Asia-Pacific Economic Cooperation

APERC Asia Pacific Energy Research Centre

APERC Update

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Outline

- Energy intensity and renewable energy share projections from the APEC Energy Demand and Supply Outlook 8th Edition
- Recent policy developments on energy efficiency and renewable energy
- Preparing the APEC Energy Demand and Supply Outlook 9th Edition

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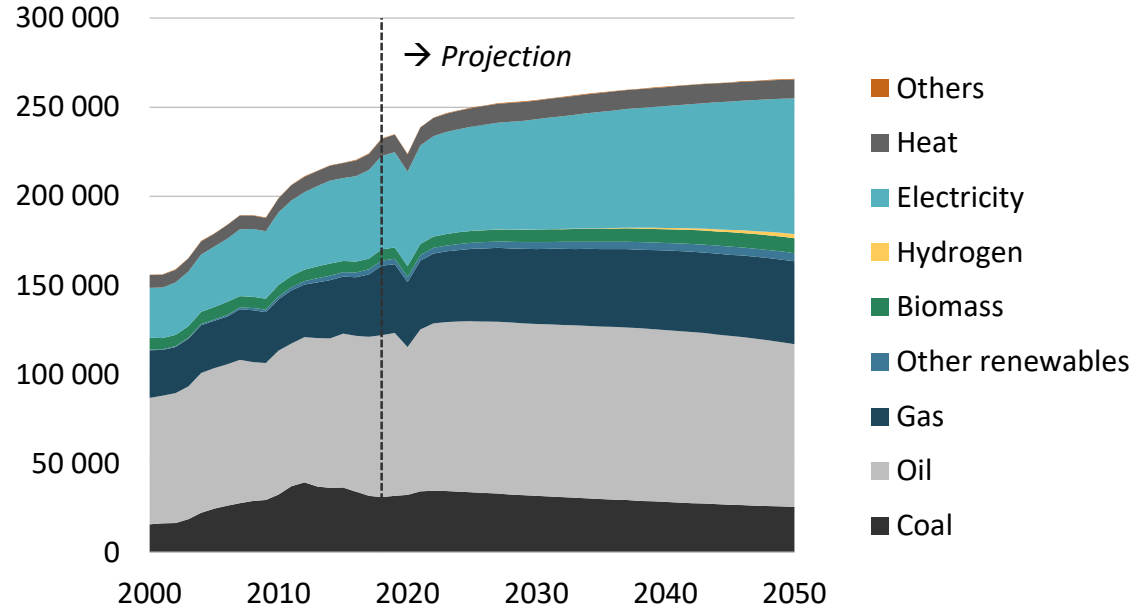
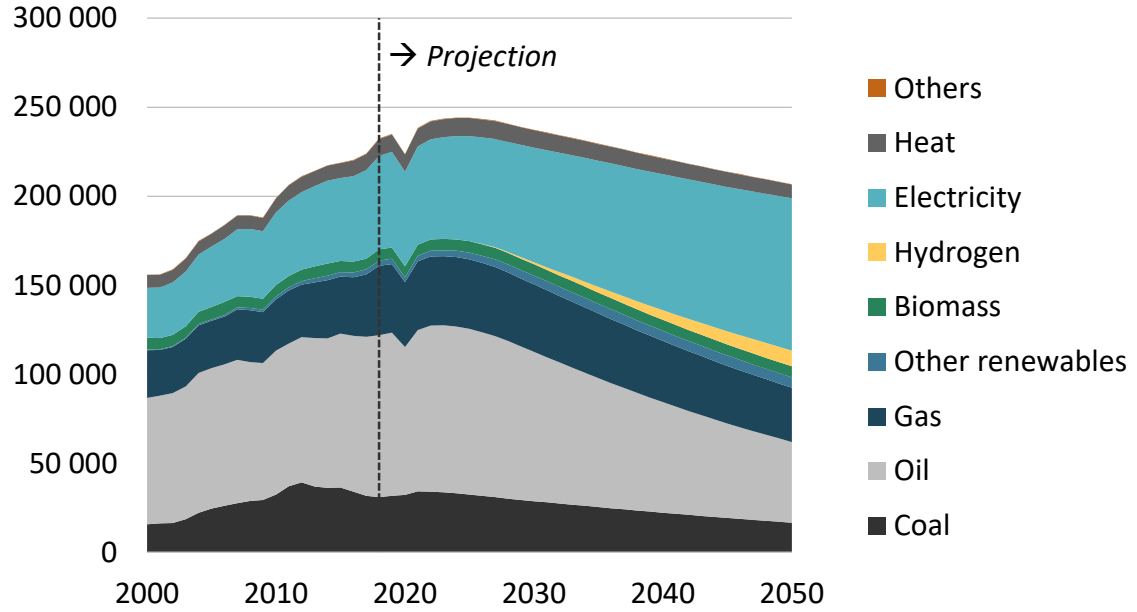
Energy demand decouples significantly from economic activity

Energy demand by fuel in REF (PJ)



Energy demand by fuel in CN (PJ)

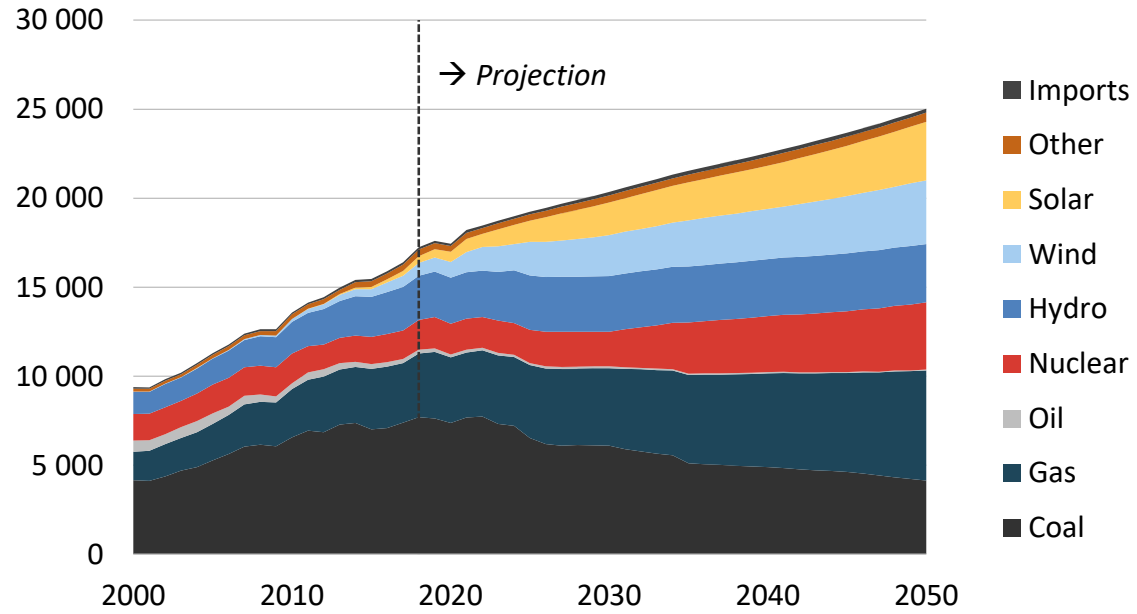


- In CN, energy efficiency and electrification enable energy demand to be 22% lower in 2050 relative to REF.
- In CN, energy use peaks in 2025.

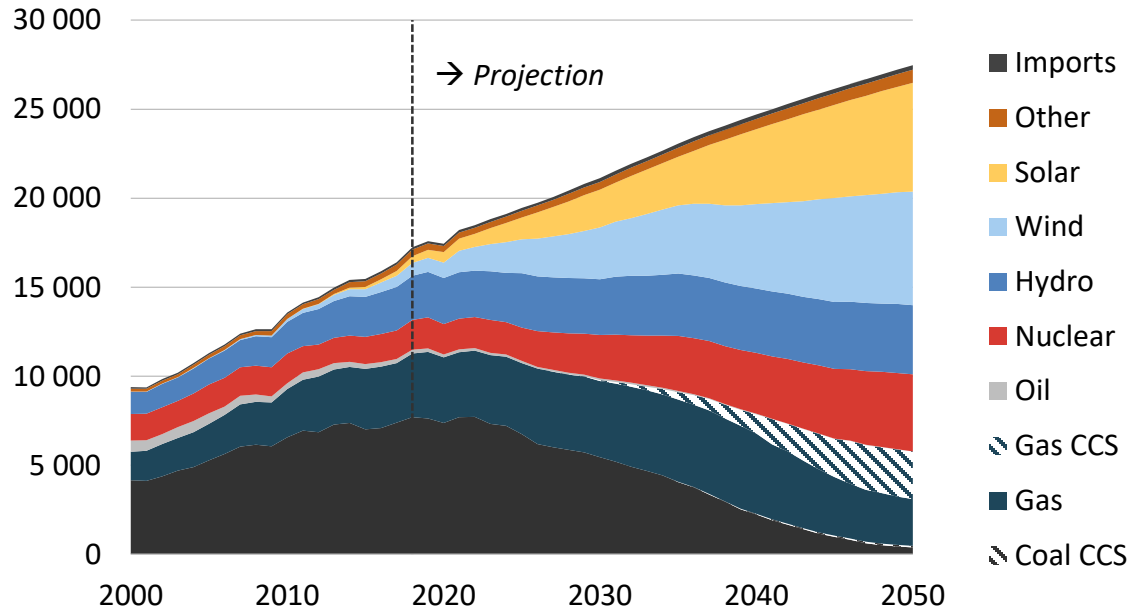
Note: Carbon Neutrality (CN) Scenario

Electricity demand is increasingly met with generation from wind and solar . . .

Electricity generation in REF (TWh)



Electricity generation in CN (TWh)

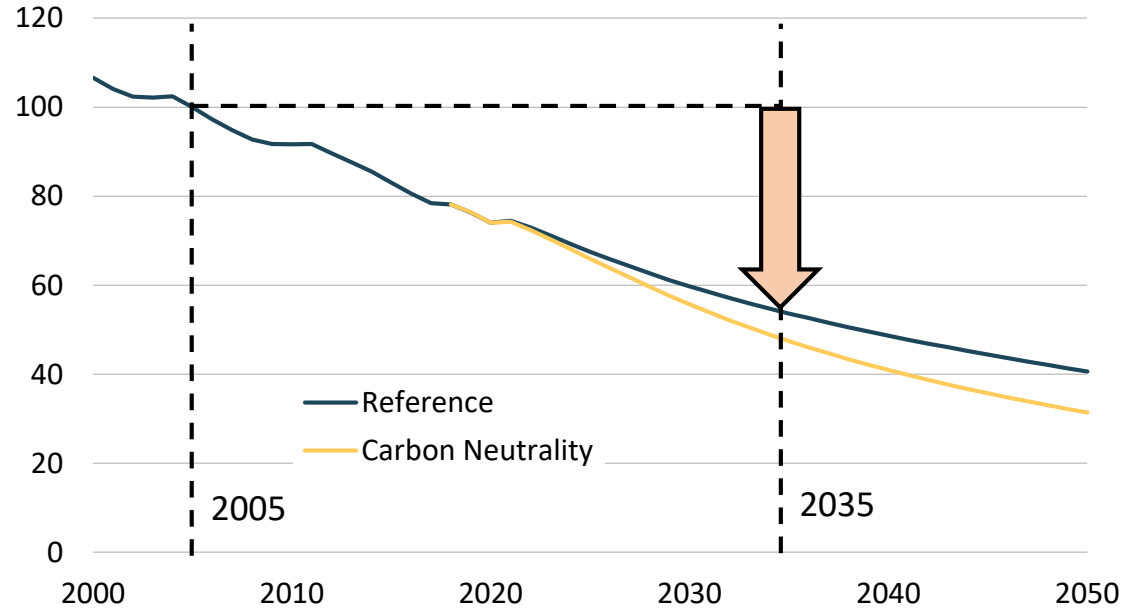


- Growth in electricity generation to meet increased demand, primarily in buildings and transport.
- Natural gas substitution for coal continues and provides balancing and ancillary services to the electric grid.

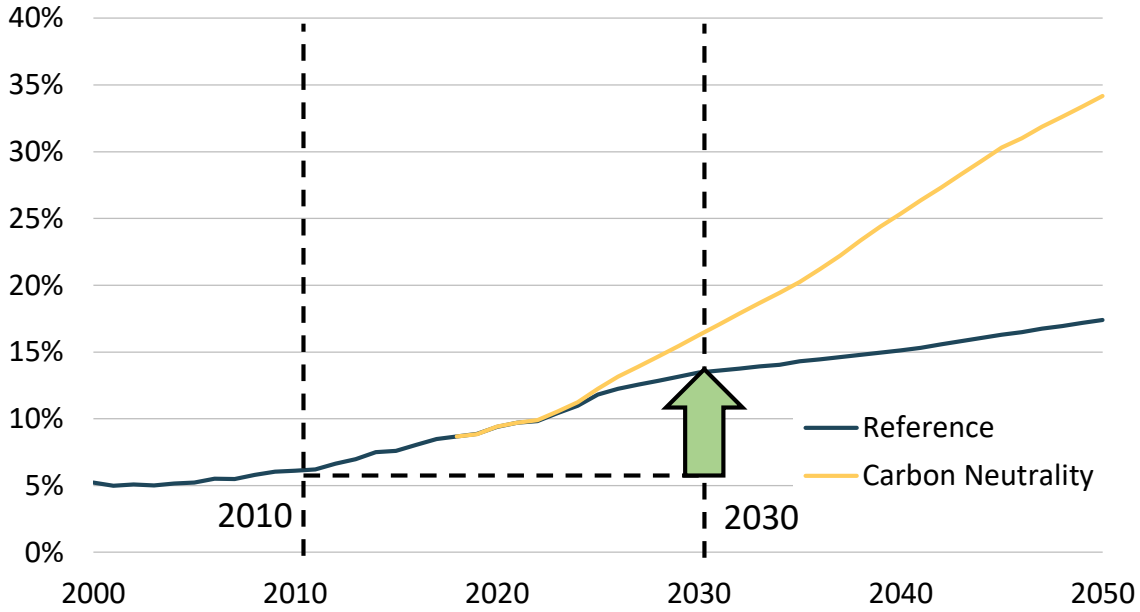
Note: Carbon Neutrality (CN) Scenario

APEC projected to meet dual energy goals

Final energy intensity (2005 = 100)



Share of modern renewable energy



- Final energy intensity declines 45% by 2034 in REF and by 2031 in CN
- Modern renewable energy share doubles by 2026 in REF and by 2025 in CN

Summary

Renewable energy share driven primarily by RE electricity generation in two economies.

Achieving the renewable energy share target is relatively straightforward while attaining the energy intensity target carries a higher level of risk.

Outlook results indicate that APEC is on track to meet both energy goals

APERC will continue to track both energy intensity and the renewable energy share

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Recent policy developments on Energy Efficiency in APEC

Information

(AUS) Commercial Building Disclosure: 1000 sqm or more office space should provide EE information for sale or lease.

(CT) Building Energy-Efficiency Rating System:
Buildings that wish to obtain a green building label must provide energy efficiency information.

Incentives

(CDA) Greener Homes Initiative: Provide grants and loans to help owners renovate but must undertake both a pre- and post-retrofit energy evaluation and launch Oil to Heat Pump financial supports for low-income groups.

(USA) Inflation Reduction Act: on energy efficiency and electrification: Provide tax credits for EVs, Energy Efficient Home, and Electrification.

Regulation

(JPN) Revised Act on Rationalization of Energy Use: Require significant energy users to report non-fossil-fuel usage, submit an energy transition plan, and encourage the demand response measures.

(PRC) Benchmarking Levels for Energy Efficiency in Industry Key Areas: expanding and improving benchmarking levels **from 25 to 36 fields.**

Source: APERC Energy Overview 2023 (2023) and other news websites.

Recent policy developments on Renewable Energy in APEC

Market-based

(JPN) Introduction of Feed-in Premium (FIP): Introduce the FIP system to encourage power generation linked to market prices to reflect the actual cost.
(e.g. non-fossil value, balancing cost)

(ROK)Renewable Energy Bidding System: Introduce renewable energy generators (greater than 3MW) to participate in the electricity bidding market to stabilize the supply and demand of the electricity market.

Incentives

(CDA) Clean Energy Technology & Clean Electricity Investment Tax Credit: 15%~30% refundable invest. tax credits are funded by the federal government

(USA) National Clean Investment Fund & Clean Communities Investment Accelerator : capitalize on clean energy financing and invest. and support underserved communities. (Part of IRA)

Regulation

(CT) Renewable Energy Dept. Act (Revs.):

1. Major electricity users (>5000 kW) must install above 10% of the contracted capacity of RE, energy storage, or procure T-RECs;
2. New buildings are required to install a specific capacity of solar panels.

Note: RECs (Renewable Energy Certificates)

Source: APERC Energy Overview 2023 (2023) and other news website.

Takeaways

Energy efficiency policies can progressively enhance the clarity of energy-related information, guiding consumers toward more energy-efficient choices.

Electrification and demand response have been integrated into current energy efficiency regulations and incentive programs.

Renewable energy policies have considered the intermittency of renewable energy to mitigate the potential impacts on the power grid.

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Preparing the Outlook 9th Edition

- Since the 1st edition was published in 1998, the APEC Energy Outlook has responded to global trends.
  - From 6th to 8th edition of the APEC Energy Outlook, the scenarios have continuously updated.
- APERC provide two potential energy pathways for the **APEC Energy Outlook 9th Edition**.
  - The projection period for the Outlook 9th Edition is until **2060**
  - Considering the critical technology development trends (CCS, Energy storage, EV and Hydrogen)

	6th	7th	8th	9th
Period	2013-2040	2016-2050	2018-2050	2021-2060
Base year	2013	2016	2018	2021
Scenarios	Business-as-Usual (BAU) Improved Efficiency (IE) High Renewables (HR) Alternative Power Mix (APM)	Business-as-Usual (BAU) APEC Target (TGT) 2-Degrees Celsius (2DC)	Reference (REF) Carbon Neutrality (CN)	Reference (REF) Target(TGT)
Publication	2016	2019	2022	2025

Main objectives for Outlook 9th Edition

- **Two core objectives are:**
  1. Estimate energy demand and supply trends
  2. Estimate progress on APEC energy-related goals

- **Additional objectives are:**
  1. Estimate CO2 emissions from energy combustion
  2. Quantify the decarbonization of power sector. (discussing new APEC target)
  3. Provide a rough estimate of fugitive methane emissions from the supply side
  4. Estimate the capital investment in key sectors
  5. Communicate challenges and opportunities along policy pathways

Scenario in the 9th Edition

The Reference scenario (REF)

- A set of economy-specific pathways where existing policies are retained, and new policy measures are included if and only if they are supported by implementation details.
- In the absence of details, energy intensity, fuel switching, investment, technology deployment, and energy supply are assumed to loosely follow historical trends.

The Target scenario (TGT)*

- Illustrates a hypothetical pathway for each economy towards realizing energy-related policy targets, even if implementation details are not available.
- When details are not available, economy targets provide directional guidance and a general sense of policy priorities to inform assumptions.

Next Steps

- **Scenario assumption setting:** APERC researchers are creating scenario assumptions for each economy and may reach out to economy representatives for feedback

- **Analysis:** modeling scenarios for each economy and have several internal discussions.

- **External reviews:** APERC researchers will share preliminary results with economy representatives

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Thank you.

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