Asia-Pacific Economic Cooperation

APERC Asia Pacific Energy Research Centre

13.a Report on Progress toward Energy Intensity Reduction Goal, Renewable Energy Doubling Goal, and Renewable Energy Capacity Tripling Goal

The 69th Meeting of APEC Energy Working Group (EWG69)

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Outline

- Progress toward APEC's **energy intensity goal**
- Progress toward APEC's **renewable energy doubling goal**
- Starting point for declaration to pursue and encourage efforts to **triple global renewable energy capacity by 2030**

Progress toward APEC's energy intensity goal

APEC's final energy intensity continues to decline

Annual change in APEC final energy intensity, 2006-22

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2005-22
Change in Final Energy Consumption (FEC)	2.5%	3.5%	0.8%	-1.0%	5.6%	4.2%	1.9%	1.4%	0.8%	0.6%	0.5%	1.2%	2.8%	0.2%	-4.2%	4.6%	2.3%	30.9%
Change in GDP (PPP, constant 2021 US dollars)	5.3%	5.5%	3.0%	-0.3%	5.7%	4.2%	4.2%	3.9%	3.8%	3.7%	3.4%	4.0%	4.1%	3.4%	-1.3%	6.2%	2.5%	82.3%
Change in final energy consumption intensity	-2.7%	-1.9%	-2.1%	-0.7%	-0.1%	0.0%	-2.2%	-2.4%	-2.9%	-2.9%	-2.8%	-2.8%	-1.3%	-3.1%	-3.0%	-1.5%	-0.2%	**-28.2%**

Sources: APEC statistics (EGEDA), WB (GDP PPP), CT (WEO), APERC analysis

- *GDP growth in 2022 was lower than all except two years since 2005.*
- *The drop in energy intensity was also considerably lower than the historical average.*
- *We still expect APEC to meet its energy intensity goal by 2035.*

Primary energy intensity is now declining more slowly

Annual change in APEC primary energy intensity, 2006-22

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2005-22
Change in Primary Energy Supply (PES)	2.6%	3.3%	0.6%	0.2%	5.0%	3.9%	0.9%	1.5%	0.2%	-0.5%	0.4%	1.8%	3.4%	1.7%	-2.2%	5.4%	2.1%	34.9%
Change in GDP (PPP, constant 2021 US dollars)	5.3%	5.5%	3.0%	-0.3%	5.7%	4.2%	4.2%	3.9%	3.8%	3.7%	3.4%	4.0%	4.1%	3.4%	-1.3%	6.2%	2.5%	82.3%
Change in primary energy supply intensity	-2.6%	-2.0%	-2.4%	0.6%	-0.7%	-0.3%	-3.2%	-2.2%	-3.5%	-4.0%	-3.0%	-2.1%	-0.7%	-1.6%	-0.9%	-0.7%	-0.4%	**-26.0%**

Sources: APEC statistics (EGEDA), WB (GDP PPP), CT (WEO), APERC analysis

- *The decline in primary energy intensity was also smaller than average, but the change was not as dramatic as the change in final energy intensity.*

Progress toward APEC's renewables doubling goal

Renewable energy continues to gain share

Primary energy supply, PJ

	2010	2022	% change
Non-renewables	**285,340**	**332,493**	**16.5%**
Coal	115,508	127,966	10.8%
Oil	90,050	98,578	9.5%
Gas	60,640	85,041	40.2%
Other non-renewables	19,142	20,909	9.2%
Traditional biomass	**3,131**	**2,528**	**-19.2%**
Modern renewable energy	**14,570**	**29,268**	**100.9%**
Modern biomass	4,140	6,845	65.3%
Hydro	6,357	9,157	44.0%
Geothermal	1,453	1,838	26.5%
Solar	157	3,319	2016.6%
Wind	586	4,807	720.7%
Other renewables	1,877	3,302	75.9%
Total	**303,041**	**364,289**	**20.2%**
Modern RE share	**4.81%**	**8.03%**	**67.1%**

Final energy consumption, PJ

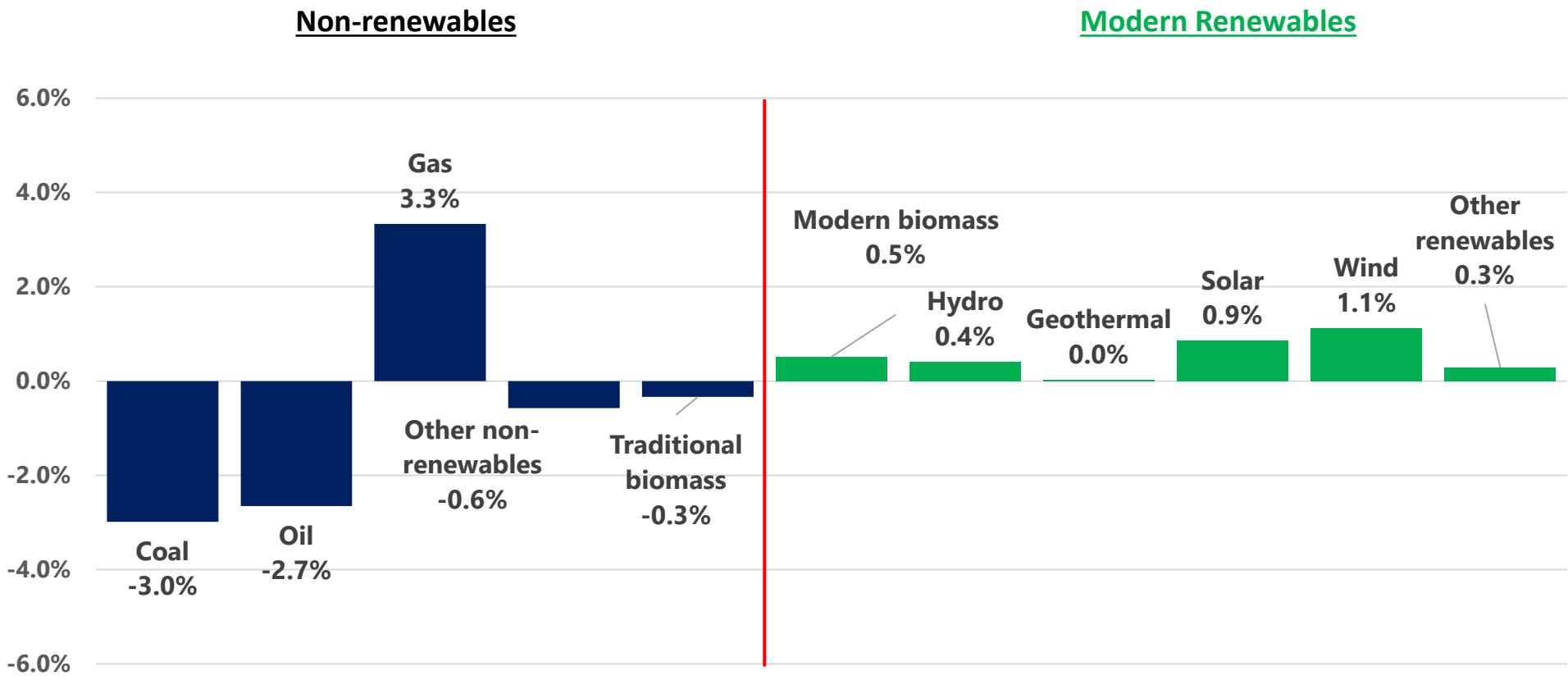
	2010	2022	% change
Non-renewables	**165,174**	**185,211**	**12.1%**
Coal	32,264	24,150	-25.1%
Oil	63,691	68,491	7.5%
Gas	25,950	36,500	40.7%
Electricity	34,797	43,571	25.2%
Heat	8,276	12,273	48.3%
Other non-renewables	196	225	14.6%
Traditional biomass	**3,131**	**2,528**	**-19.2%**
Modern renewable energy	**10,780**	**22,197**	**105.9%**
Electricity	6,346	16,022	152.5%
Heat	35	251	613.2%
Modern biomass	2,811	3,102	10.4%
Other renewables	1,588	2,821	77.6%
Total	**179,085**	**209,936**	**17.2%**
Modern RE share	**6.02%**	**10.57%**	**75.6%**

Note: Consumption of electricity and heat from renewables is calculated from the share of total electricity and heat production.Sources: APEC statistics (EGEDA), APERC analysis

RE share of the primary energy supply is just 1.6 percentage points away from the goal, while the share in final energy consumption is 1.5 percentage points away from the goal.

In energy supply, coal and oil lost shares to gas and renewables . . .

Percent change in fuel shares in **primary energy supply**, 2010-2022



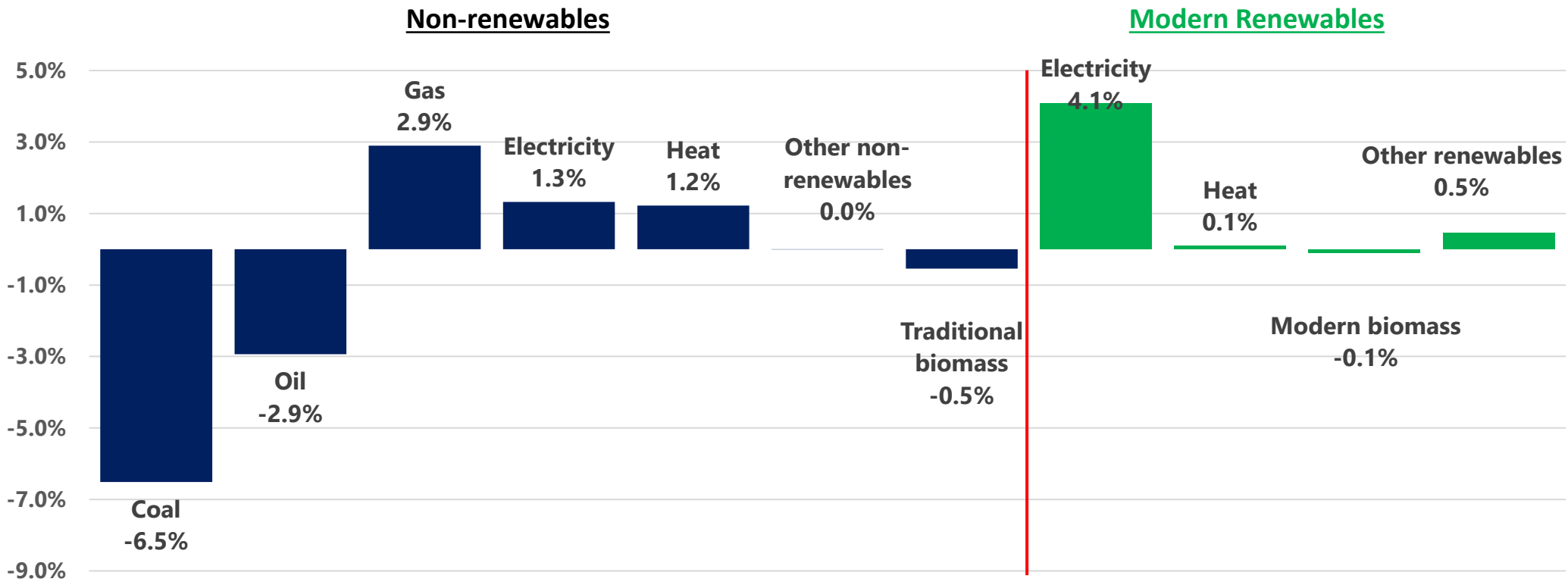
Note: Renewable energy includes electricity and heat generated from renewable energy sources

Sources: APEC statistics (EGEDA), APERC analysis

- *From 2010 to 2022, the renewable share increased by 3.2 percentage points, 40% of the way to the goal.*

In final energy use, the pattern was similar

Percent change in fuel shares in **final energy consumption**, 2010-2022



Note: Renewable energy includes electricity and heat generated from renewable energy sources

Sources: APEC statistics (EGEDA), APERC analysis.

- *From 2010 to 2022, the renewable share increased 4.6 percentage points, 40% of the way to the goal.*

Renewable power generation doubled over the last decade

Electricity Generation, TWh

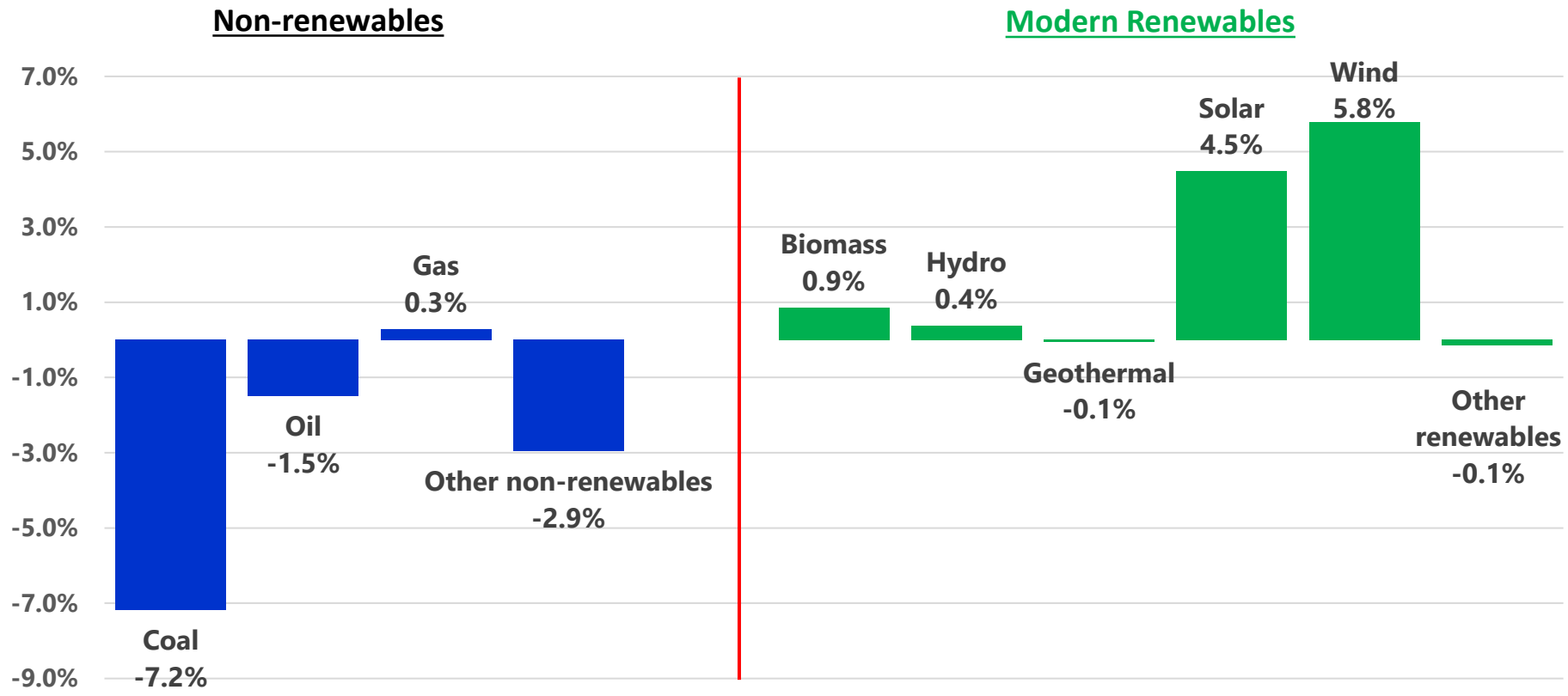
	2010	2022	% change
Non-renewables	**11,334**	**13,901**	**22.7%**
Coal	6,578	7,954	20.9%
Oil	326	177	-45.6%
Gas	2,688	3,864	43.7%
Nuclear	1,658	1,799	8.5%
Other non-renewables	84	107	27.9%
Modern renewable energy	**2,116**	**5,156**	**143.7%**
Modern biomass	67	259	286.7%
Hydro	1,783	2,598	45.7%
Geothermal	52	63	20.9%
Solar	9	867	9542.4%
Wind	163	1,335	720.7%
Other renewables	43	34	-20.7%
Total	**13,450**	**19,058**	**41.7%**
Modern RE share	**15.73%**	**27.06%**	**72.0%**

Sources: APEC statistics (EGEDA), APERC analysis

- *In 2022, modern renewable energy provided a quarter of total power generation.*

Coal and oil lost shares to renewables and gas

Percent change in electricity generation market share, 2010-2022

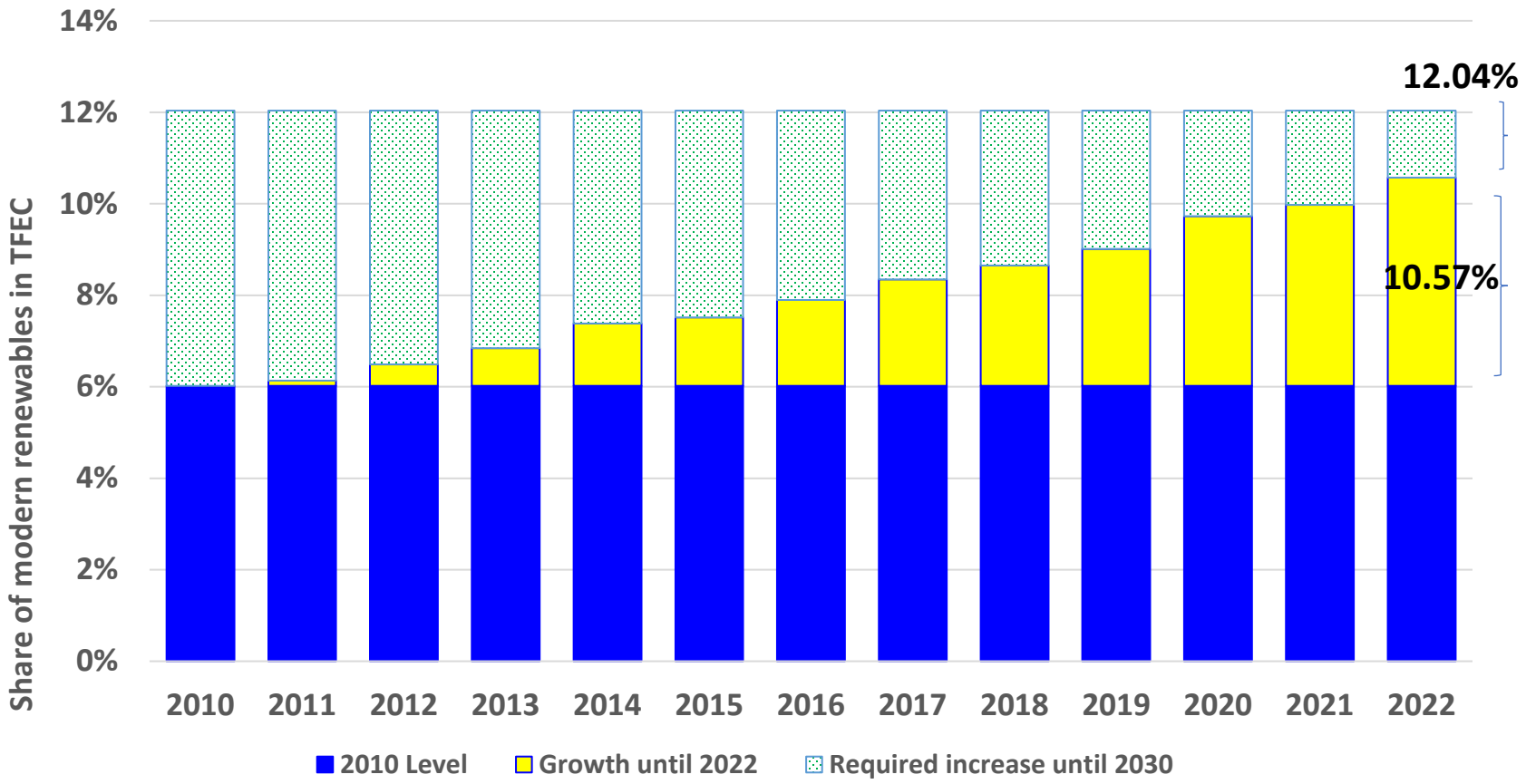


Note: Renewable energy includes electricity and heat generated from renewable energy sources

Sources: APEC Statistics (EGEDA), APERC analysis

- *From 2010 to 2022 the renewable share increased by more than ten percentage points, 72% of the way to the goal.*

Tracking the APEC renewable energy doubling goal



Just 1.47 percentage points more in the next 8 years

3.23 percentage points increase in the last 12 years

- *In 2022, just eight years to 2030, APEC increased RE share in final energy consumption by 3.2 percentage points, needing to increase by just 1.5 percentage points more in the next eight years (2022 to 2030).*

Pursuing and encouraging efforts to triple global renewable energy capacity by 2030

Support for tripling global renewable energy capacity

COP28 Declaration (excerpt)

To accelerate the energy transition, the COP 28 Presidency took a leading role in launching the Global Renewables and Energy Efficiency Pledge. With the endorsement of 130 national governments (as of 11 December, including the European Union (EU)), the Pledge stipulates that signatories commit to work together ***to triple the world's installed renewable energy generation capacity to at least 11,000 GW by 2030…..***

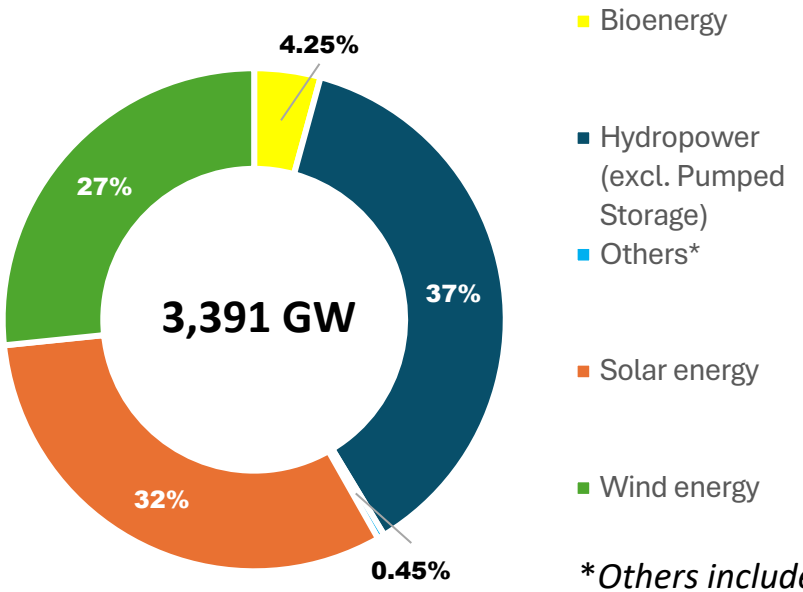
(COP28 UAE, 2023)

2023 APEC Leaders' Golden Gate Declaration (excerpt)

We will pursue and encourage efforts to triple renewable energy capacity globally through existing targets and policies as well as demonstrate similar ambition with respect to other zero and low emissions technologies including abatement and removal technologies in line with domestic circumstances by 2030.

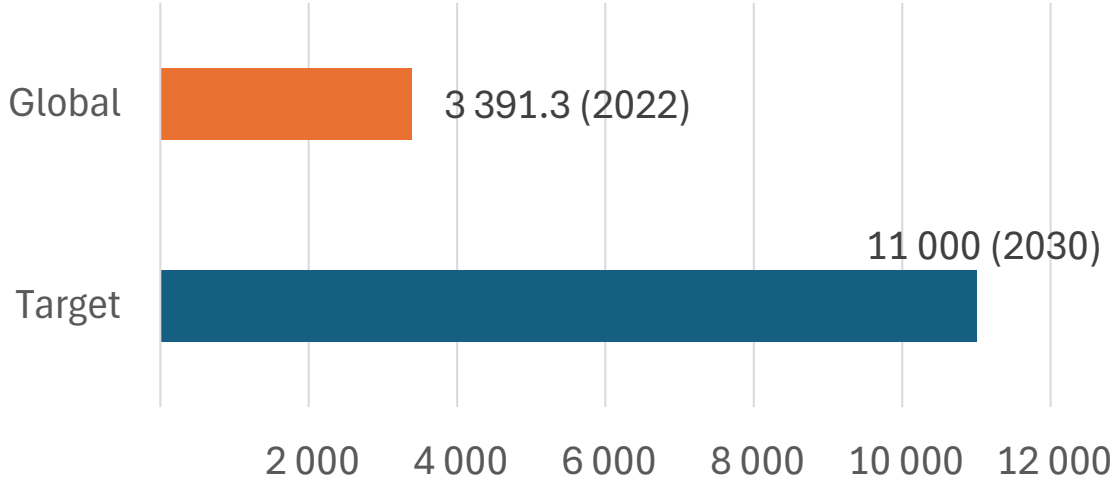
Global installed renewable energy capacity in 2022

Estimated global RE capacity (GW)



*Others include Geothermal and al other RE

Current and target global RE generation capacity (GW)

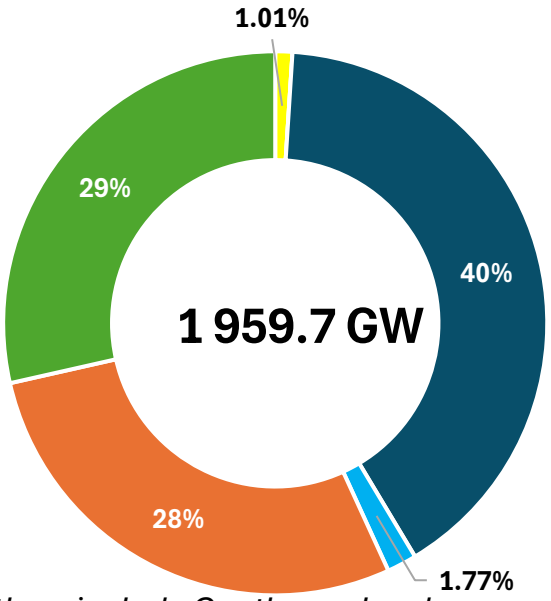


Source for both figures: IRENA

- *The COP28 target for 2030 is 11 000 GW of installed renewable generation capacity.*
- *In 2022, IRENA estimates that hydropower, solar, and wind represented roughly equal shares of installed renewable generation capacity.*

APEC's share of global RE capacity in 2022

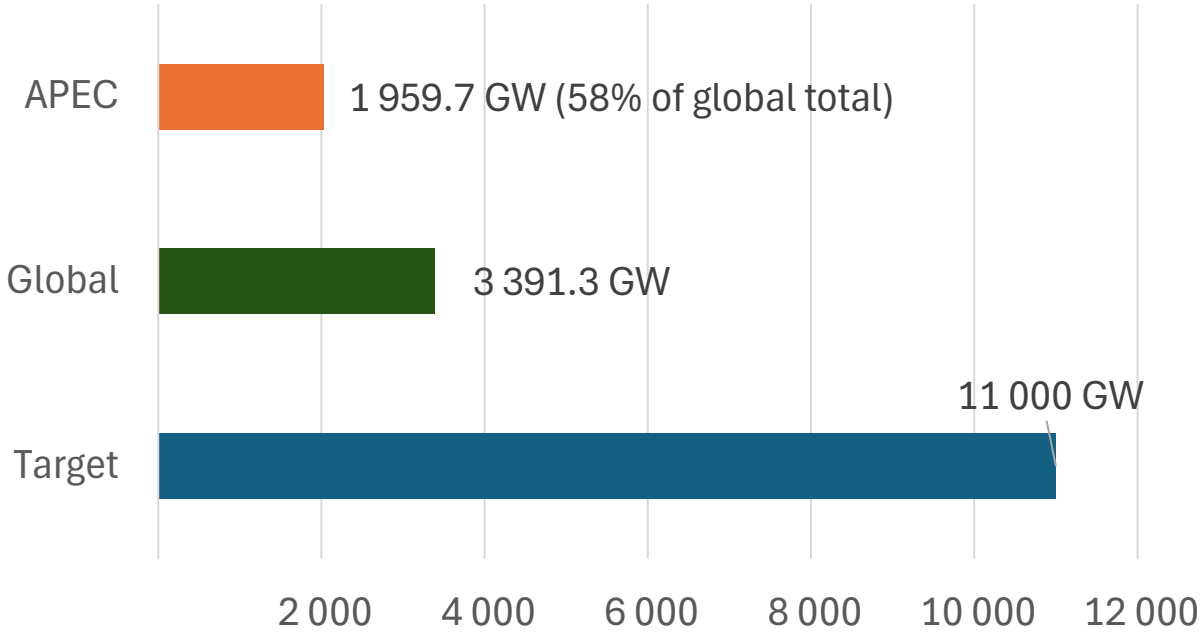
Estimated APEC RE capacity (GW)



*Others include Geothermal and all other RE

Source: EGEDA

APEC and global level relative to 2030 target (GW)



Source: EGEDA, IRENA

- *In 2021, APEC accounted for approximately 57% of the global total of RE generation capacity.*
- *In 2022, APEC accounted for approximately 58% of the global total of RE generation capacity.*

Summary

- Following the pandemic, APEC GDP and energy consumption both rebounded.
- In 2022, GDP growth in APEC was about half the historical average. The reduction in both final and primary energy intensity was considerably smaller than the historical average.
- Renewable energy, specifically solar and wind, was the fastest-growing energy source in APEC in 2022.
- Based on history and APERC projections:
  - APEC is likely to meet its final energy intensity goal.
  - APEC is almost certain to meet its renewable energy doubling goal.
- In 2022, APEC accounted for approximately 58% of global renewable generation capacity.

APERC/EGEDA will continue to track energy intensity, renewable energy share, and RE generation capacity.

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Thank you.

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