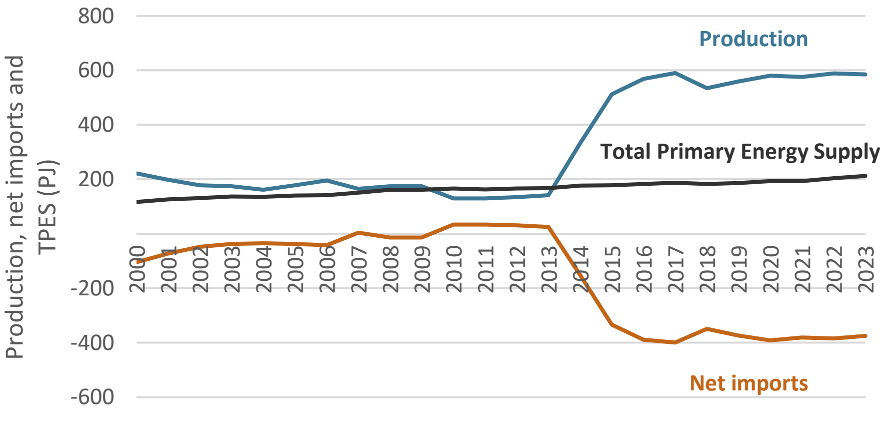
Energy Supply and Consumption

Total Primary Energy Supply

In 2023, the Total Primary Energy Supply (TPES) was 212 PJ, a 4.4% increase from the previous year. Growth continued to be driven by increased oil and gas supply in the transport and industry sectors. Excluding a rise in residential fuelwood use, renewable energy supply remained relatively steady.

Oil remained the largest contributor to TPES in 2023, accounting for 43% (91 PJ), while renewables contributed 39.7% (84 PJ) and natural gas 17% (37 PJ). PNG does not have coal and thus relies on oil, gas, and biomass to meet its energy needs.

Figure 1: Papua New Guinea's energy supply, production, and net imports (PJ), 2000 to 2023

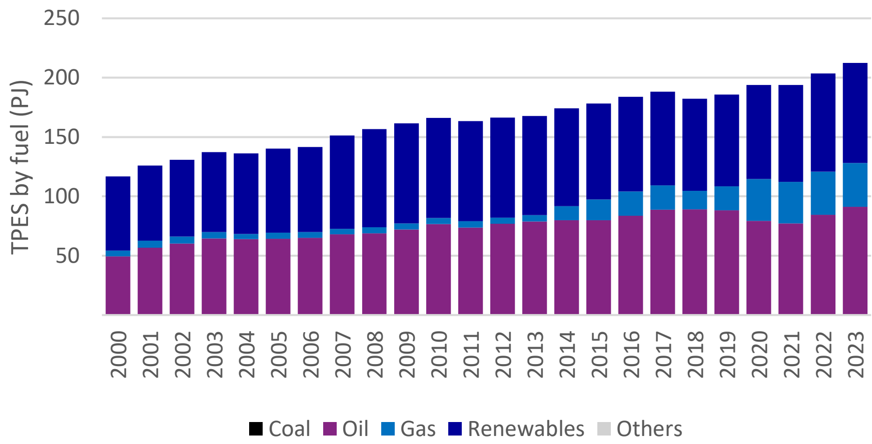


Source: EGEDA (2025)

Most of PNG's refined oil supply is split mainly between imported diesel (46 PJ) and heavy fuel oil (26 PJ), with only small amounts of gasoline and jet fuel (9 PJ). Heavy fuel oil is primarily used for power generation and industrial boilers, while diesel is used for transport and off-grid generators. This pattern differs from most APEC economies, where gasoline is a major refined product, reflecting PNG's relatively low road-transport activity and the predominance of diesel-powered vehicles. As PNG does not possess an industrial chemical sector, the economy exports all its naphtha (13 PJ), which is produced at the Napa Napa refinery.

PNG exports almost all of its crude oil production (22 PJ) but also imports a similar volume for refining at the Napa Napa refinery. The majority of exports consist of the Kutubu blend, a light, sweet crude that commands a premium price because it is relatively easy to refine.

Figure 2: Papua New Guinea's energy supply by fuel (PJ), 2000 to 2023



Source: EGEDA (2025)

PNG has abundant gas resources, with significant production starting in the mid-2010s. In 2023, around 92% of gas production was exported as LNG, totalling 442 PJ compared with 24 PJ used domestically, resulting in a large negative net import balance. Gas supply has roughly doubled since 2019, primarily due to higher and more efficient production from the existing PNG LNG facilities, which have operated above their original design capacity.

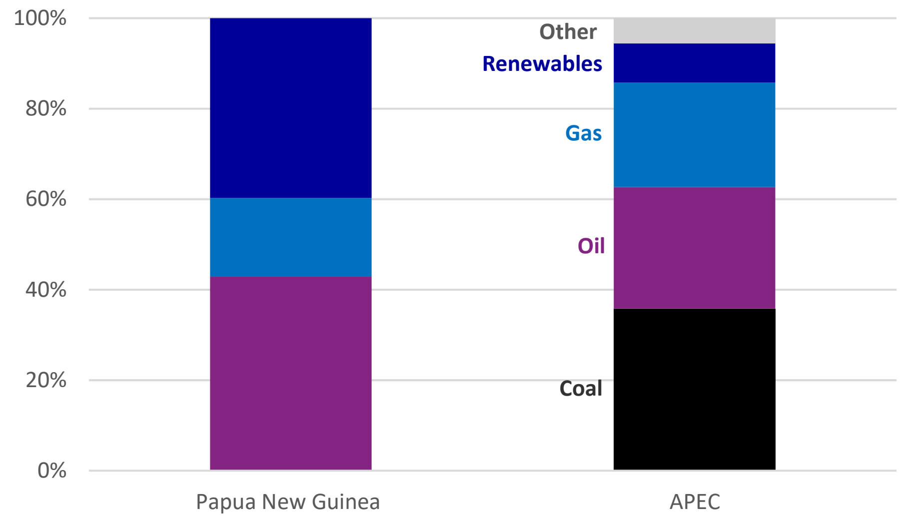
Almost all gas used domestically and exported as LNG passes through the PNG LNG plant near Port Moresby, which has a capacity of about 8.3 mtpa (≈475 PJ per year). Of the 24 PJ used domestically, approximately 13 PJ is consumed on-site for liquefaction (classified as own-use and losses). The remainder is split between auto producers, industrial facilities such as mines and palm-oil plantations that generate their own electricity off-grid (6 PJ), and the Port Moresby Gas Power Plant (6 PJ), which supplies the main grid.

The TPES of renewables in PNG is dominated by traditional biomass, mainly fuelwood and charcoal used for cooking and heating, which accounted for about 77 PJ (91.4%) of renewable supply in 2023. A small share comes from industry, mostly palm oil plants that burn waste for heat and electricity. Estimating traditional biomass use is challenging because of limited survey coverage and informal collection, so these figures carry a degree of uncertainty and should be interpreted accordingly.

Besides biomass, renewables TPES includes hydro (3.8 PJ) and geothermal (3.5 PJ) used for electricity generation. To note, geothermal TPES appears larger than the electricity produced because statistics count the heat input rather than the electrical output, exaggerating its apparent share.

PNG's TPES composition differs significantly from the wider APEC region since the economy does not utilise coal-fired electricity generation nor have any coal consumption. Oil and renewables have a larger share of TPES for PNG compared to the APEC average.

Figure 3: Energy supply mix – Papua New Guinea and APEC, 2023



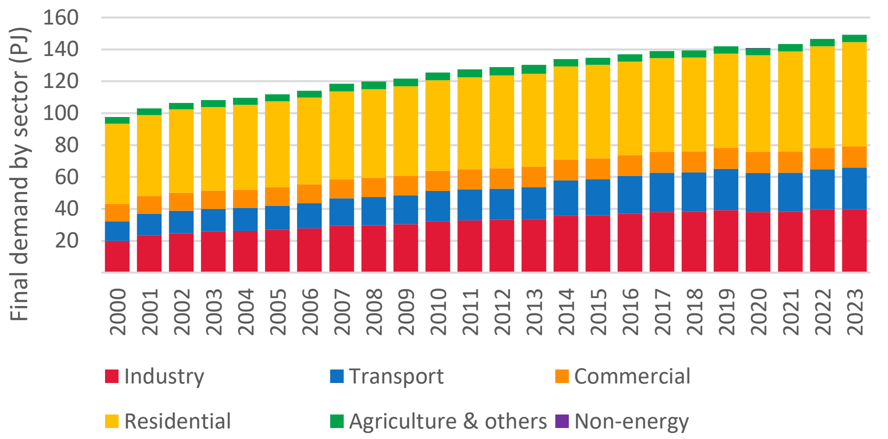
Source: EGEDA (2025)

Total Final Consumption

In 2023, PNG's total final energy consumption was approximately 149 PJ. The residential sector accounted for about 43.8% of energy use, followed by the industrial sector (26.6%) and the transport sector (17.5%). Even though agriculture contributes to roughly 30% of PNG's GDP, it accounted for only 3.1% (about 4.6 PJ) of energy use, the majority of which (4.3 PJ; 92.5%) was diesel. There is no non-energy consumption in PNG according to the energy balance data.

Energy demand in PNG has been growing steadily since 2000. Both the transport and industrial sectors have roughly doubled their energy use since 2000, reflecting increased industrial output and transport activity and highlighting the crucial role of energy in driving economic growth.

Figure 4: Papua New Guinea's final consumption by sector (PJ), 2000 to 2023



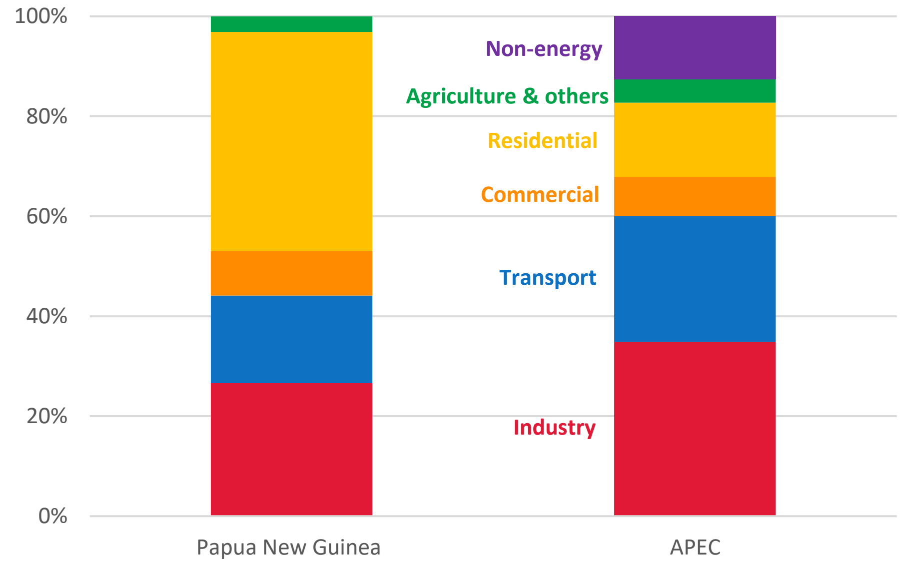
Source: EGEDA (2025)

PNG's limited road infrastructure, absence of used-car quality controls, and predominately rural population constrain transport efficiency and shape energy demand. PNG's road network is limited and faces maintenance challenges, with key regions such the populous Highlands lacking a direct connection to the capital Port Moresby. After a modest expansion between 2000 and 2015, road infrastructure per capita declined as population growth outpaced maintenance, curbing transport activity relative to other APEC economies. The NEA and the Transport Department are drafting regulations on used-vehicle quality standards and engine capacities to improve vehicle efficiency and reduce imports of inefficient vehicles, with a draft appliance and vehicle labelling and minimum energy performance regulation circulated for consultation in 2024.

The residential sector is the largest energy consumer (44% of total final consumption) but its energy use has grown by only 30% since 2000, compared with a 53% increase across all sectors. This reflects the more rapid expansion of other sectors, which is typical in a developing economy.

In the densely populated Highlands region, cool temperatures year-round increase fuelwood demand for cooking and heating. This contributes to higher biomass use and greater exposure to the environmental and health impacts associated with traditional stoves, including indoor air pollution and pressure on local wood resources. Improved biomass cooking stoves and cleaner cooking options such as LPG and electricity are generally associated with lower fuel use, reduced smoke exposure, and higher household energy efficiency.

Figure 5: Final consumption by sector, Papua New Guinea and APEC, 2023

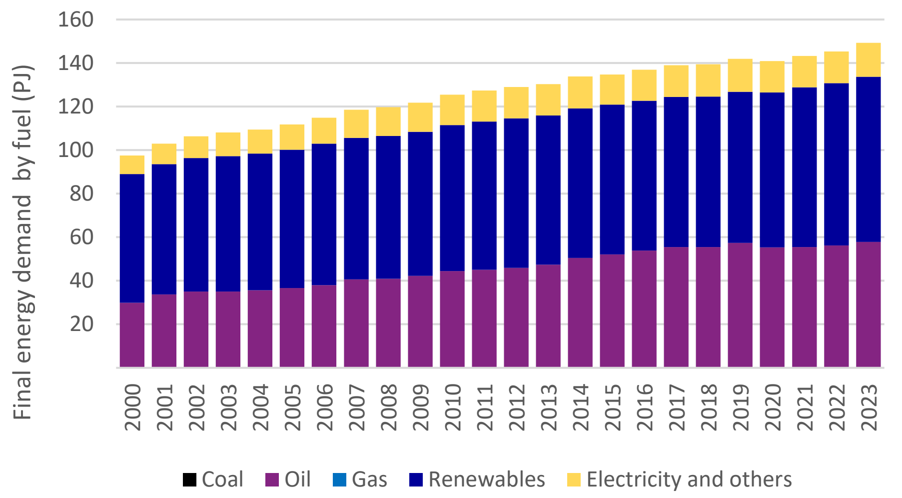


Source: EGEDA (2025)

Final Energy Demand

PNG's energy demand in 2023 was dominated by oil (39%) and renewables (51%), of which the majority was fuelwood for residential use. Electricity consumption was 10% of the final energy demand and was mostly consumed by the industrial sector.

Figure 6: Papua New Guinea's final energy demand by fuel (PJ), 2000 to 2023

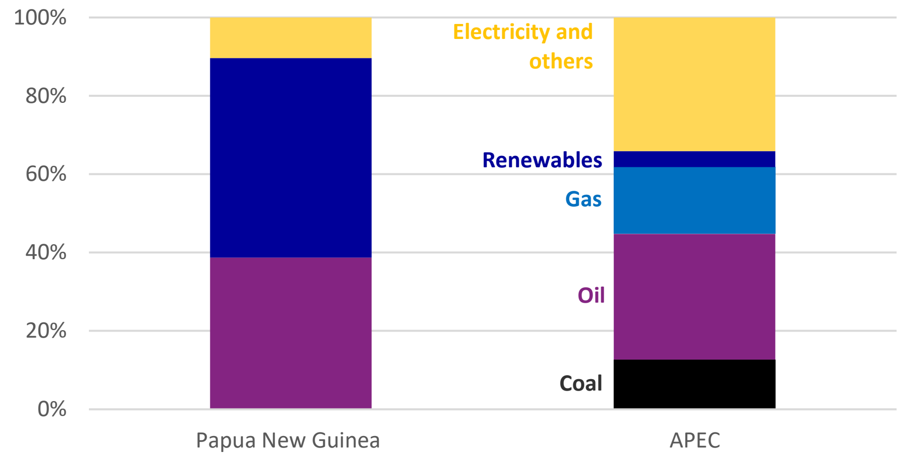


Source: EGEDA (2025)

Note: Figure 6 does not include non-energy sector consumption of energy products.

Compared to the rest of APEC, PNG's final energy demand comprises a greater share of oil and renewables. PNG's relative use of renewables is especially high compared to other economies.

Figure 7: Final energy demand fuel share, Papua New Guinea and APEC, 2023



Source: EGEDA (2025)

Oil remains a dominant fuel because diesel and heavy fuel oil generators are widely used for electricity, transport, and industrial processes, while limited road networks constrain gasoline use. Renewable energy, primarily fuelwood and charcoal, plays a central role in household cooking and heating. Expanding mini-grids, increasing access to clean cooking fuels such as LPG and electricity, and improving road infrastructure could help diversify energy sources over time. The relatively small share of electricity in total final energy consumption underscores the importance of developing reliable and affordable power to support PNG's activities.

Transformation

Power Sector

PNG's electricity network is limited, with fewer than 15% of the population connected to the grid in 2024 and supply reliability remaining low. Further, the dispersed population and rugged topography make extending the network into rural areas technically and financially challenging.

Because of the rugged terrain, the electricity network is split into separate grids. The three main grids are the Port Moresby, Gazelle, and Ramu grids, while there are at least 26 geographically isolated smaller grids (and local authorities also operate approximately 150 small rural electricity systems/mini-grids). These mini-grids are almost entirely powered by diesel and heavy fuel oil generators, resulting in high generation costs.

Given these constraints, the Government of PNG, through the NEA, developed the Off-Grid Regulation 2023, an enabling mechanism to drive implementation of the National Electrification Rollout Plan (NEROP) to connect 70% of PNG's population to electricity by 2030. The regulation establishes licensing, technical standards, and consumer-protection frameworks for mini-grids and encourages renewable and hybrid mini-grid development rather than strictly renewable-only systems. Validation of the regulation in 2025 unlocked donor financing for off-grid electrification and is expected to mobilise private investment in mini-grids. Achieving the rollout requires financial assistance from other APEC economies and could involve interconnecting existing grids to improve reliability.

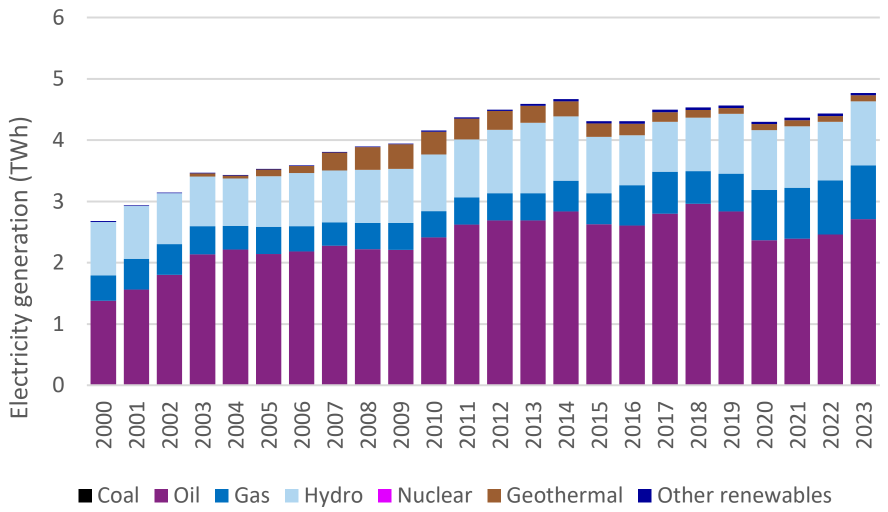
Partly due to limited transmission infrastructure, PNG's electricity consumption per capita is low compared with the APEC average, and total generation remains modest. In 2023, about 61% of the energy input for electricity generation came from diesel and heavy fuel oil. The high reliance on oil stems from the mobility of diesel generators, low upfront capital costs, and operational flexibility during blackouts. However, oil-fired generation is expensive and inefficient in the long term, so its share is expected to decline as investment in renewable and gas-fired generation increases.

In the absence of generation data by technology, estimates of fuel inputs for electricity production provide the next most useful indicator. Gas comprised 23% of electricity fuel inputs 2023; industrial auto producers generated roughly half of this, while the PNG LNG plant and the Port Moresby Gas Power Plant, which is connected to the main grid, generated the other half. Hydropower remained the largest renewable source at ~7.6% of inputs, while geothermal contributed ~7% of inputs. Small amounts of electricity were generated from biomass and biogas at palm oil plantations and other auto producers.

Estimates suggest that about 70% of PNG's electricity generation and consumption occurs at industrial auto producers such as mining facilities or plantations, which are usually located far from urban centres and often operate their own isolated grids. In some cases, these facilities supply excess power to neighbouring communities, helping to improve local grid stability and access.

PNG has also experienced an increase in the widespread adoption of off-grid solar lighting systems. Including these basic systems, about 55% of households had access to at least some electricity services in 2024, although this is not counted towards the NEROP's grid-access target. Nevertheless, fuelwood, charcoal, liquefied petroleum gas (LPG) and kerosene remain essential for cooking and heating.

Figure 8: Papua New Guinea's electricity generation by fuel, 2000 to 2023

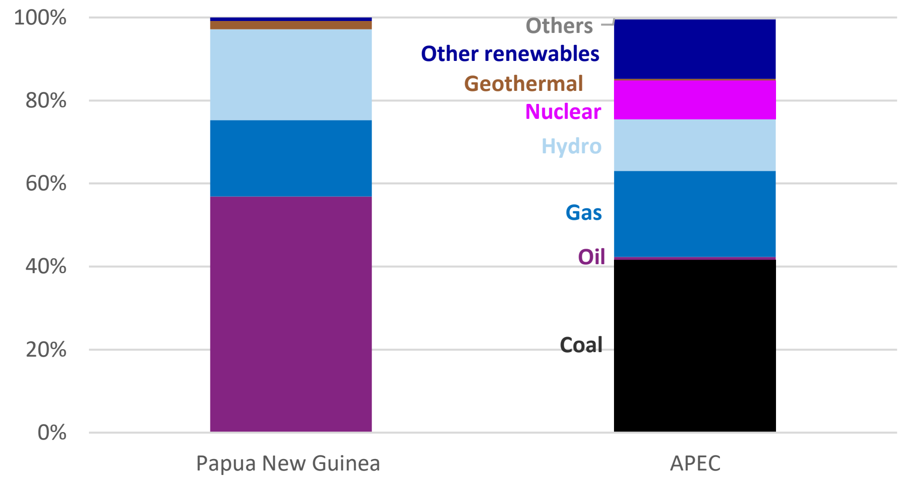


Source: EGEDA (2025)

PNG uses a large proportion of oil for generation compared to the APEC average, as it relies heavily on low-capacity oil generators for electricity generation. The prominence of hydro and geothermal generation in PNG is partly due to the small amount of generation capacity needed to make those sources significant, relative to the APEC average and the economy's total.

In terms of input fuel quantities for electricity generation, 25 PJ of fuel oil, 11 PJ of natural gas, and 6 PJ of diesel were used in 2023. The remaining electricity output (about 25%, 4 PJ) came from renewables. These fuel inputs are estimated to have produced around 17 PJ of electricity, though uncertainty remains due to the challenges of accurately estimating output from small diesel generators.

Figure 9: Electricity generation fuel share, Papua New Guinea and APEC, 2023



Source: EGEDA (2025)

Refining

PNG has an oil refining capacity of about 32,500 barrels per day (≈72 PJ per year). In 2023, the refinery produced 21 PJ of refined petroleum products from 22 PJ of crude input. The refinery's capacity is insufficient to meet domestic demand, so PNG imports the majority of the refined oil it consumes while exporting most of its domestic production. Notably, the crude processed domestically is currently sourced through imports.

The PNG LNG plant, just outside Port Moresby, has a capacity of roughly 8.3 million tonnes per annum (mtpa) (≈475 PJ) and produced 442 PJ (exports) in 2023. The planned Papua LNG project, led by TotalEnergies, is targeting a final investment decision in 2026. If built, it would add around 5.4 mtpa and lift total capacity towards 14 mtpa. Other proposed expansions, such as the P'nyang gas field, remain in pre-FEED stages and have not yet reached final investment decision.

A benefit of the PNG LNG plant is that it has facilitated LPG supply for household use. Total residential LPG consumption was 0.1 PJ in 2023, providing a cleaner alternative to kerosene (1.5 PJ) and fuelwood (62 PJ) for heating and cooking. However, LPG remains expensive and distribution outside of urban centres near Port Moresby is limited.

Energy Transition

Papua New Guinea's energy transition is closely tied to its broader development trajectory. A key challenge is developing infrastructure to deliver new energy sources to widely dispersed populations across rugged terrain. Expanding electricity access through NEROP offers households alternatives to fuelwood and kerosene, while improving reliability may reduce reliance on small diesel generators, which remain popular due to their transportability, lower capital requirements, and ability to provide backup power during outages. It is important to distinguish between the transition in the power sector and the transition in household cooking practices. While electrification can reduce reliance on diesel generators, it does not automatically replace the use of biomass or kerosene for cooking.

The economy has abundant gas resources and currently exports most production as LNG. Potential domestic uses include electricity generation, production of other fuels (such as ammonia and LPG), and supply for industrial processes. Global shifts from coal and oil towards gas could increase LNG demand, though long-term demand is uncertain as major importers pursue decarbonisation. This creates a context in which PNG faces the dual challenge of managing export opportunities alongside domestic energy requirements and supply diversification.

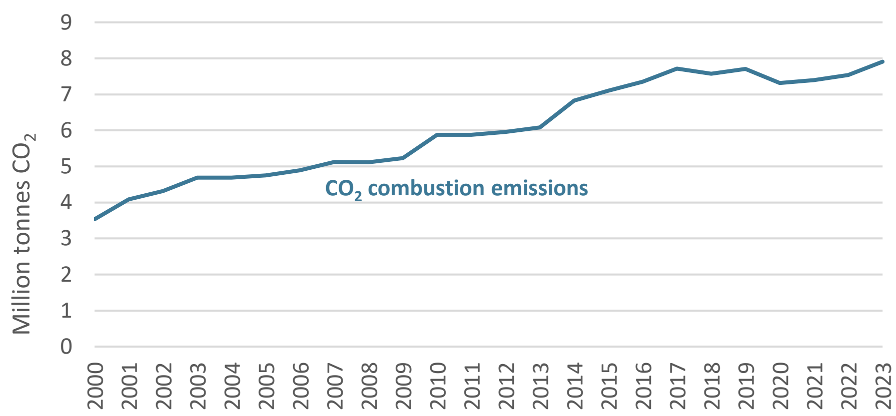
Beyond traditional biomass, PNG has significant potential for modern renewable energy, particularly hydro, geothermal, solar and biogas. As the government invests in electrification and renewables, the energy mix is expected to shift away from imported oil towards renewable energies and natural gas.

Energy transition topics are further covered in the PNG chapter of the 9th APEC Energy Demand and Supply Outlook.

Emissions

PNG emitted about 7.9 Mt of CO_2 from fuel combustion 2023, which was only about one-thousandth of APEC's total CO_2 emissions. Emissions are expected to grow as PNG expands power generation, as well as industrial and transport activity. Emissions from burning fuelwood are not counted in these statistics, though they have health and local environmental impacts.

Figure 10: Papua New Guinea's CO_2 combustion emissions (million tonnes), 2000 to 2023



Source: EGEDA (2025)

Energy Security

PNG's energy security challenges are closely linked to its dependence on imported fuels for most oil use (oil accounted for about 39% of total final energy consumption in 2023). This dependence was underscored by repeated aviation fuel disruptions. A Jet A1 supply shock in January 2023 forced airlines to suspend domestic flights, and PNG later declared a 30-day emergency over fuel supply in August 2023. Disruptions and rationing of Jet A1 continued to affect airline operations through 2024 and into early 2025.

The economic impacts are amplified by geography. The capital Port Moresby is not connected by road to Lae or the populous Highlands region, making air transport essential for passenger travel, freight, and service delivery. The shortages reflect structural constraints, including reliance on a single supplier (Puma Energy), limited storage capacity and import logistics, and foreign-exchange constraints that can delay procurement and replenishment.

Recent responses have focused on improving supply resilience. Prime Minister James Marape apologised to affected smaller airlines; Ok Tedi Mining Limited established an alternative Jet A1 supply chain; Mission Aviation Fellowship reported improved supply conditions in 2025; and Kumul Petroleum Holdings Limited began building a new jet-fuel import and storage facility at Motukea International Wharf, intended to provide around four to six weeks of storage capacity.

APEC Energy Goals

There are two energy-related objectives that APEC member economies have agreed to meet as a collective: to improve energy intensity and double the share of modern renewables.

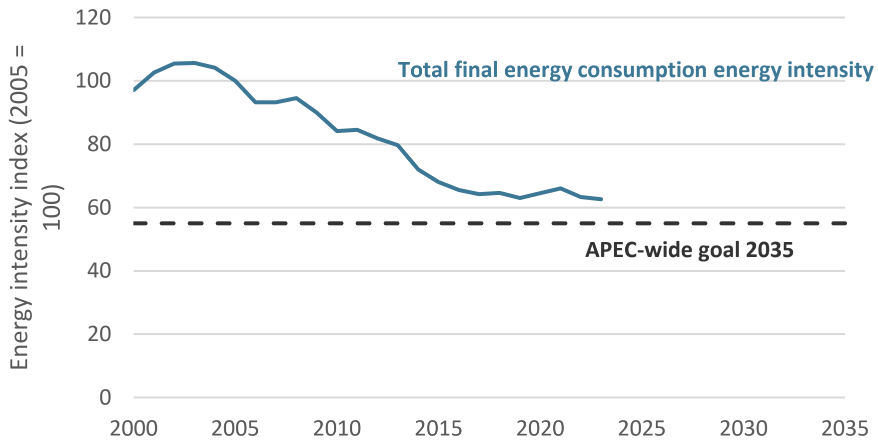
Energy Intensity Goal

In 2011, APEC member economies agreed to increase their ambition to reduce energy intensity by 45% in 2035, relative to a 2005 baseline. The original goal was a 25% improvement by 2030, relative to a 2005 baseline.

APEC is on track to achieve this energy intensity improvement. The goal does not impose individual economy targets, but it is possible to track the progress of individual APEC economies relative to the overarching proportional improvement.

PNG has improved its energy intensity over the past two decades and this improvement is expected to continue, particularly with implementation of the NEROP and the Energy Labelling and Minimum Energy Performance Standards for Appliances, Equipment and Lighting Products Regulation 2024. The regulation, developed with assistance from the United Nations Industrial Development Organization, sets minimum efficiency standards and labelling requirements for common appliances and aims to reduce electricity demand and phase out ozone-depleting substances. PNG's energy intensity (total final energy consumption per unit of GDP) has improved by about 40% from the 2005 baseline. This improvement reflects both efficiency gains and structural changes in the economy, including rapid growth in LNG export revenues since 2014. APEC has set a collective goal of reducing energy intensity by 45 % by 2035 relative to a 2005 baseline, but this target is not binding to individual economies.

Figure 11: Papua New Guinea total final energy consumption intensity index, 2000 to 2023 (2005 = 100)



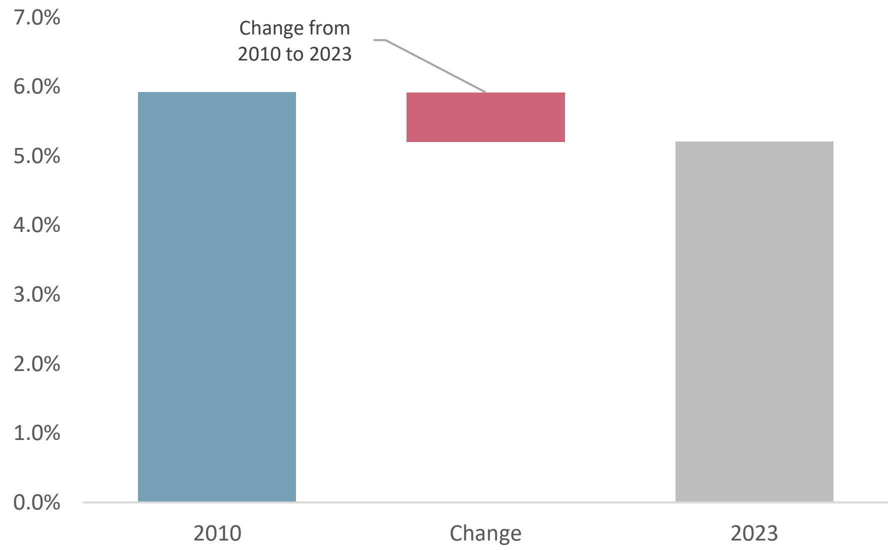
Source: EGEDA (2025)

Doubling of Renewables

The second energy goal involves doubling the share of modern renewables in the APEC energy mix for the period 2010 to 2030. There is no economy-level goal for individual member economies, but improvements by individual economies will contribute to the doubling goal.

PNG's modern renewable energy share was approximately 5.2% in 2023. This share has changed little since 2010 because modern renewables and total energy supply have grown at similar rates. Traditional biomass used in households is excluded from the definition of modern renewables; if it were included, the renewables share would be nearly 50%.

Figure 12: Papua New Guinea's modern renewable energy share, 2010 and 2023

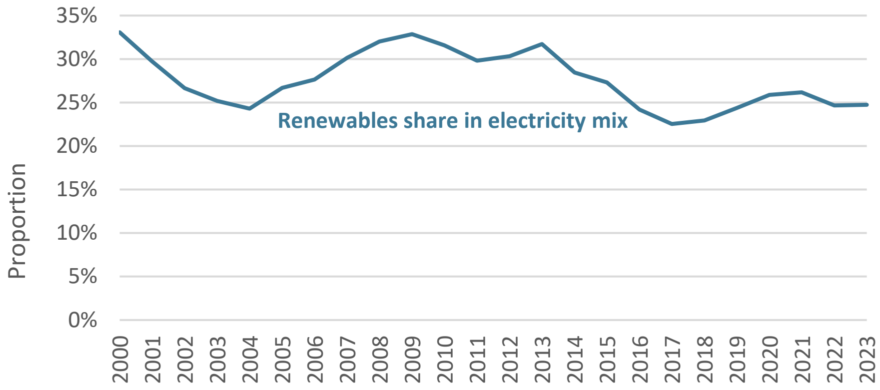


Source: EGEDA (2025)

Note: Biomass used in the residential and commercial sectors is assumed to be traditional biomass and is not included in the definition of modern renewables. All other renewables (biomass used by industry, hydro, geothermal, etc.) are considered modern renewables. Modern renewables also include the share of electricity that is generated from renewable sources.

PNG's renewable generation share was 25% in 2023. The renewable generation share has been relatively flat since 2000 because increases in renewable output have largely kept pace with the growth of total generation. The modest year-to-year variation reflects project-specific developments such as the expansion of the Lihir gold mine geothermal scheme.

Figure 13: Papua New Guinea's renewable generation share, 2000 to 2023



Source: EGEDA (2025)

Energy Policy

Energy Policy	Details	Reference
National Energy Policy (2017-2027)	Sets the overall direction for PNG's energy sector, including improved energy security, increased access, and greater renewable deployment. The policy underpins the 70% electrification target by 2030 and supports private-sector participation.	ADB Legal and Policy Resources Center
National Electrification Roll-Out Plan (NEROP)	Operational plan for achieving 70% electricity access by 2030 and universal access by 2050, combining grid densification/expansion with off-grid and mini-grid solutions across provinces.	Asia Pacific Energy Portal
National Energy Authority Act (2021)	Establishes the National Energy Authority (NEA) as the primary regulator for the energy sector, including licensing and oversight functions previously held by other institutions.	ADB Legal and Policy Resources Center
NEA Corporate Plan (2023-2027)	Sets NEA's near-term implementation priorities: regulation for mini-grids, data and planning, improving reliability, reducing reliance on diesel generation, and mobilising investment to meet electrification targets.	NEA Corporate Plan
Off-Grid Regulation for Small Power Systems (2023; validated 2025)	Creates licensing, technical standards and consumer-protection frameworks for mini-grids and decentralised renewable/hybrid systems to help scale private investment in off-grid electrification.	UNDP Papua New Guinea
Second Nationally Determined Contribution (NDC)	Updates PNG's climate commitments, including power-sector and energy-efficiency measures that support higher renewable electricity and reduced fossil-fuel dependence over time.	UNFCCC NDC Registry (PDF)
NDC Electricity Roadmap (2021-2030)	Implementation roadmap for the NDC in the electricity sector, outlining actions, sequencing and investment needs for generation, grids and access expansion through 2030.	PNG REDD+ (PDF)
Minimum energy performance standards (MEPS) and energy labelling (programme)	Policy intent to improve appliance and equipment efficiency (e.g., labelling and MEPS) to reduce electricity demand growth and improve end-use efficiency.	UNFCCC NDC Registry (PDF)
National Petroleum Authority reforms (2025)	National Petroleum Bill 2025 and Oil and Gas Amendment Bill 2025 create the National Petroleum Authority (NPA) as the petroleum regulator and update the governance framework for oil and gas.	Department of Prime Minister & NEC
Petroleum production-sharing policy (under development)	Government consultations to introduce a production-sharing regime intended to increase the state's share of benefits from oil and gas projects.	The National (PNG)

Notable Energy Developments

Energy Development	Details	Reference
National Energy Access Transformation (NEAT) Project	World Bank approved a USD 204 million project (Nov 2024) to expand access for more than 400,000 people, scale renewable generation, modernise networks, and support off-grid solutions including a pilot mini-grid concession.	World Bank press release (2024)
Bougainville (Buka) solar-plus-storage mini-grid tender	UNOPS tender (Mar 2025) for a phased PV+BESS mini-grid on Buka Island: initial 2 MW PV/8 MWh storage, expansion up to ~10 MW PV/20 MWh, plus grid rehabilitation to reduce diesel reliance.	UNOPS / UNGM (2025)
PNG Power partial privatisation decision	Cabinet decision (Dec 2024) to partially privatise PNG Power Limited to attract investment and improve operational performance and service quality.	Department of Prime Minister & NEC (2024)
Ok Tedi establishes Jet A1 supply chain for airlines	Ok Tedi (Jun 2024) announced a reliable Jet A1 supply chain for major airlines amid recurring aviation fuel shortages linked to supply disruptions.	Ok Tedi Mining Ltd (2024)
Ok Tedi plans expanded fuel storage	Ok Tedi (Dec 2024) indicated it would continue supplying Jet A1 and invest in new bulk storage for diesel and aviation fuel to strengthen longer-term resilience.	The National (2024)
Motukea Jet A1 import & storage facility construction	Kumul Petroleum began construction (Dec 2024) of a Jet A1 import and storage facility at Motukea (four 3,000 m³ tanks) to improve aviation fuel security.	Kumul Petroleum (2024)
PNG Electrification Partnership (PEP) donor programme	Multi-donor partnership supporting electrification goals (Australia; Japan; New Zealand; and the United States), originally announced with about USD 1.7 billion in support for PNG's domestic electrification programme.	The National (2018)
USAID-PEP support to PNG Power operations	USAID-PEP reported supporting initiatives with PNG Power (e.g., feeder-team data work) to improve billing and revenue collection and strengthen utility performance.	The National (2024)
Community solar mini-grid at Pimaga VET Centre	Solar mini-grid launched (Oct 2024) through a USAID-Santos partnership to supply power to a vocational training centre and staff housing in Southern Highlands.	The National (2024)
Papua LNG project timeline and financing constraints	Reuters reported the TotalEnergies-led Papua LNG project required additional work before FID, with timelines shifting toward 2025 and costs rising, alongside increasing financing constraints.	Reuters (2024)

Useful Links

National Energy Authority (NEA) — https://www.nea.gov.pg/

NEA policy and legal framework — https://nea.gov.pg/policy-legal-framework/

Department of Prime Minister & NEC (major announcements) — https://www.pmnec.gov.pg/

Petroleum & Energy (petroleum regulator / legislation) — https://petroleum.gov.pg/

Independent Consumer and Competition Commission (ICCC) — https://www.iccc.gov.pg/

PNG Power Limited — https://www.pngpower.com.pg/

World Bank (Papua New Guinea) — https://www.worldbank.org/en/country/png

Asian Development Bank (Papua New Guinea) — https://www.adb.org/countries/papua-new-guinea/main

PNG Environmental Data Portal (SPREP) — https://png-data.sprep.org/

PNG Development Strategic Plan 2010–2030 — https://png-data.sprep.org/dataset/png-development-strategic-plan-2010-2030

APEC Energy Database (EGEDA) — https://www.egeda.ewg.apec.org/egeda/database_info/index.html

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Peru

Introduction

Peru’s economy has maintained steady growth in recent years, though at a more moderate pace than in previous decades. GDP was estimated at constant 2021 USD 536 billion PPP in 2024. The National Institute of Statistics and Informatics estimates that GDP grew by 3.4% in 2025, following modest growth in 2024 (INEI, Peru, 2026).

Peru’s energy sector is characterised by a combination of significant domestic resource endowments and increasing reliance on energy imports. The economy holds notable natural gas reserves, primarily concentrated in the Camisea basin, estimated at around 7.9 trillion cubic feet. Oil reserves remain relatively limited, and domestic crude production has not kept pace with demand growth, contributing to continued reliance on imported petroleum products. As a result, despite its resource base, Peru is a net importer of hydrocarbons.

The energy system comprises two contrasting components. On the one hand, the electricity mix is relatively low in emissions, supported by strong contributions from hydropower and natural gas, and the gradual incorporation of non-hydro renewable sources such as solar and wind. On the other hand, final energy consumption, particularly in the transport and industry sectors, remains heavily dependent on oil products and natural gas. This configuration also gives rise to energy security challenges, as the system relies heavily on a single natural gas production and transport corridor.

Peru has considerable renewable energy potential, including hydropower, solar, wind, and geothermal resources, much of which remains underdeveloped. Recent additions to renewable capacity, particularly in solar and wind, reflect continued private sector participation and gradual progress in diversifying the electricity mix.

Recent policy developments have focused on expanding the natural gas transportation infrastructure, strengthening the financial sustainability of the oil refining sector, promoting private sector participation, and accelerating the diversification of the electricity mix, particularly through the expansion of renewable energy. At the same time, Peru continues to advance its climate policy framework in line with its commitments under the Paris Agreement.

Table 1: Peru’s macroeconomic data and energy reserves

Key data [a, b]		Energy reserves [c, d]	
Area (million km^2)	1.3	Oil (billion barrels)	3.1
Population (million)	34	Gas (trillion cubic feet)	9.9
GDP (2021 USD billion PPP)	536	Coal (million tonnes)	3.4
GDP per capita (2021 USD PPP)	15,662	Uranium (kilotonnes U < USD 130/kgU)	28

Source: a World Bank (2024); b World Bank (2024); c Peru’s Energy Balance 2023 (2025); d Nuclear Energy Agency and International Atomic Energy Agency (2024)

Note: Reserves are total proved reserves and reasonably assured recoverable resources for uranium.

In 2025, the Emergency Decree N° 010-2025, which established extraordinary measures for the asset reorganisation of Petroperú S.A., entrusted the Private Investment Promotion Agency (PROINVERSIÓN) with the structuring of trusts and the conducting of a process to attract private capital. This was done in order to guarantee the sustainability of assets such as the New Talara Refinery, which had reached its maximum capacity of 95,000 barrels per day (Ministry of Energy and Mines, 2025).

In 2025, the generation sector Law 32,249 was published, which modified Law 28,832 with the purpose of accelerating the diversification of the electricity matrix, improving the competitiveness of wind and solar power plants by separating the power and energy blocks.

In accordance with the provisions of the Paris Agreement, the government of Peru submitted its Third Nationally Determined Contribution (NDC 3.0) to the United Nations Framework Convention on Climate Change in November 2025. This strategic framework establishes a maximum emissions limit, conditioned, of 179 million tonness of CO_2 equivalent by 2035, serving as a cornerstone towards carbon neutrality by 2050 (National Determined Contribution 3.0, Peru).

Also during 2025, the Ministry of Energy of Peru announced that it was in the process of updating the Technical Regulation of Energy Efficiency Labeling, with the intention of incorporating 11 new categories of equipment in the near future (Ministry of Energy and Mines, 2025).

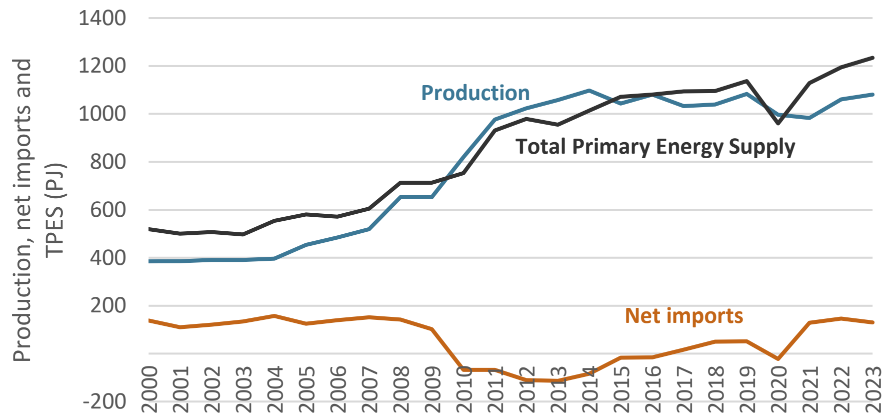
Energy Supply and Consumption

Total Primary Energy Supply

Peru's energy statistics (EGEDA, 2025) show that total energy primary supply grew by 3.3% in 2023 compared to 2022, reaching 1,234 Petajoules (PJ), up from 1,195 PJ the previous year.

Some 88% of Peru's total primary energy supply is met by domestic production, while the remainder is satisfied by imports. For almost a decade, net imports had not decreased (except for 2020); however, during 2023, net import levels decreased by 12%. According to Peru's energy balance, this decrease is due to the recovery of oil refining capacity. Meanwhile, domestic primary energy production increased by 2% compared to 2022, from 1,061 PJ to 1,081 PJ, mainly due to an increase in oil and natural gas liquids (NGL) production.

Figure 1: Peru's energy supply, production, and net imports (PJ), 2000 to 2023



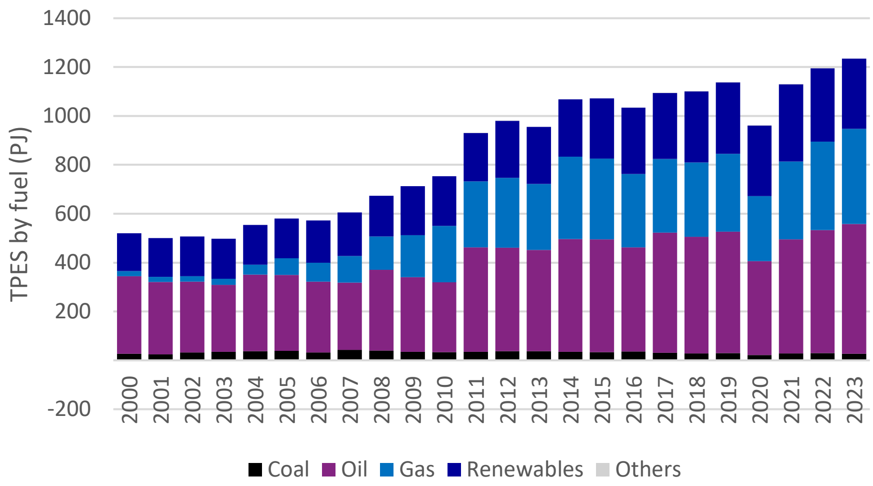
Source: EGEDA (2025)

The primary renewable energy sector represents the 23% of the primary energy supply and has remained relatively stable since 2019. In 2023, it experienced a modest decline of 4% in comparison to 2022, decreasing from 300 PJ to 287 PJ.

Since 2017, NGL production has been increasing slowly, reaching 389 PJ in 2023 from 362 PJ the previous year, a growth of 7.5%. Oil production also rose during this period, from 503 PJ to 532 PJ in 2023. These increases are mainly driven by fuel exports.

In 2023, coal was at its lowest point since 2020, declining from 30 PJ in 2022 to 27 PJ in 2023.

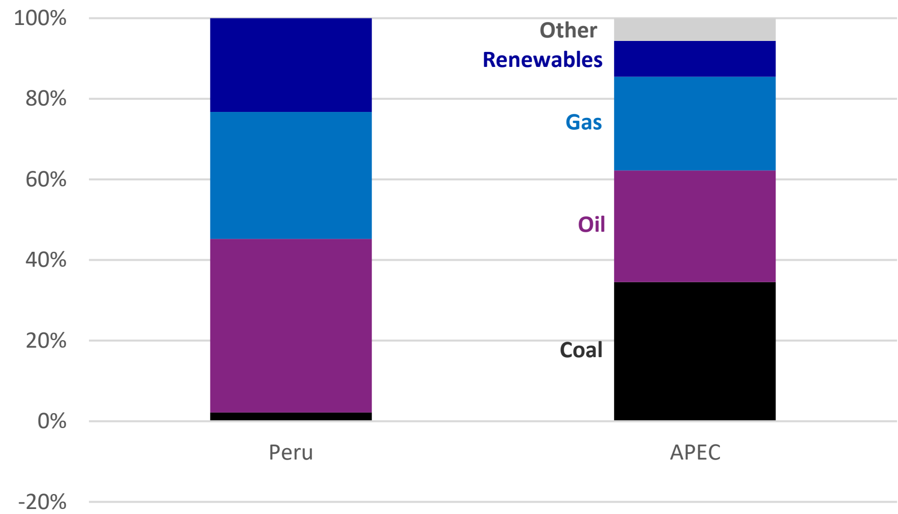
Figure 2: Peru's energy supply by fuel (PJ), 2000 to 2023



Source: EGEDA (2025)

With no nuclear and negligible geothermal, solar, and wind, Peru relies almost wholly on a combination of fossil-plus-hydro. Peru's energy mix is sharply decoupled from the APEC norm: It is the only major APEC economy where oil retains an above 40% share, yet coal falls to the low single digits. Oil dominates Peru's mix at 43%, 15% above the APEC average; gas provides another 32%, giving Peru a 76% combined oil-and-gas share versus 51% for APEC. Coal plays a marginal role in Peru (2%), far below the APEC share of 35%.

Figure 3: Energy supply mix – Peru and APEC, 2023

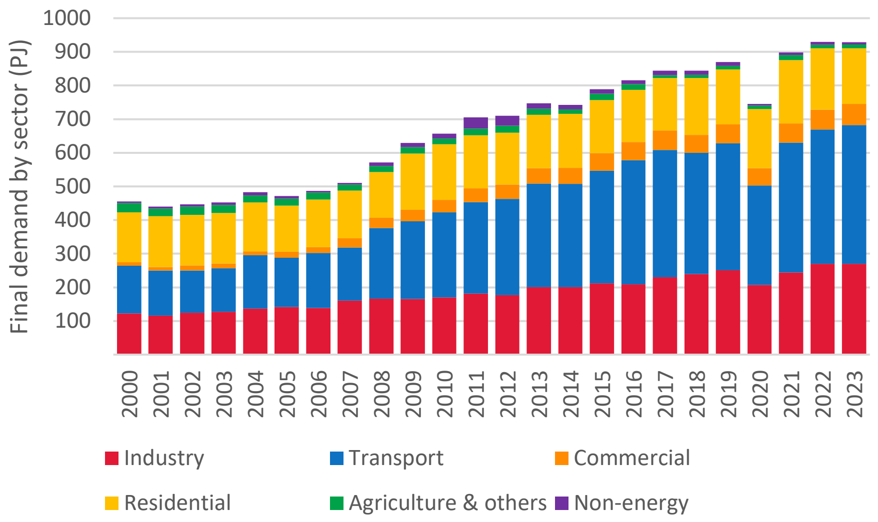


Source: EGEDA (2025)

Total Final Consumption

In 2023, Peru's final energy consumption demonstrated stability, showing minimal variation from the previous year. Total final consumption was approximately 928 PJ, comparable to the 930 PJ recorded in the preceding year. The observed discrepancies can be attributed primarily to the diverse requirements of each sector. The residential sector demonstrated a 10% decrease in energy consumption, reducing it from 183 PJ to 165 PJ, while the industrial sector remained constant at 270 PJ. Conversely, the commercial and transportation sectors exhibited an increase of 6% and 3%, respectively.

Figure 4: Peru's final consumption by sector (PJ), 2000 to 2023

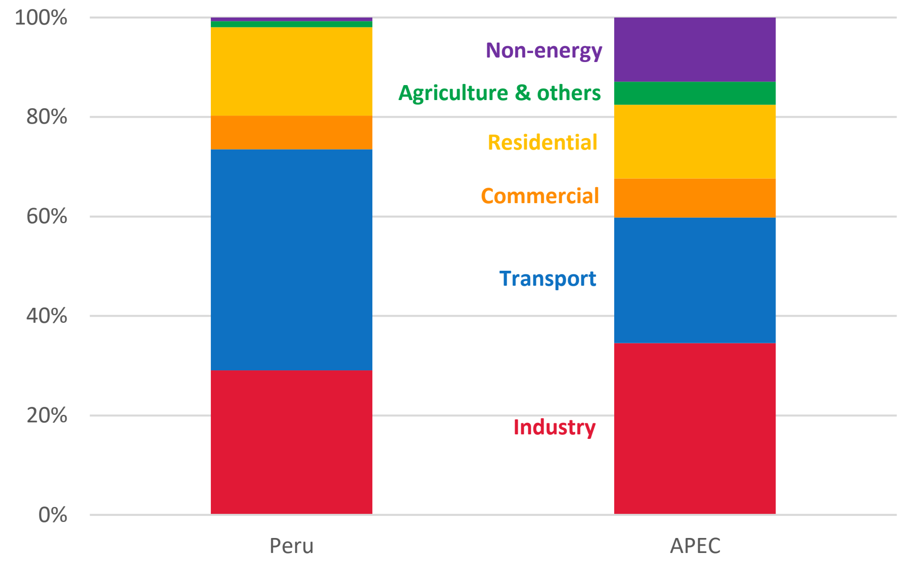


Source: EGEDA (2025)

Transport remains the largest consumer of energy products, accounting for 44% of final consumption. The industrial sector is the second largest, maintaining a 29% share, consistent with 2022, at 270 PJ. In the buildings sector, residential energy consumption declined from 183 PJ in 2022 to 165 PJ in 2023, representing 18% of final consumption, while the commercial sector increased from 59 PJ to 62 PJ, accounting for 7% of total energy consumption. Finally, agriculture and other sectors together represent nearly 2% of final energy consumption, totalling 18 PJ in 2023.

This sectoral breakdown of final energy consumption underscores the challenges of decarbonisation in Peru, as the transport sector, one of the most difficult to decarbonise, presents challenges to implementing effective fuel-switching strategies.

Figure 5: Final consumption by sector, Peru and APEC, 2023



Source: EGEDA (2025)

Another significant difference is found in the non-energy sector, where Peru's non-energy consumption of energy products is minimal, largely due to the underdevelopment of the petrochemical industry in Peru.

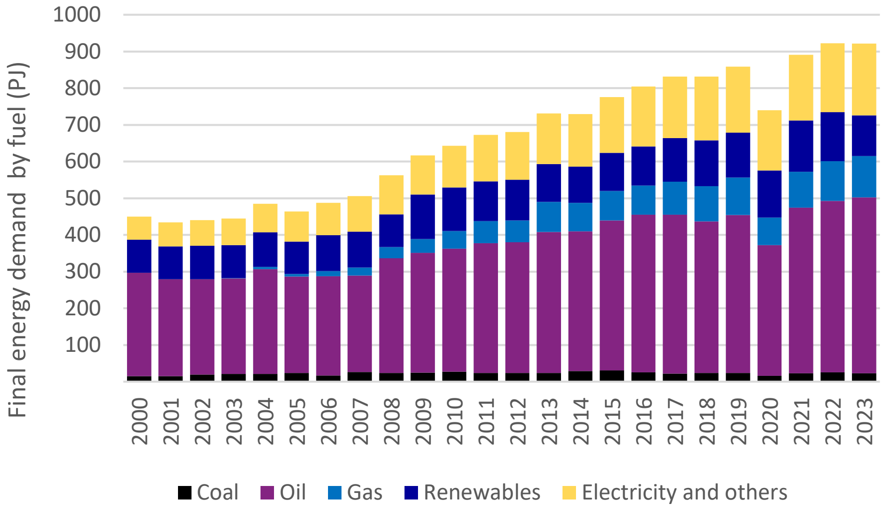
Final Energy Demand

In 2023, final energy demand remained similar to that of 2022, decreasing slightly from 923 PJ in 2022 to a total of 922 PJ. A sectoral analysis reveals that oil holds the largest share of energy demand by fuel, accounting for 52% of the total, marking an increase of 2.8% compared to the previous year, from 467 PJ in 2022 to 480 PJ in 2023. This predominant consumption can be explained by the increased use of terrestrial transport, given Peru's economic growth and the increased purchasing power of the population, which has accelerated access to vehicles.

Gas is the second most prevalent fuel, accounting for 21% of total fuel demand. In 2023, it increased by 3.1%, rising from 109 PJ in 2022 to 112 PJ in 2023.

Electricity accounts for 21% of final energy demand, with a 4.4% increase from 188 PJ in 2022 to 196 PJ in 2023.

Figure 6: Peru's final energy demand by fuel (PJ), 2000 to 2023



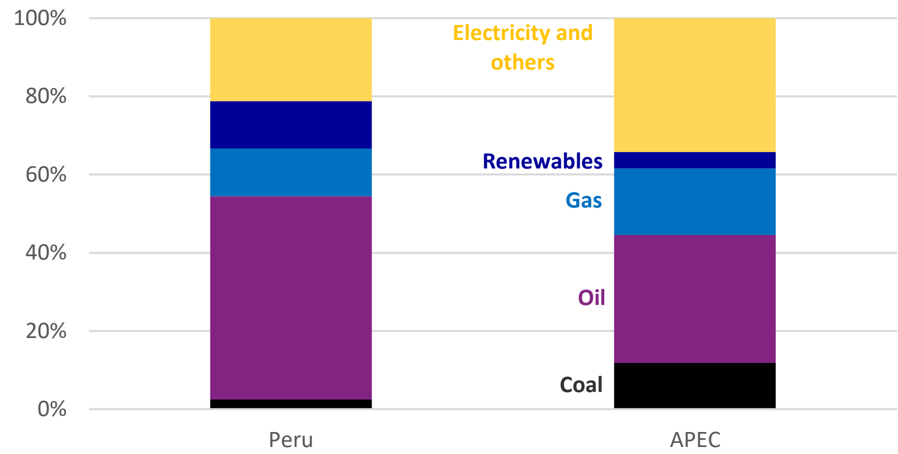
Source: EGEDA (2025)

Note: Figure 6 does not include non-energy sector consumption of energy products.

Renewable energy consumption has decreased from 134 PJ in 2022, representing a 16.7% decrease, to 111 PJ in 2023, mainly due to a reported decline in biomass use.

Finally, the final energy demand of coal in 2023 decreased to 23 PJ, representing a reduction of 11.7% compared to 26 PJ in 2022.

Figure 7: Final energy demand fuel share, Peru and APEC, 2023



Source: EGEDA (2025)

Electrification of energy demand in Peru is lower than the average observed across APEC as a region. In Peru, electricity accounts for 21% of the final energy demand, compared to 34% in APEC. This difference is mainly because space heating energy demand in buildings is minimal; consequently, fossil fuels are primarily used in the transport sector, as well as for cooking and water heating in buildings, and for thermal processes in industry ([BNE, Peru, 2023](#)).

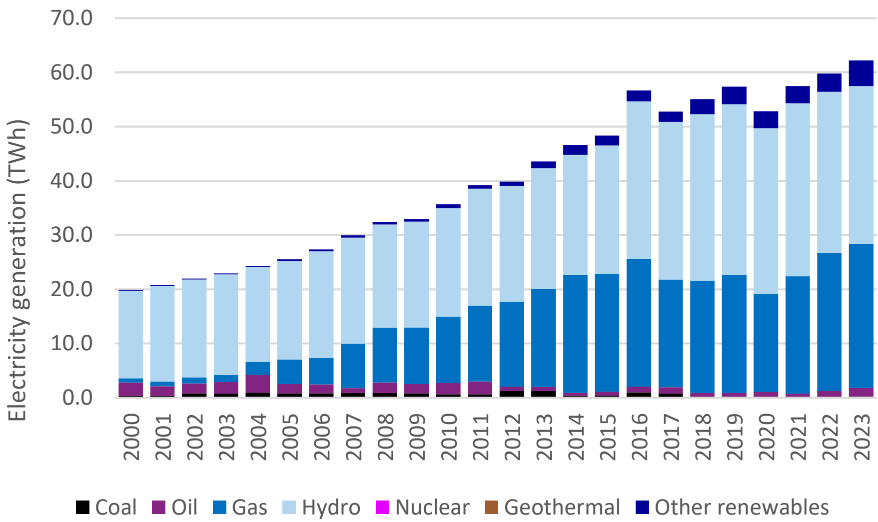
Transformation

Power Sector

Electricity generation increased by 4% in 2023, reaching 62 TWh, following a similar rise in 2022 and a strong rebound of 8.9% in 2021. Over the 2013-2019 period, electricity generation increased at an average annual rate of around 4.6%, before declining sharply in 2020 (Figure 8). Hydropower remained the dominant source of electricity generation in 2023, accounting for 47% of total output. Natural gas followed closely, contributing 43%, while wind, solar, and biofuels generated most of the remaining output.

Peru's electricity generation mix is among the least carbon-intensive in the APEC region. This is largely attributable to the dominant role of hydropower; however, the share of gas-fired generation has slowly climbed within the past two decades to meet growing electricity demand. Wind and solar generation continue to account for a small share of total electricity; however, in 2023, wind generation increased by 22% reaching 2.3 TWh, while solar generation increased by 6.6% reaching almost 1 TWh. In Peru, wind and solar generation are complementary to hydropower, especially during dry months, and help to address localised power shortages.

Figure 8: Peru's electricity generation by fuel, 2000 to 2023



Source: EGEDA (2025)

Peru's current generation capacity sits at roughly 14,400 MW and is led by thermal generation capacity at 7,052 MW, primarily from natural gas-fired plants. Hydro, wind, and solar follow at 5,358 MW, 1,021 MW and 934 MW, respectively (bnamericas, 2026).

The latest electricity generation capacity additions in Peru indicate a focus on the expansion of renewables. In 2025, Peru added 456 MW of solar, 258 MW of hydro, and 14 MW of bagasse-fired thermal generation. The planned capacity additions for 2026 confirm a continuing focus on solar capacity expansion. This is evidenced by the renewable energy project portfolio with approved pre-operational studies by COES, which totals approximately 13.8 GW of solar capacity and 7.8 GW of wind capacity (OSINERGMIN, 2026). Peru's grid coordinator stated that the newest capacity additions intend to decrease the dispatch of less economically efficient liquid fuel-fired generation (bnamericas, 2026).

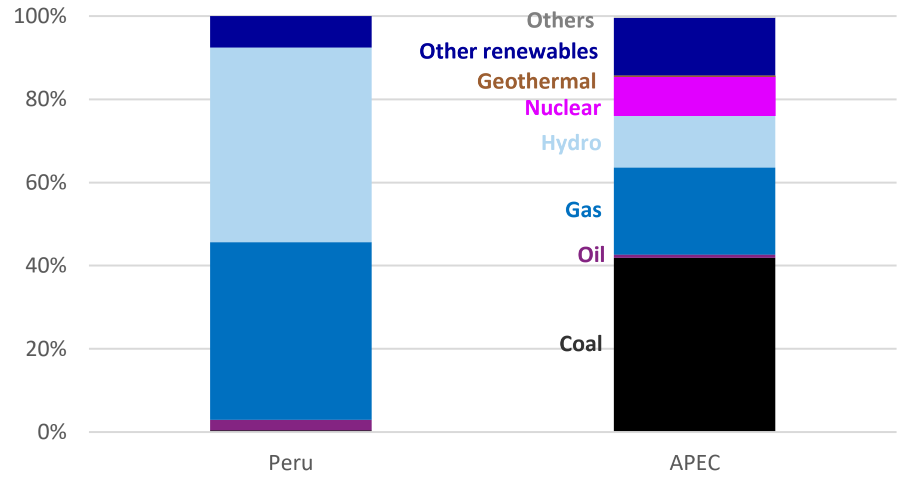
The main difference between the electricity mix in Peru and APEC is the significantly higher reliance on hydropower and gas-fired generation in Peru. The availability of hydropower and competitively priced natural gas supply have resulted in these two dispatchable electricity sources dominating the generation mix. The availability of those resources has led to the phase-out of coal for power generation, as Peru remains a marginal coal producer.

The use of liquid fossil fuels, such as diesel and fuel oil for power generation in Peru, is mainly to balance supply shortages during dry seasons. Peru's current strategy aims to minimise the use of liquid fossil fuels for power generation, given their lower economic efficiency.

The share of electricity generated by other renewables, mainly wind and solar power, in Peru is lower than in APEC. Currently, wind and solar are complementary sources; however, they are expected to play a larger role in meeting growing demand and diversifying the energy mix in the future.

The prominent role of hydropower has shaped a power generation system that relies far less on fossil fuels and exhibits lower emissions intensity compared with the APEC average.

Figure 9: Electricity generation fuel share, Peru and APEC, 2023



Source: EGEDA (2025)

Refining

Peru's refining sector is currently anchored by the Nueva Talara Refinery, which reached its full processing capacity of 95,000 barrels per day (bpd) in early 2025 following a multi-year modernisation process. This facility is central to Peru's total refining capacity of approximately 246,700 bpd and enables the processing of heavy crudes and production of low-sulphur fuels. Throughout 2026, the sector's strategy is focused on a major structural reform of the publicly owned Petroperú, which includes a plan to attract private capital and the sale of non-core assets to ensure the long-term financial and operational sustainability of Peru's refining infrastructure (Petroperú, 2026).

Energy Transition

Peru's energy transition revolves around four strategic pillars: diversifying the energy matrix, expanding electrification, promoting sustainable mobility, and developing green hydrogen (EY, 2024). While there is a strong base in hydropower, the focus is now shifting toward scaling wind and solar power to reduce dependence on fossil fuels. This effort is complemented by a rural electrification strategy aiming for 96% coverage by 2026 through the use of decentralised renewable energy systems in remote Amazonian and Andean communities.

Beyond power generation, the transition targets high-emission sectors like transport and heavy industry. There are active incentives for electromobility and the expansion of mass transit to decarbonise urban areas, while simultaneously positioning green hydrogen as a key tool for hard-to-abate industries like mining. By leveraging low-cost renewable potential, the aim is to transform Peru into a regional hub for clean energy innovation and sustainable exports.

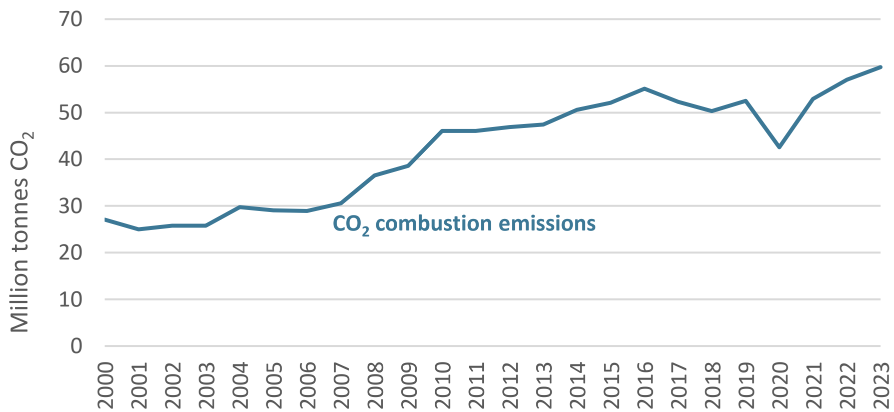
The NDC 3.0, presented in late 2025, sets a critical emissions target, conditioned, to not exceed a cap of 179 million tonnes of CO_2 equivalent ($MtCO_2e$) by 2035. This goal serves as a vital intermediate milestone toward the long-term objective of achieving carbon neutrality by 2050. Although the energy sector is a primary focus of this transition, it is important to note that over 50% of total emissions stem from land use, land-use change, and forestry, primarily driven by deforestation.

Emissions

In 2023, Peru's CO_2 combustion emissions increased by 4.6%, reaching 60 million tonnes per year. Since 2000, Peru has more than doubled its emissions, indicating that economic and population growth has been mainly supported by increased fossil fuel consumption. The increase in emissions observed in 2023 was driven by heightened activity in the transport sector and a greater share of gas-fired power generation.

Despite the growth in emissions, Peru remains one of the lowest CO_2 emitters in APEC, thanks to its low-emission power sector. It is expected that gas-fired generation growth and higher activity in the transport sector will continue to be the main drivers behind CO_2 combustion emissions growth.

Figure 10: Peru's CO_2 combustion emissions (million tonnes), 2000 to 2023



Source: EGEDA (2025)

Energy Security

Peru's current energy security strategy is based on the diversification of the energy matrix, with an emphasis on renewable energy and the development of the natural gas industry. These are regarded as the two cornerstones of the strategy to strengthen energy security by reducing the system's historical vulnerability to droughts, which can adversely affect hydroelectric generation and force a reliance on thermal power.

To ensure a reliable supply across all sectors, the current strategy focuses on expanding natural gas infrastructure, such as the SIT Gas project, to decentralise access to natural gas and decrease the use of imported oil products. Furthermore, energy security for transportation fuels and LPG is being reinforced through the modernisation of domestic refining capabilities, such as the Talara refinery, and the maintenance of strategic reserves to protect the internal market from global supply disruptions.

APEC Energy Goals

There are two energy-related objectives that APEC member economies have agreed to meet as a collective: to improve energy intensity and double the share of modern renewables.

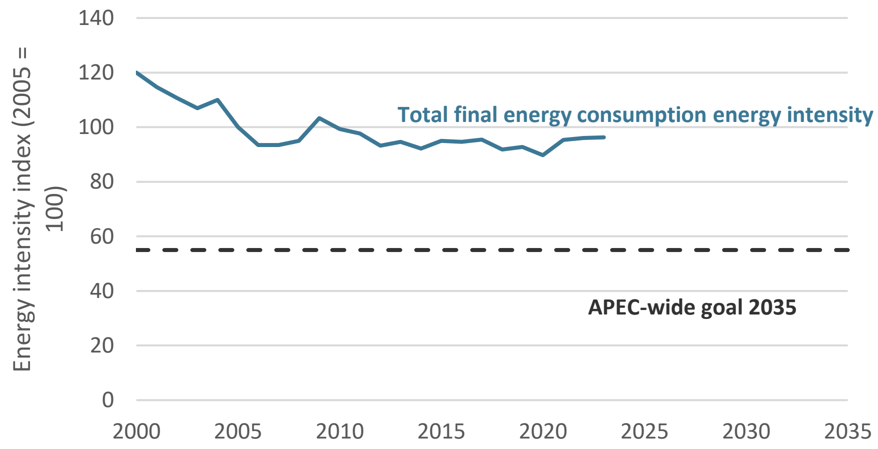
Energy Intensity Goal

In 2011, APEC member economies agreed to increase their ambition to reduce energy intensity by 45% in 2035, relative to a 2005 baseline. The original goal was a 25% improvement by 2030, relative to a 2005 baseline.

APEC is on track to achieve this energy intensity improvement. The goal does not impose individual economy targets, but it is possible to track the progress of individual APEC economies relative to the overarching proportional improvement.

From 2009 to 2020, including the pandemic year, there was a slow downward trend in Peru's energy intensity. However, after 2020, the trend reversed, showing an upward trajectory due to the economic crisis and global slowdown. However, in 2023, the energy intensity index remained unchanged compared to 2022.

Figure 11: Peru total final energy consumption intensity index, 2000 to 2023 (2005 = 100)



Source: EGEDA (2025)

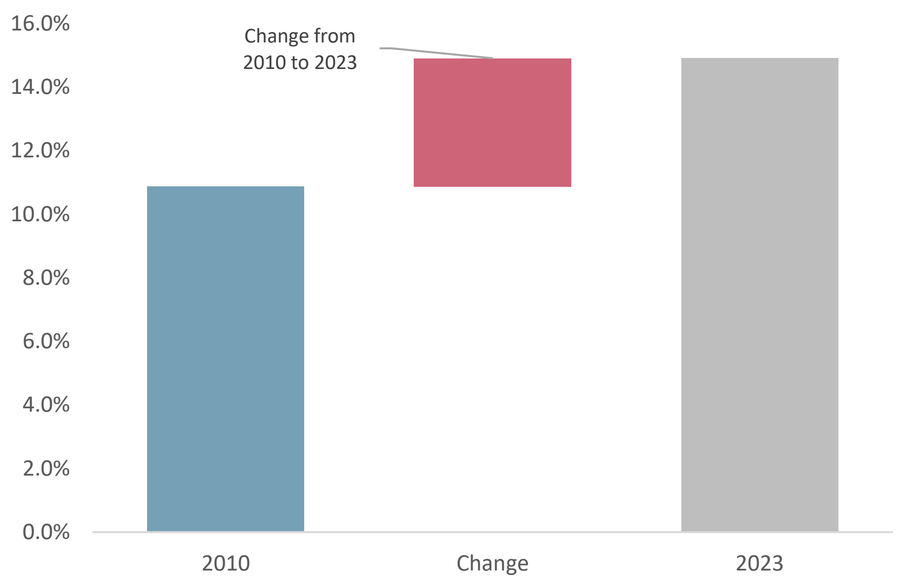
Doubling of Renewables

The second energy goal involves doubling the share of modern renewables in the APEC energy mix for the period 2010 to 2030. There is no economy-level goal for individual member economies, but improvements by individual economies will contribute to the doubling goal.

In the case of Peru, most of this share comes from renewable energy used for electricity production. Peru's share increased from 11% in 2010 to almost 15% by 2023, remaining consistent with the previous year.

However, several droughts across South America reduced hydropower output in 2023, an effect that is expected to continue influencing 2024 data, according to the World Meteorological Organization (WMO, 2025).

Figure 12: Peru's modern renewable energy share, 2010 and 2023



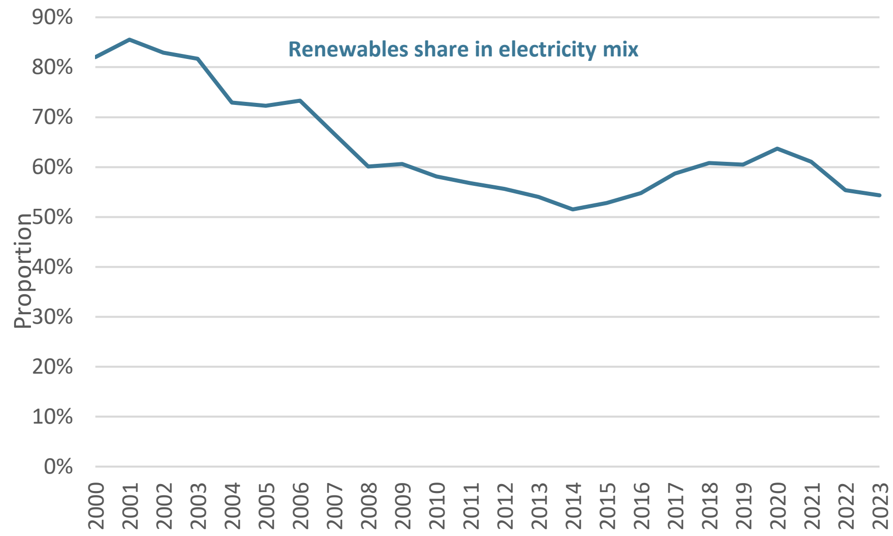
Source: EGEDA (2025)

Note: Biomass used in the residential and commercial sectors is assumed to be traditional biomass and is not included in the definition of modern renewables. All other renewables (biomass used by industry, hydro, geothermal, etc.) are considered modern renewables. Modern renewables also include the share of electricity that is generated from renewable sources.

According to the Optimal Generation and Transmission Expansion of the SEIN through 2050 plan (Ministry of Energy and Mines, 2025), Peru's electrical grid is expected to expand, increasing installed capacity from 13.6 GW to 34.4 GW by 2050. The generation mix will be driven by renewable energy, with wind, hydro, and solar contributing at least 70%.

This represents an opportunity for Peru to contribute to APEC's 2030 goal of at least doubling the energy mix up to 30%.

Figure 13: Peru's renewable generation share, 2000 to 2023



Source: EGEDA (2025)

Energy Policy

Energy policy	Details	Reference
Optimal Generation and Transmission Expansion of the SEIN through 2050	It projects the expansion of the Peruvian power system through 2050, increasing capacity from 13.6 GW to 34.4 GW. By that year, production will be led by renewables: wind power will account for 34%, hydropower for 30%, and solar for 9%. Natural gas will maintain a significant role, contributing 27% of the total generation.	Ministry of Energy and Mines
National Plan for Rural Electrification	The objective of the Rural Electrification Plan is to achieve a reduction in greenhouse gas emissions by using renewable energy in rural areas for the provision of electricity. In 2018, rural electrification reached 87% of coverage, while economy-wide electrification was 92%. The policy target is to reach 100% by 2022.	Ministry of Energy and Mines
The Southern Peruvian Gas Pipeline	This pipeline will increase the natural gas transportation capacity to 800 million cubic feet per day by 2025 through the following pipelines: • Camisea-Lima (500 km); Peru LNG (300 km). • Ica-Marcona (300 km); Marcona-Mollendo loop (500 km). • Central Highlands-Trujillo (1,100 km); Trujillo-Piura (500 km); Piura-Tumbes (400 km).	Ministry of Economy and Finance
Electric Vehicle Charging Infrastructure	Peru has approved statutory provisions for the charging infrastructure and electricity supply for electric vehicles. A proposal for specific regulations for the installation and operation of electric vehicle charging stations has been presented.	Ministry of Energy and Mines
Energy Efficiency Audits	In 2021, Peru approved legal requirements for energy efficiency audits to promote energy efficiency in public and private buildings.	Ministry of Energy and Mines
Energy Efficiency Labelling Regulation	In 2017, the technical regulation for energy efficiency labelling for 12 types of equipment was approved. However, the requirement of presenting a certificate of conformity before using the labels was postponed.	Ministry of Energy and Mines
Energy Efficiency Standards	A new set of technical specifications for washing machines and lights for street lighting has been approved. The government is obligated to acquire new products according to these new specifications.	Ministry of Energy and Mines
Nationally Determined Contribution (NDC) 3.0	Peru has updated its NDC. The mitigation commitment, conditioned, is that greenhouse gas emissions do not exceed 179 $MtCO_2eq$ in 2035.	Ministry of Environment
Declaration of Climate Emergency as of the Utmost Interest	Peru declared the climate emergency as of the utmost importance emergency and prioritised actions to implement NDCs, including setting a goal of achieving 20% non-conventional renewable energy in the electricity mix.	Ministry of Environment

Road Map for Smart Grids in Distribution 2023-30	This document proposes actions to modernise the electric distribution system that include regulatory reforms and the development of incentives and financing for smart grid projects.	Ministry of Energy and Mines
Law for the Promotion of Green Hydrogen	The purpose of this law is to promote the research, development, production, transformation, storage, conditioning, transportation, distribution, commercialisation, export, and use of green hydrogen as a fuel and energy carrier in its various applications.	Congress
Law N° 32249 that amends Law N° 28832	Law to ensure the efficient development of electricity generation to guarantee a safe, reliable and efficient electricity supply and promote the diversification of the energy matrix.	Congress

Notable Energy Developments

Energy Development	Details	Reference
Emergency Decree restructuring Petroperú S.A.	The regulations entrust the Private Investment Promotion Agency (PROINVERSIÓN) with structuring trusts and conducting a process to attract private capital, guaranteeing the sustainability of assets such as the New Talara Refinery, which reached its maximum capacity of 95,000 barrels per day.	Ministry of Energy and Mines
South Region Gas Transportation Integrated System Project (SITGAS)	The SIT Gas project is a 1,080km pipeline designed to transport natural gas from the Camisea fields to the southern regions. Its main objective is to provide a reliable fuel supply for power generation, industrial use, and residential heating while lowering energy costs. By decentralising access to domestic resources, the infrastructure aims to reduce dependence on imported oil products and enhance regional energy security. Additionally, the system serves as a critical thermal backup to stabilise the electrical grid during periods of low hydroelectric production.	Ministry of Energy and Mines
Technical information of non-conventional electric power	Compendium of projects for non-conventional electric power generation plants with pre-operational studies approved by COES.	Supervisory Body for Investment in Energy and Mining

Useful Links

Government

Central Reserve Bank, *Banco Central de Reserva* – https://www.bcrp.gob.pe/

Committee for the Efficient Operation of the System, *Comité de Operación Económica del Sistema Interconectado Nacional* – https://www.coes.org.pe/portal/

National Institute of Statistics and Information, *Instituto Nacional de Estadísticas e Informática* – https://www.gob.pe/inei/

Ministry of Energy and Mines, *Ministerio de Energía y Minas* – www.minem.gob.pe/index2.php www.minem.gob.pe/index2.php

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The Philippines

Introduction

The Philippines is an archipelago comprising 7,641 islands, grouped into three (3) major island groups Luzon, Visayas, and Mindanao, and strategically situated along major sea lanes and trade routes. Its location exposes the economy to recurring natural disasters, and its dispersed, remote communities make infrastructure provision complex and costly. Although it is richly endowed with natural resources, the bulk of its resource wealth lies in non-energy commodities such as minerals, agricultural land, and marine resources. Economic and political activity is concentrated in the National Capital Region (NCR) and a few rapidly growing regional centres. It is a dynamic, newly industrialising economy shifting from agriculture toward services and manufacturing. Against this backdrop of geographic, infrastructural, and energy constraints, the government of the Philippines has prioritised energy security, affordability, and decarbonisation.

The government of the Philippines envisions a 100% household electrification level by 2028, but the economy's archipelagic geography poses a significant challenge. As of December 2023, household electrification was at 92.7%, led by Luzon at 97.5%, followed by Visayas and Mindanao at 92.4% and 80.3%, respectively. According to the 2023-2032 National Total Electrification Roadmap (NTER), most of the remaining unenergised households will be served through grid-based solutions, particularly through regular household connections and distribution line extensions. However, households from far-flung areas will still require stand-alone home systems and microgrid systems.

Although modest, indigenous oil, gas, and coal could still support around 15% of the economy's energy supply in 2023. According to the Philippine government, as of December 2022, proven reserves are estimated at 0.01024 billion barrels of oil (oil plus condensate) and 0.273 trillion cubic feet (TCF) of gas, with cumulative production of 0.173 billion barrels of oil and 2.623 TCF of gas. Undiscovered resources are estimated at 0.260 billion barrels of oil and 4.268 TCF of gas. Coal resources provide a total resource potential of 2,366.7 Mt.

Table 1: The Philippines' macroeconomic data and energy reserves

Key data		Energy reserves [c]	
Area (million km^2)[a]	0.343	Oil (billion barrels)	0.010
Population (million)[b]	115	Gas (trillion cubic feet)	0.273
FY2023 GDP (2021 USD billion PPP)[b]	1,137	Coal (million tonnes)	2,367
FY2023 GDP per capita (2021 USD PPP)[b]	9,899		

Source: a the government of the Philippines; b World Bank (2026); c DOE, 2023b

Note: Reserves are total proved reserves. Current data are updated as of December 2022, as published by the government of the Philippines in the PEP 2023-2050. Oil includes condensate, based on a 23 barrels/MMSCF condensate-to-gas ratio.

Since economic activity is highly concentrated in the NCR and nearby regional centres, energy demand is heavily skewed toward Luzon, which accounts for most of the economy's energy consumption. More than a quarter of the 101 GWh consumed in 2023 came from NCR (DOE, 2023c). This concentration restricts large-scale solar and wind, which require extensive land that is scarce in the region.

Despite geographical challenges, the Philippines is emerging as one of the most dynamic economies in APEC Southeast Asia. Its service sector is rapidly expanding, particularly in business process outsourcing, wholesale and retail trade, and tourism. In FY2023, these developments drove a record-high GDP of USD 1,137 billion (2021 USD PPP) and a 6% rise in GDP per capita to USD 9,899 (2021 USD PPP) (World Bank, 2024). The World Bank reports that the Philippines is on track to transition from lower-middle to upper-middle-income status in FY2026 (World Bank, 2024).

Meanwhile, to address growing energy demand, the government of the Philippines, through the leadership of the Marcos Administration, crafted the Affordable, Reliable, and Clean (ARC) framework as the overarching direction of the energy sector. The ARC framework aims to facilitate **a**ccess to affordable energy, secure a **r**eliable and resilient energy supply, and transition to **c**lean, sustainable, and climate-centred energy resources (DOE, 2023a).

Affordable energy increasingly depends on targeted reforms that cut red tape, attract investment, and competitively procure renewables. The Energy Virtual One-Stop Shop (EVOSS) Act (RA 11234) created a unified electronic permitting system that streamlines approvals and lowers transaction costs. DOE Circular No. 2022-11-0034 lifted the 60% Filipino ownership limit for renewable projects. DOE Circular No. 2024-06-0018 revised renewable energy guidelines and introduced a Certificate of Authority to fast-track early project stages. The Green Energy Auction Program (GEAP) also provides competitive bidding to secure renewable capacity at the lowest possible cost. These efforts show that affordable energy results from coordinated reforms.

The Philippines is combining grid modernisation with regulatory reform to build a reliable, resilient energy supply. The Smart and Green Grid Plan (SGGP) serves as the roadmap for a modern, digital, and climate-resilient transmission system that prevents bottlenecks and outages by identifying priority projects, congestion areas, and investment needs to support renewable energy integration, grid modernisation, and system reliability. DOE Circular No. 2024-12-0031 also launched full commercial operation of the Renewable Energy Market, enabling the active trading of Renewable Energy Certificates to meet Renewable Portfolio Standards (RPS) obligations. These initiatives strengthen system reliability by building a smarter grid, integrating storage, and aligning renewable procurement with system needs.

The Philippines is also advancing a clean and climate-centred energy system through robust regulations and sector-specific roadmaps. DOE Circular No. 2023-05-0015 increased the RPS increment from 1% to 2.52% starting in 2023, requiring participants to increase their renewable shares at a faster pace. EO21 (April 2023) established a framework for offshore wind, integrating it into the EVOSS system, while Republic Act 11697 (EVIDA) promotes the development of electric vehicles across infrastructure, manufacturing, and transport programs. These measures embed climate goals into long-term rules for utilities, developers, and manufacturers.

The ARC framework is expected to progress through deeper regional integration, enhanced public-private coordination, and the adoption of emerging technologies that extend clean energy beyond the power sector. The Department of Energy (DOE) has indicated that the next phase will focus on expediting approvals through EVOSS, advancing waste-to-energy projects, and reinforcing transmission development. The Joint Energy Action Agenda, signed in December 2025 between the DOE and the Management Association of the Philippines (MAP), outlines four priority pillars for 2026-2028: (1) accelerating delivery of the energy mix, (2) addressing infrastructure bottlenecks, (3) refining the energy market to promote greater competition and financing, and (4) managing the costs of the energy transition.

Energy Supply and Consumption

Total Primary Energy Supply

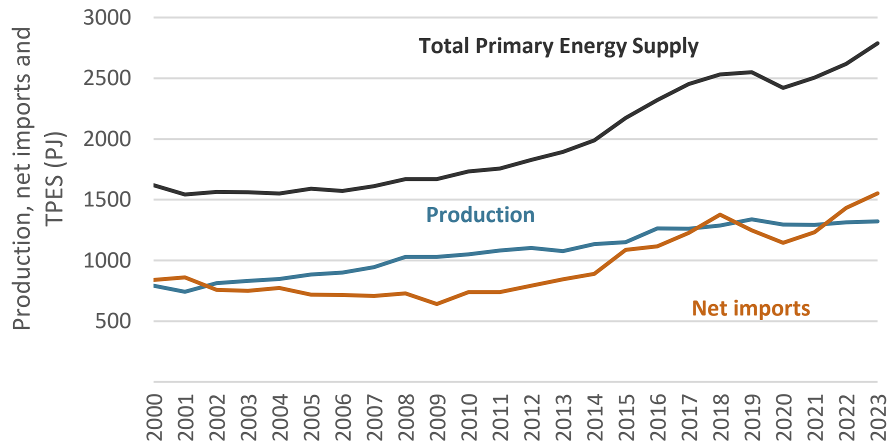
The Philippines' total primary energy supply (TPES) increased by 6.5% to 2,788 PJ in 2023. As shown in Figure 1, this extended the post-pandemic recovery that followed the sharp 5.1% contraction in 2020 and was already visible in growths of 3.4% in 2021 and 4.6% in 2022. Over the last decade (2014-2023), TPES grew by an average of about 4.0% per year, indicating sustained medium-term growth in energy demand. TPES has risen from 1,620 PJ in 2000 by around 72%, reflecting the impact of population growth, economic expansion, and greater access to energy services.

The share of domestic production in the Philippines' TPES has continued to decline, falling from over 60% in 2009-2012 to just around 47% in 2023. This trend reflects the growing reliance on imported energy to meet rising demand. After peaking in the late 2000s, the domestic production share has shown a generally downward trend, with only brief periods of recovery. As a result, the Philippines is now less energy self-sufficient than a decade ago, despite the growth in indigenous coal, gas, and renewable production.

Net imports remain dominated by coal and oil, both of which have increased overall in the last 10 years. Coal net imports rose from about 209 PJ in 2014 to 619 PJ in 2023. Oil net imports grew from roughly 673 PJ to 898 PJ over the same period, with a brief dip in 2020. Other imports remain negligible, although 2023 marked the first year with notable gas net imports (around 27 PJ), signalling that liquefied natural gas (LNG) is becoming an emerging source of import dependence.

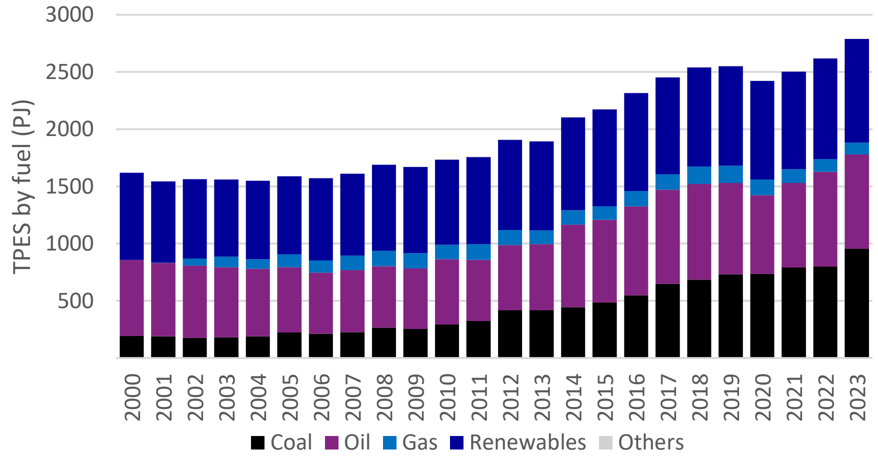
As seen in Figure 2, the increase in TPES was led by a noticeable rise in coal (19.8%), the largest fuel in the mix at about 957 PJ, which accounted for most of the absolute growth. Oil (around 821 PJ) slipped by 1.1% and gas (about 106 PJ) fell by 3.4%, while biomass (441 PJ) and geothermal (386 PJ) recorded modest gains of 1.8% and 2.9%, respectively, offering steady but smaller support to TPES growth.

Figure 1: The Philippines' energy supply, production, and net imports (PJ), 2000 to 2023



Source: EGEDA (2025)

Figure 2: The Philippines' energy supply by fuel (PJ), 2000 to 2023

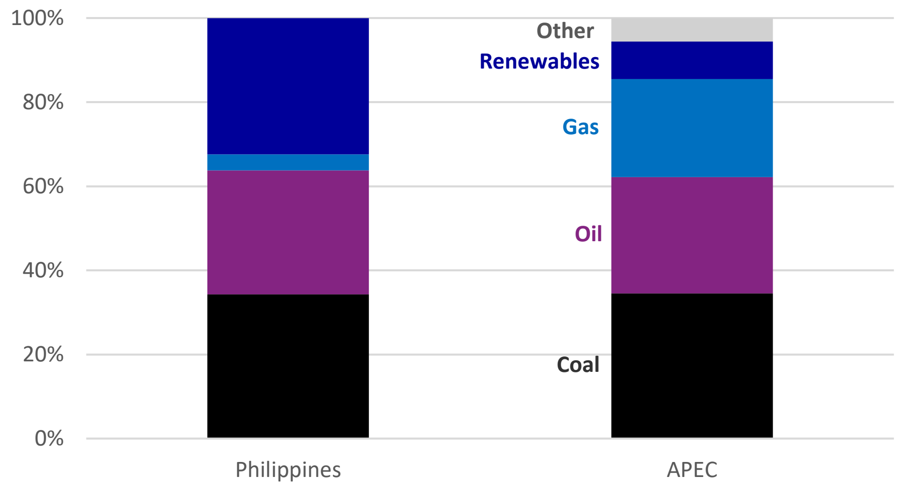


Source: EGEDA (2025)

In 2023, the Philippines' energy supply remained dominated by fossil fuels, with coal and oil accounting for more than half of the total. Coal held the largest share, at just over 34%, driven by its use in power generation, while oil followed at around 30%. Gas made up just 3.8%, indicating limited domestic supply and infrastructure. Renewables together contributed about 32%, led by geothermal and biomass.

Compared with the broader APEC region, the Philippines shows a more renewable-oriented energy mix and a relatively lower share of gas. As seen in Figure 3, while its coal share aligns closely with the APEC average of around 34%, its oil share is higher than the APEC average of 28%. In contrast, gas plays a far smaller role than in APEC overall, accounting for only 23% of the supply. Renewables remain a key strength for the Philippines, contributing more than three times the APEC average share of 8.9% and underscoring its already strong utilisation of indigenous energy resources.

Figure 3: Energy supply mix – the Philippines and APEC, 2023



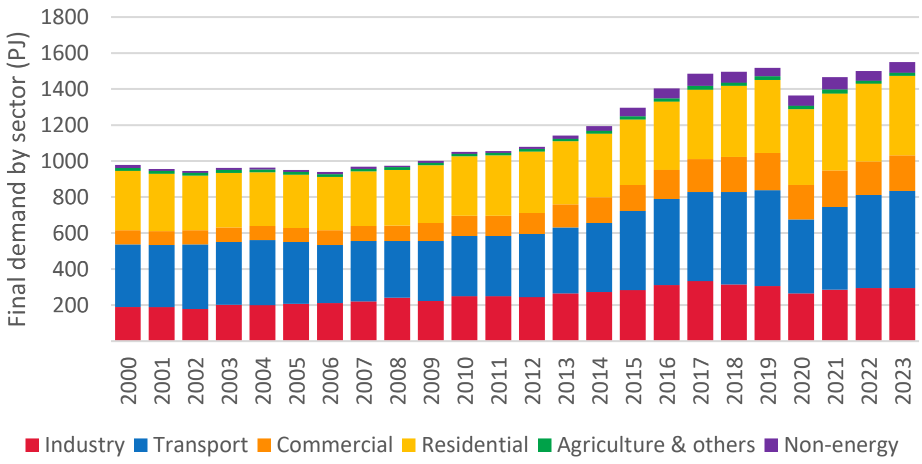
Source: EGEDA (2025)

Total Final Consumption

The Philippines' total final consumption (TFC) continued its post-pandemic recovery trajectory in 2023, rising by 3.2% to reach 1,549 PJ, as shown in Figure 4. While this growth was slightly more modest than the prior year's pace, it reflected a broad, economy-wide normalisation of energy demand.

Transport remained the economy's largest energy-consuming sector, accounting for 36% of TFC, with consumption rising by 4.4% to 538 PJ. Growth was driven by improved rail transport, a resurgent tourism industry, and stable fuel prices (DOE, 2024). Road transport, which accounted for most of the transport sectoral demand, expanded in line with a sharp rise in new vehicle sales (DOE, 2024). Domestic aviation also continued its upward trend, with low-cost carriers expanding their fleets to meet rising leisure travel demand, resulting in significant growth in passenger and cargo movements (DOE, 2024).

Figure 4: The Philippines' final consumption by sector (PJ), 2000 to 2023



Source: EGEDA (2025)

The residential sector, accounting for around 29% of TFC, recorded a 2.2% increase in energy consumption to 441 PJ. More than one million additional households were electrified in 2023, contributing to a notable rise in residential electricity use (DOE, 2024). LPG consumption also grew by 4.1% while kerosene decreased by 31%, reflecting a continued shift towards cleaner modern cooking fuels (DOE, 2024). Despite this, biomass, primarily fuelwood used for cooking in rural areas, remained the most widely used residential energy source, contributing over half of household energy requirements (DOE, 2024).

The commercial sector posted the fastest rate of sectoral growth in 2023 at 6.4%, with consumption reaching 198 PJ and its share of TFC rising slightly to around 13%. A vibrant domestic trade and the full resumption of commercial activities drove a strong expansion in gross value-added (DOE, 2024). Tourism was a key catalyst, with international visitor arrivals and receipts roughly doubling, while the business process outsourcing and other IT-enabled services sector recorded robust revenue growth (DOE, 2024).

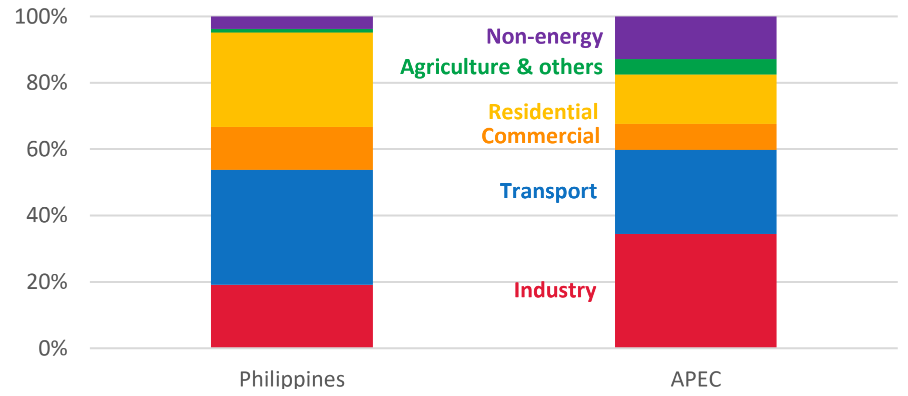
The industry sector was the only sector to decline, with consumption down by 0.5% to 296 PJ, reducing its share of TFC to just over 19%. Growth in industrial value-added slowed due to weak overseas demand and rising material and shipping costs (DOE, 2024). Excess manufacturing production capacities weighed on energy use, with specific reductions recorded in cement, basic metals, and machinery and equipment (DOE, 2024). Mining and construction also pulled back, challenged by lower local energy mineral output and inflationary pressures (DOE, 2024).

Non-energy use accounted for around 3.8% of total final consumption (TFC) in 2023, up slightly from 3.6% in 2022, and remained a relatively small part of the final energy mix. Coal consumption for final use fell further by about 12%, while oil consumption recovered by about 10%.

Agriculture, forestry, and fishery, the smallest sector at 1.1% of TFC, rebounded with a 4.5% rise in consumption to 16.9 PJ, reversing a steep contraction in the previous year. Record-high rice output, growth in poultry and livestock production, and a notable increase in energy use across the sector's activities supported this recovery (DOE, 2024).

The Philippines' TFC sectoral composition differed markedly from the broader APEC region, as seen in Figure 5. Transport dominated the Philippines' energy mix at 35% of TFC, well above the APEC average of 25%, reflecting the economy's heavy reliance on road-based mobility (DOE, 2024). Conversely, the industry's share of only 19% is far below the APEC average of 35%, underscoring the economy's services-led growth structure. The residential sector's 29% share also exceeded the APEC average of 15%, reflecting high household energy use from rural biomass and expanding electricity access. (DOE, 2024). In contrast, non-energy use and commercial sectors held smaller shares in the Philippines, suggesting comparatively less energy-intensive industrial processing and a more people-centred energy demand profile.

Figure 5: Final consumption by sector, the Philippines and APEC, 2023



Source: EGEDA (2025)

Final Energy Demand

The Philippines' total final energy consumption (TFEC, excluding non-energy use) grew by 3.0% to 1,491 PJ in 2023, maintaining a pace broadly similar to 2022. As observed in Figure 6, the 2023 level surpassed the pre-COVID-19 level by nearly 20 PJ (1.4%), marking the economy's full recovery in energy demand. Oil remained the dominant fuel at 49% of TFEC (733 PJ), followed by electricity at 23% (345 PJ) and renewables, primarily biomass, at 22% (304 PJ). Coal accounted for 5.6% (83 PJ), while gas remained absent from the final energy mix.

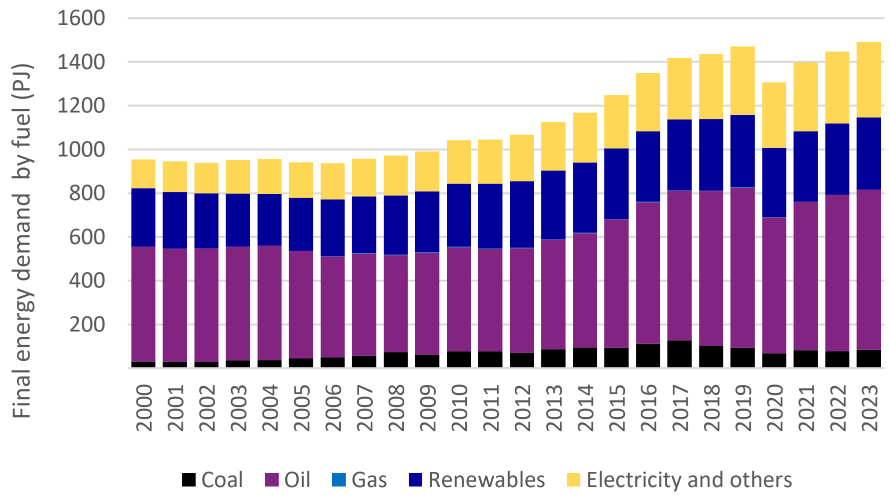
Oil consumption grew by 2.5% in 2023, down from post-COVID rebound rates and indicating a return to more stable demand. Transport accounted for most of the oil demand at 70% (515 PJ), reflecting the continued normalisation of mobility following the relaxation of COVID-19 travel policies (DOE, 2024). The commercial sector was the second largest oil consumer at 12% (89 PJ), buoyed by the full resumption of commercial activities and a doubling of foreign tourist arrivals. The residential sector followed at 7.7% (56 PJ), where a shift toward LPG and away from kerosene shaped demand. Industry accounted for 9.1% (67 PJ), reflecting a contraction in oil product use (DOE, 2024).

Electricity posted the second-highest growth rate among fuels at 4.9%, reaching an all-time high of 345 PJ. Consumption grew across all end-use sectors, with the residential sector holding the largest share at 39% (133 PJ), driven by the electrification of over a million additional households and fuel switching in cooking (DOE, 2024). Industry followed at 31% (106 PJ), where electricity remained the dominant fuel for core production processes, while the commercial sector at 27% (94 PJ) saw the strongest sectoral growth, fuelled by the expansion of IT-enabled services sector and the resurgence of tourism and trade (DOE, 2024). This broad-based growth underscores electricity's continued role as the primary modern fuel across household and industry sectors.

Renewable energy, predominantly biomass, retained a 22% share of TFEC, though growth was modest at just over 1.0%. The residential sector accounted for 83% of biomass consumption (252 PJ), driven by fuelwood use among rural households, though a gradual shift toward modern fuels such as LPG and electricity is underway. Industry accounted for 13% (39 PJ), with biomass use concentrated in food manufacturing but tempered by a broader cooling in industrial production. In comparison, the commercial sector at 5% (14 PJ) increasingly favours electricity and diesel for its core energy needs.

Coal rebounded strongly by 7.1% to 83 PJ in 2023 after declining in 2022. Outside of power generation, all direct coal consumption was used in the industry, confirming its role in specific industrial end uses.

Figure 6: The Philippines' total final energy consumption by fuel (PJ), 2000 to 2023

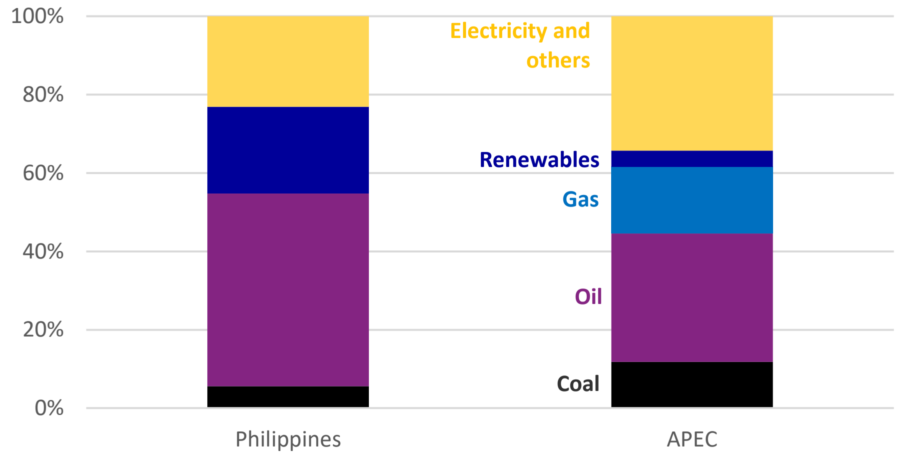


Source: EGEDA (2025)

Note: Figure 6 does not include non-energy sector consumption of energy products.

The Philippines' final energy consumption mix in 2023 was noticeably different from the APEC average across all fuels, as seen in Figure 7. Oil accounted for 49% of the Philippines' final energy consumption mix, roughly 16% points above the APEC average of 33%, driven by the economy's heavy reliance on road transport. Renewables, primarily biomass used in the residential sector, accounted for 20% of the Philippines' final energy consumption mix, nearly five times the APEC average of 4%. In contrast, gas was entirely absent from the Philippines' final energy consumption mix, as the bulk of gas supply is directed to the power sector, compared to a 17% share across APEC economies. Electricity and others made up 25% of the Philippines' final energy consumption mix, around 9 percentage points below the APEC average of 34%. The Philippines' coal share was 6%, half APEC's 12%, reflecting its limited use outside specific industrial sub-sectors.

Figure 7: Final energy consumption fuel share, the Philippines and APEC, 2023



Source: EGEDA (2025)

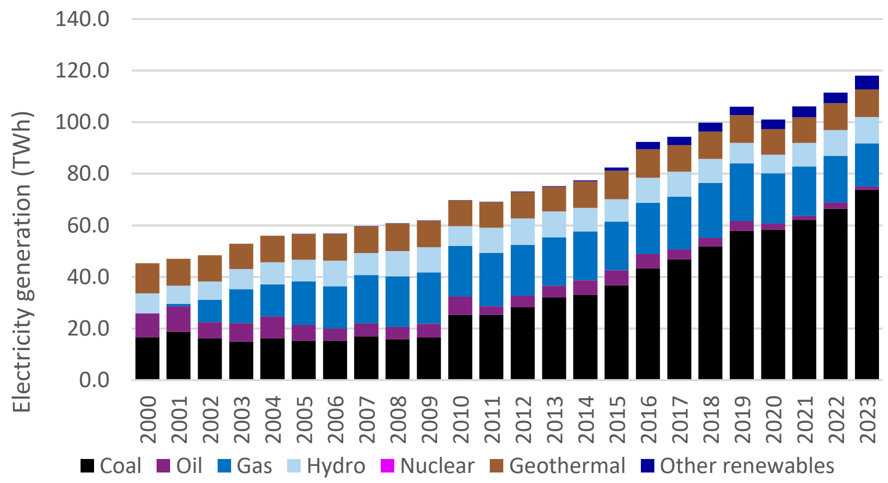
Note: does not include non-energy sector consumption of energy products.

Transformation

Power Sector

The Philippines' total electricity generation grew by 5.8% in 2023, reaching 118 TWh, a record high level. As shown in Figure 8, this marked the third consecutive year of expansion since the 2020 downturn and reflected the economy's continued recovery in energy demand. The 2023 increase was slightly stronger than the previous year's 5.1% rise, showing renewed power demand across all major sectors. This sustained growth continues a consistent long-term trend. Over the past two decades, electricity generation has expanded almost every year, except during the 2020 pandemic year when output dipped by 4.0%. The rebound since then indicates stable overall demand and continuing reliance on established thermal and renewable resources.

Figure 8: The Philippines' electricity generation by fuel, 2000 to 2023



Source: EGEDA (2025)

In 2023, coal remained the dominant source of electricity generation, accounting for 63% of total generation, up from 60% in 2022. Coal-fired generation grew by 11% year-on-year to 73,754 GWh, the largest increase among all fuels in 2023. Relative to the average share in 2000-2009, at 30%, coal's share has already doubled. In the decade from 2014-2023, coal had an average annual growth rate of 8.8%, and it still grew by 0.5% in 2020 despite most fuel sources decreasing that year due to lower demand.

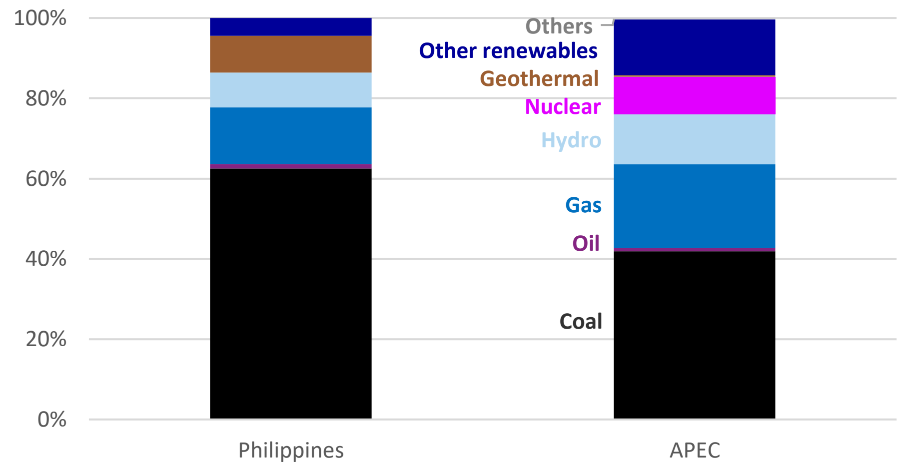
In contrast, oil-fired generation continued its decline, dropping nearly 50% to 1,304 GWh, reducing its share to just 1.1% – the lowest on record since 2000. Natural gas output also fell by 6.8% to 16,668 GWh, marking its third consecutive annual decline as the Malampaya field continued to experience declining output. These shifts further consolidated coal's dominance in the economy's electricity mix.

Among renewables, hydroelectric and geothermal generation remained the two consistent pillars of clean energy supply. Hydropower rose modestly by 2.0% to 10,287 GWh, while geothermal output increased by about 2.9% to 10,730 GWh. Combined, these two sources accounted for around 18% of the Philippines' total generation, underscoring their steady performance despite year-to-year variations in rainfall and resource conditions.

The other renewable sources, solar, wind, and biomass, continued to play a smaller yet expanding role. Their combined share reached about 4.5% in 2023. Solar generation saw the strongest growth, surging 40% to 2,544 GWh, raising its share from 1.6% to 2.2%, reflecting ongoing investment in solar capacity. Wind output also increased by 27% to 1,308 GWh, while biomass generation rose slightly to 1,391 GWh, maintaining its 1.2% share. These upward trends suggest gradual diversification toward newer renewable sources, complementing the economy's established geothermal and hydro base.

Compared with the APEC region, as seen in Figure 9, the Philippines' 2023 power generation mix remained heavily concentrated in coal, with its 63% share far exceeding the APEC average of 42%. This highlights the Philippines' enduring dependence on coal as its principal energy source. In contrast, the Philippines' natural gas share of 14% was below the APEC average of 21%, reflecting the decline in domestic gas supply. Oil-fired generation, at just 1.1%, was slightly higher than APEC's 0.8% share but continues to shrink in importance. On the renewable side, the Philippines stood out for its 9.1% geothermal share, well above APEC's 0.3%, confirming its position as one of the few geothermal leaders in the region. Although still lower than APEC's average of 13.9%, other renewables, which include solar, wind, and biofuels, have been increasing and reached 4.5% in 2023. Total renewables have reached 22%, nearly reaching APEC's 27% share. This shows steady progress toward diversifying the generation mix.

Figure 9: Electricity generation fuel share, the Philippines and APEC, 2023



Source: EGEDA (2025)

Energy Transition

The Philippines has embedded climate action into its development agenda, committing, through its Nationally Determined Contribution (NDC), to a 75% reduction in greenhouse gas (GHG) emissions from 2020 to 2030. Of this, 2.7% is unconditional, while 72% relies on international support, covering key sectors such as energy, transport, and industry. The Philippine Development Plan 2023-2028 places low-carbon development as central to resilience and sustainable growth.

To operationalise its first NDC, the government developed and published the NDC Implementation Plan (NDCIP) 2020-2030 in 2024. It details policies and measures (PAMs) that require an estimated USD 72 billion in investments and are expected to reduce emissions by about 990 $MtCO_2$. The energy sector accounts for 59% of this mitigation potential (around 587 $MtCO_2$), with an associated investment need of about USD 36.5 billion.

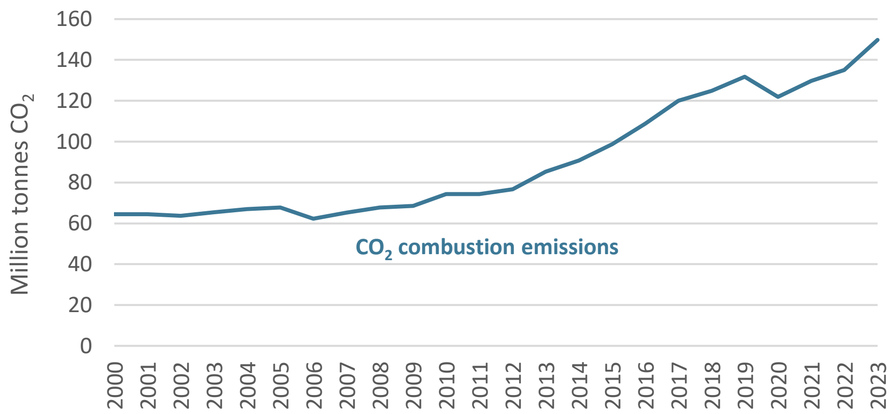
Energy transition efforts are reinforced by renewable energy (RE) targets of 35% of generation by 2030 and 50% by 2040. The Department of Energy also lifted the 40% foreign ownership restrictions in 2022, opening RE projects to full foreign equity and attracting new partnerships. This reform, frequently highlighted by President Marcos, Jr. in international forums, has positioned the Philippines as an emerging hub for clean energy investment. In parallel, the passage of the Philippine National Nuclear Energy Safety Act (Republic Act No. 12305) in 2025 established the independent Philippine Atomic Energy Regulatory Authority (PhilATOM), signalling the readiness to pursue nuclear power in line with international safety standards.

Together, these moves outline a coherent transition from ambitious climate pledges to actionable investment frameworks and enabling policies that advance the Philippines' low-carbon energy future.

Emissions

Despite the government of the Philippines' efforts, CO_2 emissions have generally trended upward over the period shown in Figure 10. Total CO_2 emissions rose by 11% to reach 149.8 $MtCO_2$ in 2023, an increase of 14.811 $MtCO_2$ from the previous year. This growth was largely driven by the power sector, where higher coal consumption accounted for most of the increase as electricity demand expanded. More than half of the emissions came from coal utilisation in power generation, followed by almost a quarter from transport. The rest originated in the industrial and building sectors (residential and commercial), which emitted roughly equal amounts of CO_2 from the direct use of fossil fuels. In the industrial sector, emissions were mainly from coal use in cement manufacturing, while in buildings, they were mostly from LPG used for cooking. Overall, the sharp rise in coal use within the power sector was the main driver of the 2023 emissions increase, complemented by moderate growth in oil use within transport.

Figure 10: The Philippines' CO_2 combustion emissions (million tonnes), 2000 to 2023



Source: EGEDA (2025)

Energy Security

Energy security is a paramount pillar within the Philippine Energy Plan (PEP) 2023-2050, under the theme Transitioning to Reliable, Clean, and Resilient Energy. The plan sets the goal of Ensuring Energy Security 24/7 for reliable supply. It adopts a Low Carbon and Climate-and-Disaster-Resilient (LCCDR) Energy Sector Framework to bolster resiliency and security of infrastructures against environmental risks. This is operationalised through the Energy Resiliency Roadmap and Framework 2023-2028 under the Department of Energy's Task Force on Energy Resiliency (TFER). These components are essential to a clean energy strategy that ensures a secure and reliable energy supply (DOE, 2023a).

Recent events, including the COVID-19 pandemic and shifts in technology and geopolitics, have exposed the Philippines' vulnerability to external supply shocks and price volatility in imported fuels. Geopolitical tensions drove successive pump price and LPG hikes despite adequate physical supply. The Philippines has only one operational refinery, the Petron Bataan Refinery in Limay, with a capacity of 180,000 barrels per day. The closure of the Shell Tabangao Refinery in 2020 left it as the only major facility, and planned expansions have yet to materialise. These pressures strain households, businesses, and the broader economy, underscoring energy security risks associated with petroleum products.

The government enforces a minimum inventory requirement (MIR) to ensure a continuous, adequate and stable supply of oil. The MIR requires refiners to hold 30 days of crude and finished products, bulk marketers and importers to hold 15 days of finished products, and LPG importers to hold 7 days of stocks. Because firms are obliged not to let stocks fall below MIR, they may front-load purchases when expecting tight supply, and the DOE can use MIR compliance to track behaviour and deter hoarding or artificial shortages during price spikes.

The Philippines is a signatory to the ASEAN Petroleum Security Agreement (APSA), which was first introduced in 1986 and later updated to strengthen regional energy cooperation (ACE, 2026). APSA aims to support ASEAN members during periods of serious oil oversupply or undersupply. Recent regional discussions, backed by the Philippines, aim to activate and test APSA’s fuel-sharing mechanism amid rising geopolitical risks.

The depletion of the Philippines' sole natural gas resource threatens the fuel supply of the natural gas power plants that supply around 20% of Luzon's power. The Philippines now has two LNG receiving and regasification facilities to support five existing gas-powered plants (DOE, 2023a). The Philippines remains active in exploring local gas reservoirs. In January 2026, President Marcos Jr. announced the discovery of a new natural gas reservoir at Malampaya East-1 (MAE-1). This was followed by the successful drilling and flow testing of the Camago-3 well in March 2026. Together, these efforts aim to secure fuel for existing gas power plants and may enable new gas-fired plants.

Transmission expansion is guided by the Transmission Development Plan (TDP), which aligns grid investments with projected demand growth, future generation, and renewable integration. This plan positions transmission expansion to better support system reliability and accommodate evolving power system requirements. Strengthening grid flexibility and reliability is a core requirement for enhancing energy security alongside new generation and supporting infrastructure.

The government remains steadfast in its commitment to ensuring a reliable and consistent power supply for consumers. Over the years, efforts have persisted to rehabilitate and refurbish both grid and off-grid facilities, with notable expansions in installed capacity. These initiatives underscore the commitment to bolstering infrastructure and ensuring the resilience of the economy’s energy supply.

APEC Energy Goals

There are two energy-related objectives that APEC member economies have agreed to meet as a collective: to improve energy intensity and double the share of modern renewables.

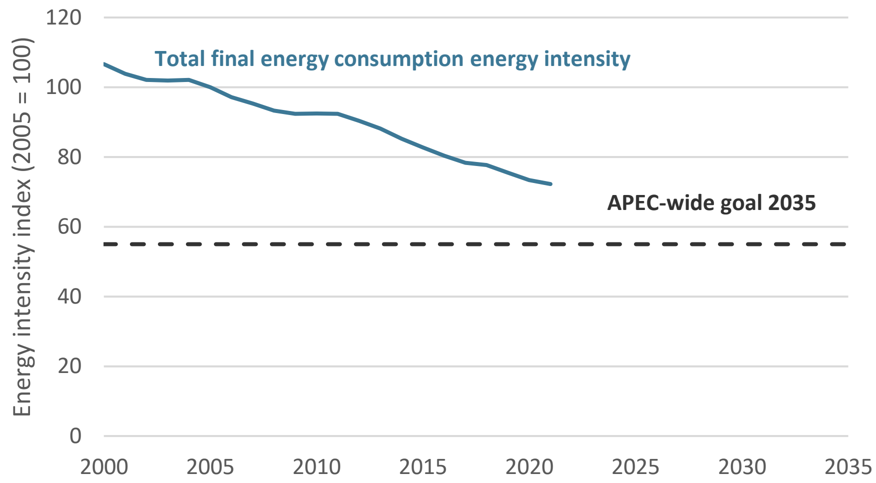
Energy Intensity Goal

In 2011, APEC member economies agreed to increase their ambition to reduce energy intensity by 45% in 2035, relative to a 2005 baseline. The original goal was a 25% improvement by 2030, relative to a 2005 baseline.

APEC is on track to achieve this energy intensity improvement. The goal does not impose individual economy targets, but it is possible to track the progress of individual APEC economies relative to the overarching proportional improvement.

The Philippines has sustained steady improvement in final energy intensity, with an average annual decline of 2.26% since 2005, as shown in Figure 11. By 2023, final energy intensity had fallen by 34% from 2005 levels, further improving on the 32% reduction recorded in 2022. This continued decline reflects a combination of policy measures, economic shifts, and technological progress. The Energy Efficiency and Conservation Act (RA 11285), together with the EE&C Roadmap, appliance standards, government energy efficiency programmes, and new building code measures, has helped curb growth in final energy use relative to GDP. Structural changes in the economy, notably the expansion of the services sector and the decline in the share of heavy industry, have also contributed to lower energy intensity. In addition, shifts in technology and the fuel mix, guided by the Philippine Energy Plan through higher renewable shares, more efficient power plants, and demand-side management, have further improved the efficiency of energy conversion and use across the economy.

Figure 11: The Philippine's total final energy consumption intensity index, 2000 to 2023 (2005 = 100)



Source: EGEDA (2025)

Doubling of Renewables

The second energy goal involves doubling the share of modern renewables in the APEC energy mix for the period 2010 to 2030. There is no economy-level goal for individual member economies, but improvements by individual economies will contribute to the doubling goal.

The Philippines supports APEC's goal of doubling modern renewable energy in TFEC through two key targets and supporting policies. The economy aims for 35% of its power generation mix to come from renewable sources by 2030, rising to 50% by 2040, and exceeding 50% by 2050. These targets are supported by the Renewable Energy Act of 2008 (Republic Act 9513), which accelerates renewable development through renewable portfolio standards, feed-in tariffs, net metering, and measures for off-grid systems. Complementing this, the Biofuels Act of

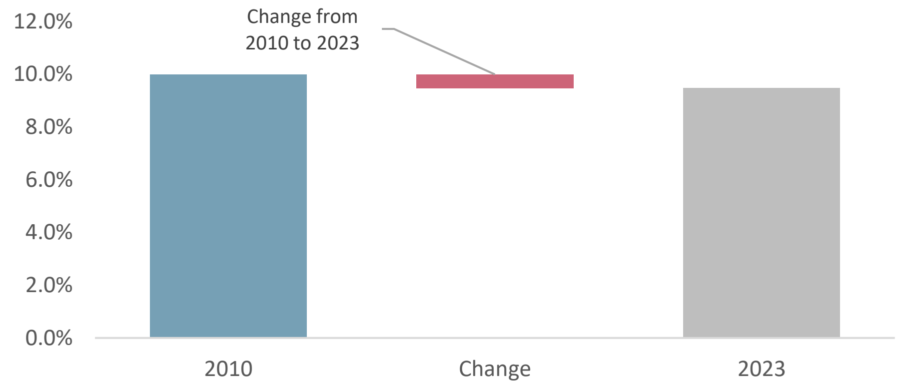
2006 (Republic Act 9367) mandates bioethanol and biodiesel blending, supported by production incentives, to promote cleaner transport fuels.

Despite these efforts, the share of modern renewable energy in the Philippines' total final energy consumption, as seen in Figure 12, has remained relatively unchanged since 2010. From 10% in 2010, the share rose slightly to a peak of 11% in 2012, then gradually declined to a low of 9.3% in 2020 and 2021. It then improved to 9.4% in 2022 and 9.5% in 2023. While the targets and supporting laws have increased the absolute amount of modern renewables, the steady rise in overall energy consumption has kept the share within the same range. Nevertheless, these measures have helped maintain a stable share of renewables despite growing energy demand.

The rise in demand outpacing renewable energy generation is most evident in the power sector. Since 2010, excluding 2020, electricity demand has consistently increased. From 2010 to 2023, electricity consumption grew at an average annual rate of 4.4%, peaking at 10% in 2016. During the same period, coal supplied most of the additional power, growing at an average annual rate of 9.4% and peaking at 18.0% in 2016. Consequently, as shown in Figure 13, the share of renewable energy in the power sector declined to a low of 21% in 2020 but has recovered slightly to 22% in 2023.

The current situation poses a major challenge for the Philippines as it works to restore the share of renewable energy in the power sector to early-2020s levels and reach 35% by 2035. The government plans to achieve this target by rapidly expanding utility-scale solar and wind, modernising and upgrading hydro and geothermal capacity, attracting private capital through auctions and incentives, and improving energy efficiency to slow demand growth. Achieving this target will strongly support APEC's goal of doubling the share of renewables.

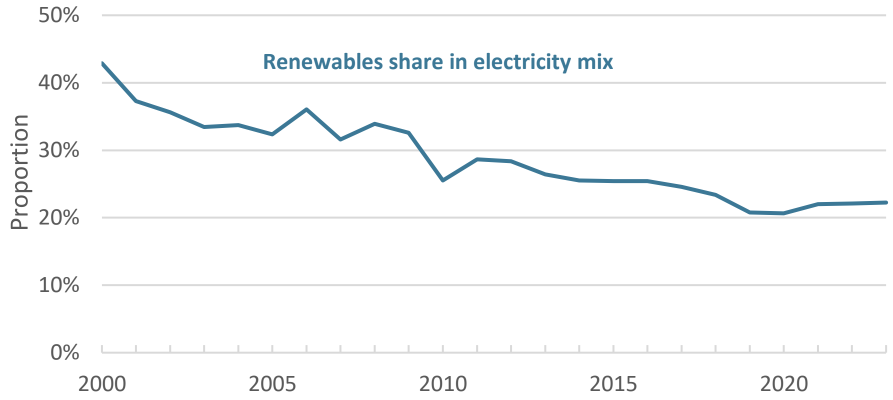
Figure 12: The Philippines' modern renewable energy share, 2010 and 2023



Source: EGEDA (2025)

Note: Biomass used in the residential and commercial sectors is assumed to be traditional biomass and is not included in the definition of modern renewables. All other renewables (biomass used by industry, hydro, geothermal, etc.) are considered modern renewables. Modern renewables also include the share of electricity that is generated from renewable sources.

Figure 13: The Philippines' renewable generation share, 2000 to 2023



Source: EGEDA (2025)

Energy Policy

Under the new government's overall thrust of creating a strong foundation for inclusive growth, the energy sector is continuously guided by the following strategies a) *AmBisyon Natin 2040* (NEDA, 2023) and b) the 8-Point Socio-Economic Agenda anchored on the Philippine Development Plan (PDP) 2023-2028 with a focus on economic and social transformation (creating more job opportunities, accelerating poverty reduction and providing affordable and clean energy, among others); and c) the United Nations' Sustainable Development Goals. Actualising these directions guided the DOE in crafting the overall government energy agenda, which aims to facilitate access to **a**ffordable energy, secure a **r**eliable and resilient energy supply, and a transition to **c**lean, sustainable, and climate-centred energy resources, known as the *ARC* objectives (DOE, 2023b).

Energy Policy	Details	Reference
Philippine Nationally Determined Contribution (NDC)	In 2021, the Philippines submitted its Nationally Determined Contribution (NDC) to the UNFCCC. It commits to a 75% greenhouse gas (GHG) emissions reduction and avoidance from 2020 to 2030. Of this, 2.71% is unconditional, and 72.29% is conditional on international climate finance and support. The NDC covers multiple sectors, including energy, transport, industry, agriculture, forestry, and waste. Identified policies and measures (PAMs) account for 11% of the 75% target, equivalent to 365 $MtCO_2$ reduction from the business-as-usual scenario. The energy sector contributes 46 $MtCO_2$ of this total, a 13% share, translating to a 1.4% reduction in the sector's GHG emissions over business-as-usual.	UNFCCC
Philippine NDC Implementation Plan (NDCIP)	In 2024, the Philippines formulated the NDC Implementation Plan (NDCIP), a roadmap that translates the economy's climate pledge into concrete action. It outlines the specific policies and measures (PAMs) to be carried out across the agriculture, waste, industry, transport, and energy sectors, along with their phasing, costs, and implementation arrangements. Implementation of the PAMs is overseen by four sector departments, namely the (1) Department of Agriculture, (2) Department of Energy, (3) Department of Environment and Natural Resources, and (4) Department of Transportation, with overall coordination handled by the NDC Technical Working Group. The total investment required to deliver the targets under the NDCIP is conservatively estimated at USD 72 billion.	Philippine Climate Change Commission
AmBisyon Natin 2040	AmBisyon Natin 2040 is the Philippines' long-term vision framework, formally adopted in 2016 as the foundational planning guide for all economy-wide development plans. It articulates the collective aspiration of the Filipino people for a life that is strongly rooted, comfortable, and secure, serving as a compass for where the economy aims to go over the next 25 years. By 2040, Filipinos envision a prosperous, predominantly middle-class society where no one is poor, where families live in a place of their own, and where every individual has enough for daily needs, unexpected expenses, and the future of their children. Beyond rising incomes, it calls for inclusive, sustainable economic growth.	Department of Economy, Planning and Development (DEPDev)
Philippine Development Plan (PDP) 2023-2028	The Philippine Development Plan (PDP) 2023 to 2028 translates AmBisyon Natin 2040 into a concrete six-year socioeconomic roadmap. President Ferdinand R. Marcos Jr. approved it in January 2023 through the National Economic and Development Authority (NEDA) Board, which is now reorganised as the Department of Economy, Planning and Development (DEPDev) under Republic Act 12145. The PDP sets medium-term targets across key development areas, including reducing poverty, expanding employment, accelerating infrastructure development, improving access to quality education and	Department of Economy, Planning and Development (DEPDev)

	healthcare, strengthening food security, and transitioning to a clean and resilient energy system. It also prioritises inclusive economic growth that benefits all Filipinos, particularly those in vulnerable and marginalised sectors.	
Philippine Energy Plan (PEP) 2023-2050	The Philippine Energy Plan (PEP) 2023 to 2050 is the primary sectoral roadmap for energy, released by the Department of Energy (DOE) in 2023 with a long-term planning horizon stretching to 2050. It operationalises the PDP's goal of transitioning to a clean and resilient energy system while keeping in mind AmBisyon Natin 2040's vision of a comfortable and secure life for all Filipinos, one in which reliable and affordable energy underpins daily living, economic activity, and competitiveness. The PEP sets the economy's renewable energy targets at 35% of the energy mix by 2030 and 50% by 2040, and defines the strategic pathway for energy security, access, and affordability across all sectors. It also serves as the key instrument for delivering the Philippines' climate commitments under the NDC, bridging the economy's long-term development ambitions with its international obligations.	Department of Energy (DOE)
Power Development Plan 2023-2050	The Power Development Plan 2023-2050 is the DOE's comprehensive roadmap for transforming the Philippines' electric power sector. It is formally integrated into the PEP and coordinates adjustments across all power industry sub-sectors, covering generation, transmission, distribution, and supply. It adopts the PEP's renewable energy targets of 35% of the power generation mix by 2030 and 50% by 2040. It projects a five to six-fold increase in installed capacity by 2050 to meet growing demand. It also outlines the entry of nuclear power generation starting in 2032, with at least 1,200 MW of capacity, supporting the PEP's strategy to provide stable baseload power while reducing reliance on fossil fuels.	Department of Energy (DOE)
Transmission Development Plan (TDP) 2025-2050	The Transmission Development Plan (TDP) serves as a strategic blueprint for expanding and improving the Philippines' power transmission network. Mandated under EPIRA, the National Grid Corporation of the Philippines (NGCP), having succeeded the National Transmission Corporation (Transco) in its operational responsibilities, submits an updated TDP annually to the Department of Energy (DOE) for integration with the Power Development Plan (PDP) and the Philippine Energy Plan (PEP). It outlines the necessary infrastructure projects and investments to support the energy transition toward clean energy, ensuring a reliable, efficient, and secure power supply to meet growing electricity demand. The TDP 2025-2050 incorporates updated development strategies, aligns with the government's renewable energy targets, and reflects stakeholder inputs gathered through economy-wide consultations.	National Grid Corporation of the Philippines
RA 9136 Electric Power Industry Reform Act (EPIRA) of 2001	Approved on 8 June 2001, this act restructured the Philippine electric power industry to promote competition, transparency, and private sector participation. It mandated the privatisation of National Power Corporation assets, the establishment of the Wholesale Electricity Spot Market, and the unbundling of generation, transmission, distribution, and supply functions. It also created the Energy Regulatory Commission as an independent regulator and embedded social measures such as lifeline rates, missionary electrification support, and a framework for retail competition and open access.	The LawPhil Project
RA 9367 Biofuels Act of 2006	Approved on January 12, 2007, this act mandates that all liquid fuels for motors and engines sold in the Philippines must contain locally sourced biofuel components, establishing a National Biofuels Board to oversee the program and set blending requirements for both bioethanol and biodiesel. It also provides fiscal incentives, such as a zero excise tax on biofuel components and VAT exemptions on raw materials used in biofuel production, while imposing penalties for violations, including false labelling, non-compliance with blending standards, and the use of harmful fuel additives.	The LawPhil Project
RA 9513 Renewable Energy Act of 2008	Approved on 16 December 2008, this act promotes the development, utilisation, and commercialisation of renewable energy resources in the Philippines by establishing a Renewable Portfolio Standards (RPS) system, a feed-in tariff mechanism, and a Renewable Energy Market where RE certificates can be traded, all administered by the Department of Energy. It provides a broad package of fiscal and non-fiscal incentives to registered RE developers, including income tax holidays, duty-free	The LawPhil Project

	importation of equipment, and special realty tax rates, while imposing penalties for violations such as non-compliance with RPS rules and falsification of documents to avail of incentives.	
RA 10531 National Electrification Administration Reform Act of 2013	Approved on 7 May 2013, this act strengthens the National Electrification Administration (NEA) by expanding its supervisory and disciplinary powers over electric cooperatives, including the authority to step in and take over ailing cooperatives, set governance standards, and grant or withhold financial assistance. It also reforms the electric cooperatives themselves by insulating their management from local politics, setting minimum qualifications for their directors and officers, and allowing them to convert into stock cooperatives or corporations while remaining under NEA oversight.	The LawPhil Project
RA 11234 Energy Virtual One-Stop Shop Act (EVOSS Act)	Approved on 8 March 2019, this act establishes the Energy Virtual One-Stop Shop (EVOSS) within the Department of Energy, creating a fully online, paperless platform that consolidates all permit and certification applications for power generation, transmission, and distribution projects into a single gateway to eliminate redundant requirements across government agencies. It mandates strict processing timeframes for all involved agencies and local government units and provides that any failure to act within those deadlines is automatically deemed approval, with government officials who willfully delay or obstruct the system facing suspension, dismissal, and perpetual disqualification from public service.	Senate of the Philippines
RA 11285 Energy Efficiency and Conservation Act	Approved on 12 April 2019, this act establishes a framework for energy efficiency and conservation by requiring government agencies, designated establishments, and energy-intensive industries to adopt energy management systems, comply with mandatory energy performance standards, and conduct regular energy audits. Central to the law is the National Energy Efficiency and Conservation Plan (NEECP), a comprehensive governance framework developed by the Department of Energy through a multi-stakeholder consultative process, which sets defined targets, feasible strategies, and regular monitoring and evaluation mechanisms across the commercial, industrial, transport, government, residential, and utilities sectors.	Senate of the Philippines
RA 11572 Philippine Energy Research and Policy Institute Act	Approved on 30 July 2021, this act establishes the Philippine Energy Research and Policy Institute (PERPI) as an independent agency attached to the University of the Philippines, tasked with conducting multidisciplinary and transdisciplinary research to generate science-based policies, strategies, and solutions for the economy's energy sector. It mandates PERPI to maintain a database of energy-related information, provide technical assistance to government agencies, and maximise the use of digital technologies for data storage and dissemination, with its own budget separate from the University of the Philippines.	Senate of the Philippines
RA 11646 Microgrid Systems Act	Approved on 21 January 2022, this act promotes the use of microgrid systems to achieve total electrification of unserved and underserved areas by mandating the Department of Energy to identify and declare such areas, then select private Microgrid System Providers (MGSPs) through a Competitive Selection Process that prioritises low-cost, indigenous, and renewable energy sources. It establishes a dynamic regulatory environment to encourage private-sector participation, grants incentives to qualified MGSPs, and imposes penalties for non-compliance, with the goal of expanding reliable, affordable electricity access to communities currently left out of the electricity grid.	Senate of the Philippines
RA 11697 Electric Vehicle Industry Act	Approved on 15 April 2022, this act promotes the development of the electric vehicle (EV) industry in the Philippines by establishing the Comprehensive Roadmap for the Electric Vehicle Industry (CREVI), an economy-wide development plan that accelerates the commercialisation and adoption of EVs to reduce the economy's dependence on imported fuel for the transportation sector. It mandates the rollout of EV charging stations, sets minimum EV fleet requirements for government agencies and public transport, and provides fiscal and non-fiscal incentives to EV manufacturers, assemblers, importers, and users to stimulate industry growth and lower the cost of EV ownership.	Senate of the Philippines
EO 116 (2020)	On 24 July 2020, EO 116, signed by President Rodrigo Duterte, directed a formal study on whether the Philippines should adopt a position on a Nuclear Energy Program, in line with IAEA guidelines. It constituted the NEP-IAC, an inter-agency	The LawPhil Project

	committee led by the DOE, to conduct prefeasibility assessments, review the legal framework, and report findings to the Office of the President.	
EO 164 (2022)	On 28 February 2022, EO 164, signed by President Rodrigo Duterte, formally adopted a position for a Nuclear Energy Program, building on the studies and public consultations completed under EO 116. It expanded the NEP-IAC's mandate to cover the development of a comprehensive roadmap, legal and regulatory framework, and infrastructure plan to integrate nuclear power into the economy's energy mix.	The LawPhil Project
EO 12 (2023)	On 13 January 2023, EO 12 signed by President Ferdinand Marcos Jr. temporarily modified the rates of import duty on electric vehicles, parts, and components under the Customs Modernisation and Tariff Act (RA 10863). It aimed to boost the local electric vehicle market and support the economy's transition to cleaner transportation, in line with the Electric Vehicle Industry Development Act.	The LawPhil Project
EO 21 (2023)	On 19 April 2023, EO 21 signed by President Ferdinand Marcos Jr. establishes a policy and administrative framework to accelerate the development of Offshore Wind (OSW) projects in the Philippines. It aimed to streamline the permitting process for OSW projects, integrating them into the Energy Virtual One-Stop Shop (EVOSS) System to reduce bureaucratic delays, in line with the economy's transition to cleaner and renewable energy sources.	The LawPhil Project
Upstream Oil and Gas Roadmap	Aims to significantly scale up domestic petroleum exploration, development, and production over to support energy independence and security by 2050.	Department of Energy
Upstream Coal Roadmap	Aims to expand indigenous coal resources and production to support reliable power supply while managing environmental impacts and supply risks.	Department of Energy
Downstream Natural Gas and LNG Roadmap	Aims to establish a world class, investment driven and efficient natural gas industry that makes natural gas the preferred fuel by all end use sectors by 2050.	Department of Energy
Downstream Oil Industry Roadmap	Aims to improve policy governing the downstream oil industry to ensure continuous supply of high quality and right quantity of petroleum products in the market by 2050.	Department of Energy

Biofuels Roadmap (Biodiesel and Bioethanol)	Aims to pursue the development of biofuels in compliance with the Biofuels Act of 2006 (RA 9367) through the following programs / initiatives: • Review the bioethanol and biodiesel mandates • Revisit blending requirement and available feedstock Biodiesel • Continuous conduct of monitoring and technical validation of existing and new biofuel production plants/projects Bioethanol • Continuous conduct of research and development (R&D), deployment and demonstration on alternative biofuel feedstock sources and technologies, in collaboration with other government agencies, academic institutions, industry, stakeholders and international counterparts/organisations • Integrate 2nd generation bioethanol technology into existing commercial plants	Department of Energy
Renewable Energy Systems Roadmap (Power Sector RE)	Aims to reach at least 35 percent renewable energy share in the power generation mix by 2030, 50% by 2040, and more than 50% by 2050 through accelerated RE deployment, through the following programs and initiatives: • Acceleration of RE Positioning • Creation of Conducive Business Environment • Reliable and Efficient Infrastructure • Promotion and Enhance Research, Design & Development Agenda	Department of Energy
Energy Efficiency and Conservation Roadmap	Aim is to achieve measurable annual reductions in energy intensity and consumption versus business as usual across all sectors through full implementation of the Energy Efficiency and Conservation Act and the National EEC Plan and Roadmap 2023–2050	Department of Energy
Alternative Fuels and Energy Technologies Roadmap	Lays out how the energy sector will mainstream alternative fuels and emerging energy technologies (AFETs) like sustainable aviation fuel (SAF), hydrogen and its derivatives (including ammonia), fuel cells, and electric mobility from now through 2050 to achieve a secure and stable supply of energy through a technology responsive energy sector.	Department of Energy
Electric Vehicles Roadmap	Aims to power a diverse range of vehicles and establish a domestic EV industry with strong export potential, with the aim of building a sustainable future, where new EVs and the required infrastructure are locally robust with reduced environmental impact	Department of Energy
Power Generation Roadmap	Aim is to ensure secure, resilient, affordable, and sustainable electricity supply by integrating new technologies and increasing system flexibility through 2050.	Department of Energy

Electricity Market Roadmap	By 2050, the Philippines aims to have a transparent and fair electricity market. In the short term (2023–2024), it will fully commercialise WESM in Mindanao, launch the initial Reserve Market, support compliance with Renewable Portfolio Standards, and study an electricity derivatives market using contracts for differences. In the medium term (2025–2028), it will implement the enhanced Reserve Market, operationalise the electricity derivatives market, and study designs that enable higher renewable energy penetration and electric vehicle demand response. In the long term (2029–2050), it will keep strengthening market design and rules to fully integrate renewable energy and electric vehicles into the electricity market.	Department of Energy
Off-Grid Development Roadmap	Aims to achieve electricity access for all, with modern, increasingly renewable-based supply in former off-grid areas, while modernising systems, increasing interconnections, and rationalising subsidies. To support this goal, the government will modernise off-grid power systems, expand renewable-based supply and consumer use, and progressively interconnect off-grid islands through technically and economically viable links.	Department of Energy
Green Energy Auction Program (GEAP)	The Green Energy Auction Program (GEAP) is a market development support program established by the Department of Energy (DOE) to promote renewable energy (RE) as a primary energy source in the Philippines through transparent, competitive selection of RE facilities. Formalised under Department Circular No. DC2021-11-0036, the GEAP supports the government's energy security goals by encouraging new capacity entry into the grid, while also helping mandated participants of the Renewable Portfolio Standards (RPS) meet their minimum requirements. Ultimately, the GEAP aims to drive greater private-sector participation in RE generation, targeting a 35% share of RE in the economy's generation mix by 2030.	Department of Energy
1st Green Energy Auction (GEA-1)	GEA-1 marked the Philippines' inaugural green energy auction, with the DOE posting the list of winning bidders on 24 June 2022. With a 98.35% success rate, the auction awarded a total of 1,966.93 MW for delivery from 2023 to 2025, covering ground-mounted solar, onshore wind, run-of-river hydro, and biomass, all at prices at or below the Green Energy Auction Reserve (GEAR) prices set by the ERC.	Department of Energy
2nd Green Energy Auction (GEA-2)	GEA-2 resulted in a significant scale-up, with the DOE releasing the Notice of Award on 12 July 2023 following the auction conducted on 3 July 2023. A total of 3,580.76 MW was committed for delivery from 2024 to 2026, broken down as: ground-mounted solar at 1,968.982 MW; onshore wind at 1,512.384 MW; floating solar at 90 MW; and rooftop solar at 9.39 MW. No commitments were received for biomass and waste-to-energy.	Department of Energy
3rd Green Energy Auction (GEA-3)	GEA-3 will deliver a combined 6,677.218 MW of new renewable capacity between 2025 and 2035, as indicated in the Notice of Award issued on 10 June 2025. The awarded portfolio spans multiple regions across the Philippines and includes hydroelectric and geothermal power plants. It includes large impounding hydro facilities, pumped storage hydropower plants designed to enhance grid flexibility and energy storage, and binary and conventional geothermal technologies that provide stable baseload generation.	Department of Energy
4th Green Energy Auction (GEA-4)	GEA-4 achieved a record award, with the DOE announcing the winning bidders on 6 November 2025, following the auction on 02 September 2025. A total of 10,195.49 MW was awarded across 123 winning bidders: ground-mounted solar at 4,179.09 MW; onshore wind at 2,518.29 MW; floating solar at 2,284 MW; Integrated RE with Energy Storage Systems (IRESS) at 1,189.29 MW; and rooftop solar at 24.82 MW, all committed for delivery from 2026 to 2029.	Department of Energy

Notable Energy Developments

Energy Development	Details	Reference
RA 12120 – Philippine Natural Gas Industry Development Act	Approved on 8 January 2025, this act establishes the Philippine Downstream Natural Gas Industry and sets a comprehensive regulatory framework for the transmission, distribution, and supply of natural gas. It promotes natural gas as a safe, efficient, and cost-effective contributor to energy security, supports the development of the Philippines as a liquefied natural gas trading and transhipment hub in the Asia-Pacific, and grants incentives to attract downstream natural gas investments. It also provides the legislative foundation for earlier policy instruments, such as the Downstream Natural Gas Roadmap, by defining the roles of government and private entities.	Senate of the Philippines
RA 12305 – Philippine National Nuclear Energy Safety Act	Approved on 18 September 2025, this act establishes a comprehensive legal framework for nuclear safety, security, and safeguards in the Philippines for the peaceful use of nuclear energy. It serves as the regulatory cornerstone of the Philippines' nuclear energy programme by centralising licensing, inspection, and enforcement, strengthening compliance with international nuclear obligations, and updating earlier institutional arrangements referenced in Executive Order 116 and the Philippine Nuclear Energy Program Roadmap.	Senate of the Philippines
Philippine Atomic Energy Regulatory Authority (PhilATOM)	The Philippine Atomic Energy Regulatory Authority (PhilATOM) is the Philippines' independent nuclear regulator responsible for overseeing all nuclear and radiation-related activities. It is established by Republic Act No. 12305, the Philippine National Nuclear Energy Safety Act, which provides a comprehensive legal framework for nuclear safety, security, and safeguards and formally creates PhilATOM as a quasi-judicial authority with sole and exclusive regulatory jurisdiction. By aligning regulation with International Atomic Energy Agency standards and separating promotion from regulation, PhilATOM is intended to enable the safe integration of nuclear power into the economy's energy mix.	Senate of the Philippines
5th Green Energy Auction (GEA-5)	GEA-5, announced on 2 March 2026 with its official activity timeline, focuses on fixed-bottom offshore wind technology and aims to deliver 3,300 megawatts of capacity between 2028 and 2030. Formally launched on 25 November 2025 and refined by a Supplemental TOR on 29 January 2026, it features clear qualification rules, milestone monitoring, and grid integration planning. GEA-5 advances renewable energy expansion, grid reliability, and energy security, aligning with Executive Order No. 21 for streamlined OSW development.	Department of Energy
10-Year Green Energy Auction Plan (GEA-6 to GEA-9)	DOE advances a 10-year Green Energy Auction plan targeting at least 25 GW of new renewable capacity through annual auctions from 2026, with project deliveries from 2027 to 2035. GEA-6 will target onshore wind and floating solar, while GEA-7 will focus on rooftop solar and solar plus battery energy storage systems in partnership with the Mindanao Development Authority. GEA-8 will feature solar on stilts, AgriSolar, and canal-top solar developed with agriculture and irrigation agencies, and GEA-9 will cover biomass, geothermal, solar, hydropower, and onshore wind. For 2027–2028, DOE aims to deploy at least 3,200 MW of solar and 85 MW of rooftop solar, with an additional 5,565 MW of diverse technologies through 2035.	Department of Energy

Useful Links

Asian Development Bank – www.adb.org

Climate Change Commission (CCC) – www.climate.gov.ph

Department of Energy, Republic of the Philippines (DOE) – www.doe.gov.ph

Department of Science and Technology (DOST) – www.dost.gov.ph/

Department of Trade and Industry (DTI) – www.dti.gov.ph/

Department of Transportation (DOTr) – www.dotr.gov.ph

Independent Electricity Market Operator of the Philippines (IEMOP) – www.iemop.ph

National Power Corporation (NPC) – www.napocor.gov.ph

National Transmission Corporation (TransCO) – www.transco.ph

Philippine National Oil Company (PNOC) – www.pnoc.com.ph

Philippine Electricity Market Corporation (PEMC) – www.wesm.ph

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The Russian Federation

Introduction

The Russian Federation, the world's largest economy by land area, spans over 17.2 million square kilometres across Eastern Europe and Northern Asia. Its energy infrastructure – comprising the Unified Power System of Russia, the Unified Gas Supply System, regional gas supply systems, the trunk pipeline system for the transportation of oil and petroleum products, as well as trunk and distribution heating networks – is among the most extensive in the world and operates across a wide range of natural and climatic conditions, from the Arctic to subtropical zones.

Russia occupies a unique position, being simultaneously a major producer, consumer, and exporter of energy resources. It ranks among the global leaders in terms of hydrocarbon reserves, hydropower potential (the second largest in the world), volumes of energy production and exports, as well as in the development, use, and export of nuclear energy technologies and equipment.

The economy's primary energy supply is dominated by natural gas, accounting for a share of over 51% in 2023, followed by oil and coal, with nuclear and hydropower comprising a significant contribution. Russia's final consumption is concentrated in the industrial and residential sectors, reflecting the economy's production base and high heating demand.

Russia's Energy Strategy to 2050, approved in April 2025, represents an important milestone in long-term energy planning and defines guidelines in the context of global challenges, energy transition, technological changes, and growing energy consumption.

The Strategy maintains stable growth in hydrocarbon production, including the increase of LNG production and exports, while expanding the role of nuclear and renewable energy. It places strong emphasis on improving energy efficiency, modernising infrastructure, and adopting cleaner technologies. Amid shifting geopolitical and economic conditions, the Strategy also underscores the importance of diversifying export routes, and deepening international energy cooperation, particularly with Asian and other developing economies.

Table 1: Russia's macroeconomic data and energy reserves

Key data [a]		Energy reserves [b, c]	
Area (million km^2)	17.234	Oil (billion tonnes) [b]	31.3
Population (million)	146.3	Gas (trillion cubic metres) [b]	63.4
GDP (2021 USD billion PPP)	5,835	Coal (billion tonnes) [b]	272.7
GDP per capita (2021 USD PPP)	39,887	Uranium (kilotonnes U < USD 130/kgU) [c]	202

Source: (a) ROSSTAT (2025); (b) Russian Energy Strategy (2025); (c) NEA (2025)
Notes: 1) Area as of January 1, 2024. 2) Oil and gas reserves are reported under the Russian classification system, which uses the categories A, B1, C1, B2, and C2. Uranium figures refer to reasonably assured recoverable resources based on data from *Uranium 2024: Resources, Production and Demand*, jointly prepared by NEA and IAEA

Table 1 provides an overview of key macroeconomic indicators and energy reserves for 2023. Economic output continued to expand, with GDP increasing by 4.1% compared with 2022, alongside a 4.4% rise in GDP per capita.

Energy Supply and Consumption

Total Primary Energy Supply

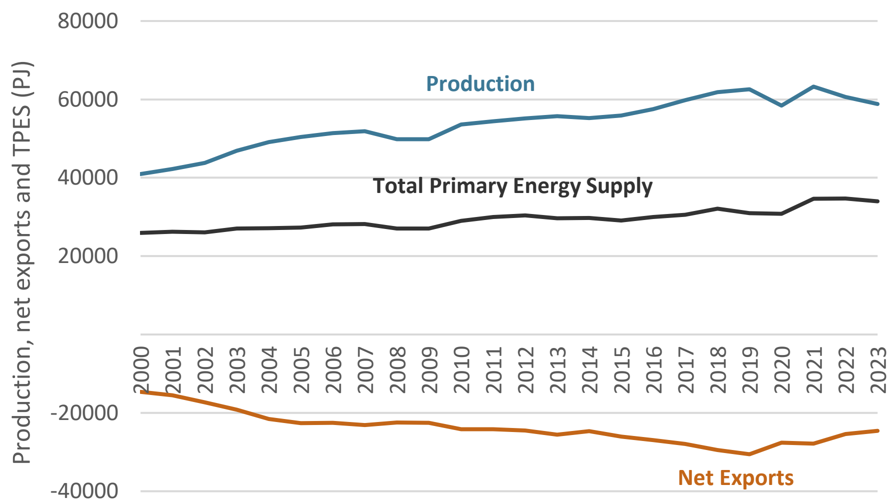
Russia is the third-largest energy producer and consumer both within the APEC region and globally, after China and the United States. In 2023, its total energy production reached almost 59 Exajoules (EJ), while total primary energy supply (TPES) amounted to 34 EJ. At the same time, Russia was the world's largest net energy exporter, with total volume exceeding 24.5 EJ in 2023.

As shown in Figure 1, energy production has declined since 2021. In 2023, total production decreased by 3.0%. This drop was mainly the result of declining exports. In particular, reductions in oil production and export volumes were influenced by the implementation of the OPEC+ agreement aimed at balancing the global oil market. Natural gas exports declined following the European Union's (EU) decision to phase out Russian pipeline gas supplies in 2022. Coal exports decreased due to the EU's embargo on Russian coal, as well as logistical constraints in eastward export routes.

In response to changes in the geopolitical landscape, Russia has been progressively reorienting exports of crude oil, petroleum products, natural gas, and coal toward southern and eastern markets. While this iteration of the *APEC Energy Overview* focuses on 2023 data, more recent data indicate a rebound in export volumes in 2024, reinforcing the shift in supply geography.

Notably, in 2024, the Asia-Pacific region's share of Russia's total energy export volume increased 1.5-fold, exceeding 60% (TASS, 2025). This share is expected to continue rising, supported by agreements with China to expand gas supplies via the existing Power of Siberia pipeline (from 38 bcm to 44 bcm per year) and via the upcoming Far Eastern Route project (from 10 bcm to 12 bcm per year), as well as by a legally binding memorandum on the construction of the Power of Siberia-2 gas pipeline and the Soyuz-Vostok transit gas pipeline through Mongolia.

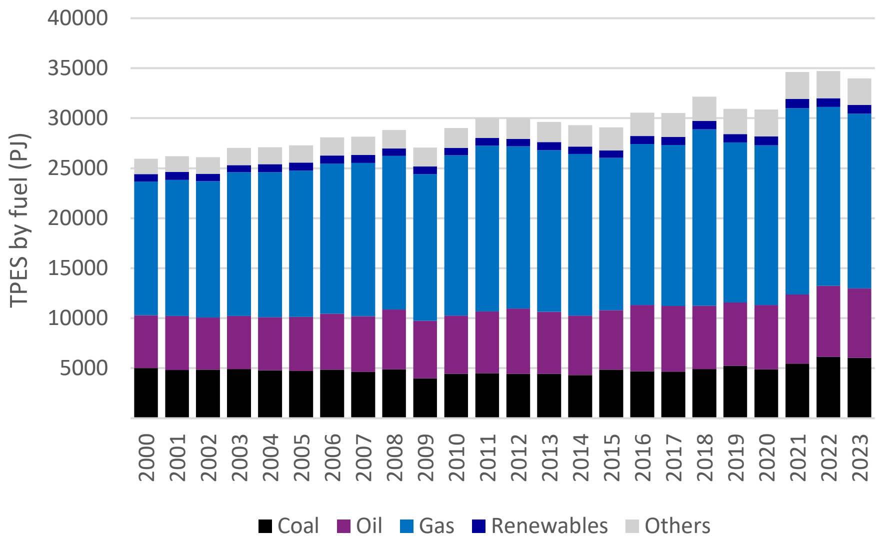
Figure 1: Russia's energy supply, production, and net exports (PJ), 2000 to 2023



Source: EGEDA (2025)

Russia's TPES fuel mix remained largely stable over the period, as illustrated in Figure 2. Natural gas consistently accounted for more than half of total supply, while the share of coal declined slightly during the 2010s. In 2023, natural gas dominated at over 51%, followed by oil (20%), coal (18%). The remaining share of around 10% came from renewables (including hydropower) and other sources such as nuclear.

Figure 2: Russia's energy supply by fuel (PJ), 2000 to 2023

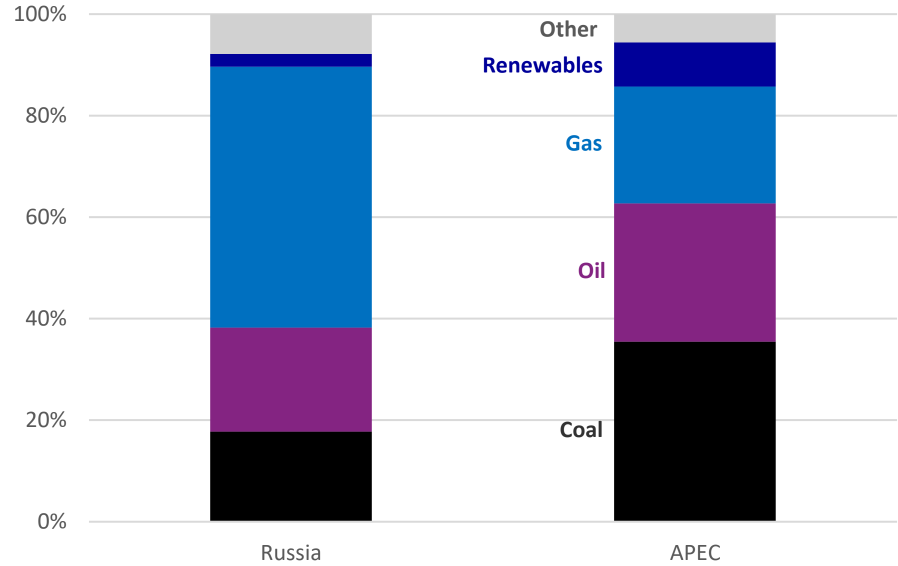


Source: EGEDA (2025)

As Figure 3 indicates, Russia's TPES fuel mix differs substantially from that of the APEC region as a whole. The share of natural gas in Russia is more than twice as high, reflecting the dominant role of gas in power generation, and its extensive use in final consumption sectors, particularly in the industry and residential sectors.

At the same time, gas consumption remains unevenly distributed across the economy due to infrastructural constraints. Major centres of gas production and consumption are geographically remote from each other, while the gas transmission network is predominantly concentrated in the western part. For example, according to the Ministry for the Development of the Russian Far East and Arctic, the average gasification level in the Far Eastern regions stands at around 28%, which is roughly three times lower than the economy-wide average (Minvostokrazvitiya, 2025).

Figure 3: Energy supply mix, Russia and APEC, 2023



Source: EGEDA (2025)

The prevalence of natural gas in Russia's energy mix is expected to be sustained, as energy policy places significant emphasis on the increased use of this energy source. Primary measures include expanding and interconnecting gas transmission infrastructure, notably through the integration of the Power of Siberia pipeline with the Sakhalin-Khabarovsk-Vladivostok system and further with the Unified Gas Supply System.

Priorities also encompass the continued implementation of Russia's gasification programme and its extension to regions across Siberia, the Far East, and the Arctic; the development of infrastructure to enable wider use of natural gas and LNG in transport; as well as the development of gas processing and gas-to-chemicals projects.

In contrast to natural gas, coal and renewables account for a significantly smaller share in Russia's energy mix than in the APEC region as a whole. In particular, the contribution of solar and wind remains modest, reflecting their limited role in electricity generation to date. This is largely due to relatively high costs, intermittency, and the need to ensure energy security across a geographically vast and climatically diverse territory.

Within this context, solar and wind energy primarily serve to address specific supply deficits and are among the most attractive options for remote areas. At present, key objectives for renewable-based generation include improving operational efficiency and competitiveness, alongside the development of electricity storage systems.

The share of coal in Russia's TPES is roughly half that observed across APEC as a whole. Nevertheless, domestic coal demand remains substantial, underpinning key segments of the economy. In 2023, coal-fired power plants generated around 18% of total electricity output, and coal plays a critical role in the metallurgical sector.

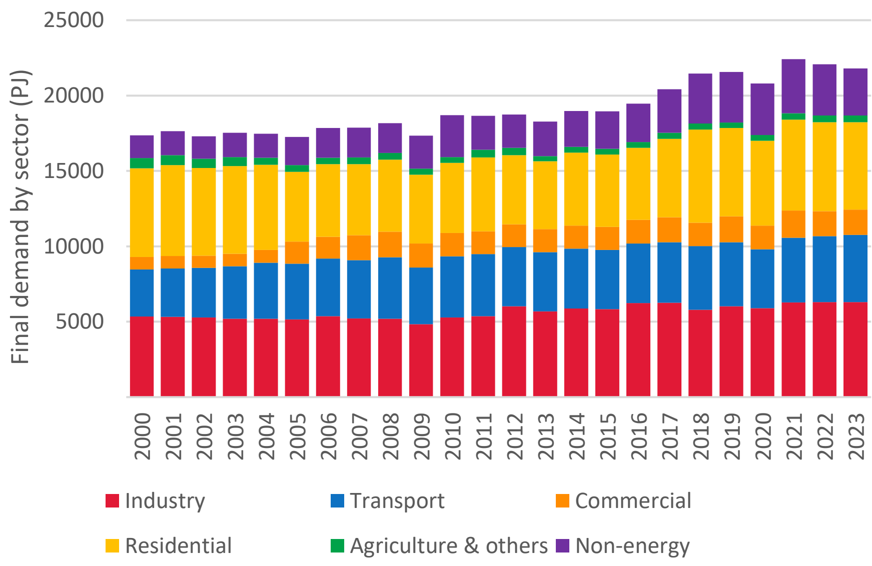
Objectives in the coal industry focus on ensuring reliable supply to the domestic market, while enhancing environmental performance and industrial safety. Strategically, Russia seeks to maintain existing production capacities and develop a new resource base in Siberia, the Far East, and the Arctic zone, targeting deposits with favourable geological conditions. This approach is expected to gradually shift coal production toward locations closer to export markets, thereby improving logistical efficiency and strengthening long-term coal sector resilience.

Total Final Consumption

Russia's final energy consumption in 2023 declined slightly compared with 2022, reaching 21.8 EJ. As shown in Figure 4, consumption had rebounded by around 8% in 2021 following a 4% drop in 2020. Between 2013 and 2019, final energy consumption grew rapidly, averaging 3% per year.

In 2023, industry remained the economy's largest energy-consuming sector, accounting for 29% of total final consumption, dominated by iron and steel, chemicals, and non-metallic minerals. This was followed by the residential sector (27%) and transport (20%). Meanwhile, when non-energy use (14%) is included, the industrial sector amounted to 43% of total final consumption. The non-energy use share is substantial due to the considerable consumption of petroleum products and natural gas as a feedstock in the chemical industry.

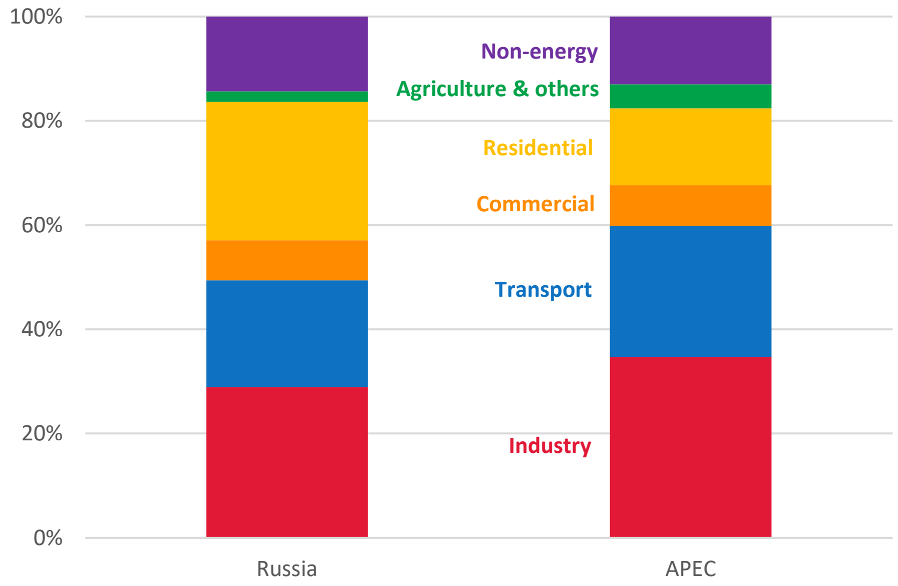
Figure 4: Russia's final consumption by sector (PJ), 2000 to 2023



Source: EGEDA (2025)

Russia, like the APEC region, has the same major energy-consuming sectors – industry, transport, and residential – which together represent around 75% of total final consumption (Figure 5). However, the sectoral shares differ. In particular, the residential sector accounts for a significantly larger share in Russia than in the APEC region as a whole, reflecting substantial energy demand for space heating for over more than half of the year.

Figure 5: Final energy demand by sector, Russia and APEC, 2023



Source: EGEDA (2025)

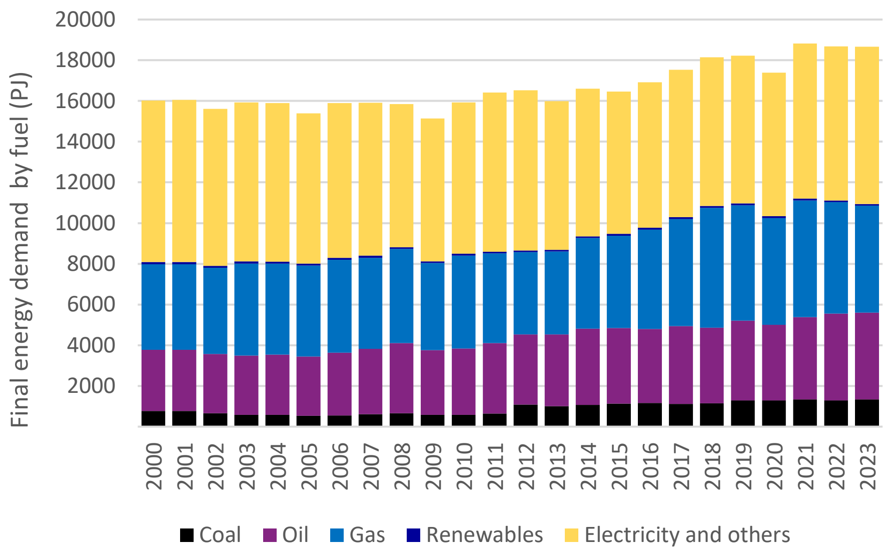
Final Energy Demand

In 2023, Russia's final energy demand, excluding non-energy use, amounted to almost 18.7 EJ (Figure 6). More than 41% of this volume was supplied by electricity and heat, broadly in line with the trend observed since 2017. Their combined share declined from 47% in 2010 due to a reduction in heat consumption.

With regard to electricity demand, industry is the largest consuming sector, ahead of the residential and commercial sectors. Meanwhile, transport also plays an important role in electricity use thanks to Russia's extensive electrified railway network, as well as strong presence of electric public transport in major cities.

The share of fossil fuels in final energy demand increased from 53% in 2010 to 59% by 2018 and has since remained largely unchanged, led by natural gas. In 2023, natural gas accounted for around half of fossil fuel consumption, while oil and petroleum products made up more than one-third.

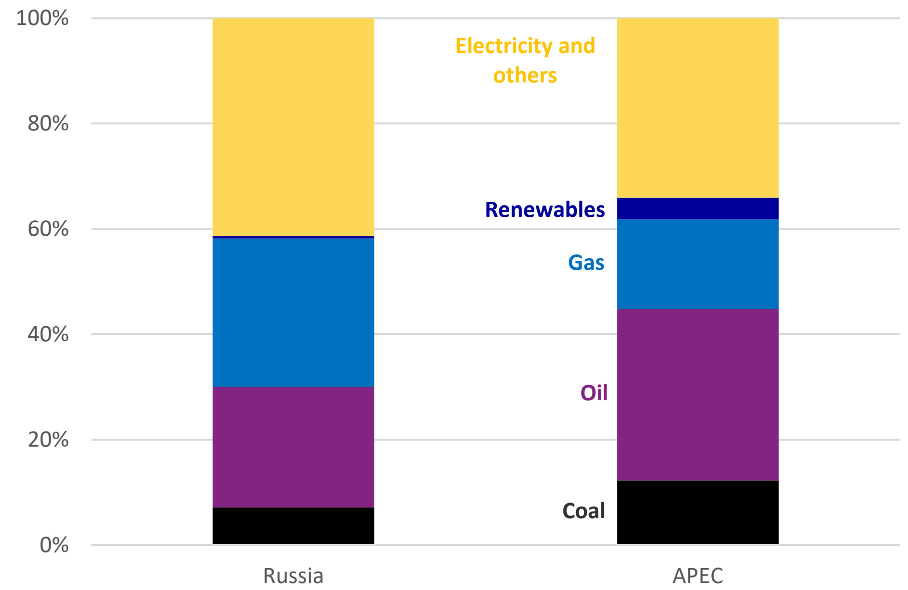
Figure 6: Russia's final energy demand by fuel (PJ), 2000 to 2023



Source: EGEDA (2025)
Note: Figure 6 does not include non-energy sector consumption of energy products.

Compared with APEC as a whole, Russia's final energy demand structure shows a lower reliance on coal (Figure 7). Overall fossil fuel dependence, however, differs only marginally, reflecting Russia's higher share of natural gas.

Figure 7: Final energy demand fuel share, Russia and APEC, 2023



Source: EGEDA (2025)

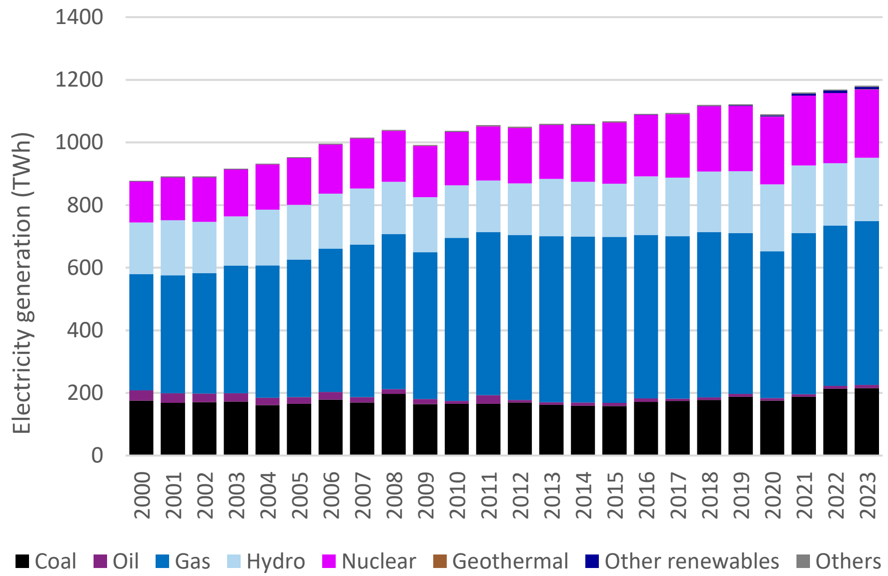
Transformation

Power Sector

Electricity generation increased by 1% in 2023, reaching 1,181 TWh, following a similar rise in 2022 and a strong rebound of 6.4% in 2021. Over the period 2013-2019, generation expanded at an average annual rate of around 1%, before declining by 2.8% in 2020 (Figure 8). Natural gas remained the dominant source of electricity generation in 2023, accounting for approximately 45% of total output. Coal, nuclear, and hydropower followed, each contributing around 18%. Overall, fossil fuels accounted for the largest share of electricity generation (63%), of which around 68% was generated at gas-fired combined heat and power (CHP) plants.

At the same time, Russia's electricity generation mix is among the least carbon-intensive of major economies. This is largely attributable to the substantial contribution of nuclear energy and hydropower, which together form the low-carbon backbone of the power system, alongside the significant role of natural gas. Solar and wind generation account for a very small share of the mix but serve a different and complementary function, enabling the rapid mitigation of localised supply shortages.

Figure 8: Russia's electricity generation by fuel, 2000 to 2023

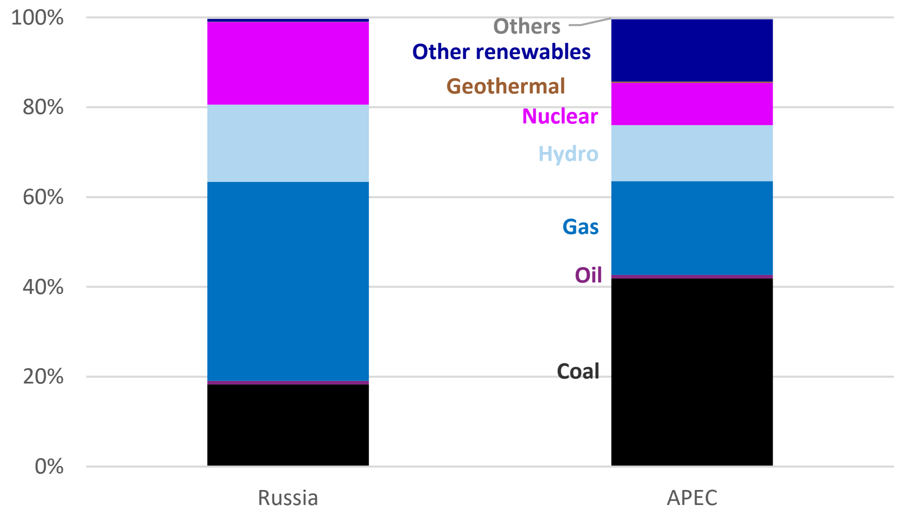


Source: EGEDA (2025)

This structure is also reflected in the installed capacity of Russia's electric power system. Particularly, as of January 2026, hydropower accounted for 19.6% of total capacity and nuclear energy for 12.8%, while wind and solar together represented 2.7% (SO UPS, 2026).

The role of generation technologies with low- or zero-carbon emissions will strengthen further, as they account for nearly 90% of planned capacity additions through to 2031. According to the Scheme and Programme for the Development of Russia's Electric Power Systems for 2026-2031, a total of almost 22 GW of new generating capacity is scheduled to be commissioned during this period, including 5.1 GW of nuclear power, 7.4 GW of gas-fired capacity (out of 9.7 GW of total thermal additions), 1.0 GW of hydropower (including pumped storage), 5.8 GW of solar and wind generation capacity, and 0.35 GW of storage systems (Ministry of Energy of the Russian Federation, 2025).

Figure 9: Electricity generation fuel share, Russia and APEC, 2023



Source: EGEDA (2025)

The electricity generation mix in Russia and the APEC region is broadly comparable in terms of the overall shares of fossil and non-fossil fuels; however, natural gas accounts for a significantly larger share in Russia (Figure 9). Within the non-fossil segment, hydropower and nuclear energy also play a more prominent role in Russia.

Refining

Oil refinery capacity in Russia has remained broadly stable over the recent years, amounting to approximately 6.8 million barrels per day in 2024, making it the third largest globally after the United States and China. In terms of refinery throughput, Russia also ranked third worldwide in 2024, accounting for 6.6% of global refining volumes (Energy Institute, 2025).

Russia's Energy Strategy to 2050 identifies continued modernisation of refineries as one of the key objectives in the sector to support meeting domestic demand for petroleum products, while enhancing export potential. According to strategic targets, the depth of refining is set to increase to 90% by 2030, compared with 84.1% in 2023. In parallel, the yield of light oil products, including gasoline, diesel fuel, and jet fuel, is projected to grow from 64% to 72%.

Energy Transition

Following the ratification of the Paris Agreement in 2019, Russia intensified its policy focus on clean energy development and greenhouse gas emissions reduction.

In July 2021, the Federal Law On Limiting Greenhouse Gas Emissions was adopted, establishing a legal framework for regulating and reducing such emissions and introducing mandatory reporting requirements for major emitters (those emitting more than 50,000 tonnes of CO_2-equivalent per year).

In October 2021, a goal to achieve carbon neutrality by 2060 was announced, and the government approved the Strategy of Socio-

Economic Development of the Russian Federation with Low Greenhouse Gas Emissions to 2050 (LT-LEDS).

To ensure competitiveness and sustainable economic growth in the context of the global energy transition, the LT-LEDS envisages a set of economy-wide and sectoral measures aimed at developing low-carbon energy, accelerating digitalisation and electrification, fostering new industries, creating high-productivity jobs, and improving resource and production efficiency.

The LT-LEDS outlines Russia's approach to a low-carbon future by the expansion of combined-cycle gas generation, nuclear, hydropower, and renewable energy. Among other measures, it aims to reduce emissions from coal-fired generation through advanced technologies, increase the utilisation of associated petroleum gas, reduce leakages during the extraction and production of energy resources, promote carbon capture, utilisation and storage (CCUS), and enhance energy efficiency in buildings. Leveraging Russia's extensive forest resources, the LT-LEDS also aims to increase the carbon absorption potential of forests and other ecosystems through improved land-use practices.

Overall, the LT-LEDS is premised on the principle of technological neutrality in emissions reduction measures (non-discrimination of the reductions and acquisitions results, including from nuclear and hydropower projects), mutual recognition of the need to improve assessments of the absorption capacity of managed ecosystems, and alignment of Russian climate regulation with international standards, including taxonomy, certificates of electricity origin, and verification systems for "green" projects.

It is worth mentioning that since 2021, a number of policy documents targeted advancing decarbonisation across energy subsectors have been adopted. These include the Concept for the Development of Hydrogen Energy in the Russian Federation (August 2021), the Concept for the Development of Production and Use of Electric Vehicles until 2030 (August 2021), and the Federal Law On Conducting an Experiment to Limit Greenhouse Gas Emissions in Selected Regions of the Russian Federation (March 2022). Particularly, as part of the regional emission limitation experiment, the Sakhalin Region was tasked with achieving carbon neutrality by 31 December 2025, and met the goal ahead of the deadline. The experiment sets emission caps for the largest emitters in the region.

In October 2023, carbon neutrality goal was approved by the Climate Doctrine of the Russian Federation, envisaging the achievement of a balance between anthropogenic greenhouse gas emissions and their absorption no later than 2060, taking into account domestic interests and development priorities. To support this objective, additional measures have been identified to decarbonise sectors of the economy and enhance the absorption capacity of managed ecosystems.

In the power sector, the General Scheme for the Placement of Electric Power Facilities to 2042 was adopted in December 2024 to ensure a balanced transformation of the sector. The Scheme prioritises the modernisation of ageing infrastructure, the expansion of nuclear and renewable energy, and a gradual reduction in reliance on coal-based thermal generation. The share of nuclear power shall rise from 18.9% in 2023 to 24% in 2042, while solar and wind increase from 0.8% to 3.3%. The Scheme projects the commissioning of almost 90 GW of new capacity by 2042 (with the total installed capacity projected to reach 299.3 GW) to support energy security, system reliability, and improved environmental performance.

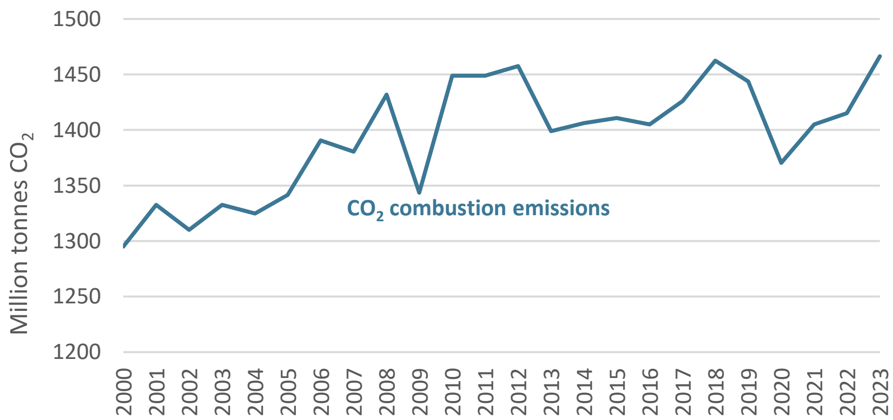
Approved in April 2025, Russia's Energy Strategy to 2050 serves as the long-term roadmap for the development of the fuel and energy complex, aimed at addressing the challenges of the global energy transition while ensuring reliable domestic energy supply and effective realisation of Russia's export potential. The Strategy is intended to be consistent with

Russia's LT-LEDS, aligning the evolution of the energy sector with climate objectives while maintaining energy security. It emphasises improving energy efficiency, scaling up low-carbon technologies, and strengthening technological sovereignty and the competitiveness of the energy sector. Selected targets of the Strategy are presented in the Energy Policy table.

Emissions

Since 2020, Russia's CO_2 emissions from fuel combustion have increased at an average annual rate of 2.3%. This followed a more moderate growth trend of around 1% per year observed between 2016 and 2019, and a sharp decline of about 5% in 2020, associated with pandemic-related economic contraction. By 2023, emissions returned to their 2018 level (Figure 10).

Figure 10: Russia's CO_2 combustion emissions (million tonnes), 2000 to 2023



Source: EGEDA (2025)

In September 2025, Russia submitted an updated Nationally Determined Contribution (NDC) to the UNFCCC, setting a target to reduce GHG emissions to 65%-67% of 1990 levels by 2035. This commitment includes accounting for the maximum possible absorption capacity of forests and other natural ecosystems and is contingent upon sustainable socio-economic development and non-discriminatory access to necessary technologies for emissions reduction (UNFCCC, 2025).

This updated NDC aligns with the requirement to submit new, more ambitious climate plans every five years under the Paris Agreement, updating the previous 2030 target of keeping net emissions at or below 70% of 1990 levels, taking into account the maximum possible absorptive capacity of forests.

As mentioned above, Russia has committed to achieving net-zero GHG emissions by 2060.

Energy Security

Energy security constitutes a central pillar of Russia's security and underpins the broader system of economic security. In 2019, the Doctrine of Energy Security of the Russian Federation was adopted, outlining key challenges, threats, objectives, and priority actions in this sphere. The basis of ensuring energy security is the reliable provision of energy resources and services to Russian consumers, as well as the fulfilment of export contracts and international obligations.

The Doctrine envisages a set of measures, including, inter alia, fostering competition within the domestic energy sector; strengthening the protection of critical energy infrastructure; promoting technical upgrading and modernisation of energy facilities; and ensuring the sustainable reproduction and expansion of the mineral resource base. In the context of growing external constraints, technological sovereignty has become a strategic priority, with a focus on import substitution.

It also emphasises the enhancement of international energy cooperation within the Eurasian Economic Union, the Commonwealth of Independent

States, BRICS, and the Shanghai Cooperation Organisation, as well as with members of OPEC, GECF, and other international organisations.

Among external challenges to energy security, the Doctrine identifies:

- A shift in the centre of global economic growth to the Asia-Pacific region.
- A slowdown in global energy demand growth and changes in its structure, including due to the substitution of petroleum products and improvements in energy efficiency.
- The expansion of the global hydrocarbon resource base and intensified competition among energy exporters.
- Evolving international regulatory frameworks in the energy sector and strengthening the position of energy-consuming economies.
- The growth of LNG production and the emergence of a global gas market.
- An increasing share of renewable energy sources in the global energy mix.

While recognising the importance of environmental issues, the Doctrine characterised the scaling-up of international efforts to accelerate the transition to a "green economy" as a distinct external challenge. It affirms Russia's support for international cooperation on climate change, insofar as such policies are consistent with domestic interests.

Meanwhile, Russia sees that it is unacceptable to consider climate change and environmental issues from a biased perspective, to undermine the interests of energy-producing economies, and to disregard such aspects of sustainable development as universal access to energy and the development of clean hydrocarbon technologies.

Drawing upon the foundations of the Doctrine, Russia's Energy Strategy to 2050, adopted in April 2025, further translates energy security into sectoral development actions and long-term targets: it emphasises maintaining Russia's role as a global energy supplier while ensuring domestic reliability and affordability.

In recent years, geopolitical and economic pressure, including foreign sanctions, has intensified challenges for energy trade, access to technology and capital, and long-term investment planning. In response, policy has increasingly focused on strengthening technological sovereignty, modernising infrastructure, and reorienting energy exports, particularly toward Asian markets.

APEC Energy Goals

There are two energy-related objectives that APEC member economies have agreed to meet as a collective: to improve energy intensity and double the share of modern renewables.

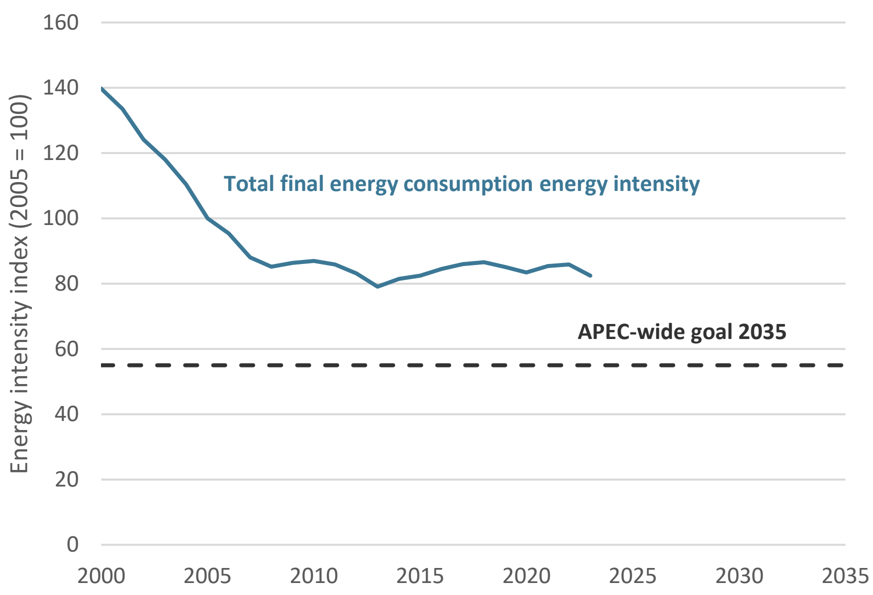
Energy Intensity Goal

In 2011, APEC member economies agreed to increase their ambition to reduce energy intensity by 45% in 2035, relative to a 2005 baseline. The original goal was a 25% improvement by 2030, relative to a 2005 baseline.

APEC is on track to achieve this energy intensity improvement. The goal does not impose individual economy targets, but it is possible to track the progress of individual APEC economies relative to the overarching proportional improvement.

As the northernmost economy in the APEC region, and with vast Arctic territories, Russia is among the most energy-intensive economies in the APEC region. Meanwhile, improvements are taking place due to energy efficiency policies and other targeted regulations. In 2023, Russia's total final energy consumption (excluding non-energy) intensity improved by 18% compared to that of 2005 (Figure 11).

Figure 11: Russia's total final energy consumption intensity index, 2000 to 2023 (2005 = 100)



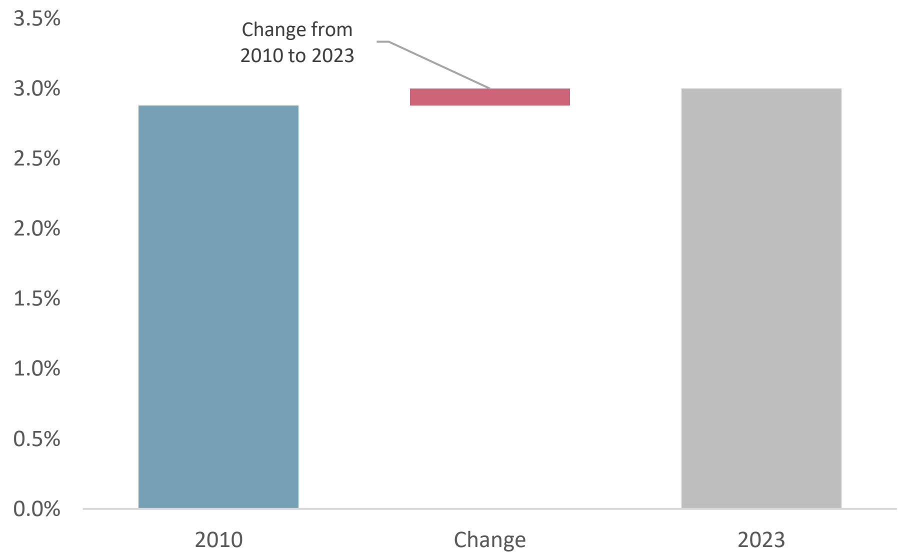
Source: EGEDA (2025)

Doubling of Renewables

The second energy goal involves doubling the share of modern renewables in the APEC energy mix for the period 2010 to 2030. There is no economy-level goal for individual member economies, but improvements by individual economies will contribute to the doubling goal.

Russia's share of renewables in final energy consumption amounted to 2.9% in 2010 and increased marginally to 3.0% by 2023 (Figure 12). The limited growth reflects structural characteristics of the economy's energy system, including the dominant role of hydrocarbons in end-use sectors, as well as the cost-effective combination of centralised electricity and heat supply systems with the development of distributed generation, alongside the gradual integration of renewable energy sources.

Figure 12: Russia's modern renewable energy share, 2010 and 2023



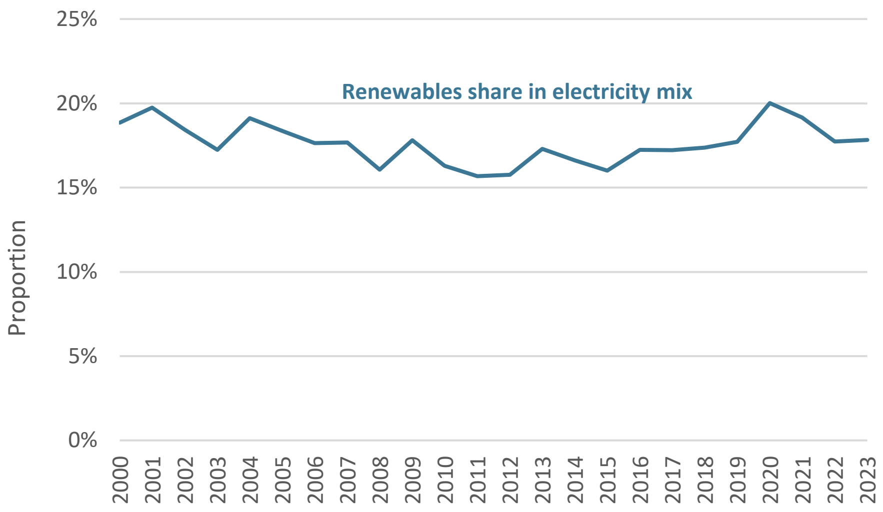
Source: EGEDA (2025)

Note: Biomass used in the residential and commercial sectors is assumed to be traditional biomass and is not included in the definition of modern renewables. All other renewables (biomass used by industry, hydro, geothermal, etc.) are considered modern renewables. Modern renewables also include the share of electricity that is generated from renewable sources.

The share of electricity generated from renewable energy sources over 2000-2023 remained relatively stable, averaging around 18% (Figure 13), with large hydropower plants accounting for almost all renewable electricity generation. Year-to-year fluctuations in renewables' share are primarily associated with variations in hydrological conditions during low-water periods. The contribution of solar, wind, and geothermal power plants was below 1% of total electricity generation.

Nevertheless, as discussed above in the Transformation section of this chapter, a substantial share of the economy's electricity generation is carbon-free. As of 2023, over 18% was produced by nuclear power plants and a further 18% generated from hydropower and other renewable sources.

Figure 13: Russia's renewable generation share, 2000 to 2023



Source: EGEDA (2025)

Energy Policy

This section includes both policies and targets, including those outlined in Russia's Energy Strategy to 2050.

Energy Policy and Targets	Details	Reference
Oil and condensate production	Increase from 531 Mt in 2023 to 540 Mt by 2030, remaining broadly stable at this level through 2036 and 2050, supported by enhanced recovery, horizontal drilling, and development of complex reserves.	Russia's Energy Strategy to 2050 (Order of the Government of the Russian Federation No. 908-r dated 12.04.2025)
Oil refining depth	Increase from 84.1% in 2023 to 90% by 2030, remaining at 90% through 2036 and 2050.	
Natural gas production	Rise from 637 bcm in 2023 to 853 bcm by 2030, 965 bcm by 2036, and 1,107 bcm by 2050, supported by growing domestic consumption and LNG production expansion.	
LNG production	Expand from 33 Mt in 2023 to 90-105 Mt by 2030, to 110-130 Mt by 2036, and to 110-175 Mt by 2050.	
Utilisation rate of associated petroleum gas	Increase from 82% in 2023 to 87% by 2030, 91% by 2036, and 95% by 2050 (excluding new fields).	
Petrochemical production	Increase polymer production from 7.2 Mt in 2023 to at least 10 Mt by 2030 and 2036, and to at least 14 Mt by 2050.	
Gasification rate	Expand from 73.8% in 2023 to 82.9% by 2030, 84% by 2036 and 86.2% by 2050, driven primarily by expanded gasification across Siberia, the Far East, and Arctic regions.	
Consumption of natural gas (methane) as a motor fuel	Increase use from 2.19 bcm in 2023 to 6.7-9 bcm by 2030, 11.5-16.8 bcm by 2036, and to 21.3-29.3 bcm by 2050.	
Total installed capacity	Increase from 254.3 GW in 2023 to 274.7 GW by 2030, 287 GW by 2036, and 331.2 GW by 2050, while renewable capacity is projected to rise by more than 40% by 2050.	
Electricity transmission and distribution losses	Reduce from 10.1% in 2023 to 8.9% by 2030, 8.8% in 2036, and below 7.3% by 2050.	
Alternative fuels in road transport	Raise the share of vehicles using alternative fuels (including EVs, natural gas, and hydrogen) from 1% in 2023 to 14% by 2050.	
Technological sovereignty	Double the use of domestic energy technologies by 2036 and quadruple by 2050. Increase the share of domestic equipment in the fuel and energy sector to 90% by 2050.	
Emissions reduction in coal mining	Reduce GHG emissions in coal mining by 25% by 2050 via clean technologies and coal chemistry.	

Greenhouse gas emission (GHG) level	Second NDC of the Russian Federation: reduce GHG emissions to 65%-67% of 1990 levels by 2035, taking into account the maximum possible absorptive capacity of forests and other ecosystems and subject to sustainable and balanced socio-economic development and non-discriminatory access to equipment and technologies necessary for reducing GHG emissions and increasing removals.	Decree of the President of the Russian Federation No. 547 dated 06.08.2025
Carbon neutrality commitment	A long-term goal to achieve carbon neutrality by 2060 has been established in the Climate Doctrine of the Russian Federation.	Decree of the President of the Russian Federation No. 812 dated 26.10.2023
General Scheme for the Placement of Electric Power Facilities to 2042	Key elements: 1. Capacity expansion: by 2042, around 88.5 GW of new generation capacity is planned to be commissioned, while more than a quarter of the existing capacity (out of a total 253.5 GW) will be modernised. Total installed capacity is projected to reach 299.3 GW by 2042. 2. Changes in the structure of installed capacity: the share of nuclear power increases from 11.7% in 2023 to 15.7% in 2042, while solar and wind expand from 1.9% to 7.3%. Over the same period, the share of thermal power plants declines from 65.6% to 56.6%. 3. Changes in the electricity generation mix: the share of nuclear power rises from 18.9% in 2023 to 24% in 2042, while solar and wind increase from 0.8% to 3.3%. At the same time, thermal generation declines from 62.7% to 57.4%, and the share of hydropower (including pumped storage) decreases from 17.6% to 15.3%. 4. The maximum forecast peak load in the power system is projected to reach 205 GW by 2042.	Order of the Government of the Russian Federation 4153-r dated 30.12.2024

Useful Links

Ministry of Energy of the Russian Federation – http://minenergo.gov.ru/en

Ministry of Natural Resources and Environment of the Russian Federation – https://www.mnr.gov.ru/en/

Ministry of Economic Development of the Russian Federation – https://en.economy.gov.ru

Federal State Statistics Service of the Russian Federation – https://eng.rosstat.gov.ru/

Ministry of Industry and Trade of the Russian Federation – http://minpromtorg.gov.ru/en

Federal Customs Service of the Russian Federation – https://eng.customs.gov.ru

Russian Energy Agency under the Ministry of Energy of the Russian Federation – https://rosenergo.gov.ru/

Rosatom State Atomic Energy Corporation – https://rosatom.ru/en/index.html

PJSC Rosneft – https://www.rosneft.com/

PJSC Lukoil – https://www.lukoil.com/

PJSC Transneft – http://www.en.transneft.ru/

PJSC Gazprom – http://www.gazprom.com/

PJSC Novatek – https://www.novatek.ru/en/
JSC SUEK – https://www.suek.com/
PJSC Rosseti – http://www.rosseti.ru/eng/
PJSC RusHydro – http://www.eng.rushydro.ru/
JSC Atomenergoprom – http://atomenergoprom.ru/en/
PJSC Inter RAO – http://interrao.ru/en/

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Ministry for the Development of the Russian Far East and Arctic (June 2025), *The level of gasification of the Far East should double by 2030*. Available at: http://www.dfo.gov.ru/press/news_DV/7977/

Russian Power System Operator (2026), *Electric Power System of Russia*. Available at: https://www.so-ups.ru/functioning/ups/ups2026/ (accessed: 10 March 2026).

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UNFCCC (September 2025), *Second Nationally Determined Contribution of the Russian Federation*. Available at: https://unfccc.int/sites/default/files/2025-09/RF_second_NDC.pdf

Federal Law No. 296-FZ dated 02.07.2021 *“On Limiting Greenhouse Gas Emissions”*. Available at: http://www.kremlin.ru/acts/bank/47013

Order of the Government of the Russian Federation No. 3052-r dated 29.10.2021 *"On Approval of the Strategy of Socio-Economic Development of the Russian Federation with Low Greenhouse Gas Emissions to 2050”*. Available at: http://static.government.ru/media/files/ADKkCzp3fWO32e2yA0BhtIpyzWfHaiUa.pdf Unofficial translation is available at: https://unfccc.int/sites/default/files/resource/Strategy%20of%20Socio-Economic%20Development%20of%20the%20Russian%20Federation%20with%20Low%20GHG%20Emissions%20EN.pdf

Decree of the President of the Russian Federation No. 216 dated 13.05.2019 “*On Approval of the Doctrine of Energy Security of the Russian Federation”.* Available at: https://minenergo.gov.ru/upload/iblock/61f/dn7323hf8e60yz8sil6huhz9sx52dtur/document_96941.pdf

Singapore

Introduction

From 2023 to 2025, Singapore's energy sector aggressively advanced its "Four Switches" strategy to balance decarbonisation with energy security. A major policy milestone was the achievement of the 1.5 gigawatt-peak (GWp) solar target in 2024 – a full year ahead of schedule – alongside the 285 MWh energy storage system on Jurong Island, which became fully operational in early 2023, to manage solar intermittency (SG Green Plan, 2025). The Energy Market Authority (EMA) also scaled-up its low-carbon electricity import goals from four GW to six GW by 2035, granting conditional licenses for cross-economy projects from Cambodia; Indonesia; and Viet Nam (EMA, 2026). To ensure long-term stability, Singapore mandated in 2024 that all new gas power plants must be at least 30% hydrogen-compatible and 10% more carbon-efficient, with the first of these hydrogen-ready units expected to join the grid starting in the 2025/2026 time frame. Additionally, the government tightened its carbon tax to SGD 25 per tonne in 2024, providing a strong price signal for industrial emitters to pivot toward cleaner technologies (EMA Annual and Sustainability Report FY2024/2025).

Table 1: Singapore's macroeconomic data and energy reserves

Key data [a, b]		Energy reserves [c, d]	
Area (million km^2)	734	Oil (billion barrels)	0
Population (million)	5.92	Gas (trillion cubic feet)	0
GDP (2021 USD billion PPP)	766.7	Coal (million tonnes)	0
GDP per capita (2021 USD PPP)	129,555	Uranium (kilotonnes U < USD 130/kgU)	0

Source: a Department of Statistics Singapore (2024); b World Bank (2024); c BP (2024); d UN (2024)

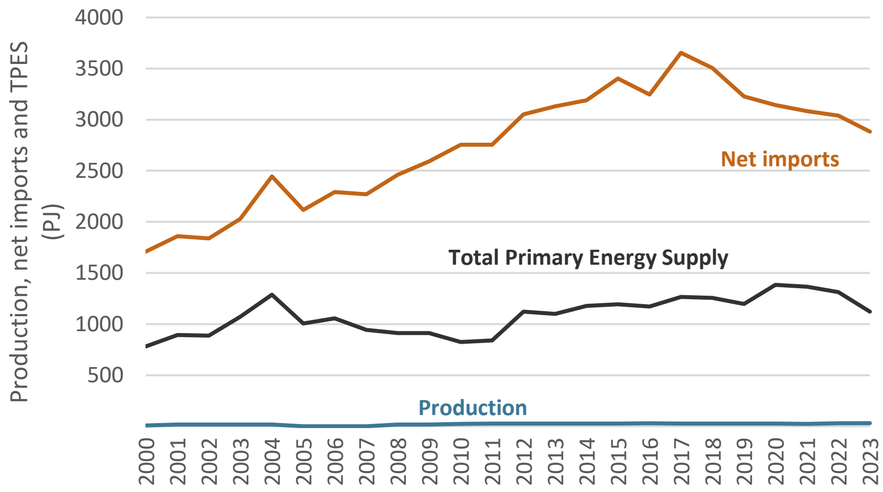
Note: Reserves are total proved reserves and reasonably assured recoverable resources for uranium.

Energy Supply and Consumption

Total Primary Energy Supply

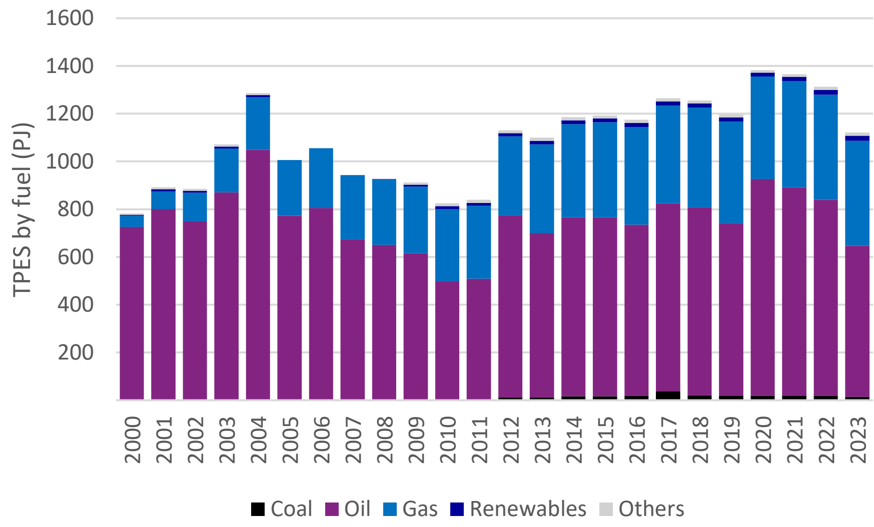
In 2023, Singapore experienced a 14.6% decrease in its total primary energy (TPES), decreasing from 1,313 PJ to 1,121 PJ. This was largely driven by a more modest growth in GDP at 1.8% in 2023, compared with 4.1% growth in the previous year. Lower consumption of transport fuels in 2023 was another contributing factor, reflecting progress towards Singapore's goal of transitioning to cleaner-energy vehicles, which contributed to the overall drop in energy demand. In line with the drop in consumption, net imports of energy decreased by 5.2% (Figure 1).

Figure 1: Singapore's energy supply, production, and net imports (PJ), 2000 to 2023



Source: EGEDA (2025)

Figure 2: Singapore's energy supply by fuel (PJ), 2000 to 2023

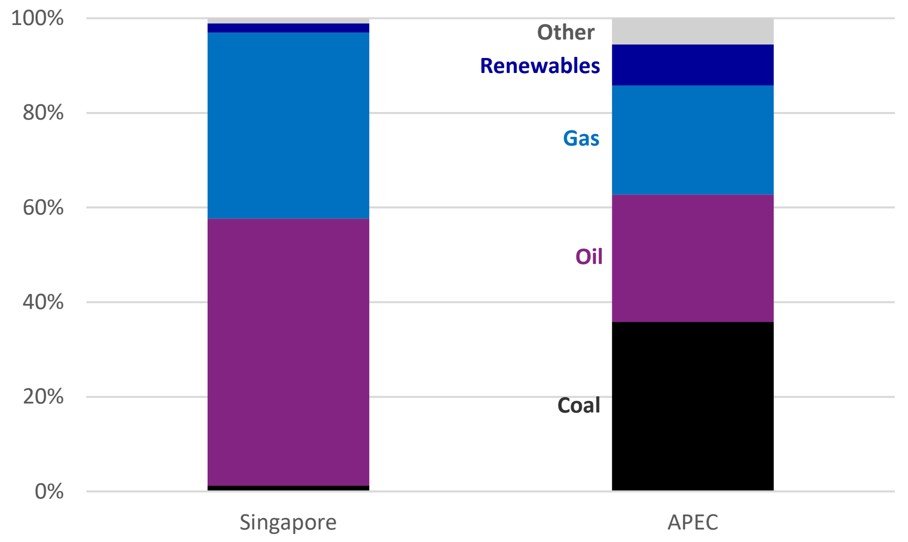


Source: EGEDA (2025)

Despite the dominance of oil in Singapore's energy supply mix (Figure 2), its share has been decreasing over the past two decades, displaced by the increased role of natural gas in the economy's supply mix. This shift has been supported by piped natural gas imports from Indonesia and Malaysia, and imported liquefied natural gas (LNG), with Australia consistently remaining Singapore's top supplier due to geographical proximity.

Singapore's energy profile is distinct within the APEC region due to its significant reliance on imported natural gas for power generation. Singapore generates more than 90% of its electricity and much of its industrial energy needs from natural gas, sourced as both piped gas from neighbouring economies and imported LNG. Concurrently, Singapore depends heavily on oil supply, specifically refined oil products, to meet substantial demand from international marine and aviation bunkering sectors. Domestic supply of renewables is currently limited; however, Singapore has implemented strategic plans to incorporate a higher share of renewable energy and other low-carbon alternatives, such as regional electricity imports, into its future energy mix as part of its ongoing energy transition.

Figure 3: Energy supply mix – Singapore and APEC, 2023

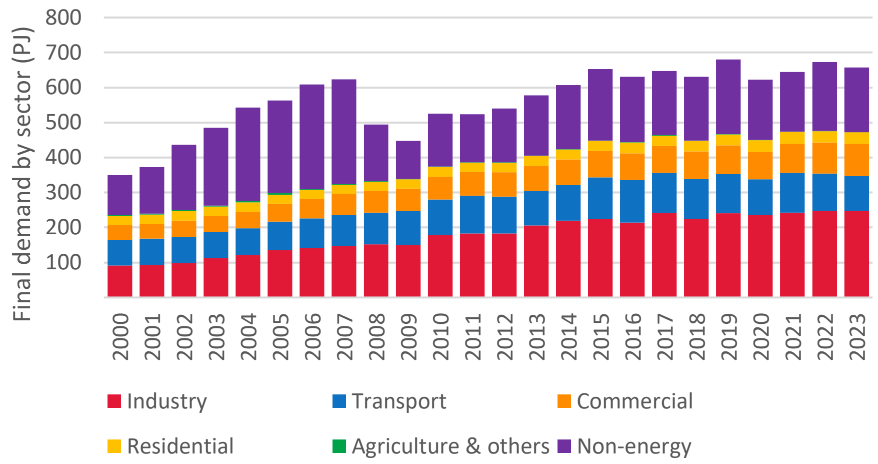


Source: EGEDA (2025)

Total Final Consumption

Singapore's final energy consumption decreased by 2% to reach 658 PJ in 2023 (Figure 4). Transport and non-energy sectors contributed the most to this decrease. The non-energy (petrochemical) sector, in particular, faced market headwinds between 2022 and late 2023 due to a global over-capacity downcycle driven largely by capacity expansions and lower-than-expected growth in China. While sectoral output in Singapore began to recover in 2024, regional oversupply remains a primary challenge.

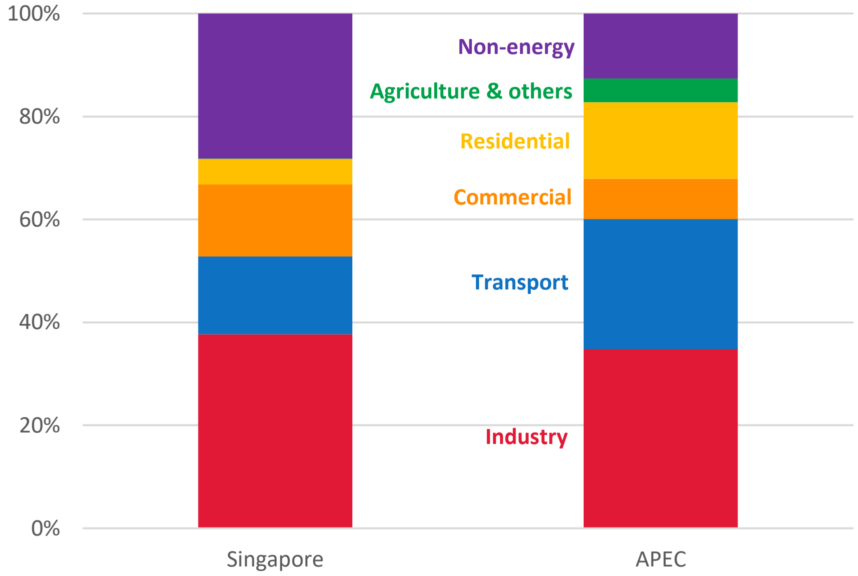
Figure 4: Singapore's final consumption by sector (PJ), 2000 to 2023



Source: EGEDA (2025)

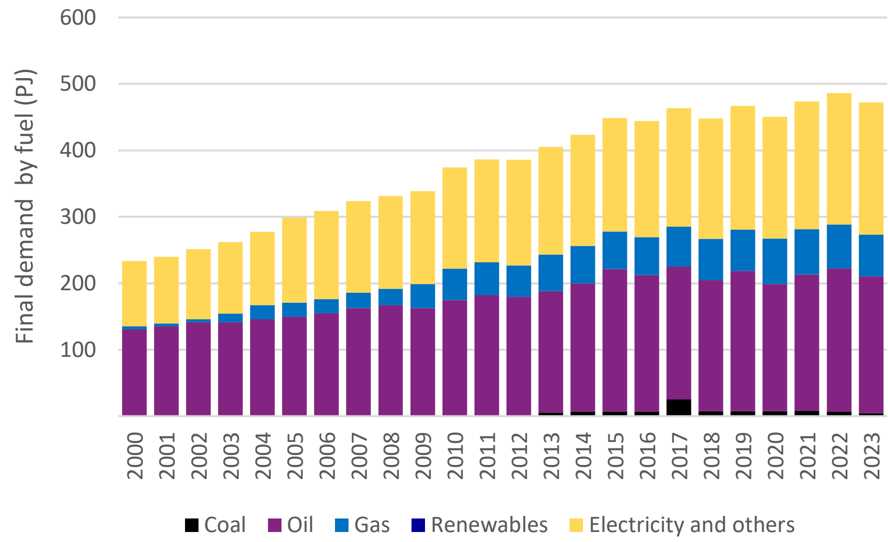
Given the significant petrochemical landscape in Singapore, the share of non-energy sector in final energy consumption was well above the APEC average in 2023 (Figure 5). Similarly, as a regional hub for commercial and financial activities, Singapore's economy had a higher share of final energy consumption in the commercial sector compared to APEC. Being a small-city economy, levels of residential and transport activities were lower than other economies, resulting in smaller shares of these sectors compared to those of APEC.

Figure 5: Final consumption by sector, Singapore and APEC, 2023



Source: EGEDA (2025)

Figure 6: Singapore's final energy demand by fuel (PJ), 2000 to 2023



Source: EGEDA (2025)

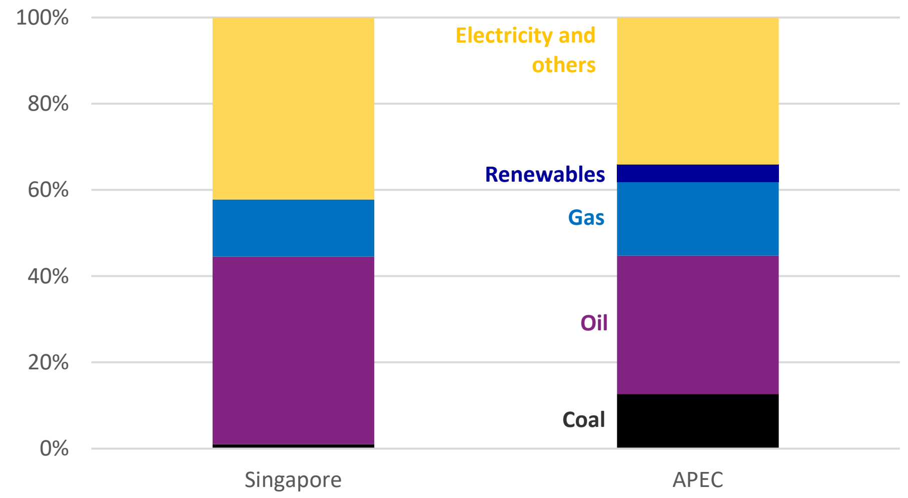
Note: Figure 6 does not include non-energy sector consumption of energy products.

Final Energy Demand

Singapore's final energy demand totalled 472 PJ in 2023, 3% lower than 2022 levels (Figure 6). Oil demand, which holds the largest share at 44%, decreased by 5%, primarily due to the decline in motor gasoline and diesel demand in the transport sector. Electricity demand, in contrast, continued to grow as Singapore emphasises electrification to decarbonise the economy. Electricity demand in end-use sectors continued to increase its share to 42%, almost equal to that of oil.

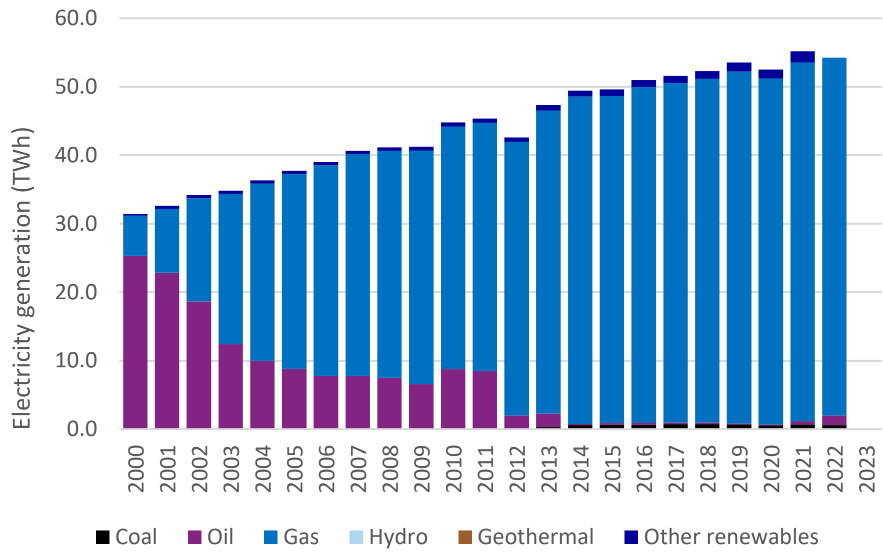
Singapore's electricity share was slightly higher than the APEC average, given that 100% access to electricity has been achieved in the economy (Figure 7). The share of oil in Singapore is also significantly higher, largely driven by high international marine and aviation bunker demand. Shares of gas and coal in final energy consumption in 2023 were lower than the APEC average due to limited industry applications.

Figure 7: Final energy demand fuel share, Singapore and APEC, 2023



Source: EGEDA (2025)

Figure 8: Singapore's electricity generation by fuel, 2000 to 2023



Source: EGEDA (2025)

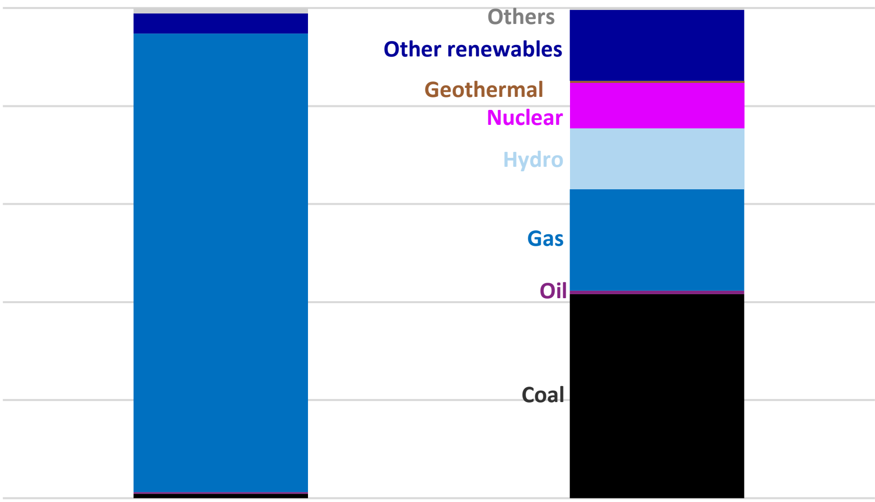
Transformation

Power Sector

In 2023, Singapore's electricity generation was maintained at the same level as in 2022 at 57.4 TWh (Figure 8). Generation from natural gas grew by 3% and continued its dominance at 91% in total generation mix. Coal and oil generation decreased in tandem while renewables generation stayed at the previous year's level.

The dominant role of natural gas in Singapore's electricity generation fuel mix resulted in a gas share well above the APEC average in 2023 (Figure 9). Conversely, Singapore had proportionally less electricity generation from coal and renewables compared to APEC.

Figure 9: Electricity generation fuel share, Singapore and APEC, 2023



Source: EGEDA (2025)

Refining

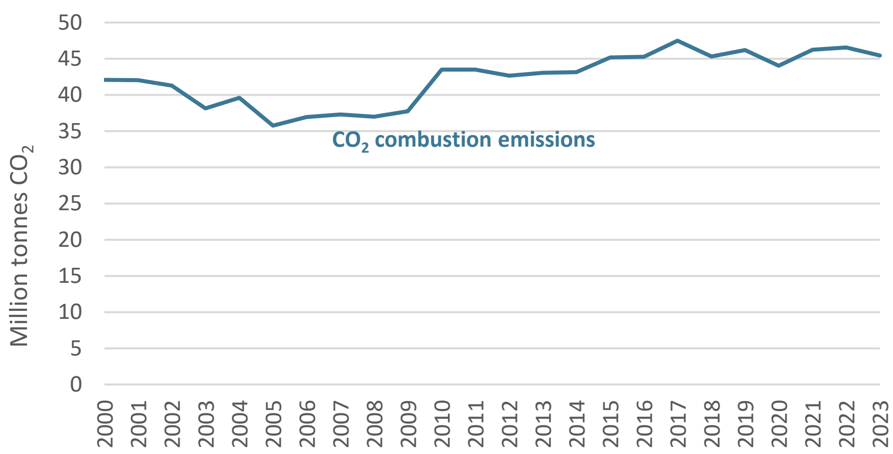
From 2020 to 2025, Singapore's oil refining sector underwent a strategic restructuring to focus on decarbonisation and high-value chemicals. The period began with a sharp drop in demand due to COVID-19, forcing major refineries like those on Jurong Island and Pulau Bukom to reduce output. A pivotal shift occurred in late 2020 with the divestment of Shell's Bukom and Jurong facilities to the CAPGC joint venture in 2024-2025. Simultaneously, the sector pivoted toward renewable fuels, highlighted by Neste's expansion of its Singapore refinery to produce greater volumes of renewable diesel and aviation fuels with the aim of establishing Singapore as the world's largest producer of sustainable aviation fuels (SAF). However, traditional refining capacity continues to face pressure from regional competition from China and India. Simultaneously, ExxonMobil continued its construction on the installation of high-pressure reactor technology designed to convert lower-value fuel oil into high-performance lubricant base stocks. These developments collectively underscored 2023 as a year where the industry aggressively prioritised high-value specialty products and biofuels over traditional crude processing.

Energy Transition

Emissions

Between 2023 and 2025, Singapore's total CO_2 emissions experienced a notable downward trend before stabilising, primarily driven by industrial restructuring and a significant shift in carbon policy. Singapore's fuel combustion-related CO_2 emissions totalled 45 million tonnes in 2023, down 2.3% from the previous year (Figure 10). This decline was largely attributed to reduced manufacturing output in the petrochemical sector and improved efficiency in the power sector. However, the National Climate Change Secretariat (NCCS) has cautioned that total domestic emissions may still fluctuate or rise slightly through 2025 as the economy recovers and new industrial facilities come online before the target of peaking emissions by 2030 (www.nccs.gov.sg). Note should be taken on a slight difference with Statistic Singapore's report. (https://tablebuilder.singstat.gov.sg/table/TS/M891321)

Figure 10: Singapore's CO_2 combustion emissions (million tonnes), 2000 to 2023



Source: EGEDA (2025)

APEC Energy Goals

There are two energy-related objectives that APEC member economies have agreed to meet as a collective: to improve energy intensity and double the share of modern renewables.

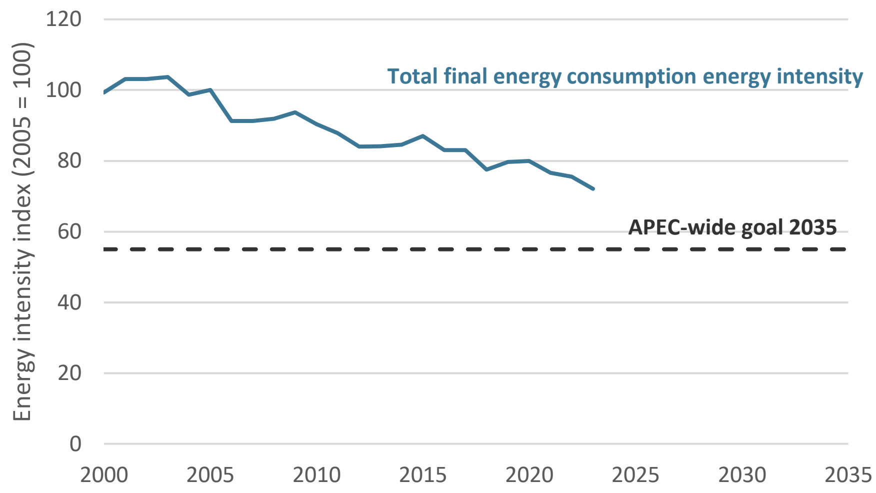
Energy Intensity Goal

In 2011, APEC member economies agreed to increase their ambition to reduce energy intensity by 45% in 2035, relative to a 2005 baseline. The original goal was a 25% improvement by 2030, relative to a 2005 baseline.

APEC is on track to achieve this energy intensity improvement. The goal does not impose individual economy targets, but it is possible to track the progress of individual APEC economies relative to the overarching proportional improvement.

Singapore's energy intensity continued to decrease by over 4% in 2023 compared to 2022 levels (Figure 11). Since 2005, Singapore has reduced its energy intensity by 28% as of 2023 data and appears to be on course to achieve the APEC energy intensity goal ahead of schedule.

Figure 11: Singapore's total final energy consumption intensity index, 2000 to 2023 (2005 = 100)

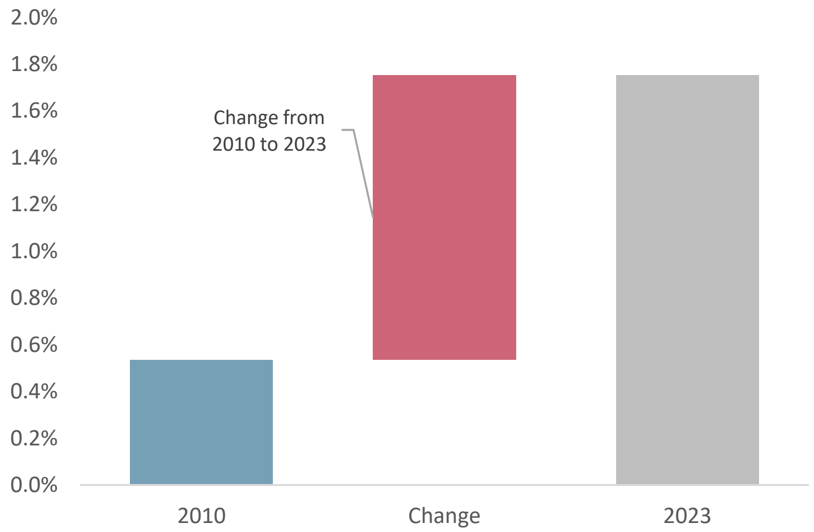


Source: EGEDA (2025)

Doubling of Renewables

The second energy goal involves doubling the share of modern renewables in the APEC energy mix for the period 2010 to 2030. There is no economy-level goal for individual member economies, but improvements by individual economies will contribute to the doubling goal.

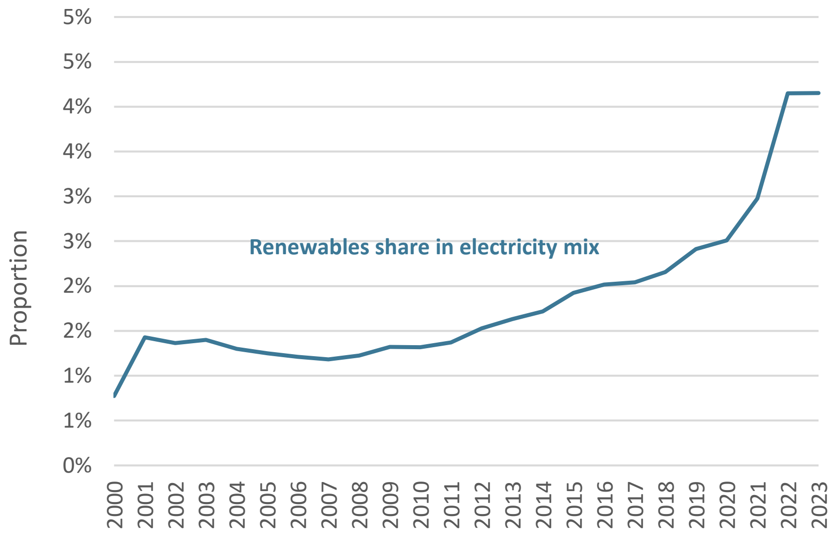
Figure 12: Singapore's modern renewable energy share, 2010 and 2023



Source: EGEDA (2025)

Note: Biomass used in the residential and commercial sectors is assumed to be traditional biomass and is not included in the definition of modern renewables. All other renewables (biomass used by industry, hydro, geothermal, etc.) are considered modern renewables. Modern renewables also include the share of electricity that is generated from renewable sources.

Figure 13: Singapore's renewable generation share, 2000 to 2023



Source: EGEDA (2025)

Singapore had a low share of modern renewables within its energy mix in 2010, reflecting the prevalence of fossil fuels in its supply mix. The low share of renewable energy in the economy is primarily due to its small size and dense urban landscape, which present significant challenges to the adoption of conventional variable wind and solar renewables at scale. Beyond land constraints, Singapore faces limitations in the viability of many alternative energy options, with solar being the only viable form of renewable energy. Renewables maintained 4.2% of total electricity mix for the second consecutive year in 2023 (Figure 13).

Energy Policy

Energy Policy	Details	Reference
Singapore’s Carbon Policy Report 2025	For the first time, Singapore publicly set out how it plans to cut emissions to meet its 2030 climate targets, with energy efficiency, carbon capture technology, and clean energy imports expected to be among the most effective measures.	Economic Development Board (EDB)
Update Climate Targets	On 10 February 2025, Singapore announced that it would further reduce its emissions to between 45 and 50 $MtCO_2e$ in 2035, as part of its 2035 Nationally Determined Contribution (NDC). This builds on the 2030 NDC to reduce emissions to around 60 $MtCO_2e$ by 2030, after peaking emissions earlier. This is aligned with Singapore’s Long-Term Low-Emissions Development Strategy (LEDS) to achieve net-zero emissions by 2050.	National Climate Change Secretariat Singapore (NCCS)
Singapore Green Plan 2030	Singapore is aggressively pursuing its energy transition through the Singapore Green Plan 2030, which identifies "Energy Reset" as a central pillar.	Green Plan
Energy Market Authority (EMA)	EMA released its annual sustainability report 2024/2025, which announced the achievement of installed solar capacity target at 1.5 GWp in 2024, one year ahead of schedule.	EMA

Notable Energy Developments

Energy Development	Details	Reference
Establishment of Singapore’s GasCo	A new entity, Singapore GasCo Pte Ltd (Singapore GasCo), has been established to centralise the procurement and supply of natural gas to the power sector in Singapore.	Energy Market Authority Singapore (EMA)
Launching of 285 megawatt-hour ESS on Jurong Island	In February 2023, Singapore officially launched a 285 megawatt-hour energy storage system (ESS) on Jurong Island. This is the largest ESS in Southeast Asia and was commissioned in six months, the fastest in the world of its size to be deployed.	Green Plan

Singapore has surpassed its 2025 solar target	Singapore has surpassed its 2025 solar target earlier than expected, reaching 1.5 GWp of installed solar capacity by the close of 2024.	EMA
EMA Grants Conditional Approval of more power imports	In 2024/2025, the Energy Market Authority (EMA) granted conditional approvals for major power imports from Australia; Cambodia; Indonesia; and Viet Nam.	EMA

Useful Links

National Environment Agency (NEA) – The National Environment Agency

Energy Market Authority (EMA) – www.ema.gov.sg

National Climate Change Secretariat (NCCS) – https://www.accc.gov.au/

Singapore Green Plan – www.greenplan.gov.sg

Singapore Economic Development Board (EDB) – www.edb.gov.sg

Singapore's First Biennial Transparency Report 2024 National Environmental Agence – Singapore BTR1 2024.pdf

Carbon Policy Report 2025 – Overview

References

EGEDA (Expert Group on Energy Data Analysis, APEC Energy Working Group) (2023), *APEC Energy Database.* https://www.egeda.ewg.apec.org/egeda/database_info/index.html

EI (Energy Institute) (2024), *Statistical Review of World Energy*. https://www.energyinst.org/statistical-review

Chinese Taipei

Introduction

Chinese Taipei is an archipelago comprising Taiwan, Penghu, Kinmen, and Matsu, located off the southeast coast of China and the southwest coast of Japan. In 2023, its gross domestic product (GDP) reached USD 1,744 billion (2021 USD, purchasing power parity), representing a 4.9% increase from the 2022 level. The population remained at approximately 23 million in 2023, although a declining demographic trend is expected over the coming decades. Chinese Taipei's GDP per capita remains high relative to the APEC region, reaching USD 74,731 (PPP) in 2023.

Chinese Taipei has limited domestic energy resources. According to the *CIA World Factbook*, proved reserves amount to only 1 million tonnes of coal, 2.4 million barrels of crude oil, and 220 billion cubic feet of natural gas. While some domestic production of crude oil and natural gas exists, volumes remain marginal. As a result, Chinese Taipei's energy system is highly dependent on imports, making energy security a persistent structural concern.

In recent years, energy policy has shifted from planning to implementation, marking a transition into a more execution-focused phase. The Climate Change Response Act, enacted in 2023, provides the legal foundation for climate action. The Act establishes a legally binding 2050 net-zero emissions target, clarifies institutional responsibilities for climate governance, and introduces a carbon fee mechanism. In January 2025, Chinese Taipei formally launched its carbon fee system, with a standard rate of TWD 300 (approximately USD 9-10) per tonne of CO_2e and preferential rates available for entities implementing approved voluntary reduction plans. The year 2025 served as a trial period, with full implementation scheduled for 2026.

On the supply side, the decommissioning of Chinese Taipei's last operating nuclear reactor in 2025 completed the phase-out of nuclear power. Under the Second Energy Transition, policy priorities focus on coal reduction with natural gas as a bridge fuel, expanding renewable energy, and investments in system resilience, with the objective of maintaining electricity supply adequacy during the transition period.

On the demand side, energy efficiency is a core policy focus, comprising strengthened mandatory energy-saving targets for large energy users and expanded financing support for small and medium enterprises (SMEs) via energy service companies (ESCOs), and subsidies for replacing old home appliances with energy efficient-models to scale up efficiency improvements.

Table 1: Chinese Taipei's macroeconomic data and energy reserves

Key data [a, b]		Energy reserves [a]	
Area (thousand km^2)	36.2	Oil (million barrels)	2.4
Population (million)	23.4	Gas (billion cubic feet)	220
GDP (2021 USD billion PPP)	1,744	Coal (million tonnes)	1
GDP per capita (2021 USD PPP)	74,731	Uranium (kilotonnes U < USD 130/kgU)	-

Source: a CIA (2025); b World Bank (2025)

Note: Reserves are total proved reserves and reasonably assured recoverable. resources for uranium.

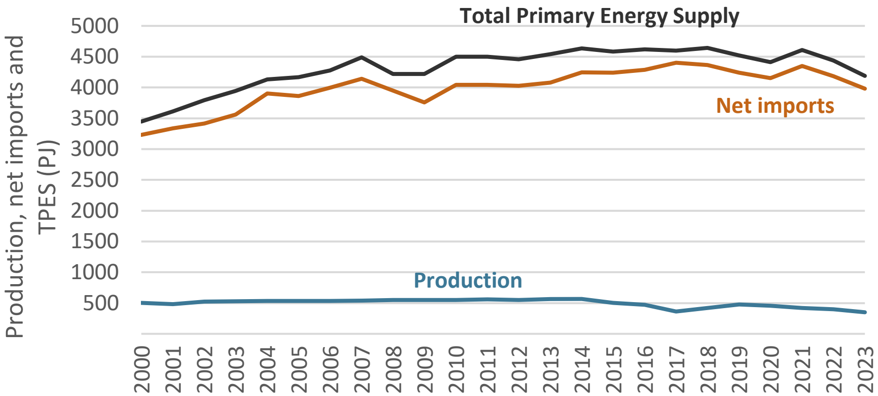
Energy Supply and Consumption

Total Primary Energy Supply

The total primary energy supply (TPES) in Chinese Taipei declined by 5.6% to 4,187 PJ in 2023 (Figure 1). This decrease was driven by reductions in coal (−5.8%), oil (−6.4%) and gas (−1.5%), which accounted for 35%, 33% and 24% of TPES in 2023, respectively. In contrast, renewable energy increased by 16% between 2022 and 2023, reaching a 3% share of TPES in 2023.

Chinese Taipei remains highly dependent on foreign energy supplies. In 2023, net imports accounted for more than 90% of TPES, although total net imports declined compared with the previous year (Figure 1).

Figure 1: Chinese Taipei's energy supply, production, and net imports (PJ), 2000 to 2023

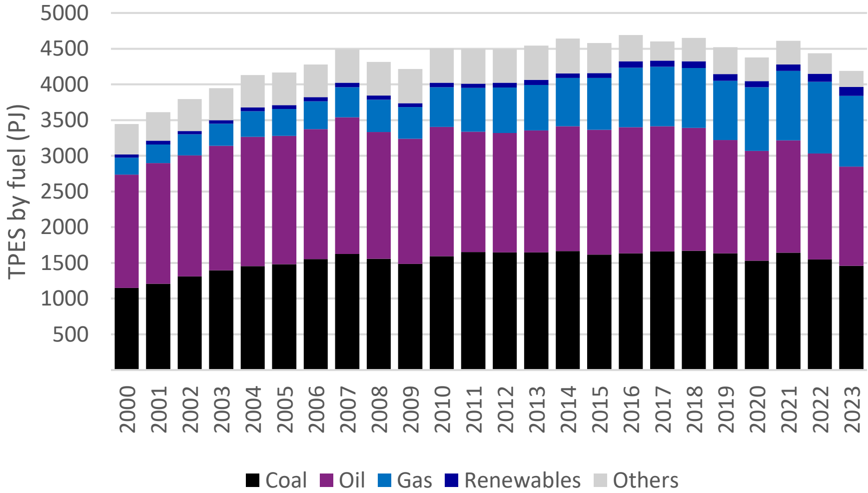


Source: EGEDA (2025)

Oil and coal continued to dominate the energy supply mix, jointly accounting for the majority of TPES. Coal was used primarily for power generation, while oil supply was largely consumed as feedstock for fuel refining and downstream economic activities. Natural gas, mainly utilised for power generation and industrial processes, remained a key component of the energy system in 2023, despite a slight moderation compared with 2022 levels (Figure 2).

Over the 2000-2023 period, energy supply trends across fuel types in Chinese Taipei have diverged. Oil's contribution to TPES has shown a persistent downward trend, recording a negative compound annual growth rate (−0.6%). In contrast, natural gas consumption recorded a strong positive compound annual growth rate of approximately 6.5%, reflecting its expanding role in the energy mix. Coal consumption recorded a modest positive compound annual growth rate of about 1%, despite fluctuations and a recent decline. Renewable energy showed steady long-term growth, with recent acceleration driven by solar and wind expansion.

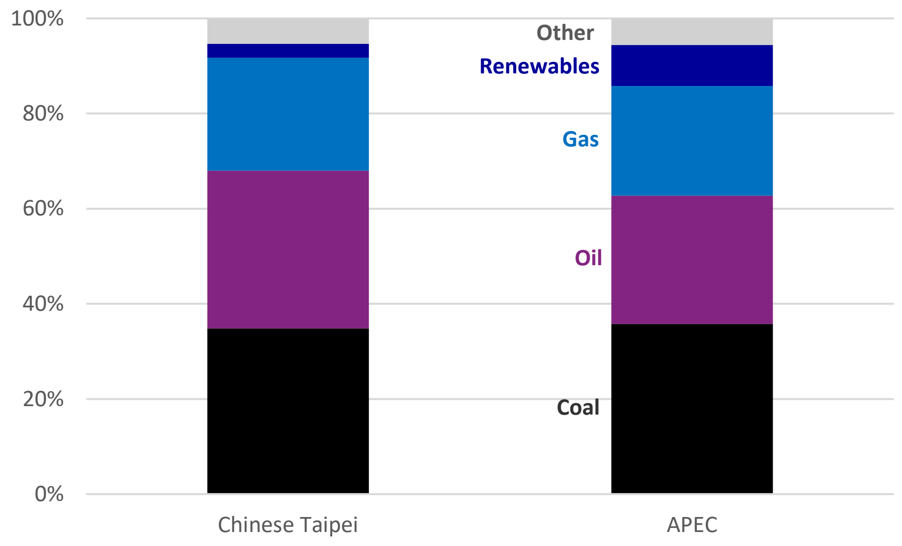
Figure 2: Chinese Taipei's energy supply by fuel (PJ), 2000 to 2023



Source: EGEDA (2025)

In terms of percentage shares, compared with aggregate APEC TPES, Chinese Taipei shows a higher share of oil and a lower share of renewable energy, while the shares of natural gas and coal are broadly similar to those in the APEC region.

Figure 3: Energy supply mix – Chinese Taipei and APEC, 2023

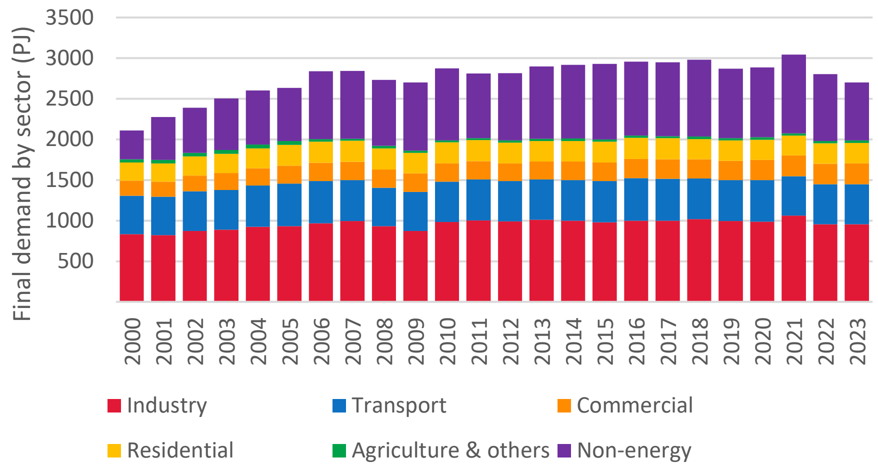


Source: EGEDA (2025)

Total Final Consumption

Total final consumption (including non-energy use) in Chinese Taipei amounted to 2,700 PJ in 2023, representing a 5.3% decline from 2022 levels (Figure 4). This decrease was mainly driven by reduced demand from the non-energy sector. The industrial sector was the largest energy-consuming sector in 2023, accounting for 35% of TFC. The non-energy sector followed, representing 26% of TFC. Transport energy consumption in 2023 remained broadly unchanged from 2022, at 494 PJ and accounting for 18% of TFC.

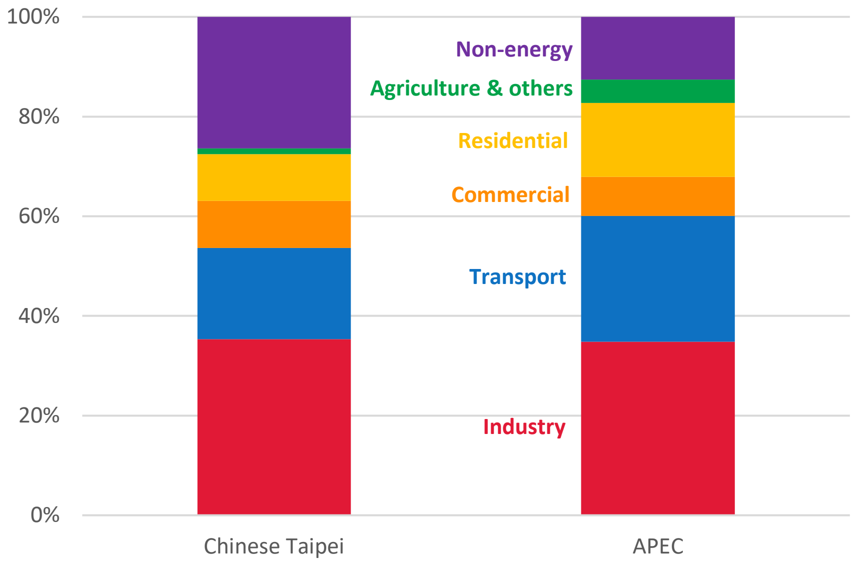
Figure 4: Chinese Taipei's final consumption by sector (PJ), 2000 to 2023



Source: EGEDA (2025)

In 2023, the share of the non-energy sector in total final consumption in Chinese Taipei (26.4%) was significantly higher than the APEC average (12.6%), reflecting the extensive use of petroleum products as feedstock in the refining and petrochemical industries. The shares of the industry (35.3%) and commercial (9.4%) sectors were also slightly higher than the APEC averages (34.8% and 7.8%, respectively). In contrast, the shares of the transport, agriculture, and other sectors were lower than those of the APEC region.

Figure 5: Final consumption by sector, Chinese Taipei and APEC, 2023



Source: EGEDA (2025)

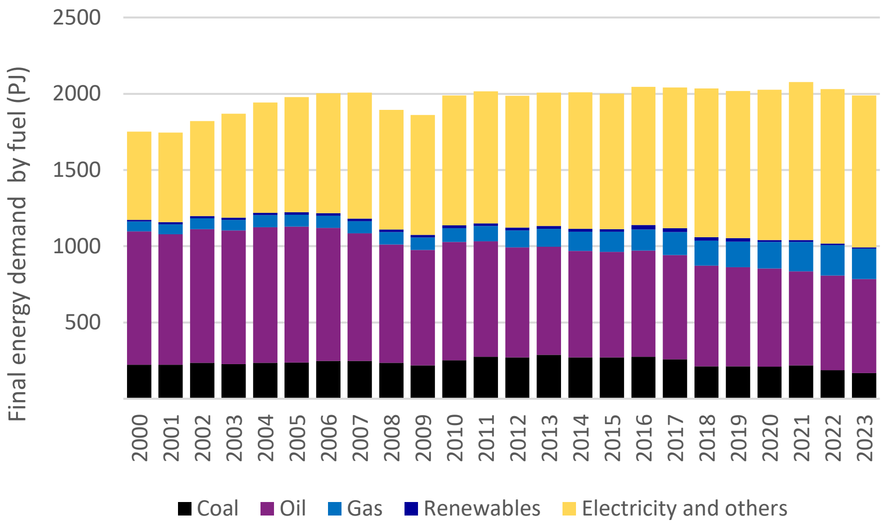
Final Energy Demand

Total final energy consumption (TFEC – non-energy excluded) in Chinese Taipei in 2023 was 1,988 PJ, slightly lower than the 2022 level (Figure 6). This decline reflected reductions in coal, oil, renewables, and "electricity and other" energy sources, while natural gas increased marginally by 1 PJ. In terms of fuel shares, oil remained the largest component of TFEC, followed by electricity and coal, while natural gas and renewables accounted for smaller shares.

From 2010 to 2023, TFEC in Chinese Taipei remained broadly stable, with a near zero compound annual growth rate. Although the compound annual growth rate (CAGR) of coal (-3.1%), oil (-1.7%) and renewables (-7%) were all negative, these declines were largely offset by continued growth in natural gas (6.2%) and "electricity and others" (1.2%). The strong growth trend in gas was mainly due to the industrial sector, while the moderate growth trend in 'electricity and others' resulted from both the industrial and residential sectors.

Despite the overall stability in TFEC over the past decade, a clear fuel-switching trend has emerged. Final consumption of coal and oil has declined steadily, reflecting structural changes in industrial activity and improvements in energy efficiency. In contrast, natural gas consumption increased rapidly, driven primarily by industrial demand, while "electricity and other" energy sources continued to expand, supported by rising electrification in both the industrial and residential sectors. As a result, the composition of TFEC has shifted away from solid and liquid fuels toward gaseous fuels and electricity, indicating gradual progress in the end-use energy transition, even as total final energy demand remained broadly unchanged.

Figure 6: Chinese Taipei's final energy demand by fuel (PJ), 2000 to 2023



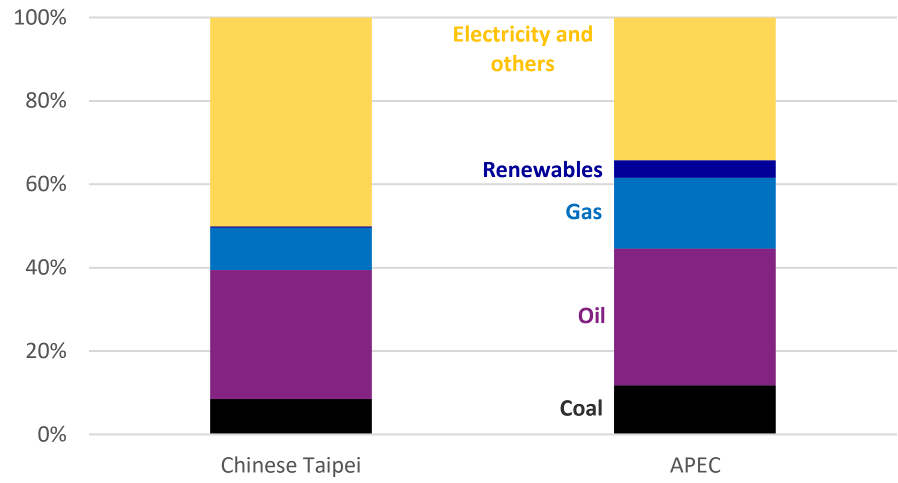
Source: EGEDA (2025)

Note: Figure 6 does not include non-energy sector consumption of energy products.

In 2023, "electricity and other" energy sources accounted for around half of TFEC (50%) in Chinese Taipei, a considerably higher share than in the APEC region (34.1%). This reflects the relatively high level of electrification in Chinese Taipei's industrial and building sectors, particularly in electrical and electronic machinery.

By contrast, oil and natural gas accounted for 31% and 10.1% of TFEC, respectively, both below the corresponding shares in the APEC region (oil at 32% and natural gas at 17%). Oil consumption within TFEC is dominated by the transport sector and is expected to decline over time with the increasing adoption of electric vehicles (EVs) (Figure 7). Overall, Chinese Taipei has a comparatively higher reliance on electricity and lower dependence on fossil fuels in final energy consumption relative to the APEC average.

Figure 7: Final energy demand fuel share, Chinese Taipei and APEC, 2023



Source: EGEDA (2025)

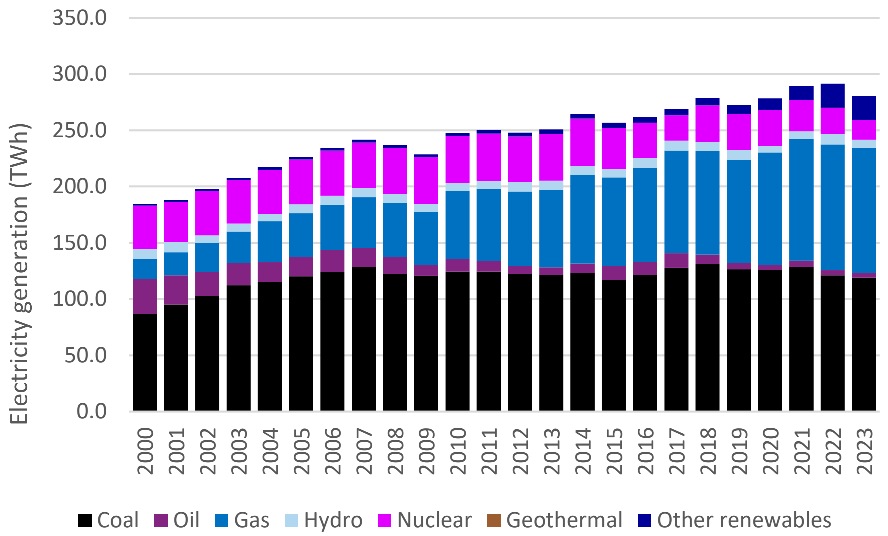
Transformation

Power Sector

Electricity generation in Chinese Taipei amounted to 282.4 TWh in 2023, a decline of 2% from 2022 (Figure 8). The generation mix remained dominated by fossil fuel power plants (coal, natural gas, and oil), which together accounted for 83% of total generation. Among fossil fuels, coal represented the largest share at 42%, followed by natural gas at 39%, and oil at 2% in 2023.

Over the 2010-2023 period, electricity generation from nuclear (−6.3%), oil (−6.9%), and coal (−0.3%) recorded negative compound annual growth rates, while generation from renewables (8.3%), natural gas (4.8%), and hydro (-0.3%) increased. The sustained decline in nuclear generation reflects the progressive decommissioning of existing nuclear power plants in Chinese Taipei. Overall, these trends indicate a gradual shift in the power generation mix toward natural gas and renewables, alongside reduced reliance on oil and nuclear power over the past decade.

Figure 8: Chinese Taipei's electricity generation by fuel, 2000 to 2023

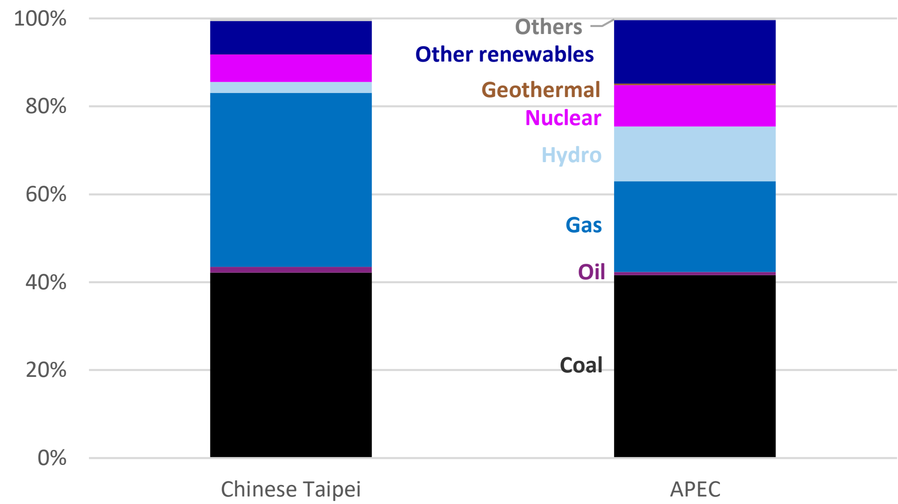


Source: EGEDA (2025)

In 2023, coal accounted for 42% of Chinese Taipei's electricity generation, broadly in line with the APEC regional average (Figure 9). In contrast, the share of gas-fired generation in Chinese Taipei reached 39.5%, nearly double the APEC average of 20.6%. As a result, fossil fuels accounted for 83% of total electricity generation in Chinese Taipei, substantially higher than the APEC regional level of 63%.

This reflects Chinese Taipei's energy transition pathway, under which gas-fired generation has expanded as a lower-emissions alternative to coal. Meanwhile, renewables in Chinese Taipei accounted for 9.7% of electricity generation in 2023, remaining below the APEC regional share of 14.5%.

Figure 9: Electricity generation fuel share, Chinese Taipei and APEC, 2023



Source: EGEDA (2025)

Refining

The refining market in Chinese Taipei is characterised by a highly concentrated structure, operating as an oligopoly dominated by two companies: CPC Corporation and Formosa Petrochemical Corporation (FPCC). CPC is a public-owned enterprise with a primary focus on supplying transportation fuels to the domestic market, particularly gasoline and diesel. FPCC, by contrast, specialises in petrochemical production, with an export-oriented focus on refined fuels and petrochemical feedstocks.

Currently, three refineries are operating in Chinese Taipei: CPC's Taoyuan Refinery with a capacity of 200 kb per day, CPC's Dalin Refinery at 400 kb per day, and FPCC's Mailiao Refinery at 540 kb per day, bringing total refining capacity to approximately 1,140 kb per day. Among these facilities, the Dalin and Mailiao refineries are highly integrated with downstream petrochemical operations, enhancing operational flexibility and value-added production.

In the short- to medium-term, refining and petrochemical activities face increased external and market-related pressures due to changes in regional trade conditions, which have introduced greater uncertainty for export-oriented operations. These developments are associated with near-term pressures on refining margins and utilisation rates.

Over the longer term, structural shifts in energy demand, including the gradual electrification of road transport and the implementation of long-term emissions reduction pathways, are expected to moderate growth in domestic fuel demand. In response, refiners in Chinese Taipei are increasingly shifting toward higher value petrochemical production, including deeper refinery petrochemical integration and specialty chemical development, to enhance resilience and competitiveness under the energy transition.

Energy Transition

To stabilise power supply, improve air quality, and advance climate objectives, Chinese Taipei has enshrined the 2050 net-zero emissions target in law under the Climate Change Response Act. This provides the legal foundation for establishing periodic and binding regulatory greenhouse gas reduction targets.

The Phase 3 Periodic Regulatory Goals, covering 2026-2030, were approved on 6 May 2025. This phase sets a strengthened net greenhouse gas emissions reduction target of 26%-30% (28% ± 2%) below 2005 levels by 2030, and operationalises short- to medium-term actions through sectoral plans, carbon pricing, and other regulatory measures.

Building on this framework, the voluntarily submitted 2035 NDC 3.0 was approved on 3 November 2025. It aligns with and extends the Phase 3 pathway by committing to a 36%-40% (38% ± 2%) reduction below 2005 levels by 2035, while retaining the 2030 interim target of 26%-30%. These targets are implemented through a phased regulatory structure to ensure consistency between domestic obligations and international climate commitments.

The government's official "Pathway to Net-Zero Emissions by 2050" outlines strategies to expand renewable energy, accelerate energy transition technologies, and enhance system resilience. As part of long-term power system planning, renewable energy capacity, particularly offshore wind and solar, is projected to grow substantially by 2050, with associated expansions in hydrogen energy and other innovative energy sources.

Chinese Taipei officially shut down its final operating nuclear reactor (Maanshan Unit 2) in May 2025, consistent with the long-standing "nuclear-free" policy. In the transition, gas-fired generation, CCUS, and hydrogen are included in the projected future generation mix, although official plans emphasise a broad pathway approach rather mandating specific generation shares.

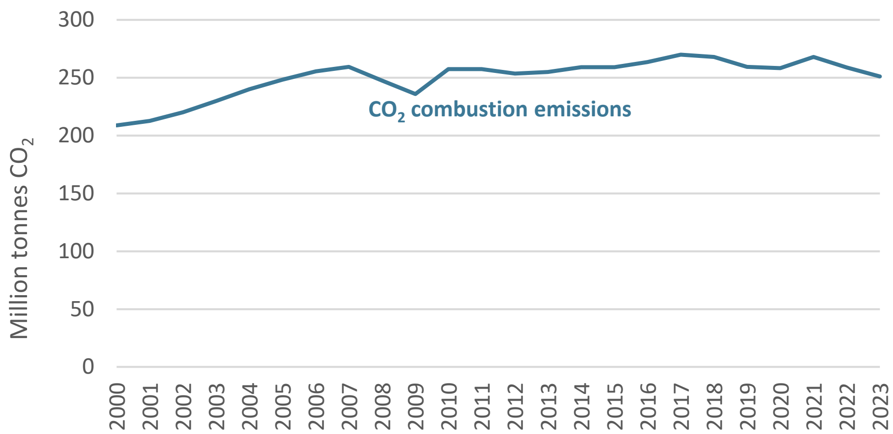
Emissions

CO_2 combustion emissions in Chinese Taipei have remained relatively stable since 2010, fluctuating within a narrow range rather than showing a sustained downward trend (Figure 10). Emissions declined slightly after peaking around 2017-2018 and have experienced minor year-to-year variations, including a temporary increase in 2021.

In 2023, CO_2 combustion emissions were 251 million tonnes, about 3% lower than in 2022, and generally consistent with levels observed over the past decade. Emissions have stayed around 250 million tonnes since 2010.

The persistence of emissions at this level suggests that further efforts would be required to align with a pathway toward net-zero GHG emissions by 2050.

Figure 10: Chinese Taipei's CO_2 combustion emissions (million tonnes), 2000 to 2023



Source: EGEDA (2025)

Energy Security

In Chinese Taipei, energy security is a key component of broader energy policy, alongside decarbonisation and system reliability. The government's strategy focuses on reducing reliance on fossil fuels, expanding renewable energy, and strengthening grid resilience and energy storage to support system flexibility and supply stability in line with longer-term climate and energy goals.

Natural gas continues to play a transitional role in maintaining system reliability as renewable capacity increases. Given that more than 95% of Chinese Taipei's energy supply is imported, enhancing supply resilience through fuel diversification and measures to manage import dependence remains a key policy consideration.

Beyond fuel mix adjustments, energy security efforts also emphasise strengthening energy infrastructure, improving operational flexibility, expanding storage capacity, and integrating demand-side measures to reduce vulnerability to external disruptions and support reliable power delivery.

APEC Energy Goals

There are two energy-related objectives that APEC member economies have agreed to meet as a collective: to improve energy intensity and double the share of modern renewables.

Energy Intensity Goal

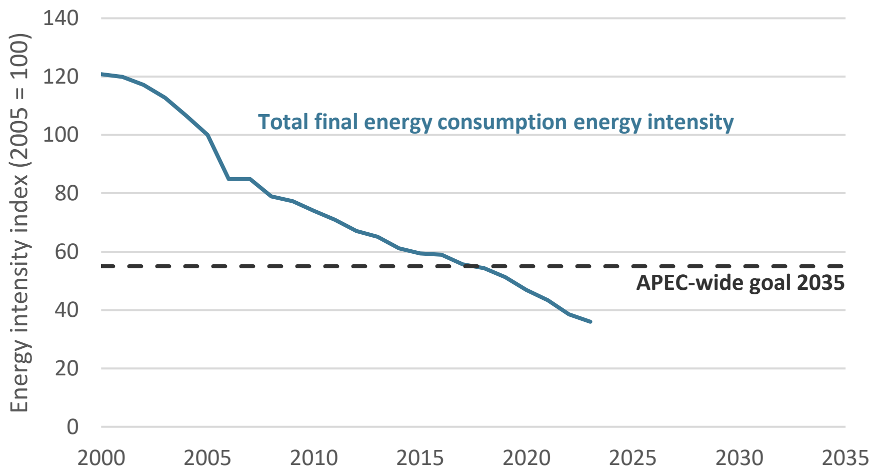
In 2011, APEC member economies agreed to increase their ambition to reduce energy intensity by 45% in 2035, relative to a 2005 baseline. The original goal was a 25% improvement by 2030, relative to a 2005 baseline.

APEC is on track to achieve this energy intensity improvement. The goal does not impose individual economy targets, but it is possible to track the progress of individual APEC economies relative to the overarching proportional improvement.

In 2023, the final energy intensity of Chinese Taipei's TFEC improved by 36%, compared with the 2005 level (Figure 11). A similar downward trend is observed in energy intensity measured on a TPES and TFC basis.

Energy intensity in Chinese Taipei has declined continuously alongside efficiency improvements. Since 2018, energy intensity has remained below the APEC-wide 2035 target level of 55 (indexed; 2005 = 100), indicating sustained progress relative to the regional benchmark.

Figure 11: Chinese Taipei's total final energy consumption intensity index, 2000 to 2023 (2005 = 100)



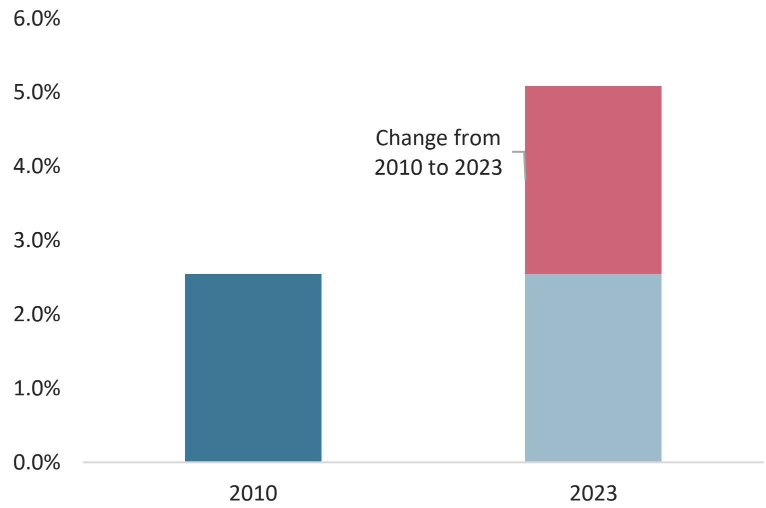
Source: EGEDA (2025)

Doubling of Renewables

The second energy goal involves doubling the share of modern renewables in the APEC energy mix for the period 2010 to 2030. There is no economy-level goal for individual member economies, but improvements by individual economies will contribute to the doubling goal.

Chinese Taipei's share of modern renewables increased from 2.55% in 2010 to 5.08% in 2023, broadly in line with the APEC average (Figure 12). Over the same period, the APEC average rose from about 6% to 10.7%, reflecting continued expansion of modern renewable energy deployment across the region. Given its relatively low 2010 baseline, Chinese Taipei's progress illustrates how incremental increases can contribute to the APEC-wide doubling objective.

Figure 12: Chinese Taipei's modern renewable energy share, 2010 and 2023

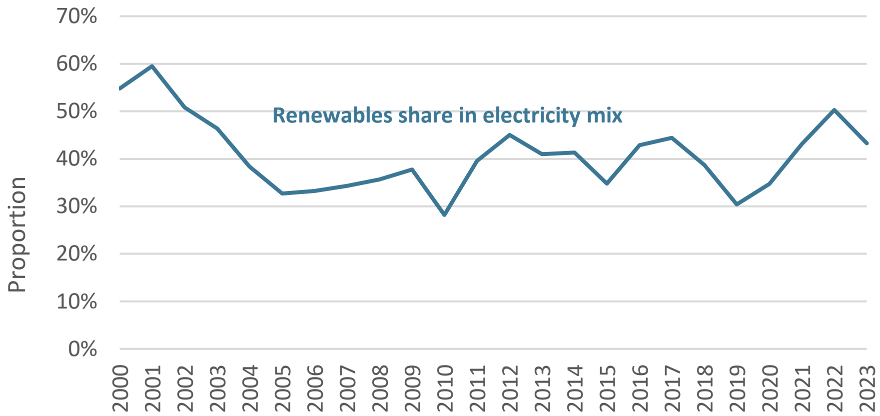


Source: EGEDA (2025)

Note: Biomass used in the residential and commercial sectors is assumed to be traditional biomass and is not included in the definition of modern renewables. All other renewables (biomass used by industry, hydro, geothermal, etc.) are considered modern renewables. Modern renewables also include the share of electricity that is generated from renewable sources.

Chinese Taipei's share of renewable electricity generation increased from about 5% in 2010 to around 10% in 2023 (Figure 13). The renewable share rose gradually over the period, remaining relatively stable through the mid-2010s before accelerating after 2020. This trend reflects sustained capacity additions in solar PV and wind power, which led to higher renewable electricity generation as these sources were progressively integrated into the power system from 2021 onward.

Figure 13: Chinese Taipei's renewable generation share, 2000 to 2023



Source: EGEDA (2025)

Energy Policy

Energy Policy	Details	Reference
Chinese Taipei's NDC 3.0	Chinese Taipei's NDC 3.0 was updated and announced on 3 November 2025. It sets a target to reduce net greenhouse gas emissions by 36%-40% below 2005 levels by 2035, with an interim reduction of 26%-30% by 2030, in support of the legally established goal of net-zero emissions by 2050 under the Climate Change Response Act. The NDC follows the ICTU format and the principle of common but differentiated responsibilities, emphasising domestic mitigation actions while allowing limited international cooperation, and covers mitigation, adaptation, climate governance, energy transition, carbon pricing, just transition, and transparency arrangements.	[Ministry of Environment [MOE] (2025)]
Phase 3 Greenhouse Gas Periodic Regulatory Goals	This domestic binding framework (under Article 10 of the Climate Change Response Act) covers 2026-2030 is approved in May 2025. It sets a strengthened net GHG emissions reduction target of 28% ± 2% (equivalent to 26%-30%) below 2005 levels by 2030, an upgrade from the prior NDC's 24% ± 1%. It includes an electricity emission factor target of 0.319 kg CO_2e/kWh by 2030 (~35% reduction) and sectoral goals across energy, manufacturing, residential/commercial, transport, agriculture, and waste, and enables ministries to revise action plans within six months.	[Ministry of Environment [MOE] (2025)]
Regulations Governing the Collection of Carbon Fees	Regulations were announced in 2024 and became effective in 2025, establishing the supporting mechanisms for implementing the carbon fee system under the Climate Change Response Act, including the following elements: • Entities subject to carbon fees: the fee will be levied on power, gas supply, and manufacturing industries that emit more than 25,000 metric tonnes of carbon dioxide equivalent per year. • Payment timing: the fee rates took effect on 1 January 2025. Starting from the year following the rates' effective date, fee payers must calculate and pay the carbon fee annually by the end of May of the following year, based on greenhouse gas emissions from the previous full calendar year (1 January to 31 December). The first actual payments based on 2025 emissions are due by the end of May 2026. • Carbon fee calculation: the carbon fee payable is calculated by multiplying chargeable emissions by the applicable fee rate. The standard rate is TWD 300 (approximately USD 9-10) per tCO_2e. Preferential rates of TWD 50 (approximately USD 1.5-2) or TWD 100 (approximately USD 3-3.5) per tCO_2e apply to entities with approved self-determined emission reduction plans, aligned with SBTi or benchmark-based reduction pathways, subject to approval by the central competent authority. • For industries assessed as having a high carbon leakage risk, adjustment coefficients apply, with an initial coefficient of 0.2 and phased increases planned in subsequent stages. To qualify, entities must submit and obtain approval for a self-determined reduction plan from the	[Ministry of Environment [MOE] (2025)]

	central competent authority (MOENV/CCA). For these industries, chargeable emissions are not deducted from the 25,000 tCO_2e applicability threshold.	

Notable Energy Developments

Energy Development	Details	Reference
Electricity Act amendment	Chinese Taipei has drafted amendments to the Electricity Act, which were officially announced on 28 May 2025, following passage in the third legislative reading. The key points of the proposed amendments are as follows: • Definitions: added "Specific Electricity Supply Enterprises" and defined energy storage facilities. Removed the restriction that renewable energy retailers can only sell to end-users. (Article) • Integrated Operations: removed the prohibition on transmission/distribution enterprises from concurrently operating other electricity businesses (enabling the integrated utility model), while mandating strict accounting separation. (Article 6 & 75) • Market Neutrality: empowered regulators to establish independent trading units or enforce neutrality measures on electricity trading platforms, with penalties for non-compliance. (Article 11 & 78-1) • Licensing: established application procedures for Specific Electricity Supply Enterprises and set a transition deadline for existing market participants to obtain licenses. (Article 15) • Retailer Expansion: removed the restriction preventing electricity retailing enterprises from installing major power generation equipment. (Article 47 & 74)	Executive Yuan (2025)
Renewable Energy Development Act	Chinese Taipei amended the Renewable Energy Development Act on 11 June 2025. The key elements of the amendments include: • Updated the framework for incentives regarding energy crops grown on fallow or idle agricultural and forest lands. It stipulates that the Ministry of Agriculture (updated from COA) will co-manage the reward criteria and funding through the Agricultural Development Fund. (Article 13-3)	Ministry of Economic Affairs [MOEA] (2025)
New or Expanded Data Centres with Contracted Capacity ≥5 MW Must submit Energy Utilization Manuals	Effective 5 November 2025, Chinese Taipei amended subordinate regulations under the Energy Administration Act, requiring hyperscale data centres and co-location data centres with contracted capacity of 5 MW or above to submit Energy Utilization Manuals (EUMs) prior to construction for review and approval by the competent authority. The key elements are as follows: • Requires all newly established or expanded data centres with contracted capacity of 5 MW or	Ministry of Economic Affairs [MOEA] (2025); Executive Yuan (2025)

	above to submit EUMs for approval prior to construction, covering both hyperscale and co-location facilities. • Establishes a dedicated category for the information services industry to address the rapid expansion of AI and cloud computing infrastructure. The category "Data Processing, Hosting, and Related Services" is formally introduced, requiring projects with a planned total capacity of 5,000 kW (5 MW) or more to undergo a mandatory energy plan review prior to project approval. • Data centres are required to prepare and submit EUMs, covering the following: selection of information equipment, configuration of information software services, data management, cooling systems, power systems, energy monitoring and management, and overall energy performance. • Mandates that large-scale AI and data facilities achieve an annual average Power Usage Effectiveness of ≤ 1.3 for hyperscale facilities and ≤ 1.4 for co-location facilities.	
Standards for the Installation of Solar Photovoltaic Power Generation Equipment on Buildings	Chinese Taipei promulgated the Standards for Installing Photovoltaic Generation Equipment on Buildings pursuant to Paragraph 2, Article 12-1 of the Renewable Energy Development Act on 19 December 2025. The Standards set out specific requirements regarding the entities subject to compliance, installation thresholds, exemption conditions, and application procedures for the installation of photovoltaic generation equipment on buildings exceeding a prescribed scale. Key provisions of the Standards are summarised below: • Would make rooftop/onsite solar mandatory for most new, expanded, or substantially renovated buildings above specified floor area thresholds. • Sets a baseline requirement of at least 1 kW of solar capacity per 20 m² of floor area for qualifying buildings, subject to technical and site-specific constraints. • Allows exemptions where sunlight is insufficient, unsuitable for the installation of photovoltaic generation equipment, or other technical issues make installation impracticable. • Photovoltaic generation equipment installed in accordance with the Standards shall comply with the requirements. • The Executive Yuan announced the amendment to Article 12-1 of the Renewable Energy Development Act on February 13, 2026, which shall take effect from August 1, 2026.	Executive Yuan (2025)
Nuclear Policy Status	Nuclear power was phased out in May 2025 following the shutdown of the Maanshan (Third) Nuclear Power Plant upon licence expiry. • A referendum held on 23 August 2025, sought approval to restart the plant subject to safety review. Although 74.17% of valid ballots (approximately 4.34 million votes) supported the proposal, the referendum did not pass due to failure to meet the statutory voter turnout threshold of 25%.	Central Election Commission (2025)

2026 Feed-in Tariffs of Renewable Energy Electric Power	Chinese Taipei began introducing the FIT mechanism in 2010. The FIT rate for 2026 was unveiled on 2 January 2026. Compared to 2025, the FIT rate for rooftop solar PV systems (all scales, including those between 1 kW and 10 kW) remains unchanged to provide a stable investment environment, while other categories such as onshore wind have seen slight increase. The FIT tier for small hydropower (1-100 kW) introduced in the previous year has been maintained to continue supporting small-scale localised development. Notably, a new high-incentive FIT tier for Next-generation Geothermal energy was introduced in 2026 to encourage the exploration of advanced baseload renewables. The FITs for other renewable energy installations, including hydropower and traditional geothermal, remain largely consistent with the rates from last year.	Energy Administration, Ministry of Economic Affairs [MOEA] (2026)
2024 Electricity Supply and Demand Report	Chinese Taipei released the 2024 Electricity Supply and Demand Outlook in September 2025, presenting updated projections for electricity demand growth and power supply development over the 2025 to 2034 period. The outlook estimates an average annual electricity demand growth rate of around 1.7%, reflecting the combined effects of AI-related infrastructure expansion, semiconductor industry investment, emerging industries, and the continued implementation of energy efficiency measures. Recent data indicate that economic growth has continued alongside relatively stable electricity consumption, and future demand projections incorporate updated assumptions on industrial expansion and structural efficiency improvements. On the supply side, the outlook highlights continued expansion of natural gas-fired generation capacity as the main source of firm capacity to support system reliability. Between 2025 and 2034, a net addition of approximately 12.2 GW of gas-fired capacity is planned, including projects by Taipower and independent power producers. In parallel, renewable energy deployment is expected to continue, with solar photovoltaics, offshore wind, geothermal energy, and small hydropower contributing to the medium-term energy mix.	Energy Administration, Ministry of Economic Affairs [MOEA] (2025)

Useful Links

CPC – https://www.cpc.com.tw/en/

EA (Energy Administration), MOEA – https://www.moeaea.gov.tw/ECW/english/home/English.aspx

Electricity Price and Related Tariff Review – https://www3.moeaea.gov.tw/ele102/Content/Messagess/contents.aspx?MmmID=654246034150461022

Energy labelling website – https://www.energylabel.org.tw/

Energy Statistics Information System – https://www.esist.org.tw/

Feed-in tariffs (FIT) review – https://www.moeaea.gov.tw/ECW/RENEWABLE/news/News.aspx?kind=1&menu_id=767

Formosa Plastics Group – https://fpg.com.tw/tw

Law and Regulations Retrieving System, Ministry of Economic Affairs (MOEA) – https://law.moea.gov.tw/EngNewsList.aspx

Minimum Energy Performance Standards (MPES) website – https://www.meps.org.tw/

MOE (Ministry of Environment) – https://www.moenv.gov.tw/

MOE Climate Change Talks platform – https://www.climatetalks.tw/

MOEA (Ministry of Economy Affairs) – https://www.moea.gov.tw/Mns/english/home/English.aspx.

MOI (Ministry of the Interior) – https://www.moi.gov.tw/english/

MOTE (Ministry of Transportation and Communication) – https://www.motc.gov.tw/ch/index

NDC – https://www.ndc.gov.tw/en/Default.aspx.

Non-manufacturing energy audit reporting system – https://energynet.tgpf.org.tw/

Renewable Energy Certification Centre (T-REC) – https://www.trec.org.tw/https://www.trec.org.tw/

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Thailand

Introduction

In 2025, Thailand's energy transition continued to advance as the economy balances economic growth, energy security, and decarbonisation goals. Central to this development is the government's Power Development Plan (PDP), updated in 2025 with a completion target for March 2026, which places a clear emphasis on increasing the share of renewable energy in the electricity mix. The broader energy transition is also closely linked to the industrial policy, with electric vehicle (EV) incentives designed to strengthen Thailand's automotive sector and boost exports, and helping to cut transport emissions and stimulate production of EVs and batteries. Despite these advances, challenges persist, including continued reliance on imported natural gas and crude oil as domestic gas production declines, and the need for substantial investment to realise net-zero targets by 2050.

Thailand has also made notable progress in CO_2 emission reduction efforts as part of its broader climate strategy. Total CO_2 combustion emissions were maintained for two consecutive years despite continued growth in GDP. The government submitted the updated Nationally Determined Contribution (NDC 3.0) to UNFCCC in November 2025, setting a more ambitious goal to cut net greenhouse gas emissions by 47% below 2019 levels by 2035 and to achieve net zero by 2050, accelerating earlier targets. Policy measures to support reductions include plans for a carbon tax on oil and petroleum products and the development of carbon credit systems under the Paris Agreement, aimed at incentivising lower emissions across industry and energy sectors. Thailand's participation in international schemes such as the global aviation carbon offset programme (CORSIA) also expanded opportunities to cut aviation emissions through the production of biofuels and tradable credits.

Table 1: Thailand's macroeconomic data and energy reserves

Key data [a]		Energy reserves [b,c]	
Area (km^2)	513,120	Crude oil and condensate[c] (end 2023, million barrels)	609
Population (million)	71.7	Gas[c] (end 2023, billion cubic feet)	11,414
GDP (2021 USD billion PPP)	1,519	Coal[b] (end 2020, million tonnes)	1,063
GDP per capita (2021 USD PPP)	21,191	Uranium (kilotonnes U < USD 130/kgU)	N/A

Source: a World Bank (2025); b EI (2025); c EPPO (2024)

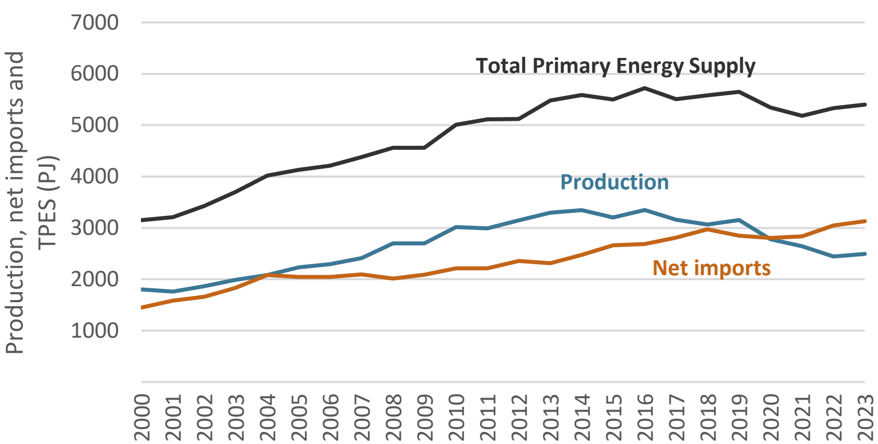
Note: Reserves are total proved reserves and reasonably assured recoverable resources for uranium.

Energy Supply and Consumption

Total Primary Energy Supply

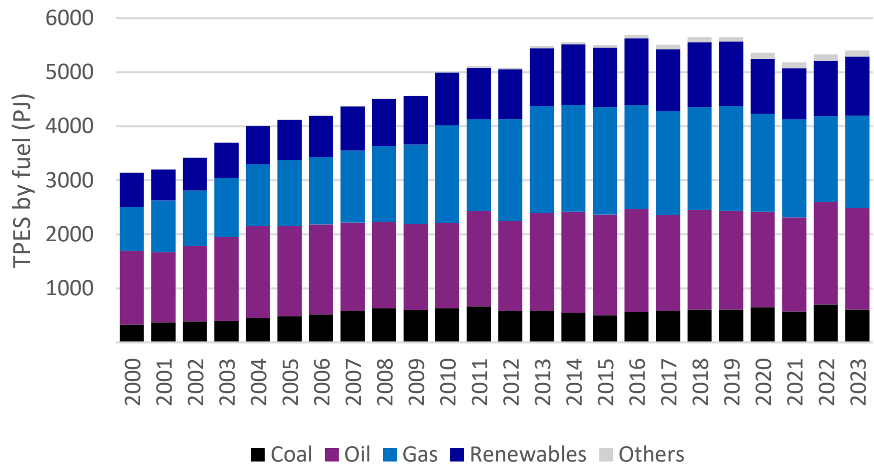
In 2023, Thailand experienced a 1.3% increase in its total primary energy (TPES), amounting to 5,400 PJ (EGEDA, 2025). Production, mostly natural gas from the Gulf of Thailand, increased slightly at 1.3% for the first time compared with the previous year after a continuous decline from the peak in 2016. Net imports, mostly crude oil and natural gas, increased by 2.6% (Figure 1).

Figure 1: Thailand's energy supply, production, and net imports (PJ), 2000 to 2023



Source: EGEDA (2025)

Figure 2: Thailand's energy supply by fuel (PJ), 2000 to 2023



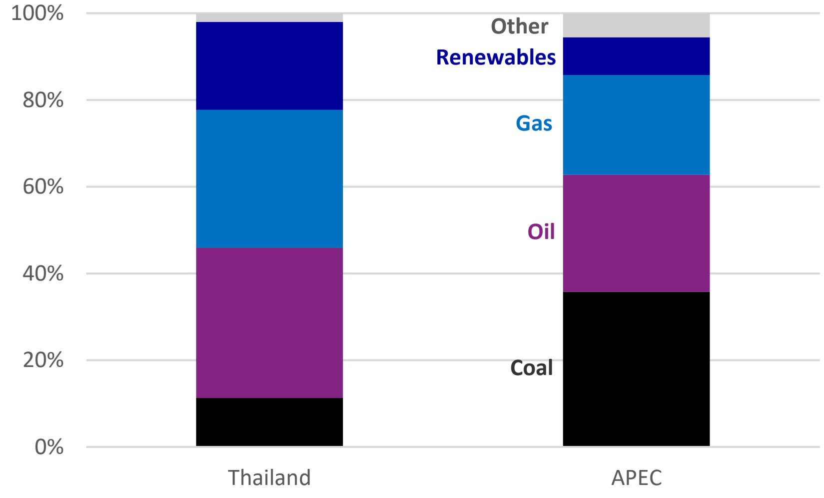
Source: EGEDA (2025)

Fossil fuels play a dominant role in Thailand's energy supply mix, with coal, oil, and gas contributing to 78% of TPES in 2023 despite six consecutive years of decline from a peak of 90% in 2016 (Figure 2). Coal experienced the strongest decline (by 13% compared with 2022) due to lower uses in industry and power sectors. Gas supply increased strongly by 7.8%, while renewables have also been on the rise. Depleting domestic gas reserves led to an increased import of liquefied natural gas (LNG). The share of domestic gas production to imported gas, including both pipeline and LNG, was recorded as 57% in 2023.

To address the challenges and enhance energy security, the government has undertaken initiatives such as expanding LNG receiving terminals, implementing more regasification systems, and constructing gas storage tanks. These efforts aim to support higher LNG receiving capacity, with a target of reaching 46 million metric tonnes per annum (Mmtpa) by 2027.

Compared to APEC, Thailand utilises a substantially smaller proportion of coal supply (Figure 3). This is largely attributed to the economy relying on a limited coal deposit in Mae Moh, Lampang province, for power generation. Thailand has been actively transitioning towards cleaner energy sources, amplifying the prominence of gas in its energy mix since the discovery of domestic gas in the 1980s. As for renewables, biomass and solar energy constitute the primary sources alongside hydroelectric power. Notably, Thailand engages in the energy trade of hydroelectric power from Lao PDR, a move facilitated by its geographical proximity coupled with investment from Thai companies to develop Laos' large hydropower potential.

Figure 3: Energy supply mix – Thailand and APEC, 2023

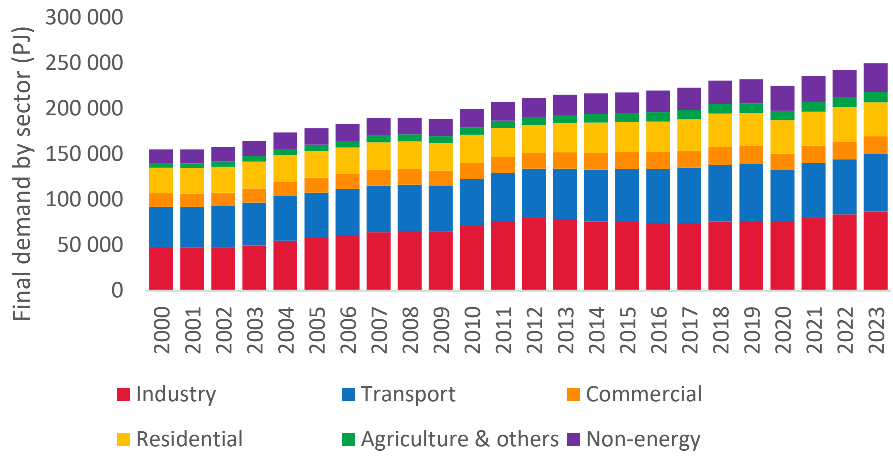


Source: EGEDA (2025)

Total Final Consumption

Total final consumption in 2023 was higher than 2022 by 1.5% (Figure 4). The transport sector experienced strongest growth at 4.2% owing to continued growth in tourism. The non-energy sector, mostly petrochemicals, continued to expand, growing 1.5% from the previous year.

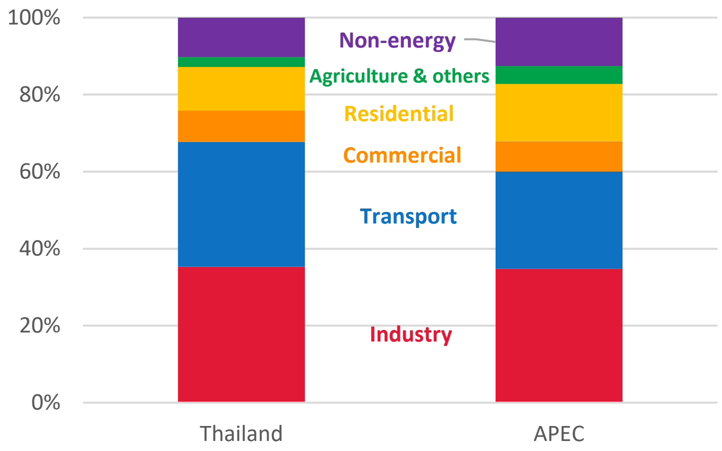
Figure 4: Thailand's final consumption by sector (PJ), 2000 to 2023



Source: EGEDA (2025)

Thailand's industry sector exhibited a comparable market share to that of APEC (Figure 5). Notably, the transport segment surpassed APEC's share, while conversely, the residential sector lagged.

Figure 5: Final consumption by sector, Thailand and APEC, 2023

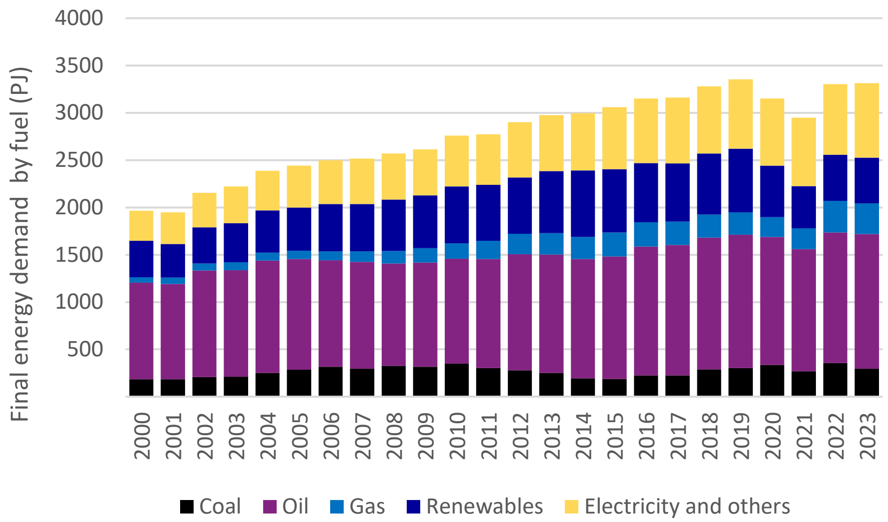


Source: EGEDA (2025)

Final Energy Demand

Thailand experienced a marginal increase in its final energy demand, rising by 0.3% in 2023 (Figure 6). Fossil fuels continue to constitute 60% of this demand. Electricity experienced the highest growth at 5%, gradually increased its share of final energy demand to 23%. Oil grew by 3.3 % while coal and gas declined by 17% and 4%, respectively.

Figure 6: Thailand's final energy demand by fuel (PJ), 2000 to 2023

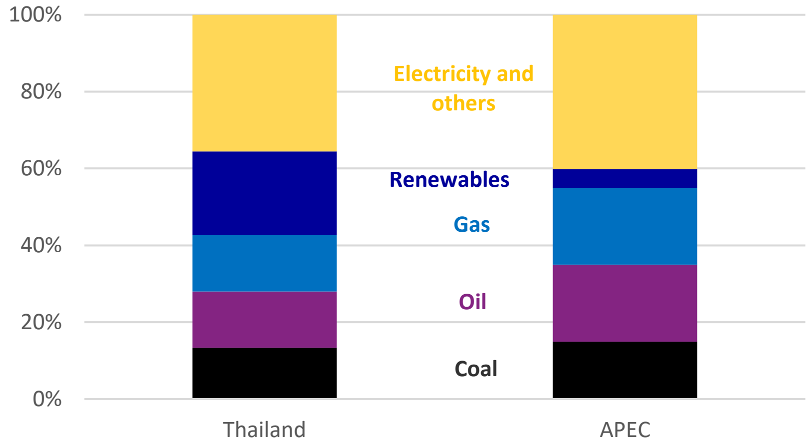


Source: EGEDA (2025)

Note: Figure 6 does not include non-energy sector consumption of energy products.

The composition of Thailand's final energy demand differs from that of APEC in several aspects. The abundance of agricultural wastes, mostly biomass sourced from the agricultural sector, contributes to the high share of renewables at 15%, compared with 4% of APEC region. In contrast, shares of oil and gas were significantly lower at 10% each, with share of “electricity and others” at comparable to the average of APEC.

Figure 7: Final energy demand fuel share, Thailand and APEC, 2023



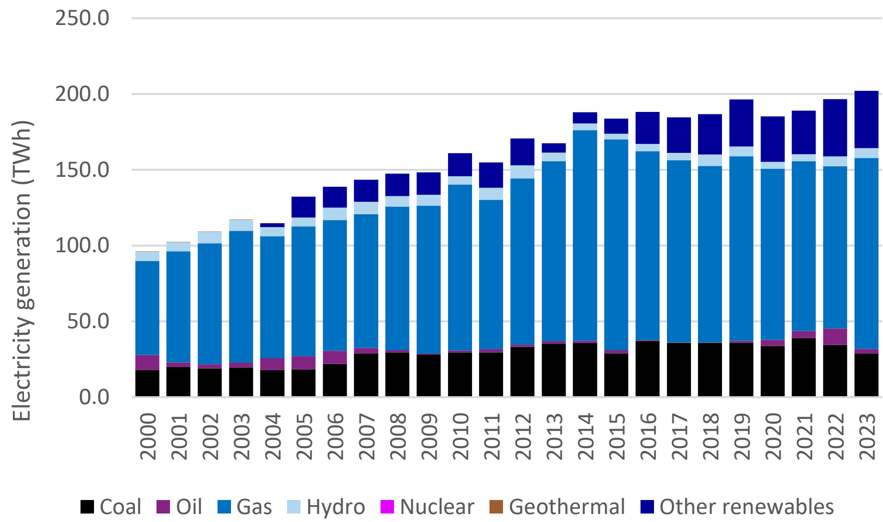
Source: EGEDA (2025)

Transformation

Power Sector

Electricity generation continued to increase (Figure 8), reaching 202.1 TWh in 2023, with natural gas accounting for 54% of generation. The year-on-year percentage growth of total generation in the last decade has been at around 2%. The share of other renewables (excluding hydro) has continued to rise since 2013, reaching 19% of the share mix, exceeding coal for two consecutive years. The increasing share of renewables is largely driven by added solar PV capacity, supported by policy effort to decarbonise the power sector. The year-on-year growth of generation from "other renewables" has been at 20% in the past decade, reaching 38 TWh in 2023.

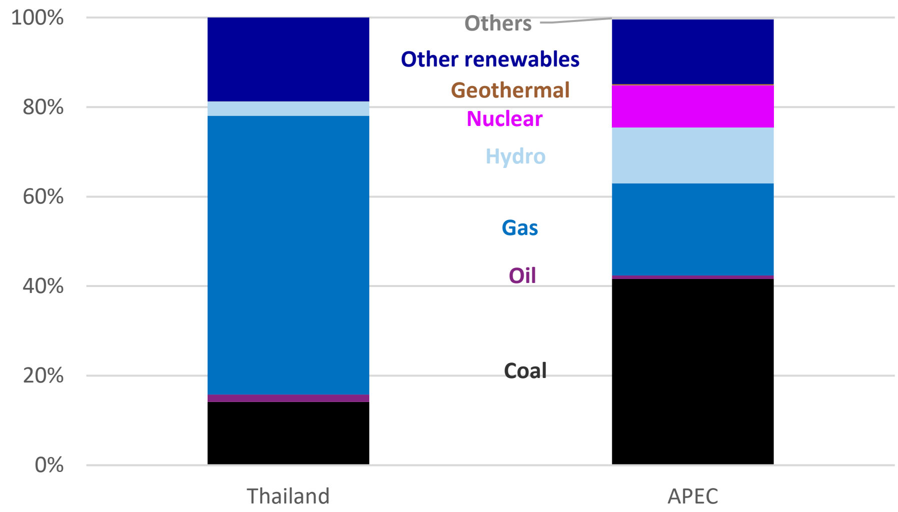
Figure 8: Thailand's electricity generation by fuel, 2000 to 2023



Source: EGEDA (2025)

The dominance of natural gas in Thailand's generation mix becomes evident when compared to the APEC average (Figure 9). While this reliance on gas was previously driven by the abundance of domestic resources, declining gas production has prompted Thailand to focus on renewables sources in order to reduce reliance on gas generation. In comparison to the APEC average, Thailand exhibits a lower proportion of coal and hydroelectricity generation. Growth in "other renewables" is expected to continue, driven by supportive policies, abundant renewables potential, particularly solar and biomass, and the growing cost competitiveness of related technologies.

Figure 9: Electricity generation fuel share, Thailand and APEC, 2023



Source: EGEDA (2025)

Refining

Thailand is among the few economies in APEC's Southeast Asia that has a self-sufficient policy for petroleum product production. The petroleum refining sector in Thailand comprises six major refineries. In 2023, Thailand's refinery capacity stood at 1,242 thousand barrels per day (kb/d), compared with domestic petroleum product consumption of 1,093 kb/d (EPPO, 2024). Thailand's refinery sector also serves as a major supplier of petroleum products to neighbouring economies, exporting 181 thousand kb/d (EPPO, 2024).

Crude oil intake by refineries was 1,054 thousand kb/d in 2023, indicating an approximately utilisation rate of 86% (EPPO, 2024). A substantial decline in domestic crude oil production has resulted in a higher import volume. Thailand produced 70 kb/d of crude oil and condensates and imported 962 kb/d of crude oil, accounting for 93% of total crude oil and condensate supply. Thailand imported crude oil in 2023 from the Middle East (46%), the Far East (30%), and other regions (24%) (EPPO, 2024).

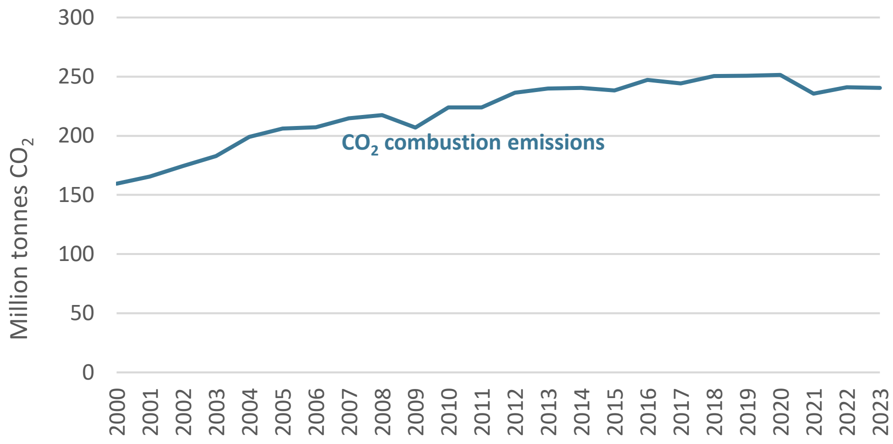
Energy Transition

In 2025, Thailand made historic progress in its energy transition by advancing a comprehensive Climate Change Act, marking its first dedicated climate law. In December, the Cabinet approved the draft legislation, which sets a legal framework to guide Thailand towards net-zero greenhouse gas emissions by 2050 while strengthening adaptation to climate impacts. The Act establishes governance structures such as a climate policy committee, a climate fund, and systems for monitoring, reporting, and verifying emissions across key sectors. It also introduces carbon-pricing tools, including carbon taxes and foundations for an emissions trading system, and mandates broader corporate reporting of greenhouse gas emissions.

Emissions

Thailand's total CO_2 emissions demonstrated a slight decline in 2023 compared to the previous year, from 241 million tonnes in 2022 to 240.6 million tonnes in 2023. This modest decrease occurred even as global energy-related CO_2 emissions reached record highs in 2023. Despite this recent downward trend, a majority of Thailand's emissions continue to stem from the burning of fossil fuels, with oil and natural gas accounting for the largest share in the energy sector.

Figure 10: Thailand's CO_2 combustion emissions (million tonnes), 2000 to 2023



Source: EGEDA (2025)

Energy Security

Thailand's self-sufficiency, a ratio of domestic production to total primary energy supply, has declined from its peak of 61% in 2012 to 46% in 2023. In 2023, domestic production accounted for 7%, 42%, and 57% of crude oil, coal, and gas supply, respectively (EPPO, 2024). Domestic natural gas production stood at 2,653 million standard cubic feet per day (mmscfd), which was comparable to the previous year. LNG imports in 2023 averaged 1,455 mmscfd, a 24% increase from the previous year to compensate for a decline in domestic production (EPPO, 2024).

APEC Energy Goals

There are two energy-related objectives that APEC member economies have agreed to meet as a collective: to improve energy intensity and double the share of modern renewables.

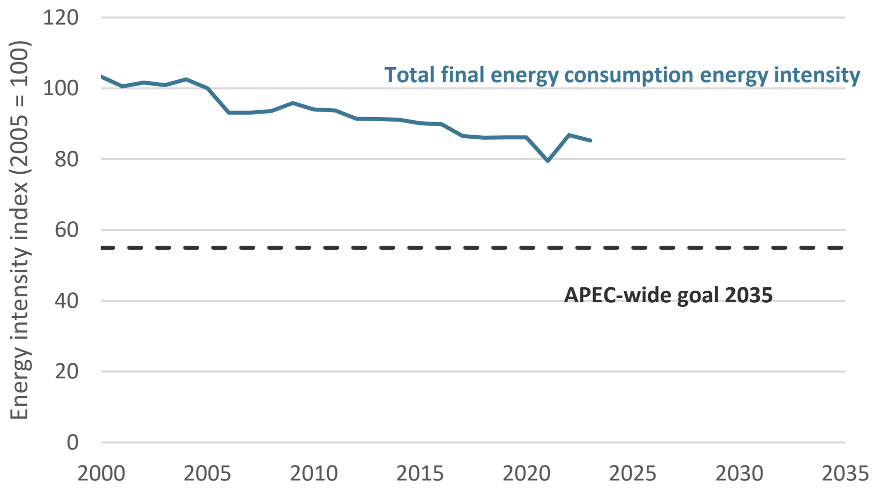
Energy Intensity Goal

In 2011, APEC member economies agreed to increase their ambition to reduce energy intensity by 45% in 2035, relative to a 2005 baseline. The original goal was a 25% improvement by 2030, relative to a 2005 baseline.

APEC is on track to achieve this energy intensity improvement. The goal does not impose individual economy targets, but it is possible to track the progress of individual APEC economies relative to the overarching proportional improvement.

Thailand has achieved significant success in reducing its energy intensity through targeted policies and programmes over the past decades. Thailand's total final energy consumption intensity index was at 85% in 2023 compared to a 2005 baseline. A major highlight was the government's 1995 energy conservation policy, which included successful demand-side management plans. For example, this initiative was supported by the establishment of the Energy Efficiency Revolving Fund in 2002, which provided low-interest loans to overcome financial barriers for energy efficiency projects. These efforts were further reinforced by public awareness campaigns and the setting of energy efficiency standards for buildings and appliances, fostering broad public and industry support and helping contain CO_2 emissions.

Figure 11: Thailand's total final energy consumption intensity index, 2000 to 2023 (2005 = 100)

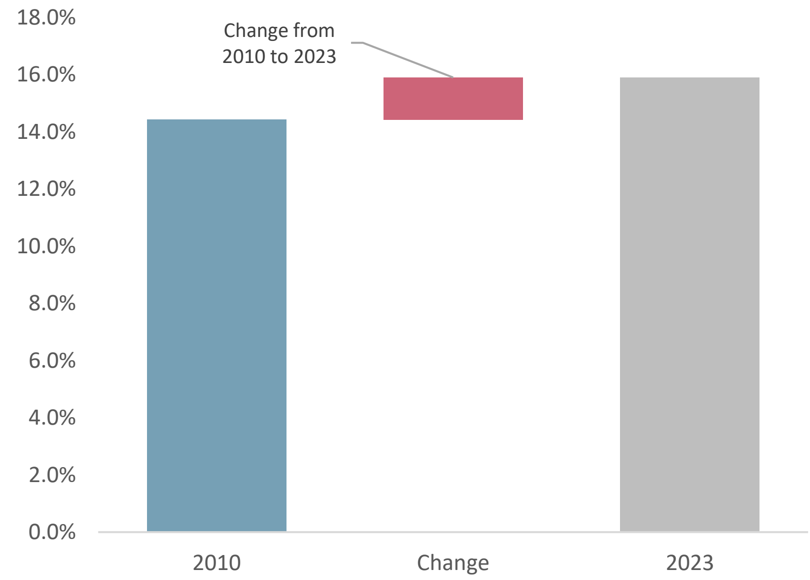


Source: EGEDA (2025)

Doubling of Renewables

The second energy goal involves doubling the share of modern renewables in the APEC energy mix for the period 2010 to 2030. There is no economy-level goal for individual member economies, but improvements by individual economies will contribute to the doubling goal.

Figure 12: Thailand's modern renewable energy share, 2010 and 2023

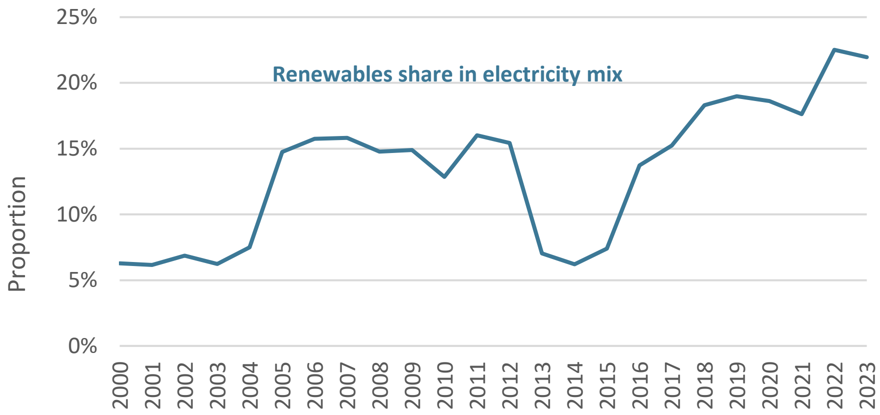


Source: EGEDA (2025)

Note: Biomass used in the residential and commercial sectors is assumed to be traditional biomass and is not included in the definition of modern renewables. All other renewables (biomass used by industry, hydro, geothermal, etc.) are considered modern renewables. Modern renewables also include the share of electricity that is generated from renewable sources.

Between 2010 and 2023, Thailand experienced a 1.5 percentage point increase in its share of modern renewable energy, reaching 15.9% in 2023. Although Thailand experiences lower annual growth rates compared to some APEC economies, Thailand's modern renewable energy share surpassed that of APEC, as APEC aims to achieve a 12% share of modern renewable energy by 2030.

Figure 13: Thailand's renewable generation share, 2000 to 2023



Source: EGEDA (2025)

Energy Policy

Energy Policy	Details	Reference
Draft Power Development Plan-2024	Thailand's Power Development Plan (PDP 2024) has undergone a pivot due to an accelerated climate goal. The draft originally planned for 2024 is being revised to align with a new target to reach net-zero emissions by 2050, moved forward from the previous 2065 goal.	Energy Planning and Policy Office (EPPO)
EV 3.0 Policy	The updated comprehensive incentive programme to support EV manufacturers and incentivise EV sales.	Board of Investment of Thailand (BOI)

Notable Energy Developments

Energy Development	Details	Reference
Cabinet approves Thailand’s first carbon tax	On 21 January 2025, the Thai Cabinet approved a draft Ministerial Regulation proposed by the Ministry of Finance (MoF) that serves to implement a carbon tax as part of its efforts to reduce greenhouse gas emissions and promote environmental sustainability.	EY Global
Cabinet approves draft Climate Change Act	Thailand is actively pursuing its first comprehensive Climate Change Act, which is currently a draft bill going through the legislative process and is expected to be finalised and implemented by early 2027. The Thai Cabinet approved the draft in principle in December 2025.	(summary of content) (full draft-in Thai)

Useful Links

Thailand's Energy Statistics 2024 – https://www.eppo.go.th/index.php/en/

References

EGEDA (Expert Group on Energy Data Analysis, APEC Energy Working Group) (2024), *APEC Energy Database.* https://www.egeda.ewg.apec.org/egeda/database_info/index.html

EI (Energy Institute) (2024), *Statistical Review of world Energy*. https://www.energyinst.org/statistical-review

EPPO (Energy Policy and Planning Office) (2023), *Energy Statistic of Thailand 2023*.

https://anyflip.com/qivjx/nvxn/

United States

Introduction

The United States is a geographically diverse and resource-rich economy with a large energy system that is highly integrated in the oil and natural gas markets and regionally interconnected in electricity generation and transmission. Its varied geology and climate underpin substantial endowments of oil, natural gas, coal, and renewable resources, supporting large-scale energy development and forming the structural foundation of the United States' role as both a major energy producer and consumer.

The United States is one of the world's largest energy consumers. Of the APEC economies, the United States has the second-highest level of energy consumption and comprised almost a quarter of APEC's total primary energy supply (TPES) in 2023. This high level of demand reflects a large and diversified economy, high per-capita energy use, and an energy-intensive transport sector.

The United States is also a major producer of energy. Presently, the United States is the global leader in oil and gas production. This position is supported by the rapid expansion of shale development, which has significantly increased domestic output. This sustained high-level of production has strengthened U.S. energy security and has enabled the economy to increase its exports.

The second Trump Administration, which began January 2025, led to an energy policy shift that highlights the concept of "American Energy Dominance". This strategy focuses on expanding energy supply, accelerating innovation, and strengthening domestic energy security. Key priorities include boosting advanced nuclear R&D, streamlining LNG exports and permitting, promoting energy affordability and consumer choice, refilling the Strategic Petroleum Reserve, enhancing grid reliability, and furthering commercial nuclear power.

Table 1: United States' macroeconomic data and energy reserves

Key data [a, b]		Energy reserves [c, d]	
Area (million km^2)	9.8	Oil (billion barrels)	46
Population (million)	343	Gas (trillion cubic feet)	604
GDP (USD billion, 2026)	31,820	Coal (billion short tons)	468
GDP per capita (USD, 2026)	92,880	Uranium (kilotonnes U < USD 130/kgU)	68

Source: a U.S. Census (2026); b IMF (2026); c EIA (2025); d IAEA & NEA (2025)

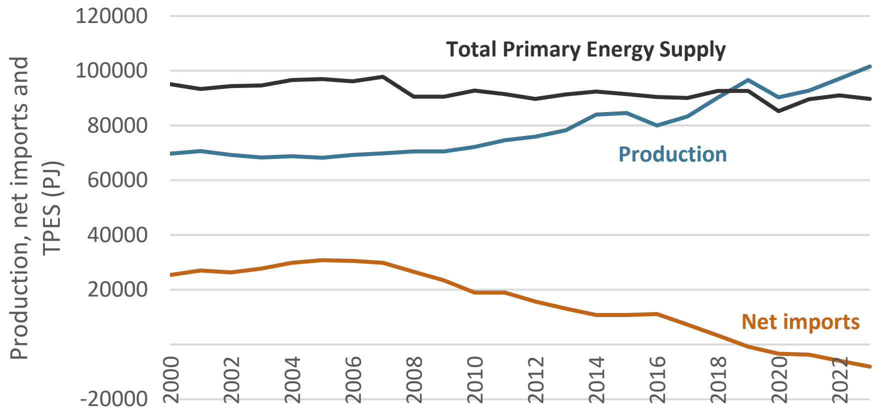
Note: Reserves are total proved reserves and reasonably assured recoverable resources for uranium.

Energy Supply and Consumption

Total Primary Energy Supply

U.S. total primary energy supply (TPES) reached approximately 89,700 PJ in 2023, a -1.5% change from 2022 values. Production continues to increase, while net imports continue to decrease.

Figure 1: United States' energy supply, production, and net imports (PJ), 2000 to 2023

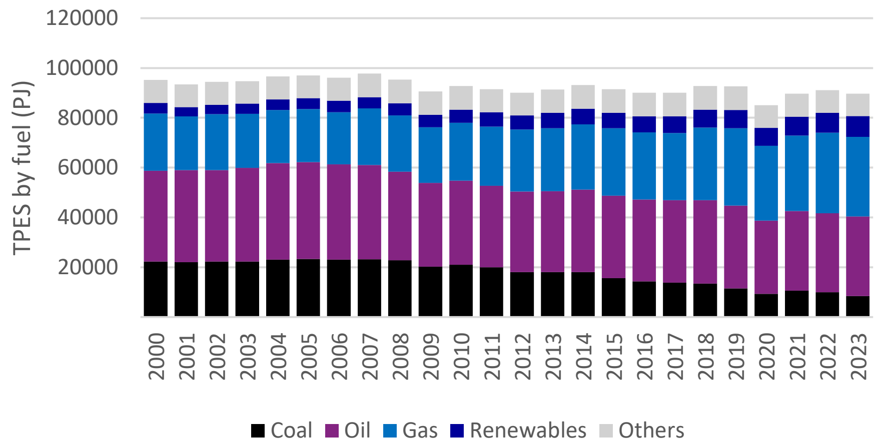


Source: EGEDA (2025)

U.S. production grew to approximately 101,600 PJ in 2023, a 4.6% increase from 2022 values, driven mainly by crude oil and natural gas production growth.

The United States continues to be a net exporter, a trend that began in 2019. Fossil fuels dominate U.S. energy exports, with petroleum products, crude oil, natural gas (including LNG), and coal comprising most of the exported energy, supported by strong domestic production and expanded export infrastructure. The United States is currently the world's largest exporter of LNG.

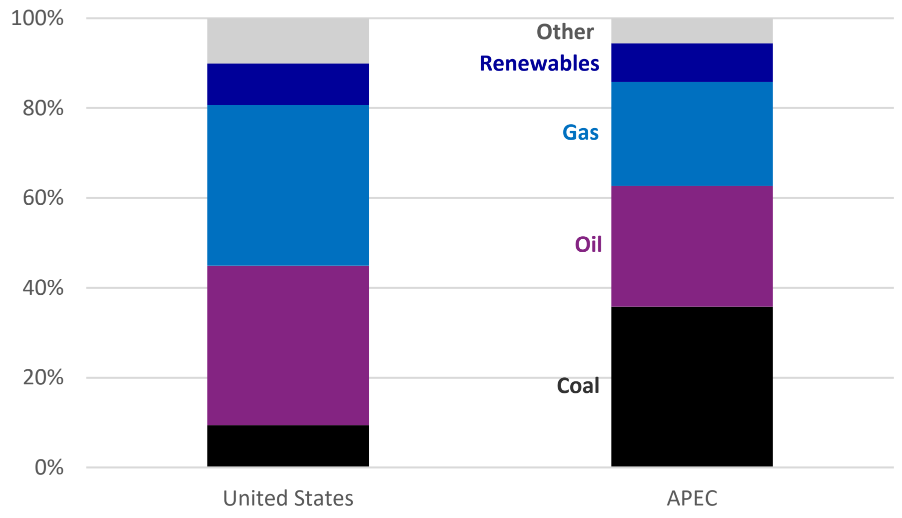
Figure 2: United States' energy supply by fuel (PJ), 2000 to 2023



Source: EGEDA (2025)

The U.S. energy supply is dominated by fossil fuels, representing 81% of the total. According to the latest EGEDA data, in 2023, 36% of TPES came from crude oil, 36% from natural gas, and 9% from coal. Renewables accounted for 9% of TPES, and "other" sources, including nuclear and non-energy use of fuels, accounted for 10%.

Figure 3: Energy supply mix – The United States and APEC, 2023



Source: EGEDA (2025)

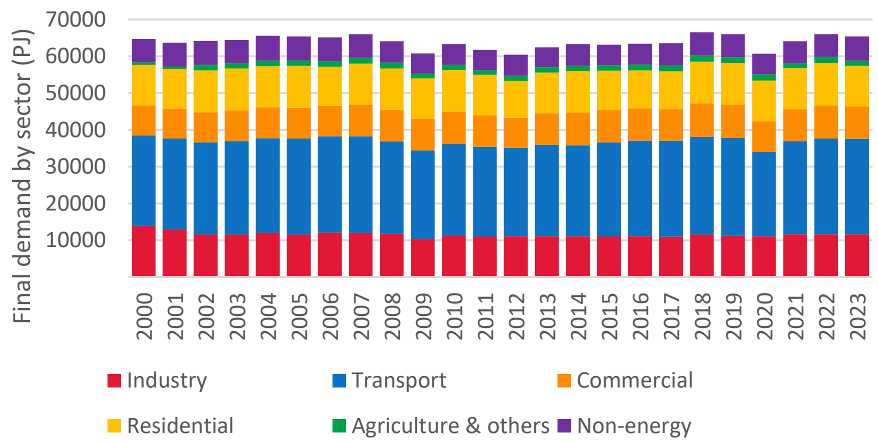
While both the United States and APEC average display a high usage of fossil fuels in TPES, the composition differs. The United States has a lower share of coal, but a higher share of oil and gas, reflecting the economy's role as a major producer and consumer of those two fuel sources.

In comparison to the 2023 APEC average TPES percentage shares, the U.S. primary energy supply contains a nine-percentage point higher share of oil, and a 13-percentage point higher share of gas, but a 27-percentage point lower share of coal than the APEC average. Renewables were equivalent, and for "Others", the United States' share was four percentage points higher. Overall, U.S. TPES encompasses almost a quarter of APEC's total TPES at 24%.

Total Final Consumption

The United States is the world's second-largest energy consumer. In 2023, total final consumption reached approximately 65,400 PJ. Total final consumption includes the consumption of energy commodities by the non-energy sector.

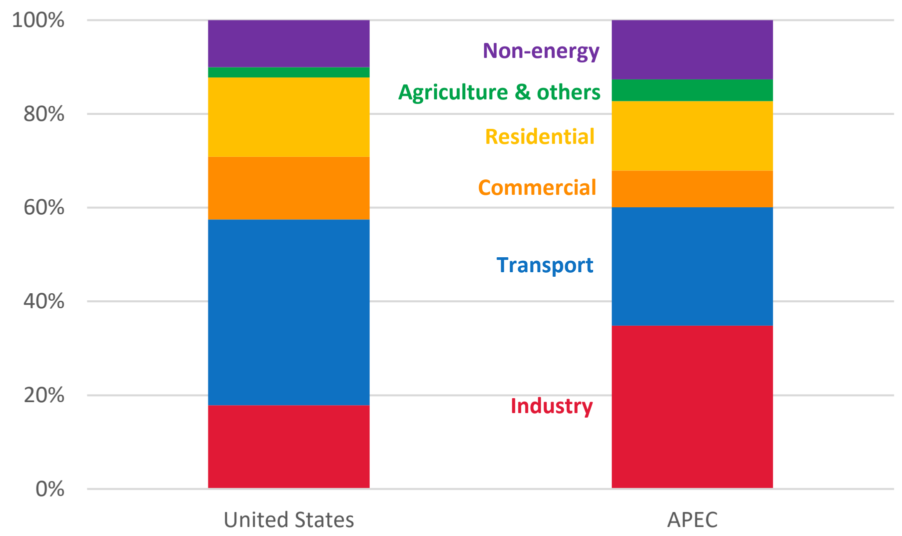
Figure 4: United States' final consumption by sector (PJ), 2000 to 2023



Source: EGEDA (2025)

The transport sector comprises the highest share of this total at 40%, followed by the buildings sector (commercial + residential) at 30%, then industry (18%), non-energy (10%), and agriculture & others (2%).

Figure 5: Final consumption by sector, United States and APEC, 2023



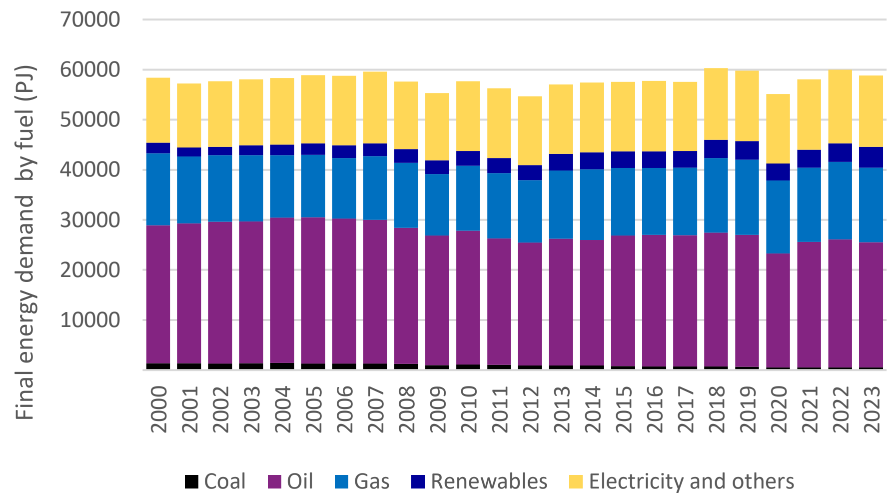
Source: EGEDA (2025)

In comparison to APEC, the U.S. transport sector's 40% share of the total final consumption is 15-percentage points higher than the APEC average, owing to the high level of individual car ownership in the United States as well as the fact that cars are generally larger in the United States than in other APEC economies. In contrast, the industry sector in the United States represents a smaller share than in the rest of APEC: While industry represents over one-third of the total in APEC at 35%, it is less than a fifth in the United States, which is due to large energy-intensive manufacturing bases in other APEC economies. For the other sectors, the United States' commercial sector is five percentage points higher than the APEC average, and the U.S. residential sector's share is two percentage points higher than the APEC average, the "agriculture & others" sector is three percentage points lower, and the non-energy sector is two percentage points lower.

Final Energy Demand

U.S. final energy demand measured approximately 58,800 PJ in 2023, a 2% decrease from 2022 levels. Final energy demand excludes the consumption of energy products by the non-energy sector and is a subset of final consumption.

Figure 6: United States' final energy demand by fuel (PJ), 2000 to 2023



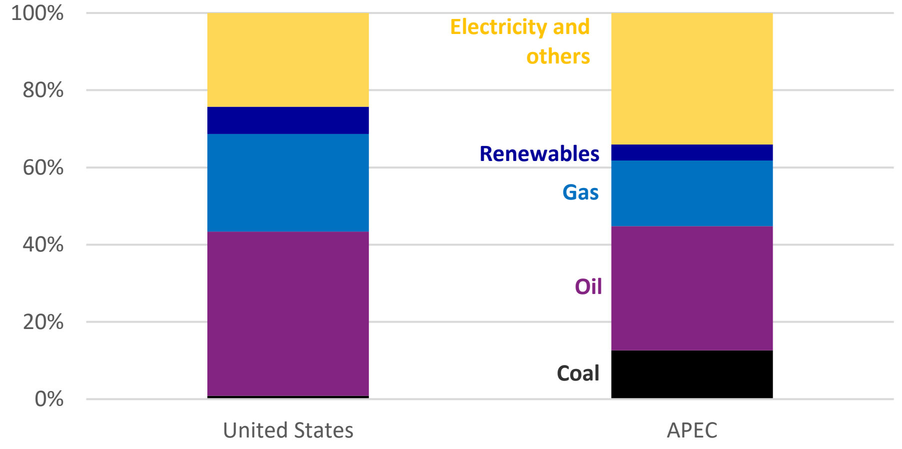
Source: EGEDA (2025)

Note: Figure 6 does not include non-energy sector consumption of energy products.

By fuel type, renewables rose from the previous year whereas other fuel types decreased slightly. Oil represents the largest share at 43%, followed by gas (25%), "electricity and others" (24%), renewables (7%), and coal (1%).

Oil's predominance is largely attributable to its central role in the transportation sector, where liquid fuels power the majority of personal vehicles, freight trucks, and aviation. Electricity represents the second-largest share, reflecting its widespread applications across multiple sectors. Natural gas accounts for a substantial portion of energy consumption due to its versatility and efficiency in residential and commercial heating, industrial processes, and baseload electricity generation.

Figure 7: Final energy demand fuel share, United States and APEC, 2023



Source: EGEDA (2025)

Overall, APEC reflects a diverse mix of emerging and advanced economies where coal use, electrification, and industrial growth play a larger role when compared to solely observing the United States' mix.

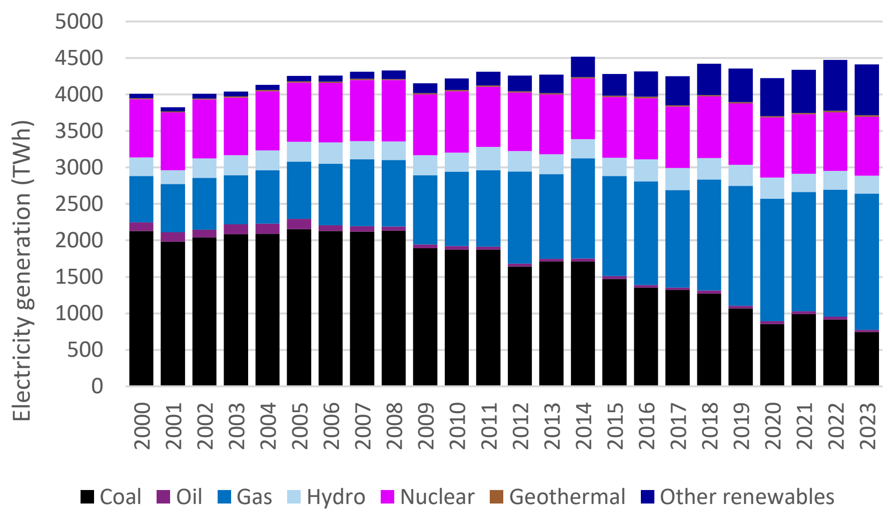
In comparison to the aggregate total final energy consumption of APEC, the United States relies less on coal (almost 12 percentage points lower than the APEC average) and "electricity and others" (almost 10 percentage points lower than the APEC average), but more on the other fuel sources. As aforementioned, oil is structurally entrenched in the U.S. system due to the high energy demand from the transport sector (over 10 percentage points higher than the APEC average for oil).

Transformation

Power Sector

The United States generated 4,430 TWh of electricity in 2023, which is around 1% less than was generated in 2022.

Figure 8: United States' electricity generation by fuel, 2000 to 2023



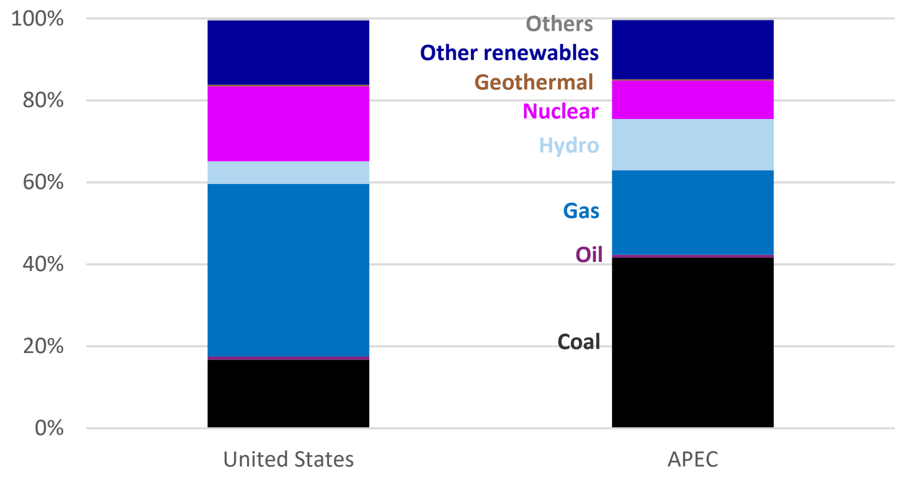
Source: EGEDA (2025)

Coal historically dominated electricity generation in the United States, but its share has steadily declined as low-cost natural gas has become more widely available. In 2000, coal accounted for 53% of the power generation mix, falling to 17% by 2023. Over the same period, natural gas increased from 16% to 42% of the mix. Compared with 2022, coal generation declined by 18%, while natural gas generation rose by 7%.

The share of "other renewables" has also grown over time, an increase of over 1,000% from 2000 levels.

In 2023, the electricity mix was: 42% gas, 18% nuclear, 17% coal, 16% “other renewables”, 6% hydro, 1% oil, and less than 1% geothermal and other fuels.

Figure 9: Electricity generation fuel share, United States and APEC, 2023



Source: EGEDA (2025)

Electricity generation by fuel type varies between the United States and the APEC average. The U.S. electricity mix reflects a gas-rich system optimised for flexibility, whereas APEC’s mix shows higher coal reliance, reflecting baseload requirements associated with rapid demand growth, alongside varied access to gas and low-carbon technologies. Compared to the APEC average, gas is over 21 percentage points higher in the U.S. electricity generation mix, whereas coal is almost 25 percentage points lower. Additionally, the United States has a higher share of nuclear power (9 percentage points higher), but a lower share of hydropower (7 percentage points lower). Other fuel values are broadly similar.

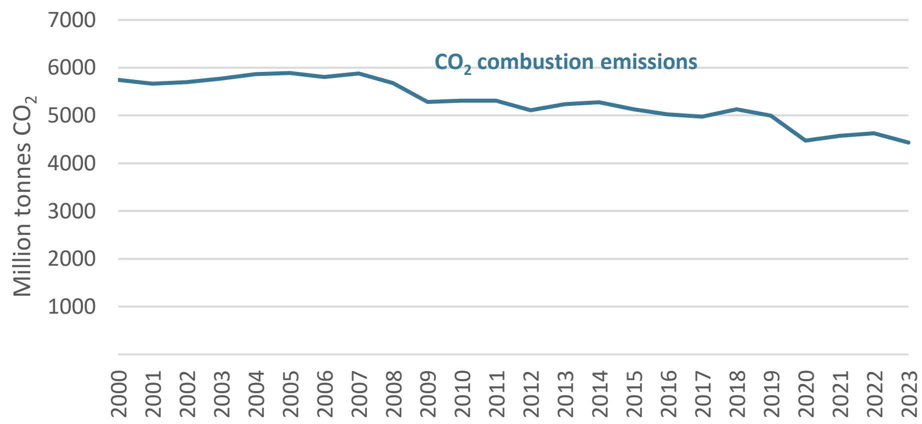
Energy Transition

Under the second Trump administration, energy transition issues in the United States have been framed less as a move toward decarbonisation and electrified systems and more as a reorientation of federal policy toward energy dominance, reliability, and affordability through conventional and baseload energy sources.

Emissions

U.S. CO_2 combustion emissions display long-term decline from the mid-2000s peak, falling from nearly 6,000 million tonnes to around 4,400 million tonnes by 2023. The downward trend reflects coal-to-gas switching in the power sector, improvements in energy efficiency, and growing deployment of renewables.

Figure 10: United States’ CO_2 combustion emissions (million tonnes), 2000 to 2023



Source: EGEDA (2025)

Energy Security

The current U.S. administration has sought to bolster energy security by advancing a comprehensive strategy centred on expanding domestic energy production, reducing regulatory constraints on energy infrastructure, and repositioning the United States as a leader in energy output and export capacity. Central to this agenda was the issuance of the “Unleashing American Energy” executive order, signed on 20 January 2025, which articulates a federal policy that supports energy exploration and production on federal lands and waters, accelerates permitting processes, and prioritises the development of traditional energy resources such as oil, natural gas, coal, nuclear, hydropower, and critical minerals as matters of economic and security interest. To coordinate these efforts across the federal government, the Administration established the National Energy Dominance Council, chaired by the U.S. Interior Secretary and vice-chaired by the U.S. DOE Secretary, to advise on strategies to progress permitting, production, distribution, and regulation of U.S. energy resources in order to maintain global competitiveness and reduce foreign energy dependence.

Consistent with the aforementioned executive order, U.S. DOE implemented a series of directives aimed at operationalising the Administration’s energy priorities. In early February 2025, DOE issued the Secretarial Order “Unleashing the Golden Era of American Energy Dominance”, directing the Department to expand energy production, stimulate technological innovation, and remove barriers to infrastructure development, asserting that a robust domestic energy sector underpins both economic prosperity and security. Subsequent DOE statements and press releases highlighted early milestones, including the resumption of LNG export approvals and advancing record levels of approvals for future U.S. LNG export capacity, framed as reinforcing the reliability, affordability, and global standing of U.S. energy supplies. Other actions highlighted advancing baseload generation, strengthening grid reliability, and lowering energy costs for consumers.

APEC Energy Goals

There are two energy-related objectives that APEC member economies have agreed to meet as a collective: to improve energy intensity and double the share of modern renewables.

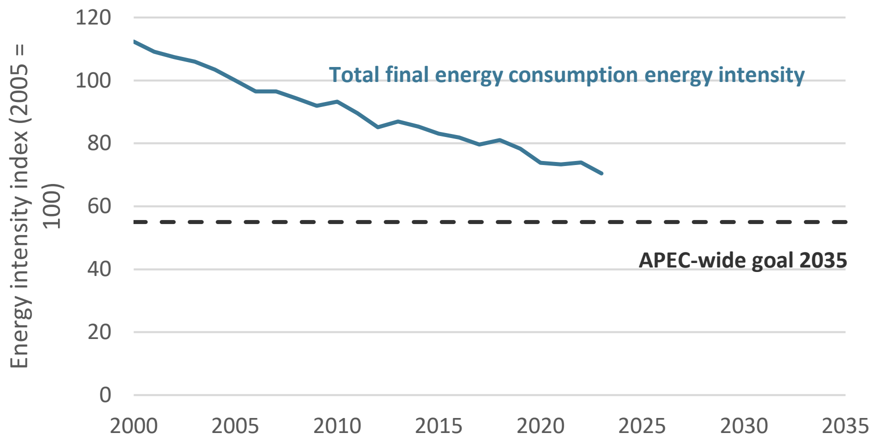
Energy Intensity Goal

In 2011, APEC member economies agreed to increase their ambition to reduce energy intensity by 45% in 2035, relative to a 2005 baseline. The original goal was a 25% improvement by 2030, relative to a 2005 baseline.

APEC is on track to achieve this energy intensity improvement. The goal does not impose individual economy targets, but it is possible to track the progress of individual APEC economies relative to the overarching proportional improvement.

The United States made relatively steady progress in improving energy intensity, reflecting a more efficient use of energy in relation to economic activities. In 2023, energy intensity in the United States was around 38% lower than in 2005. This trend can be attributed to numerous factors, such as advancements in energy-efficient technologies, energy conservation actions, and changes in the industrial and economic landscape. Both federal and state-level policies, alongside voluntary efforts from businesses, have helped drive energy efficiency across various sectors.

Figure 11: United States' total final energy consumption intensity index, 2000 to 2023 (2005 = 100)

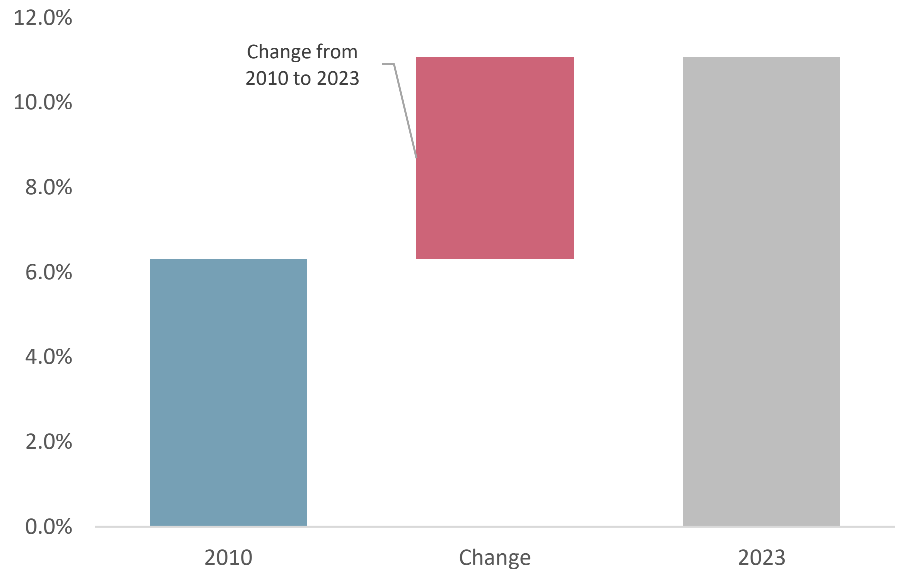


Source: EGEDA (2025)

Doubling of Renewables

The second energy goal involves doubling the share of modern renewables in the APEC energy mix for the period 2010 to 2030. There is no economy-level goal for individual member economies, but improvements by individual economies will contribute to the doubling goal.

Figure 12: United States' modern renewable energy share, 2010 and 2023

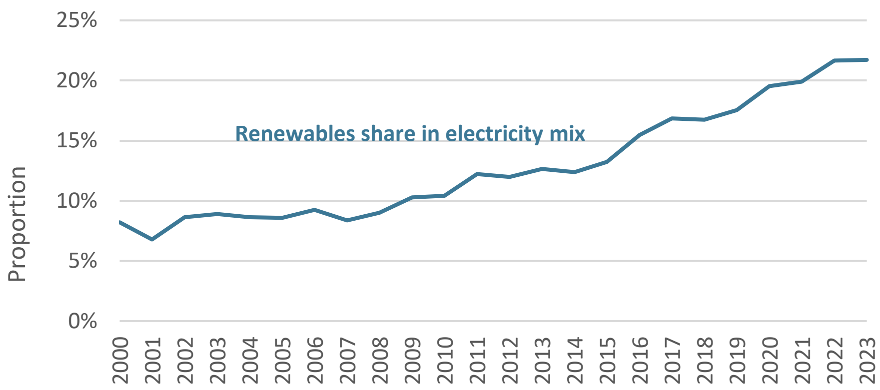


Source: EGEDA (2025)

Note: Biomass used in the residential and commercial sectors is assumed to be traditional biomass and is not included in the definition of modern renewables. All other renewables (biomass used by industry, hydro, geothermal, etc.) are considered modern renewables. Modern renewables also include the share of electricity that is generated from renewable sources.

From 2010 to 2023, the share of modern renewables in the United States' total final energy consumption (TFEC) grew from 6.3% to 11.0%. In the same time frame, the APEC total showed a similar growth trend, increasing from 6% to 10.7%.

Figure 13: United States' renewable generation share, 2000 to 2023



Source: EGEDA (2025)

The latest EGEDA data from 2023 shows that renewable energy accounted for 22% of the U.S. electricity generation, up from 10% in 2010, more than doubling over this period.

Energy Policy*

**This section includes both policies and government-announced initiatives.*

Energy Policy	Details	Reference
Unleashing the Golden Era of American Energy Dominance	On 5 February 2025, the U.S. Secretary of Energy announced the "9 Pillars for American Energy Dominance", a comprehensive strategy focused on expanding energy supply, accelerating innovation, and strengthening domestic security. Key priorities include boosting advanced nuclear R&D, streamlining LNG exports and permitting, promoting energy affordability and consumer choice, refilling the Strategic Petroleum Reserve, enhancing grid reliability, and supporting the full potential of commercial nuclear power. This strategy builds on the themes highlighted in the "Unleashing American Energy" executive order, signed on 20 January 2025.	The U.S. Department of Energy & The White House
One Big Beautiful Bill Act	On 4 July 2025, the "One Big Beautiful Bill Act" was signed into law. While the Act contains many non-energy provisions, its energy-related measures include the accelerated phase-out of renewable energy, efficiency, and EV tax credits; expanded existing biofuels and manufacturing incentives; and expanded support for fossil fuel development through reduced royalties, mandated offshore leasing, and streamlined permitting.	U.S. Congress
U.S. Nuclear Renaissance	The Trump Administration aims to expand U.S. nuclear energy capacity from 100 GW to 400 GW by 2050 through executive actions focused on innovation, security, regulation, and industry. The plan includes accelerating reactor testing at U.S. Department of Energy labs, building reactors on federal land for security, reforming the Nuclear Regulatory Commission (NRC) to speed up licensing, bolstering the nuclear workforce, and revitalising the domestic nuclear fuel cycle through renewed uranium mining and enrichment.	The U.S. Department of Energy
Withdrawal from the Paris Agreement	The United States, under the second Trump Administration, formally withdrew from the Paris Agreement for a second time on 27 January 2026. This move ends U.S. commitments to submit emissions-cutting plans and fulfil other obligations under the Paris Agreement.	The White House
Grid Reliability Orders	The U.S. Department of Energy issued a series of emergency orders in 2025 under Section 202(c) of the Federal Power Act directing utilities and grid operators to keep specific power plants and generating units operating to help maintain electric system reliability across various regions of the United States, with many orders taking effect in late 2025 and extending into early 2026. The U.S. Department of Energy is also funding improvements to the grid to strengthen grid resilience and innovation.	The U.S. Department of Energy & The U.S. Department of Energy
Reinvigorating Coal	The 8 April 2025 U.S. executive order titled "Reinvigorating America's Beautiful Clean Coal Industry and Amending Executive Order 14241" directs federal agencies to prioritise and expand domestic coal production, remove regulatory barriers, and promote coal as essential to energy	The White House

	security and economic growth, including identifying coal resources on federal lands and encouraging coal use and exports.	
Deregulation of Home Appliances	The U.S. Department of Energy announced it has postponed the implementation of several home appliance energy standards and withdrawn other conservation standards in order to reduce regulatory costs, expand consumer choice, and lower prices for American families. These actions, framed as part of a broader deregulatory effort under the current administration, aim to remove mandates on central air conditioners, heat pumps, walk-in coolers, freezers, and other equipment to increase consumer options.	The U.S. Department of Energy
Critical Mineral Supply Chain Security	The U.S. Department of Energy is prioritising critical mineral security by reshoring supply chains, reducing dependence on foreign sources, and investing heavily in domestic production and innovation. Through funding, a restructured lithium loan with government equity, and new technologies developed by DOE labs, U.S. DOE is accelerating the extraction and commercialisation of critical minerals from unconventional and domestic sources like coal waste.	The U.S. Department of Energy
Wind and Solar Subsidy Rollback	The executive order "Ending Market Distorting Subsidies for Unreliable, Foreign-Controlled Energy Sources" on 7 July 2025 directs U.S. federal agencies to phase-out tax credits and preferential policies for wind and solar energy, arguing these subsidies distort markets, are costly, unreliable, and increase dependence on foreign supply chains. It instructs the Treasury and Interior Departments to enforce termination of key clean energy tax incentives and revise related regulations to prioritise more reliable, domestically controlled energy sources within 45 days of enactment	The White House
Energy Affordability vis-à-vis Date Centres	The United States announced a Ratepayer Protection Pledge, signed by leading AI companies and hyperscalers, to protect Americans from electricity price hikes due to data center energy requirements, by requiring members of the pledge to build, bring, or buy new generation resources and cover the cost of all power delivery infrastructure upgrades required for their data centres.	The White House

Notable Energy Developments

Energy Development	Details	Reference
First to Export 10 million tonnes of LNG in a Month	The United States has maintained its status as the world's leading exporter of LNG, and became the first to export 10 million tonnes of LNG in single month (October 2025). This was supported by the commencement of Venture Global's Plaquemines export facility and the continued scale-up of Cheniere's Corpus Christi Stage 3 project.	Reuters

Big Tech Expands Energy Investments	Major tech companies have expanded investments into a range of energy sources, such as renewables, gas, and nuclear power, to meet soaring data centre electricity demand.	Reuters

Useful Links

APEC Expert Group on Energy Data and Analysis (EGEDA) – https://www.egeda.ewg.apec.org/

Energy Institute Statistical Review of World Energy – https://www.energyinst.org/statistical-review

International Atomic Energy Agency (IAEA) – https://www.iaea.org/

OECD Nuclear Energy Agency (NEA) – https://www.oecd-nea.org/

The White House Statements and Releases – https://www.whitehouse.gov/briefing-room/statements-releases/

U.S. Department of Energy – https://www.energy.gov/

U.S. Department of State – https://www.state.gov/

U.S. Energy Information Administration – https://www.eia.gov/

U.S. Environmental Protection Agency – https://www.epa.gov/

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Viet Nam

Introduction

Viet Nam is one of Asia's fastest-growing economies with an average annual GDP growth of 6% over the last decade. In 2023, GDP reached USD 1,359 billion (2021 USD PPP) with a 5.1% growth rate. This growth rate is far lower than in 2022 (8.1%) due to a sharp decline in global demand for exports, impacting key manufacturing sectors.

In 2023, the economy's population was 100.4 million, with an urban population share of 38% (GSO, 2024).

Viet Nam's energy sector is transitioning from relying on fossil fuels to adopting cleaner energy sources to reduce greenhouse gas emissions, particularly in the power generation sector. At the same time, the Vietnamese government has prioritised energy security, resilience, and affordability to support economic growth amid the ongoing global energy crisis and fluctuating energy prices.

Viet Nam possesses diverse natural resources, including 4.4 billion barrels of oil, 23 trillion cubic feet of gas, and 3360 million tonnes of coal (Table 1). In addition, Viet Nam has substantial potential for renewable energy development, particularly hydro, solar, wind, and biomass. Recognising this, the government set targets to increase the share of renewables in the power mix to 28%-36% by 2030 and 74%-75% by 2050 (PMVN, 2025).

In recent years, Viet Nam has issued key energy policies, aiming to achieve the net-zero target by 2050. In February 2025, the New Electricity Law took effect after being officially adopted by the National Assembly of Viet Nam. In April 2025, Viet Nam issued Decision No. 768/QD-TTg approving revisions to the National Power Development Plan for 2021-2030, "Revised PDP8". It took effect immediately upon issuance and replaced the original Power Development Plan 8 ("Initial PDP8"), which was released in May 2023. In August 2025, the Politburo issued Resolution No. 70-NQ/TW on ensuring Viet Nam's energy security until 2030, with a vision to 2045. This was followed by Resolution No. 253/2025/QH15 on specific mechanisms and policies for domestic energy development for the 2026-2030 period, which was passed by the National Assembly in December 2025. In February 2026, the Ministry of Industry and Trade (MoIT) issued Decision No. 363/QĐ-BCT to approve the revised National Energy Master Plan (NEMP) for the 2021-2030 period, with a vision to 2050, originally established in July 2023. This recalibration sets new targets for oil, gas, coal, and renewable energy to support ambitions for sustained double-digit economic growth through 2030.

Table 1: Viet Nam's macroeconomic data and energy reserves

Key data [a, b]		Energy reserves [c, d]	
Area (million km^2)	0.33	Oil (billion barrels)	4.4
Population (million)	100.4	Gas (trillion cubic feet)	23
GDP (2021 USD billion PPP)	1,359	Coal (million tonnes)	3,360
GDP per capita (2021 USD PPP)	13,546	Uranium (kilotonnes U < USD 130/kgU)	-

Source: a GSO (2024); b World Bank (2025); c BP (2025); d UN (2025)

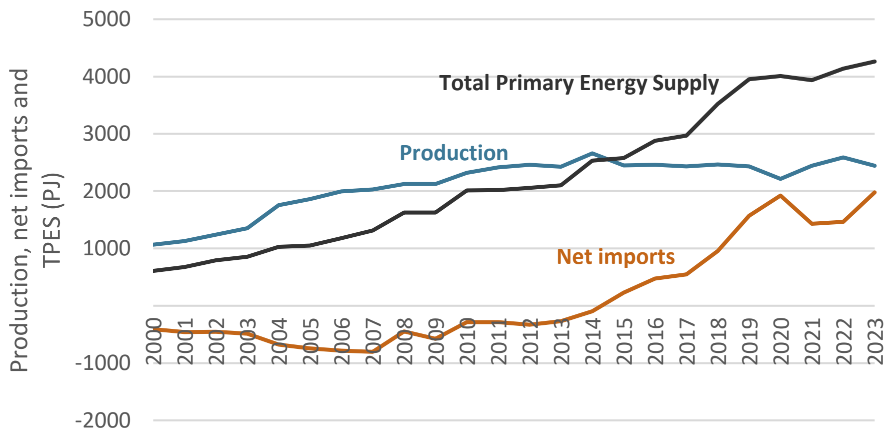
Note: Reserves are total proved reserves and reasonably assured recoverable resources for uranium.

Energy Supply and Consumption

Total Primary Energy Supply

With anticipated high economic growth continuing in the near term, securing reliable and affordable energy supplies remains a top priority for Viet Nam's government. As illustrated in Figure 1, total primary energy supply (TPES) increased at an average annual rate of 8.8% from 2000 to 2023. After peaking in 2014, indigenous energy production declined and plateaued, and energy imports grew thereafter. Although indigenous production rebounded in 2021 and continued to increase in 2022, this recovery proved short-lived, with output falling by 5.5% in 2023 compared with the previous year. In 2023, TPES grew by 3% compared to the previous year, reaching 4,262 Petajoules (PJ) (EGEDA, 2025).

Figure 1: Viet Nam's energy supply, production, and net imports (PJ), 2000 to 2023



Source: EGEDA (2025)

Viet Nam possesses extensive coal resources in the northern provinces, including anthracite and semi-anthracite coal in Quang Ninh and sub-bituminous coal in the Red River Delta regions. To date, most indigenous coal production occurs in the Quang Ninh coal basin, yielding approximately 40 million tonnes annually, representing 90% of the total coal output.

Currently, no production is occurring in the Red River Delta region due to technical and economic obstacles. The government's Development Strategy for the Coal Industry, outlining a vision through 2045, aims to launch pilot mining activities in the Red River coal basin before 2040. If these pilots succeed, large-scale industrial mining could begin prior to 2050 (DSCI, 2024).

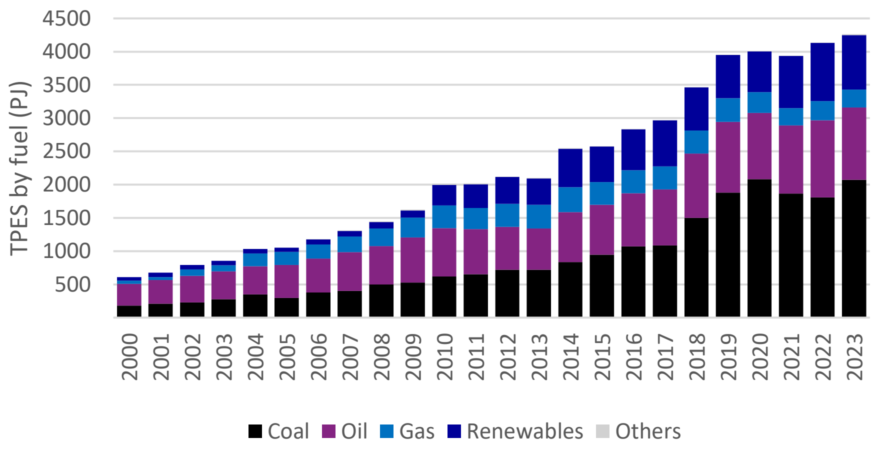
Crude oil and natural gas are primarily extracted offshore in southern Viet Nam. However, economically viable crude oil reserves are anticipated to be exhausted before 2030. A notable recent development in natural gas is the Ca Voi Xanh project in the central provinces of Quang Nam and Quang Ngai with initial gas production targeted after 2030.

Hydropower is the leading renewable energy source, accounting for roughly 29% of electricity generation in 2023. Viet Nam plans to leverage hydropower and other renewables to partially replace fossil fuels through increased electrification, aiming for net-zero emissions by 2050.

Viet Nam was a net energy exporter for several decades; however, since 2015, it has become a net energy importer. This shift is primarily due to significant growth in energy demand and a decline in domestic production. In recent years, energy imports have surged dramatically, apart from 2022 (see Figure 2), and are expected to continue to rise alongside demand growth in the coming decades. In 2023, net imports increased by 30% to meet the high energy demand.

In 2023, energy demand and consequently TPES continued to grow due to persistent industrial expansion. In recent years, coal-fired power plants and energy-intensive industries such as steel production, aluminium smelting, cement manufacturing, and fertiliser production have played a significant role in increasing coal supply. While coal supply increased by approximately 15% in 2023, the oil and gas supply declined by 6.4% and 5.6%, respectively, compared to the previous year.

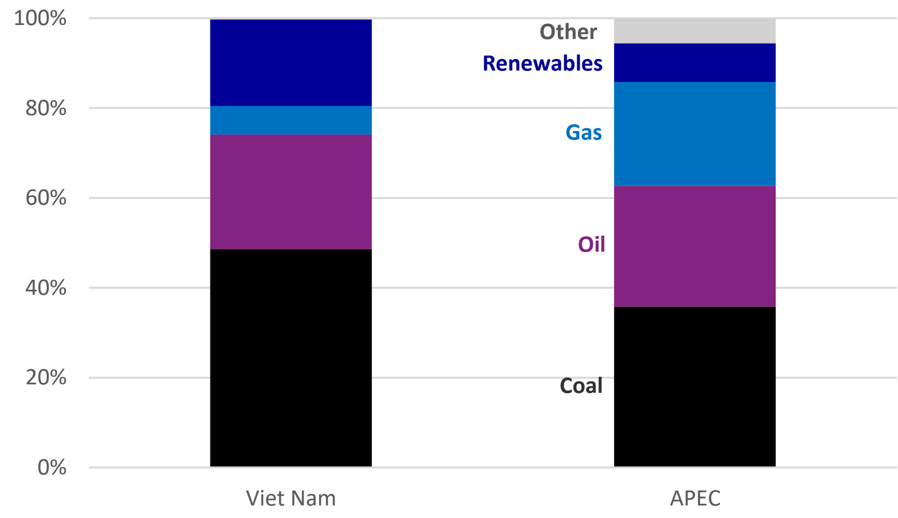
Figure 2: Viet Nam's energy supply by fuel (PJ), 2000 to 2023



Source: EGEDA (2025)

In contrast to the previous year, the renewables supply dropped from 873 PJ to 819 PJ in 2023 (EGEDA, 2025). This decrease is primarily attributable to transmission grid bottlenecks, a shift from a feed-in tariff (FIT) to new pricing mechanisms for new projects, and severe drought conditions that reduced overall hydropower output.

Figure 3: Energy supply mix – Viet Nam and APEC, 2023



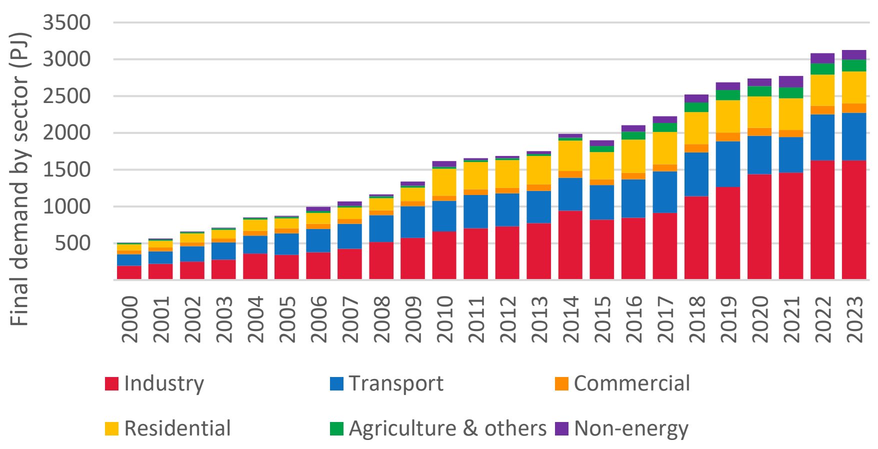
Source: EGEDA (2025)

Figure 3 illustrates the energy supply mix for Viet Nam and the APEC region in 2023. In Viet Nam, coal accounted for nearly 49% of the total energy supply in 2023, substantially higher than the ~36% share in the APEC region. Viet Nam's oil share was about 25.5%, which is 1.4% less than in the APEC region. Viet Nam's gas share was only 6.4%, considerably lower than the 23.1% for the APEC region. Conversely, renewables made up 19% of Viet Nam's energy supply, more than twice the APEC region's 8.6% average.

Total Final Consumption

Viet Nam's total final consumption, including energy and non-energy fuel use, increased by an average of 8.3% year-on-year from 2000 to 2023 (see Figure 4). This significant rise mainly reflects rapid growth in GDP and population. In 2023, total final consumption reached 3,127 PJ, a 4.1% increase compared to the previous year.

Figure 4: Viet Nam’s final consumption by sector (PJ), 2000 to 2023

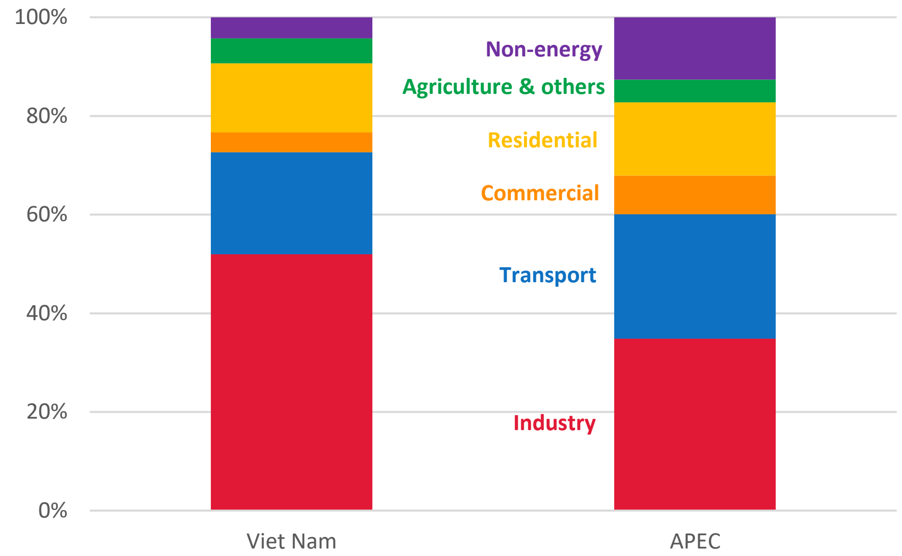


Source: EGEDA (2025)

In 2023, the industrial sector was the dominant end-use sector, accounting for 52% of total energy consumption in 2023, including non-energy uses. The transport sector followed, representing roughly 21%. For the buildings sector, the commercial sector constituted 4%, while the residential sector accounted for 14%. Agriculture, forestry, fishery, and other uses together made up only 5.2%.

Viet Nam's industrial energy consumption represents over half of the total final energy use at 52%, significantly exceeding the APEC average of 35%. This high level of industrial energy demand is driven by government policies aimed at accelerating industrialisation and modernisation. In comparison, the share of energy use in Viet Nam's transport sector is lower than the regional average in APEC.

Figure 5: Final consumption by sector, Viet Nam and APEC, 2023



Source: EGEDA (2025)

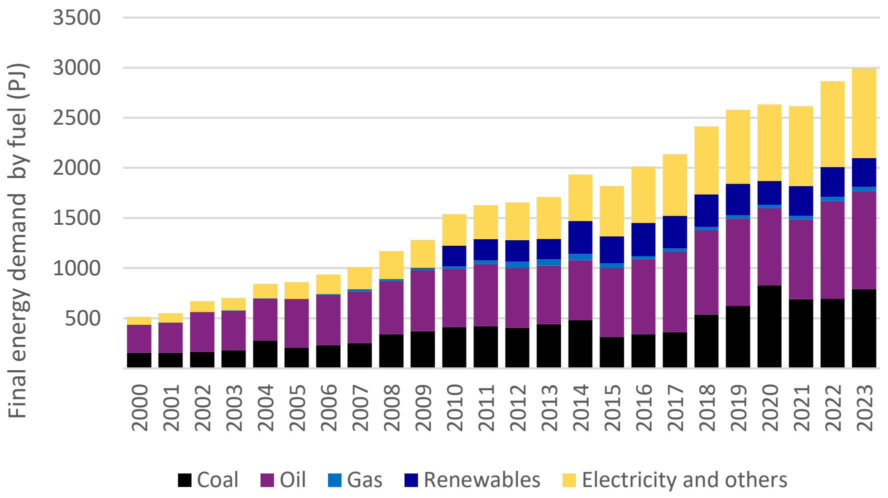
The energy consumption share in the residential and commercial sectors in Viet Nam was slightly lower than that of APEC, while agriculture and others had similar shares in Viet Nam and APEC.

The energy consumption in the non-energy sector in APEC had a larger share than that of Viet Nam.

Final Energy Demand

In 2023, fossil fuels accounted for 60% of Viet Nam’s final energy consumption (see Figure 6). Within this category, oil was the dominant source at approximately 33%, followed by coal at 26%, and minorly gas at 1.3%.

Figure 6: Viet Nam's final energy demand by fuel (PJ), 2000 to 2023



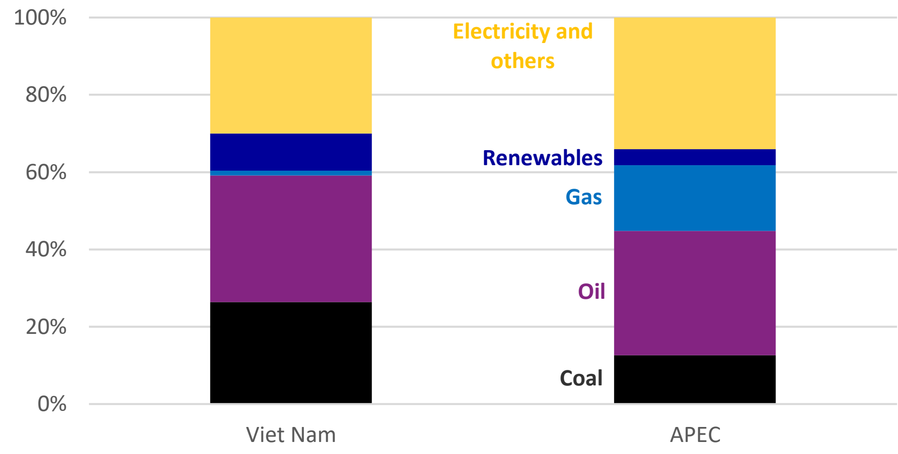
Source: EGEDA (2025)

Note: Figure 6 does not include non-energy sector consumption of energy products.

Electricity and other sources combined made up nearly 30% of the final energy demand. Additionally, renewable energy sources contributed to around 10% of Viet Nam's final energy consumption.

In 2023, coal comprised more than twice the share of final energy demand in Viet Nam compared to the APEC region (Figure 7). Additionally, Viet Nam's oil demand share was slightly higher than that of the APEC region. However, natural gas' share in Viet Nam was only 1.3% of its final energy demand, significantly below the APEC average of 17%. Conversely, Viet Nam's renewable energy share was over two times greater than that of the APEC region. The proportions of electricity and other energy sources showed only minor differences between Viet Nam and the APEC region average.

Figure 7: Final energy demand fuel share, Viet Nam and APEC, 2023



Source: EGEDA (2025)

Transformation

Power Sector

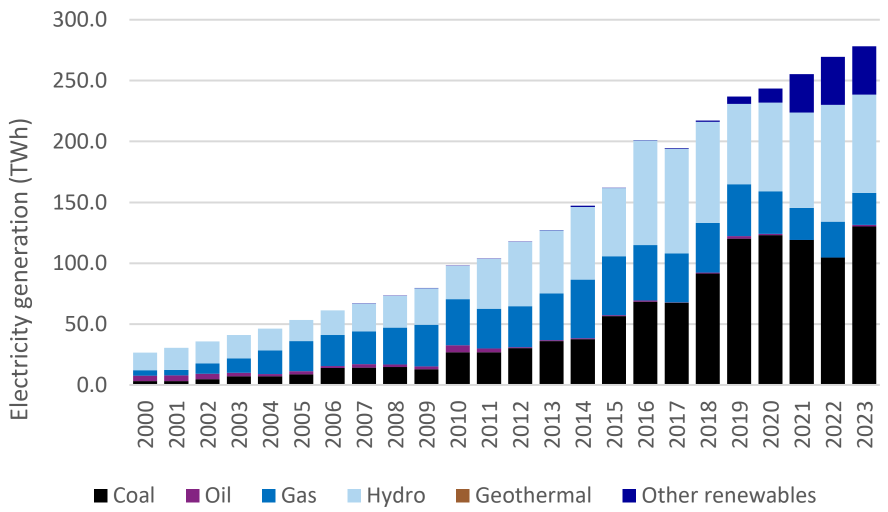
Figure 8 illustrates the electricity generation by fuel type in Viet Nam from 2000 to 2023. During this period, the electricity demand grew rapidly, with an annual increase of 11% (EGEDA, 2025). While the electric grid extends across Viet Nam, different generation technologies tend to be localised in specific regions due to the uneven distribution of domestic energy resources. Coal-fired power plants are mainly situated in the north, whereas gas-fired plants, along with solar and wind farms, are predominantly found in the south.

In 2023, Viet Nam produced approximately 278 terawatt-hours (TWh) of electricity, a 3.8% increase from the previous year. Fossil fuel-based power generation (coal, oil, and gas) made up half of the total mix (57%), followed by hydro at 29%. Renewable generation and other sources accounted for 14% of the total generation mix (EGEDA, 2025).

Viet Nam's power sector is still reliant on coal. Approximately 47% of the electricity production was generated from coal in 2023, representing an increase of nearly 14% per annum from 2010 to 2023 (EGEDA, 2025).

Before 2018, Viet Nam had limited solar and wind capacity. The introduction of the feed-in tariff mechanism significantly boosted solar installations starting in 2017. By the end of 2023, renewable energy capacity totalled 21,664 MW, representing 27% of the total installed generation capacity (EVN, 2023).

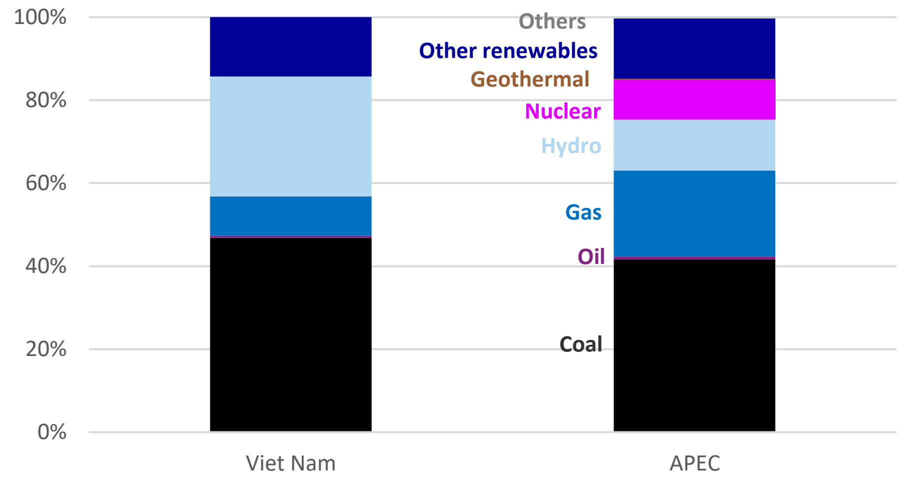
Figure 8: Viet Nam’s electricity generation by fuel, 2000 to 2023



Source: EGEDA (2025)

The Vietnamese government issued a new Power Development Plan PDP8 in May 2023 and subsequently revised it in April 2025. This plan outlines the path to Viet Nam’s 2050 net-zero carbon emission goal. According to the revised PDP8, Viet Nam plans to gradually reduce coal power generation and increase renewables, biomass, and hydropower energy, as well as energy storage.

Figure 9: Electricity generation fuel share, Viet Nam and APEC, 2023



Source: EGEDA (2025)

Viet Nam's electricity share from coal in 2023 was 5.2% lower than that of the APEC region, and its gas share was around half of the regional share (Figure 9). In 2023, hydropower comprised about 29% of Viet Nam's electricity generation, making it the second-largest source in the mix. This percentage is more than double APEC’s hydropower share. Additionally, wind, PV, and other bioenergy resources in Viet Nam produced slightly more electricity than the APEC regional average.

Energy Transition

Since COP26 in 2021, the government has introduced numerous new policies related to energy and climate change. These include the Action

Plan for Methane Emissions Reduction by 2030 (PMVN, 2022a), the National Climate Change Strategy to 2050 (PMVN, 2022b), the Ministry of Foreign Affairs' Climate Diplomacy Action Plan to implement Viet Nam's COP26 commitments from 2022 to 2025 (MOFA, 2022), the Construction Sector's Action Plan for Climate Change Response covering 2022-2030 with a vision to 2050 to fulfil COP26 commitments (MOC, 2022), the Ministry of Industry and Trade's Action Plan for COP26 commitments, the Scheme on Tasks and Solutions for COP26 results (MOIT, 2022), the Action Program on Green Energy Transition and Reduction of Carbon and Methane Emissions in Transportation (MOT, 2022), the National Power Development Plan for 2021-2030 with a vision to 2050 (PMVN, 2023), the Energy Master Plan for 2021-2030 with a vision to 2050 (NEMP, 2023), the Implementation Plan for PDP8 (PMVN, 2024a), the revised Electricity Law (EVNPECC, 2024), Coal Industry Development Strategy until 2030, with a vision to 2045 (PMVN, 2024b), Hydrogen Energy Development Strategy (PMVN, 2024c), the Politburo's Resolution No. 70-NQ/TW (The Central of Committee, 2025), and the revised Power Development Plan (PMVN, 2025), Resolution No. 253/2025/QH15 of the National Assembly on specific mechanisms and policies for domestic energy development for the 2026-2030 period (NAVN, 2025), and the revised National Energy Master Plan for 2021-2030 with a vision to 2050 (NEMP, 2026).

These new policies focus on potential solutions and measures to reduce CO_2 emissions while maintaining energy security, reliability, and affordability, particularly in sectors with high GHG emissions.

Emissions

As an industrialising economy, CO_2 emissions from energy-related sectors have grown six-fold over the past 23 years. In 2023, emissions reached 281 million tonnes, a significant increase from 45 million tonnes in 2000 (see Figure 10). Rising emissions levels have been driven by growing energy demand associated with rapid economic expansion and population growth. Persistent reliance on fossil fuels in the power and industrial sectors further complicates efforts to achieve net-zero emissions. Viet Nam’s power sector is responsible for over half of the total energy-related CO_2 emissions. The other key sectoral contributors are the industrial and transportation sectors.

In recent years, Viet Nam has implemented measures to reduce GHG in various sectors, especially the energy production and industry consumption sectors.

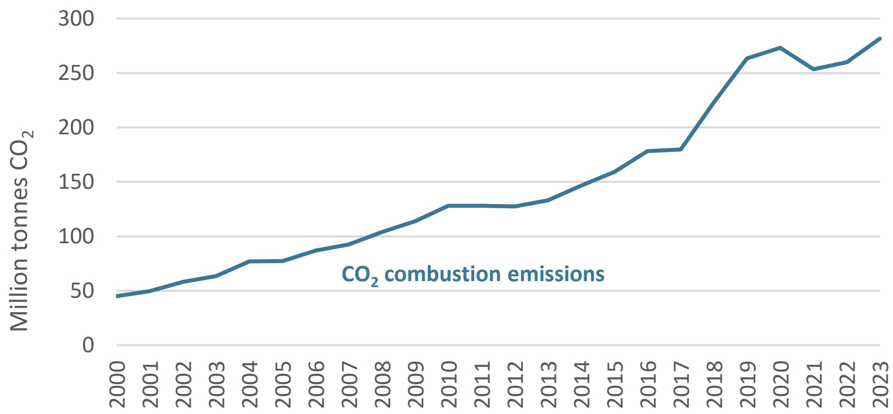
In the energy sector, key measures to reduce greenhouse gas emissions included accelerating the share of renewable energy, promoting energy savings and efficiency improvements, and minimising transmission losses. These efforts contributed to a reduction of 68 million tonnes of CO_2 equivalent ($MtCO_2eq$) in 2020 relative to the 2014 baseline.

In the industrial sector, two key strategies for reducing carbon emissions were replacing clinker in cement production and implementing advanced technologies in the chemical and steel industries. In 2020, the mining, construction, and chemical industries collectively achieved a reduction of 4 $MtCO_2eq$ (NDC, 2022).

Viet Nam first submitted its Intended Nationally Determined Contribution (INDC) in 2015 and signed and approved the Paris Agreement in 2016. Following the agreement's entry into force in November 2016, the INDC was revised into a Nationally Determined Contribution (NDC). Viet Nam updated its NDC in both 2020 and 2022. The 2022 update commits Viet Nam to cut greenhouse gas emissions by 16% below 2005 levels by 2030 using domestic resources, representing a substantial increase from the 2020 pledge. With financial assistance from international organisations, the emission reduction goal will further rise from 16% to 44%.

Currently, Viet Nam is actively finalising the draft of the Nationally Determined Contribution (NDC) 3.0 for the 2026–2035 period.

Figure 10: Viet Nam's CO_2 combustion emissions (million tonnes), 2000 to 2023



Source: EGEDA (2025)

Energy Security

Viet Nam became a net energy importer in 2015, and this dependence is expected to grow over the next decade, potentially accounting for 53%-60% of total primary fuel consumption by 2030. Viet Nam imports coal, crude oil, petroleum products, and liquefied natural gas (LNG), making energy import security a top priority for the Vietnamese government.

Reliance on imported fuels exposes Viet Nam to global price volatility and the risk of international supply disruptions. Reducing import dependence will strengthen the resilience of the economy's energy system.

To address these challenges, the revised PDP8 limits the expansion of new LNG-fired and coal-fired power capacity, while promoting domestic and renewable energy sources. Under the revised plan, solar and wind generation are expected to account for 38% and 28%, respectively, of Viet Nam's total installed capacity by 2050, supporting both energy security and emissions reduction goals.

In particular, the installed capacity of offshore wind power is expected to rise to 6 GW by 2030 and 139 GW by 2050, as Viet Nam plans to maximise the technical capacity of offshore wind power for electricity generation and new energy production. The revised PDP8 also emphasises the use of renewables to generate new energy (hydrogen, green ammonia), which will become a "new economic sector" for Viet Nam for both domestic and export demand (PDP8, 2025).

Nevertheless, renewable energy generation is inherently variable and requires complementary sources to maintain a reliable electricity supply during the night, cloudy periods, or low-wind conditions. These balancing sources include hydropower, battery storage, and thermal generation (coal- and gas-fired power plants). As a result, domestic coal and natural gas production remains important during this transitional period to prevent energy supply disruptions in Viet Nam.

In October 2023, in a ceremony attended by the Prime Minister, Petrovietnam and its partners signed an agreement to launch the Block B-O Mon gas-to-power value chain project, following more than 20 years of negotiations. The nearly USD 12 billion project in southwest Viet Nam is expected to supply approximately 5.1 billion cubic meters (bcm) of natural gas annually to gas-fired power plants with a total capacity of 3,800 MW. Its component projects are also expected to help upgrade infrastructure, generate thousands of jobs, and promote economic restructuring in many localities (Vietnam Energy, 2023).

On 6 January 2026, Murphy Oil announced a historic oil discovery at the Hai Su Vang (HSV-2X) appraisal well in Block 15-2/17 of the Cuu Long Basin, located 40 miles offshore from Ho Chi Minh City. With estimated recoverable resources exceeding 430 million barrels of oil equivalent (MMBOE), this is potentially the largest discovery in the ASEAN region in 20 years. The HSV-2X well encountered 429 feet of net oil pay and achieved a test flow rate of 6,000 barrels of oil per day. Murphy Oil CEO Eric Hambly described this as a "pivotal moment" for the company's operations in Viet Nam (Business, 2026).

APEC Energy Goals

There are two energy-related objectives that APEC member economies have agreed to meet as a collective: to improve energy intensity and double the share of modern renewables.

Energy Intensity Goal

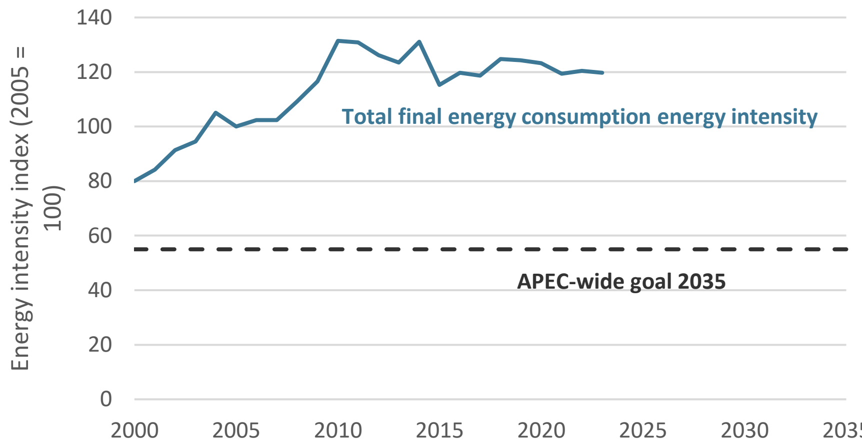
In 2011, APEC member economies agreed to increase their ambition to reduce energy intensity by 45% in 2035, relative to a 2005 baseline. The original goal was a 25% improvement by 2030, relative to a 2005 baseline.

APEC is progressing toward its goal of improving energy intensity. While the target does not specify individual economy objectives, it allows for monitoring each APEC economy's progress in relation to the overall proportional improvement.

Viet Nam implemented the National Energy Efficiency Program and the Law on Energy Efficiency and Conservation in 2006 and 2010, respectively (NAVN, 2010; PMVN, 2006). Viet Nam's total final energy consumption intensity improved over the 2011-23 period, decreasing by approximately 1%. Nevertheless, its final energy consumption intensity remains high compared to other economies.

Viet Nam has approved the National Program on Energy Efficiency and Conservation for 2019-2030. The initiative aims to reduce overall energy consumption by 8%-10% and keep electricity losses below 6% (PMVN, 2019). It also supports APEC's goal of decreasing energy intensity.

Figure 11: Viet Nam's total final energy consumption intensity index, 2000 to 2023 (2005 = 100)



Source: EGEDA (2025)

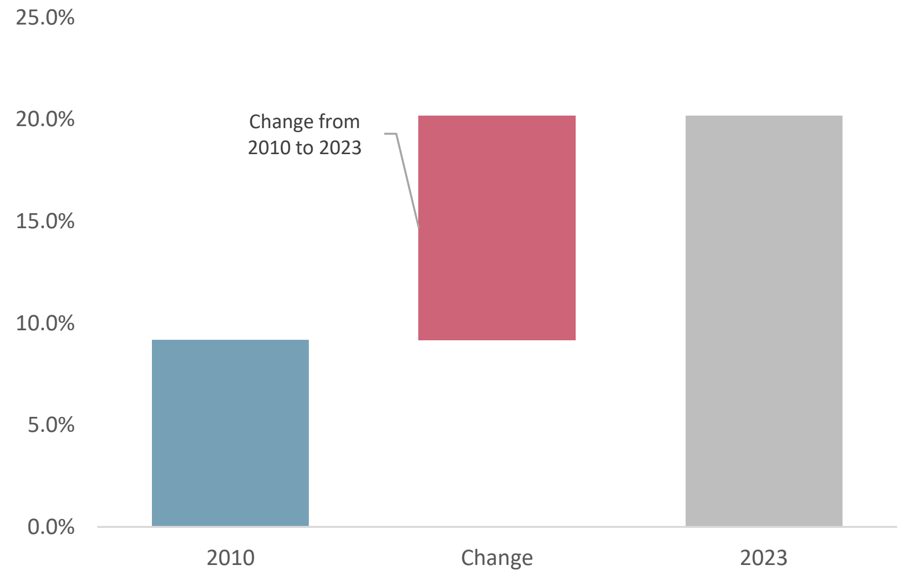
Doubling of Renewables

The second energy goal involves doubling the share of modern renewables in the APEC energy mix for the period 2010 to 2030. There is no economy-level goal for individual member economies, but improvements by individual economies will contribute to the doubling goal.

Viet Nam has a higher renewable energy base compared to the APEC region average, with a share of 9.2% in 2010 (see Figure 12), compared to APEC's 6%. By 2023, the share increased to approximately 21%, making Viet Nam's share 2.4 times greater than in 2010.

According to the NEMP, renewables are projected to constitute 15% to 20% of TPES by 2030 and 80% to 85% by 2050. This growth will help APEC achieve its goal of doubling its renewable share by 2030.

Figure 12: Viet Nam's modern renewable energy share, 2010 and 2023

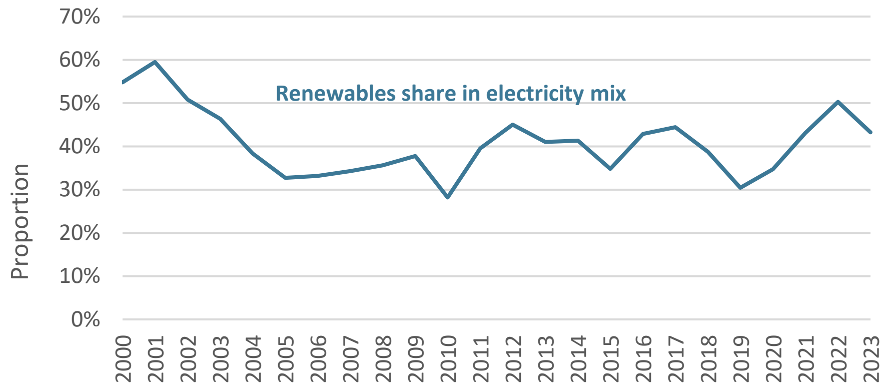


Source: EGEDA (2025)

Note: Biomass used in the residential and commercial sectors is assumed to be traditional biomass and is not included in the definition of modern renewables. All other renewables (biomass used by industry, hydro, geothermal, etc.) are considered modern renewables. Modern renewables also include the share of electricity that is generated from renewable sources.

Viet Nam has committed to achieving net-zero emissions by 2050 and intends to boost the share of renewable energy in its revised PDP8. The economy holds considerable potential for renewables, with the possibility of integrating over 90% of domestic solar, wind, and pumped storage hydropower into its electricity grid. The costs, though, of this ambitious vision remain uncertain.

Figure 13: Viet Nam's renewable generation share, 2000 to 2023



Source: EGEDA (2025)

In Viet Nam, the share of electricity generated from renewables (including hydro) decreased significantly from 55% in 2000 to 29% in 2010, before rising again to 43% in 2023 (Figure 13).

The reductions resulted from the limited remaining potential for large-scale hydropower development in Viet Nam and the electricity demand growing faster than the installation of solar and wind capacity, along with the necessary transmission infrastructure. Although solar and wind energy have seen recent growth, their expansion has not kept pace with the increasing demand for electricity.

Energy Policy

Energy Policy	Details	Reference
The Politburo's Resolution No. 70-NQ/TW	The new resolution defines energy security as a core pillar of security that is directly linked to political stability, economic growth, defence, and global integration.	Electricity Authority of Viet Nam
New Electricity Law	Viet Nam's new Electricity Law addresses the aching challenges Viet Nam's energy sector currently faces, especially by creating a strong legal framework to support clean energy development. It is seen as a prominent replacement for the outdated law that has been in force for nearly twenty years.	Vietnam Briefing
Law on Environmental Protection	This law provides statutory provisions on environmental protection activities, measures and resources used for the purpose of environmental protection, rights, powers, duties, and obligations of regulatory bodies, agencies, organisations, households, and individuals who are tasked with environmental protection.	Ministry of Natural Resources Environment
National Program on Economical and Efficient Use of Energy for the Period 2019-2030	This programme is to promote the economical and efficient use of energy by means of state management duties and solutions, technical assistance, scientific and technological research, product development, market transformation, and human resource training and development.	Viet Nam Government Portal
National Climate Change Strategy to 2050	The strategy sets the overall targets to minimise the effects or damage caused by climate change, reaching net-zero emissions by 2050.	Viet Nam Plus
National Green Growth Strategy for the period 2021-2030, with a vision by 2050	The strategy focuses on efforts to restructure the economy in conjunction with renewing the growth model, reducing the intensity of greenhouse gas emissions, and striving towards a green and carbon-neutral economy.	FAO
Viet Nam's Action Plan on Methane Emissions Reduction by 2030	The action plan targets methane emissions in cultivation, animal husbandry, solid waste management, wastewater treatment, oil and gas exploitation, coal mining and fossil fuel consumption. Total methane emission volume should not exceed 96 million tonnes of CO_2 equivalent in 2025, down 13% from 2020.	Viet Nam Plus

National Power Development Plan for 2021-2030, with a vision to 2050	On 15 May 2023, the Government of Viet Nam issued Decision 500/QD-TTg, approving a new National Power Development Plan (PDP8) for 2021-30, with a vision to 2050. The overall goal of PDP8 is to ensure domestic energy security and meet the requirements of socioeconomic development, industrialisation, and the modernisation of the economy. Commercial electricity consumption is projected to be approximately 335 TWh by 2025, around 505 TWh by 2030, and between 1114 to 1254 TWh by 2050. Electricity production and import is projected to be approximately 378 TWh by 2025, around 567 TWh by 2030, and between 1224 and 1378 TWh by 2050. Renewable energy generation is expected to reach approximately 31% to 39% by 2030 and could increase to between 68% and 72% by 2050.	Viet Nam Electricity
National Energy Master Plan (NEMP) for the 2021-2030 period, with a vision to 2050	In July 2023, the government approved the NEMP for the 2021-2030 period, with a vision to 2050 via Decision No. 893/ QD-TTg. The NEMP sets out specific targets in the energy sector, including oil and gas, coal, electricity, and renewable energy. The NEMP estimates that Viet Nam's total final energy demand will hit 107 Mtoe by 2030 and 165 to 184 Mtoe by 2050. Viet Nam intends to ensure its energy supply exceeds these estimates, aiming to have a TPES equivalent to 155 Mtoe by 2030 and 294 to 311 Mtoe by 2050	Government News
Master Plan on Exploration, Exploitation, Processing and Use of Minerals in 2021-2030, with a vision to 2050	The government has approved the Master Plan on Exploration, Exploitation, Processing and Use of Minerals in 2021-30, with a vision to 2050 via Decision No. 866/QD-TTg. The plan sets out the overall objectives for mineral development as well as the objectives and requirements for exploration, exploitation and processing for specific minerals (such as bauxite, titanium, rare earths, gold, copper, nickel, tin, wolfram, antimony, lead, zinc, etc.).	Viet Nam Plus
The Development Strategy of the Coal Industry to 2030 with a vision to 2045	Coal output is expected to be between 45 and 50 million tonnes by 2030, and between 38 and 40 million tonnes in 2031-2045. Under the strategy, the industry will focus on exploration for upgrading existing coal resources along with new coal mines. A goal set by the strategy is to start pilot exploitation in the Red River coal basin before 2040 and to proceed with industrial-scale mining before 2050 if the trial is successful.	Viet Nam News
Viet Nam's National Energy Development Strategy by 2030 with a Vision towards 2045	On 1 March 2024, the Prime Minister issued Decision No. 215/QĐ-TTg approving the National Energy Development Strategy of Viet Nam until 2030, with a vision to 2045. This decision is to implement the Politburo of the Communist Party of Viet Nam 's Resolution No. 55-NQ/TW dated 11 February 2020 on orientation of the National Energy Development Strategy of Viet Nam to 2030, with a vision to 2045. This strategy aims at (i) ensuring energy security for socio-economic development, (ii) prioritising fast and sustainable energy development, (iii) adapting to climate change and aligning with the net zero emissions target by 2050; and (iv) using energy efficiently, and environmentally friendly which deemed as an important policy and the responsibility of the whole society.	LawNet

Viet Nam’s Hydrogen Energy Development Strategy to 2030 and Vision to 2050	The Hydrogen Energy Strategy was developed based on the National Energy Development Master Plan, which lays out the foundation for the Vietnamese energy sector, including oil and gas, coal, electricity, and renewable energy, for the period from 2021 to 2030, with a vision to 2050. The overarching goal of the Hydrogen Energy Strategy is to develop the various stages of Viet Nam’s hydrogen energy ecosystem, including production, storage, transportation, distribution, domestic use, and export. This development aims to help ensure energy security, achieve domestic goals on climate change and green growth, and achieve Viet Nam’s 2050 net-zero emissions target.	Vietnam Briefing
Revised The Power Development Plan for 2021-2030, with a vision to 2050	The revised Power Development Plan aims to ensure energy security for the government's economic growth target. Regarding domestic energy security, the revised PDP8 sets the objective of fully meeting domestic electricity demand to support socio-economic development. From 2026–2030, average annual GDP growth is projected at approximately 10%, and around 7.5% for the period 2031-2050. Commercial electricity output is projected to reach approximately 500.4-557.8 billion kWh by 2030, and around 1,237.7-1,375.1 billion kWh by 2050. Total electricity generation and imports are estimated at 560.4-624.6 billion kWh in 2030, increasing to about 1,360.1-1,511.1 billion kWh by 2050. Peak load capacity is forecast to reach 89,655-99,934 MW by 2030 and 205,732-228,570 MW by 2050.	Viet Nam Government Portal
Coal Industry Development Strategy until 2030, with a vision to 2045	Coal output is expected to be between 45 and 50 million tonnes by 2030, and between 38 and 40 million tonnes in 2031-2045.	Vietnam Plus
The Politburo Resolution No. 70-NQ/TW	This resolution establishes the strategic framework for ensuring domestic energy security through 2030, with a vision to 2045. It marks a shift toward a more comprehensive approach to energy security, emphasising system resilience, sustainability, and diversification of energy sources. The resolution sets a target for renewable energy to account for approximately 25–30% of total primary energy supply by 2030, while promoting the development of a balanced energy mix and the adoption of advanced energy technologies.	Electricity Authority of Viet Nam
The National Assembly Resolution No. 253/2025/QH15	This resolution introduces a set of special mechanisms and policies designed to accelerate energy development during the 2026–2030 period. It aims to remove institutional bottlenecks by streamlining investment procedures, enhancing planning flexibility, and enabling faster project implementation. Key provisions include expanded and liberalized Direct Power Purchase Agreements (DPPA), preferential mechanisms for offshore wind development, and increased	Electricity Authority of Viet Nam

	flexibility in adjusting power planning. The resolution also opens emerging technologies, including small modular nuclear reactors (SMRs), to broader participation, including the private sector.	
Revised The National Energy Master Plan for the period 2021-2030, with a vision to 2050	The revision aligns energy planning with ambitions for sustained double-digit economic growth, while prioritising energy security by ensuring that supply capacity is developed ahead of industrial demand. The plan also advances the transition toward a competitive energy market, including the phased removal of price subsidies. In addition, it emphasises the expansion of strategic petroleum reserves to approximately 90 days of net imports by 2030.	Ministry of Industry and Trade

Notable Energy Developments

Energy Development	Details	Reference
The Nuclear power is included in the Adjusted PDP8 (2025)	In April 2025, the Government officially amended Power Development Plan VIII (PDP8) to re-include nuclear power (Decision 768/QD-TTg). Moving away from the "no-nuclear" stance of the early 2020s, the revised plan now explicitly targets the operation of the Ninh Thuan 1 & 2 nuclear power plants (approx. 4,000-6,400 MW) between 2030 and 2035.	Vietnam Briefing
First Commercial LNG Power Plants Now Operational (2025)	After years of delays, Viet Nam officially joined the global LNG importer club in 2025. The Nhon Trach 3 and 4 power plants (Dong Nai province) achieved commercial operation in mid-2025. These are the economy's first thermal plants fuelled entirely by imported LNG. With a combined capacity of over 1.6 GW, these plants are critical for stabilising the southern grid. Furthermore, the government is currently finalising a mechanism to guarantee 75% offtake for future LNG projects, a crucial "bankability" factor that foreign investors have been demanding.	Petrovietnam
A Workable Direct Power Purchase Agreements (DPPA) Mechanism (Decree 57/2025)	In March 2025, the Government issued Decree 57/2025/ND-CP to significantly expand eligibility. It permits biomass, along with wind and solar, to participate and, importantly, removes the strict "building alteration" permits that previously delayed rooftop solar industrial parks. Large consumers can now purchase power directly from renewable generators through private lines (physical DPPA) or the domestic grid (virtual DPPA) with much clearer tariff structures.	Vietnam Electricity

Useful Links

Government of Viet Nam – http://chinhphu.vn/portal/page/portal/chinhphu/trangchu

Ministry of Industry and Trade – www.moit.gov.vn/

National Energy Efficiency Program (VNEEP) – http://vneec.gov.vn/

Electricity Regulatory Authority of Viet Nam (ERAV) – www.erav.vn/

National Load Dispatch Centre (NLDC) – https://www.nldc.evn.vn/

Viet Nam Electricity (EVN) – www.evn.com.vn

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Viet Nam Oil and Gas Group (PVN) – www.pvn.com.vn

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