



**Asia-Pacific  
Economic Cooperation**

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**2019/EWG58/036**  
Agenda Item: 12ci

## **Progress Toward Renewable Energy Doubling Goal**

Purpose: Information  
Submitted by: APERC



**58<sup>th</sup> Energy Working Group Meeting**  
**Antofagasta, Chile**  
**16-17 October 2019**

# 12.c.i. Progress toward APEC's renewable energy share doubling goal

The 58<sup>th</sup> Meeting of APEC Energy Working Group (EWG)  
Antofagasta, Chile; 16-17 October 2019

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# Renewable share doubling goal milestones

- 1. EWG 47 (May 2014)** - US proposed the APEC aspirational goal of doubling the share of renewable energy by 2030 and noted that it interacted with APEC's aspirational energy intensity goal.
- 2. EMM 11 (Sep 2014)** - "Doubling the share of renewables in the APEC energy mix, including in power generation, from 2010 levels by 2030."
- 3. EWG 54 (Nov 2017)** - EWG decided that traditional biomass will not be counted; IRENA's definition of renewable energy is recommended; APEC data should be used for monitoring progress; and the goal should be monitored on both the supply and demand side.

# Renewable doubling goal definitions

Question	Options	EWG54 decision
Renewables	Definition	IRENA recommended
Biomass	All v. modern	Traditional excluded
Hydro	All v. small	All, per IRENA
Geothermal	In v. out	In, per IRENA
Measurement point	Supply v. demand	Both FED and TPES
Data	IEA v. APEC	APEC

# Extrapolation meets the goal, but projection fails

Measure	Period	Data	Result
Renewable Share Doubling	2010-2030	Supply	Extrapolation
			Projection
		Demand	Extrapolation
			Projection

# Renewable energy supply and consumption

## Primary energy supply

	2010	2017
<b>Non-renewables</b>	<b>6,883,954</b>	<b>7,378,235</b>
Coal	2,786,592	2,809,692
Oil	2,168,013	2,353,063
Gas	1,463,201	1,747,959
Other non-renewables	466,149	467,521
<b>Traditional biomass</b>	<b>114,493</b>	<b>110,288</b>
<b>Modern renewable energy</b>	<b>353,180</b>	<b>531,423</b>
Modern biomass	102,426	128,792
Hydro	152,789	209,260
Geothermal	35,499	39,889
Solar	3,743	25,378
Wind	13,989	53,648
Other renewables	44,733	74,456
<b>Total</b>	<b>7,351,628</b>	<b>8,019,946</b>
<b>Modern RE share</b>	<b>4.80%</b>	<b>6.63%</b>

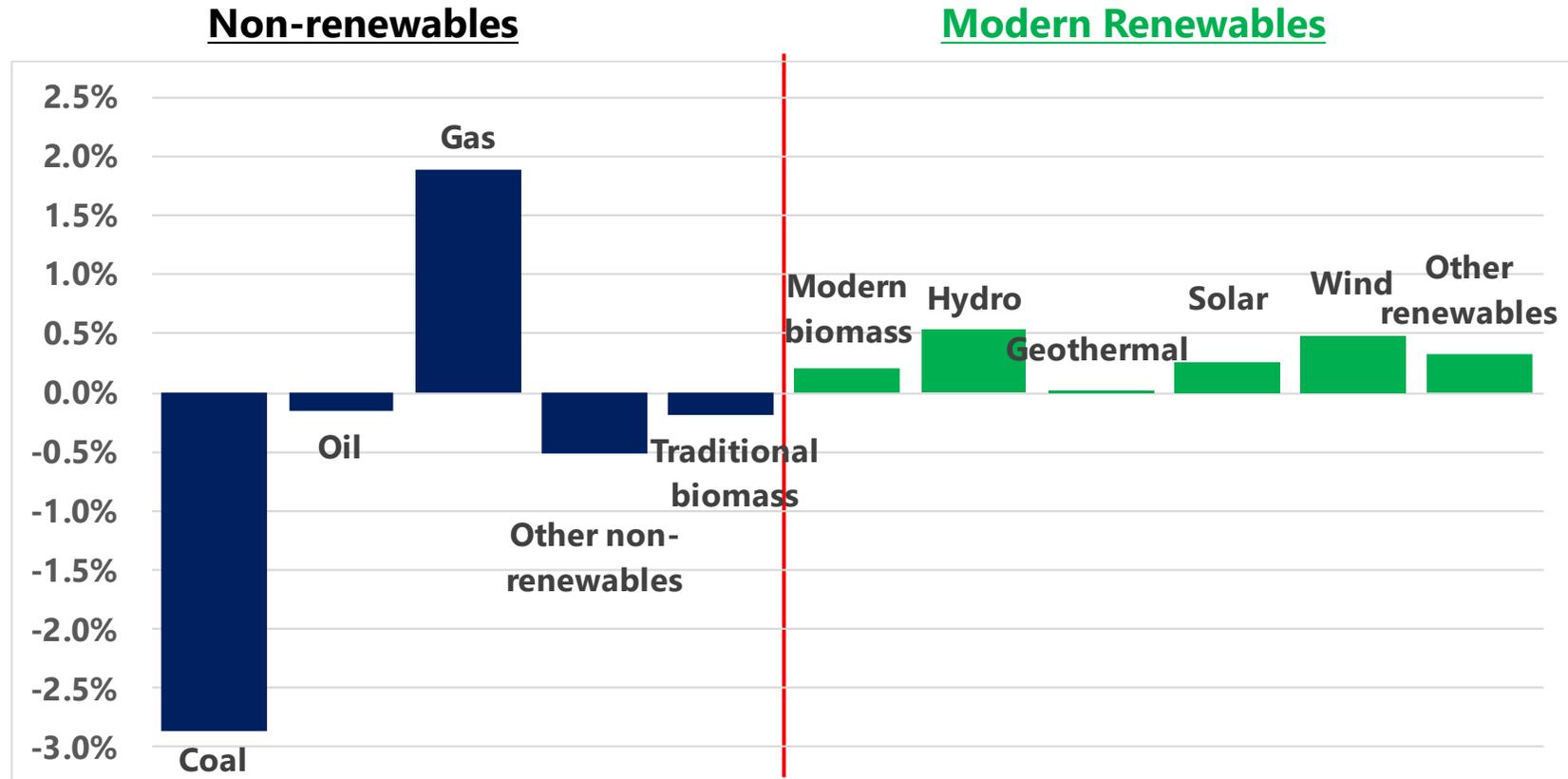
## Final energy consumption

	2010	2017
<b>Non-renewables</b>	<b>3,909,727</b>	<b>4,258,686</b>
Coal	723,221	672,312
Oil	1,541,344	1,693,200
Gas	626,698	748,338
Electricity	826,471	925,013
Heat	186,882	212,662
Other non-renewables	5,111	7,162
<b>Traditional biomass</b>	<b>114,493</b>	<b>110,288</b>
<b>Modern renewable energy</b>	<b>260,709</b>	<b>398,469</b>
Electricity	151,332	252,774
Heat	1,526	1,260
Modern biomass	70,257	76,458
Other renewables	37,595	67,977
<b>Total</b>	<b>4,284,929</b>	<b>4,767,443</b>
<b>Modern RE share</b>	<b>6.08%</b>	<b>8.36%</b>

Note: Consumption of electricity and heat from renewables is calculated from the share of total electricity and heat production. China, and Malaysia have no data on traditional biomass.  
Source: APEC data.

# Coal and other energy lost shares to gas and renewables

Percent change in fuels in primary energy supply market share, 2010-2017



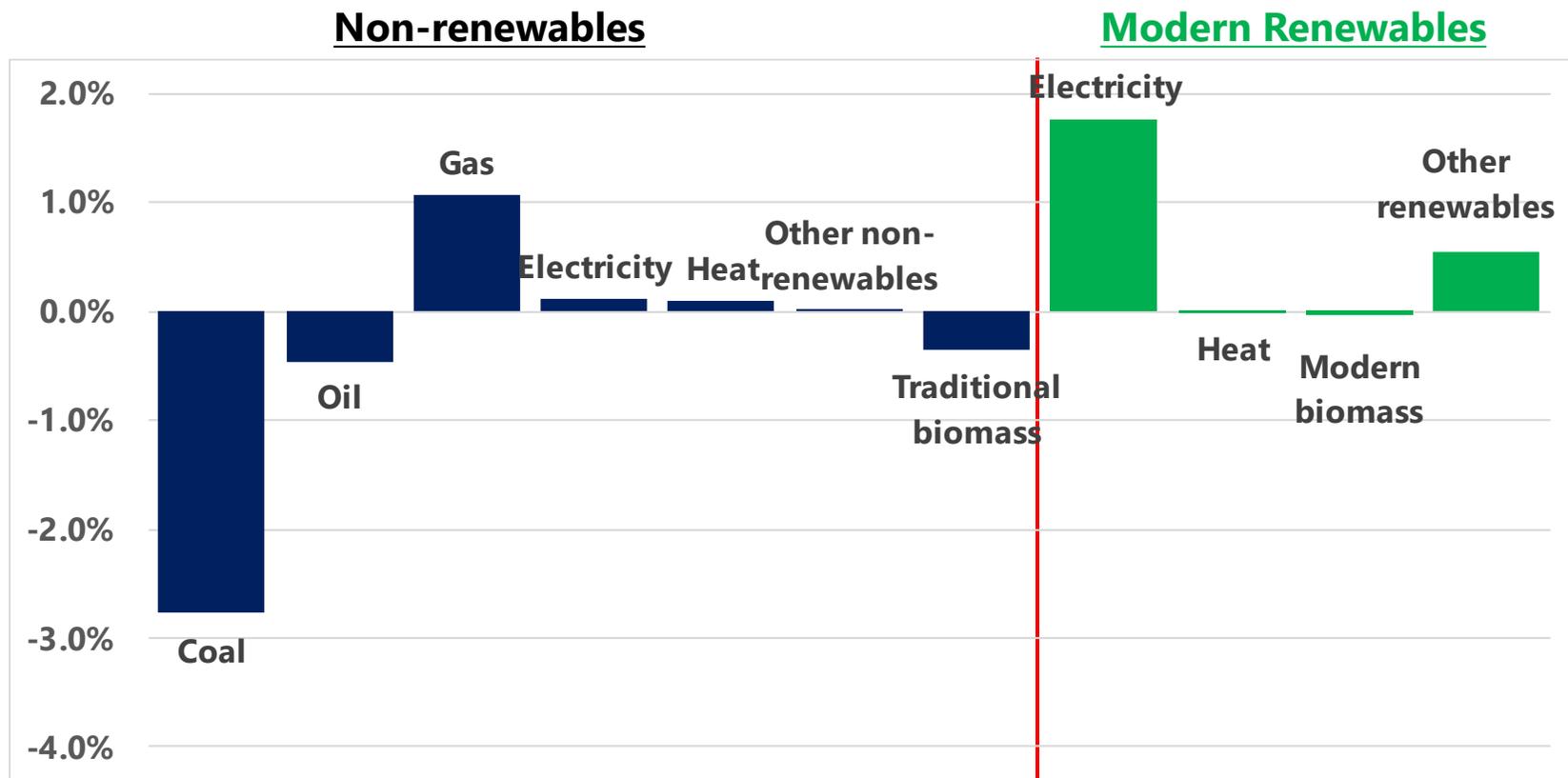
Note: Renewable energy includes electricity and heat generated from renewable energy sources

Source: APEC data

*From 2010 to 2017, the renewable share increased 1.82 percentage points, 38% of the way to the goal.*

# Coal and oil lost shares to renewables in electricity

Percent change in fuels in final energy consumption market share, 2010-2017



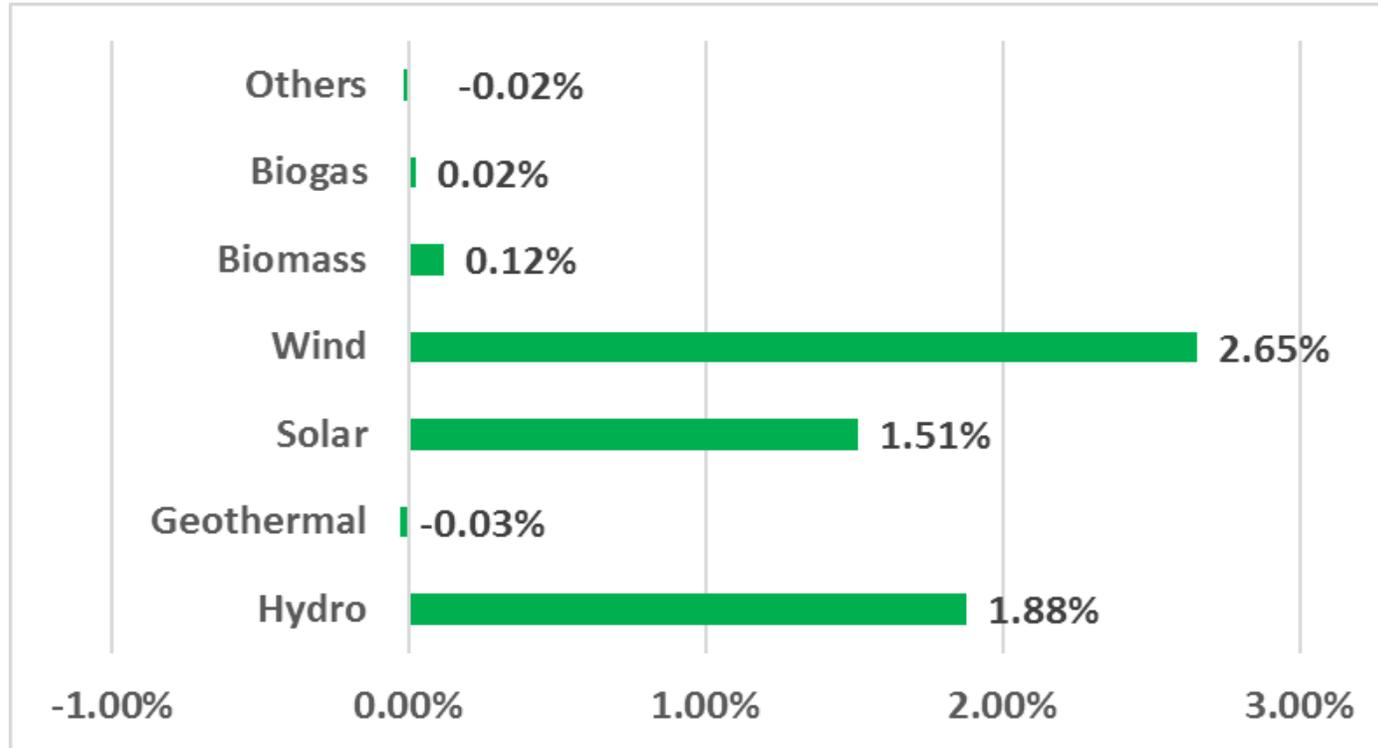
Note: Renewable energy includes electricity and heat generated from renewable energy sources

Source: APEC data.

*From 2010 to 2016, the renewable share increased 2.27 percentage points, 37% of the way to the goal.*

# Wind and hydro lead renewables power growth

Percent change in electricity generation market share, 2010-2017

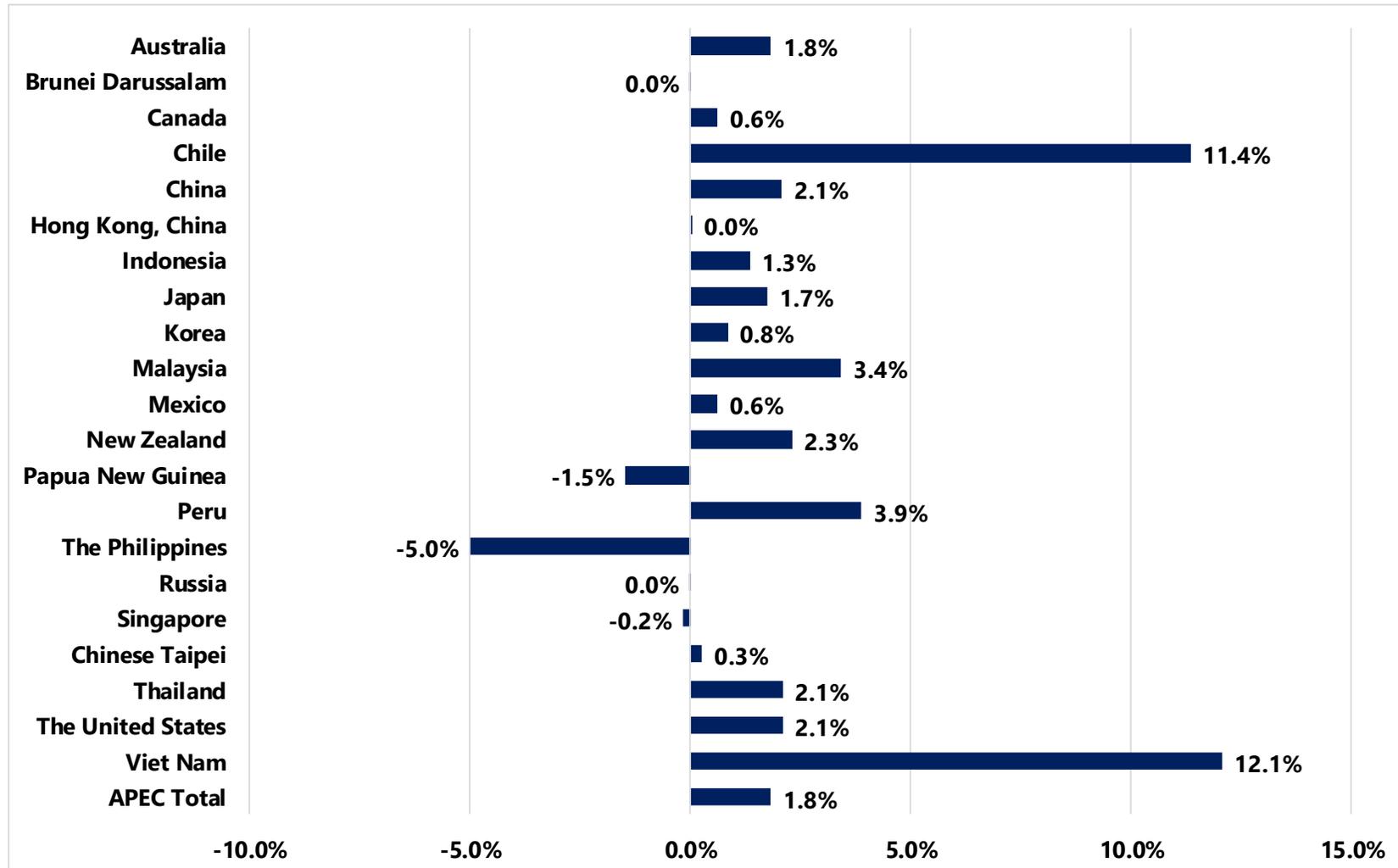


Source: APEC data.

*In absolute terms, hydro generation increased 657 terawatt hours, 42% more than wind (461 terawatt hours).*

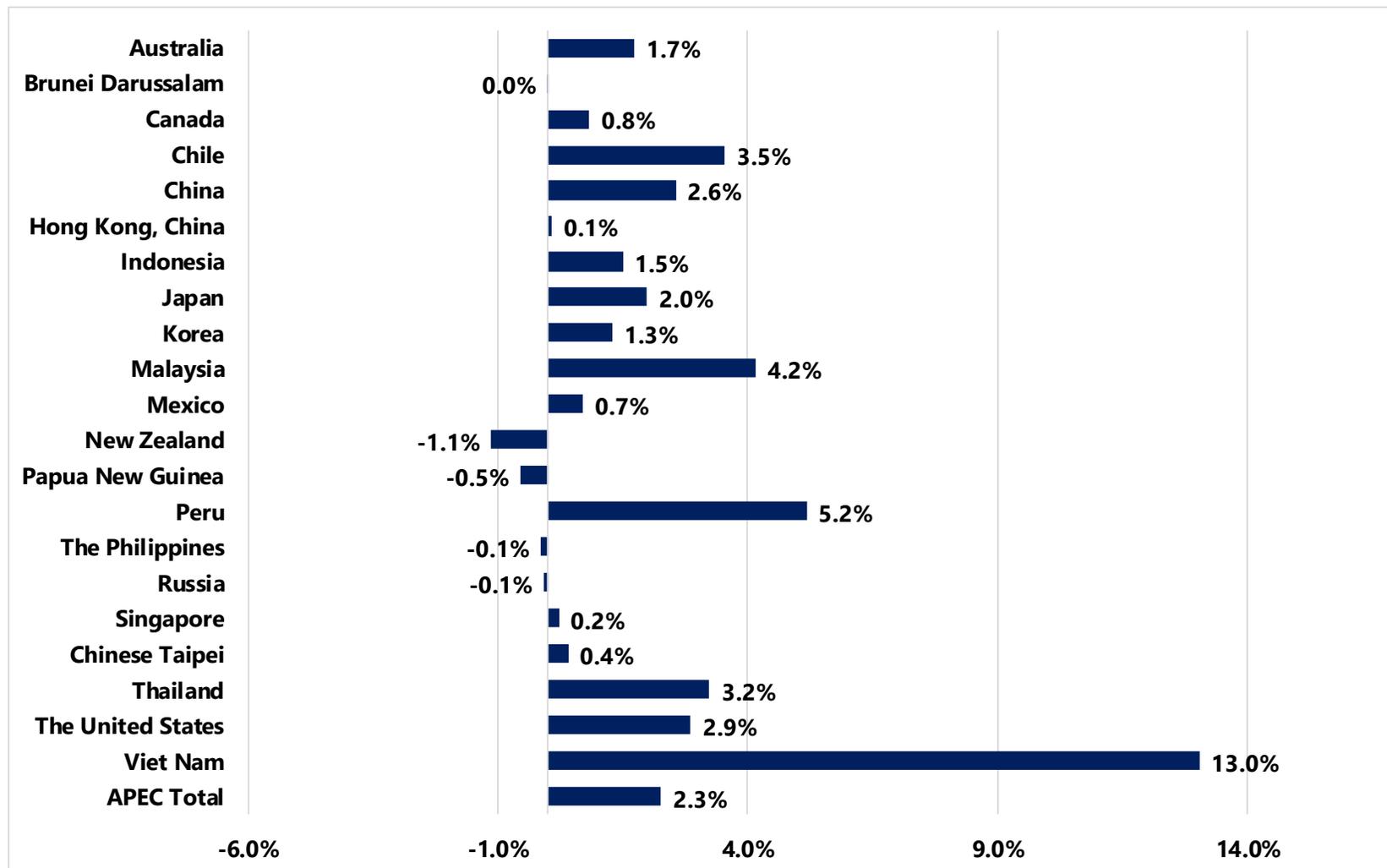
# Seven-year renewables supply changes are mostly positive

Changes in modern renewables share in TPES by economy, 2010-2017



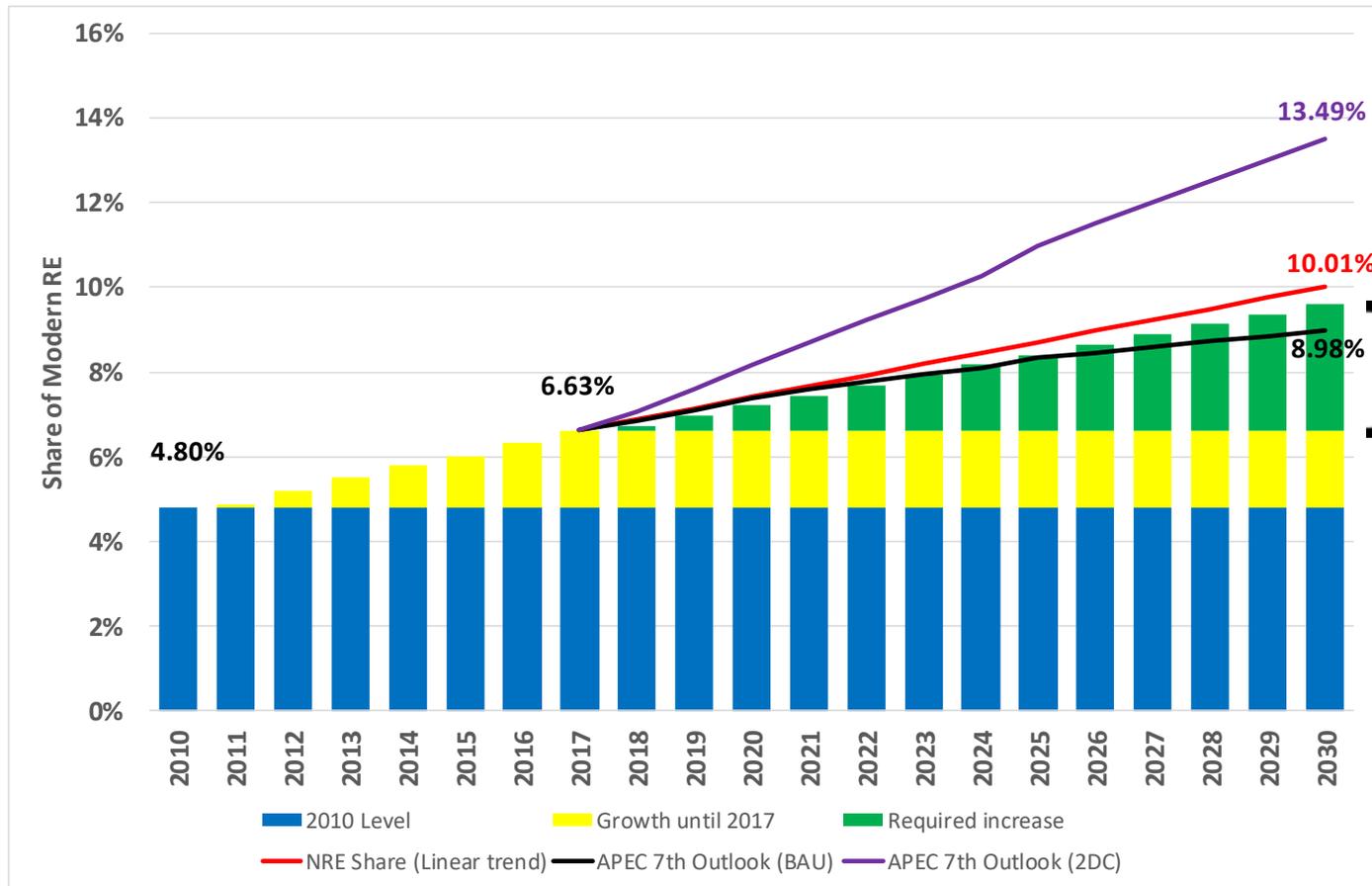
# Seven-year renewables consumption changes are mostly positive

Changes in modern renewables share in FED by economy, 2010-2017



# Supply outlook extrapolation exceeds goal

## Renewable energy share in total primary energy supply, 2010-2030

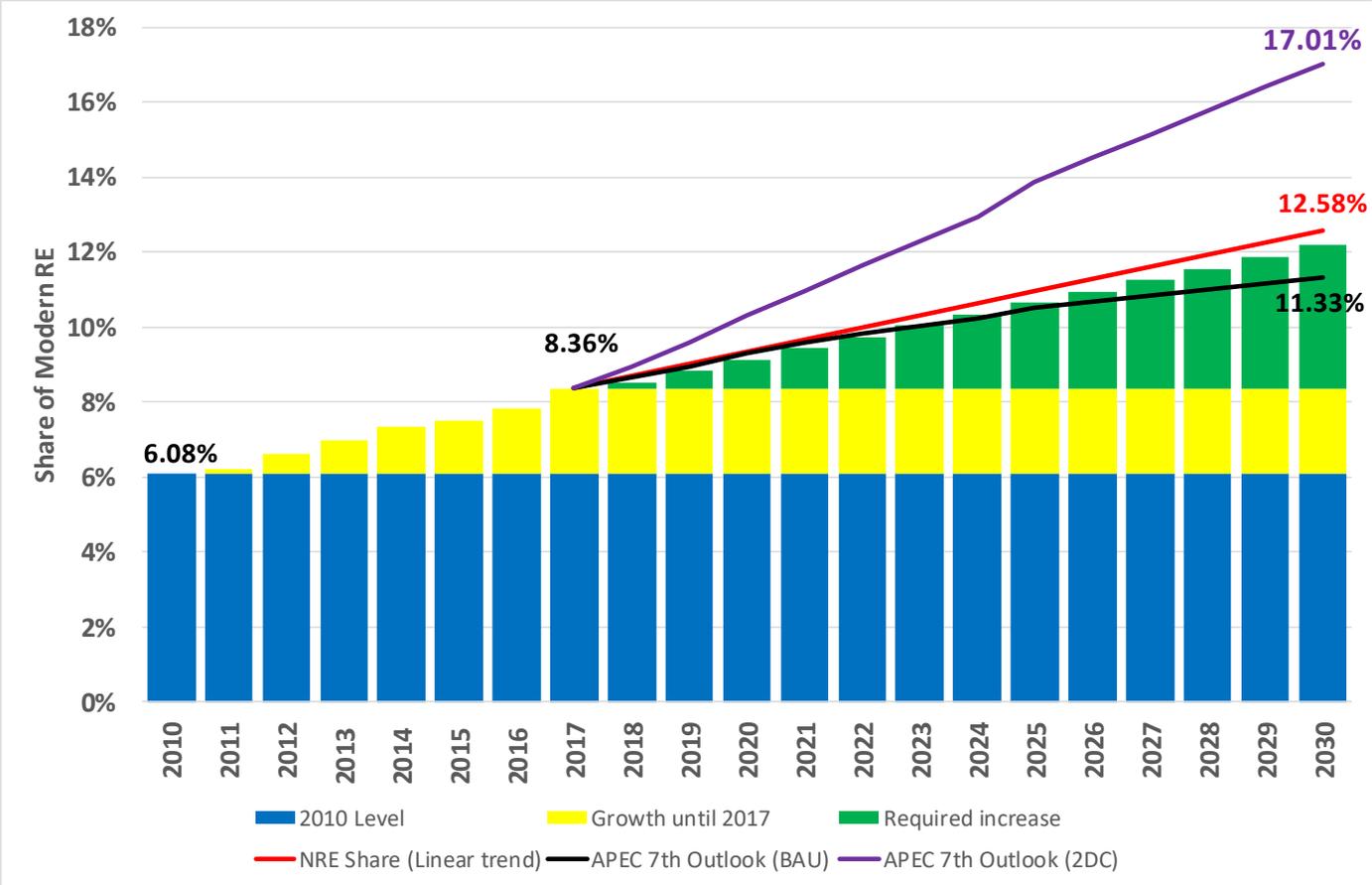


Level of RE share needed to achieve the doubling goal

Source: APEC data and APERC analysis.

# Demand outlook extrapolation also exceeds goal

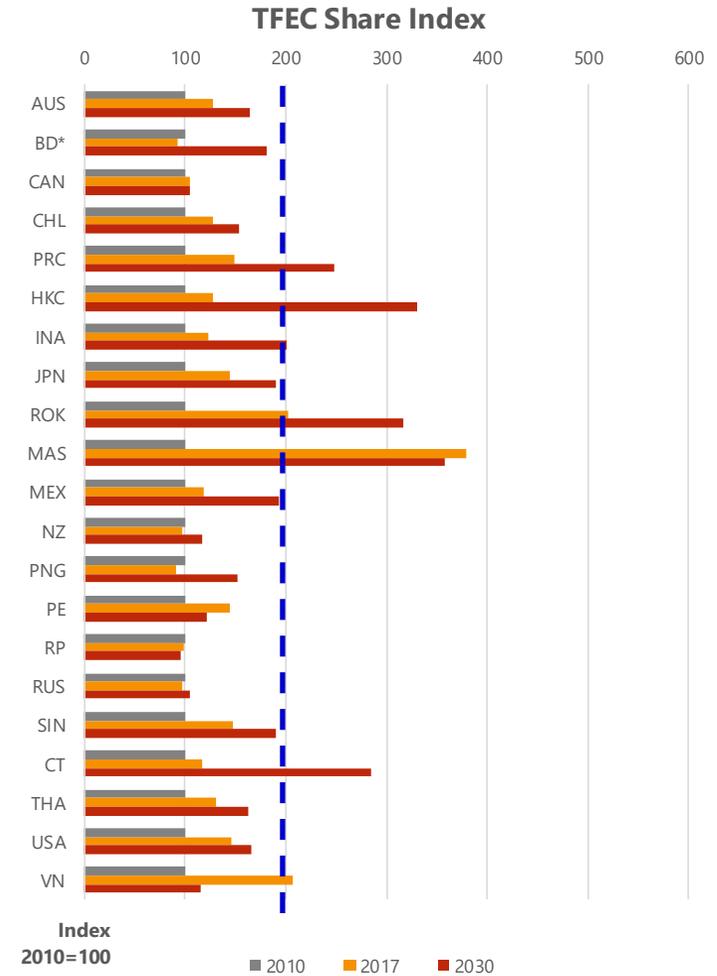
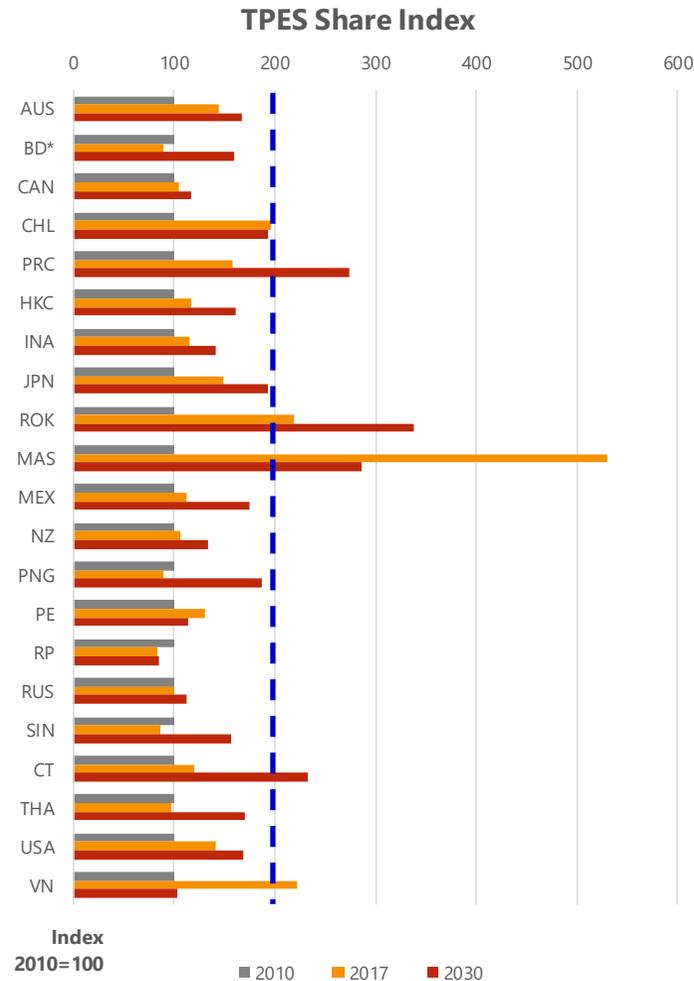
Renewable energy share in total final energy demand, 2010-2030



Level of RE share needed to achieve the doubling goal

Source: APEC data and APERC analysis.

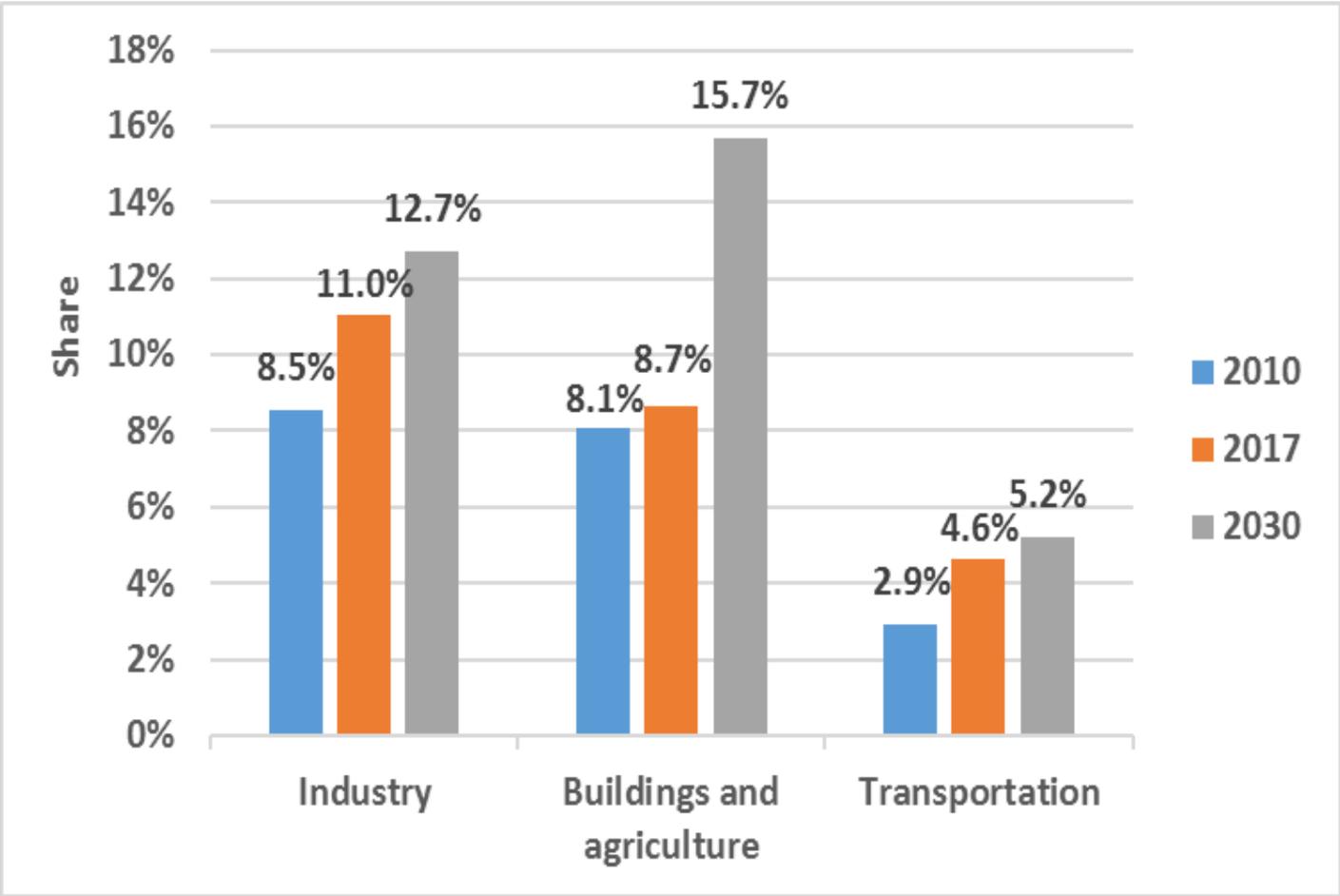
# Only few economies double renewable share



Source: APEC data and APERC analysis.

# None of the sectors meet the doubling goal

Modern renewables share by end-use sector, 2010, 2017 and 2030

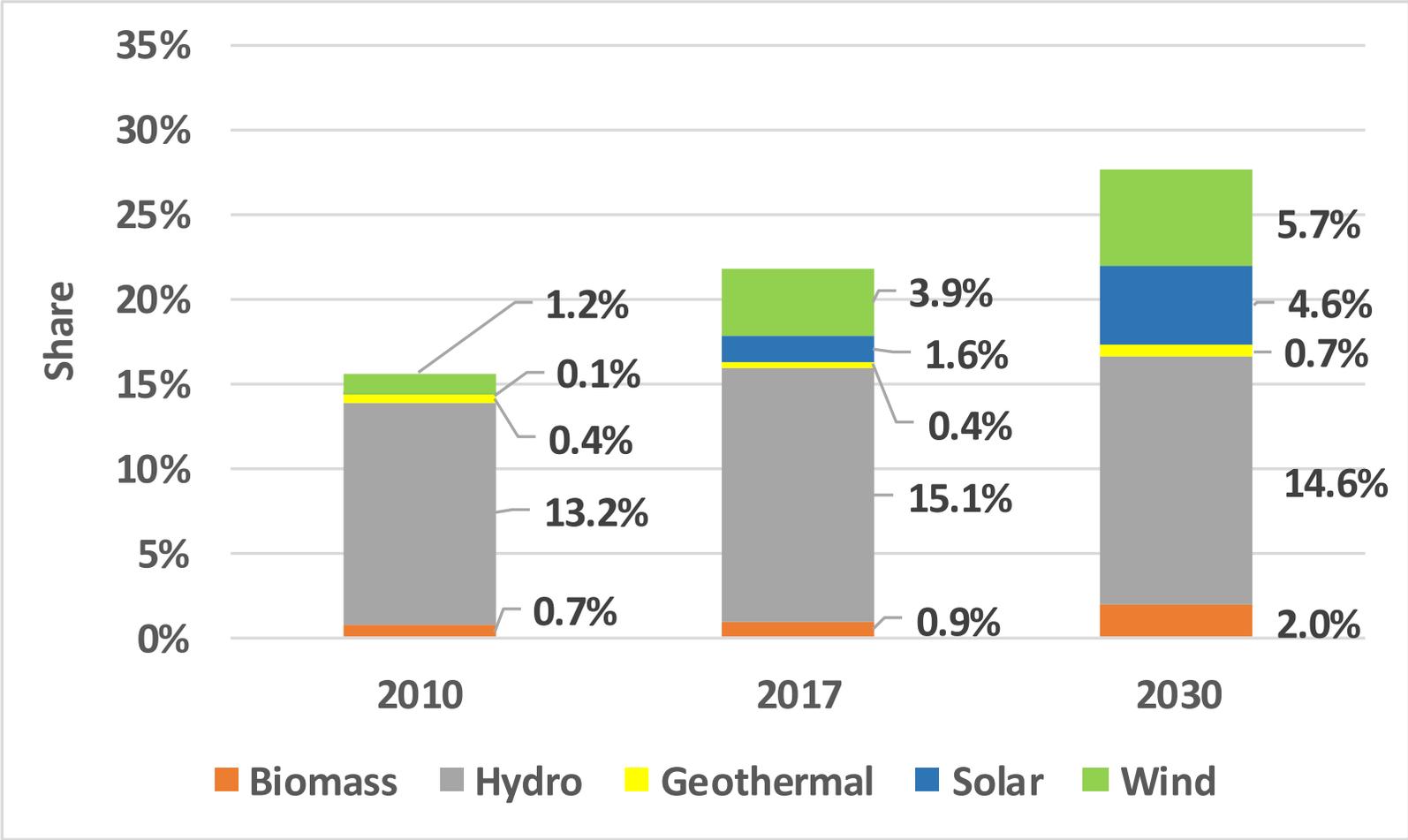


Source: APEC data and APERC analysis.



# Electric generation fails to meet doubling goal

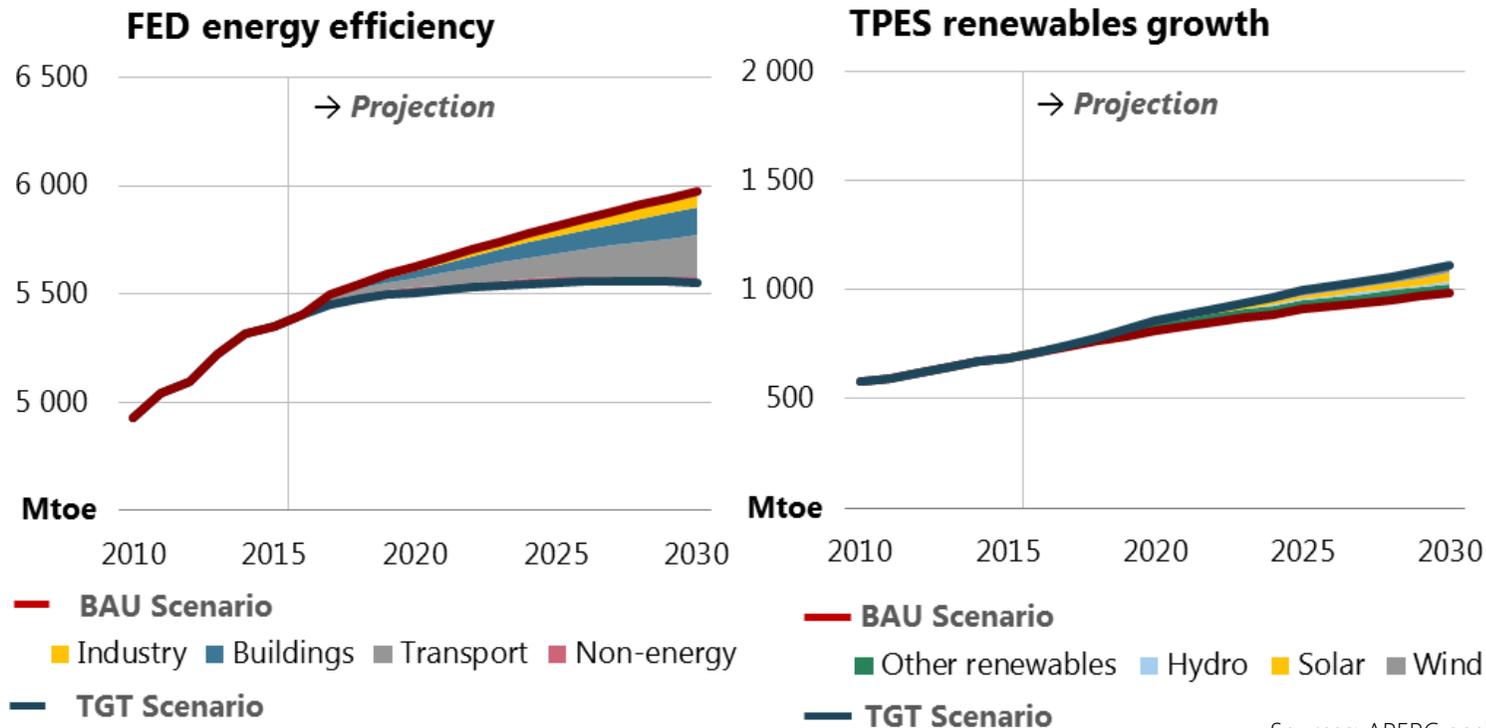
Modern renewables share in power generation, 2010, 2017 and 2030



Source: APEC data and APERC analysis.

# Efficiency supports renewables growth in TGT

Energy efficiency and renewables in the BAU and TGT, 2010-30

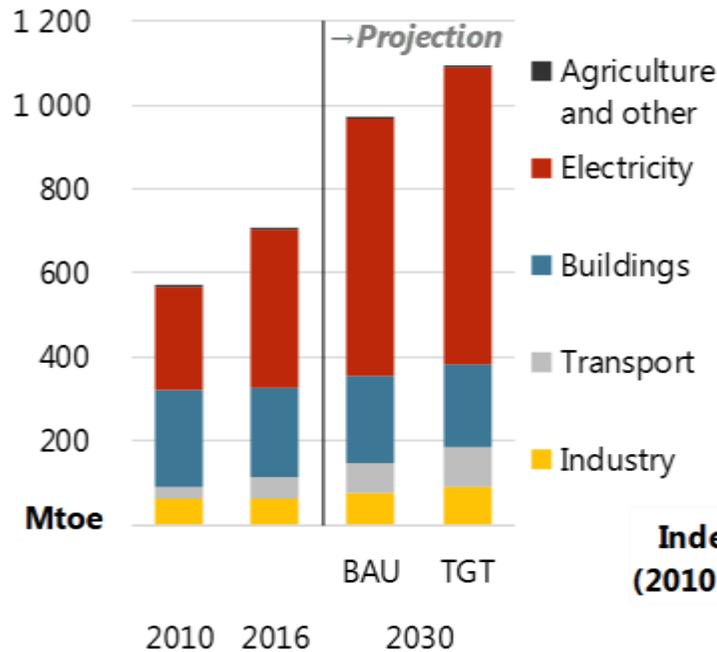


Sources: APERC analysis and IEA (2018).

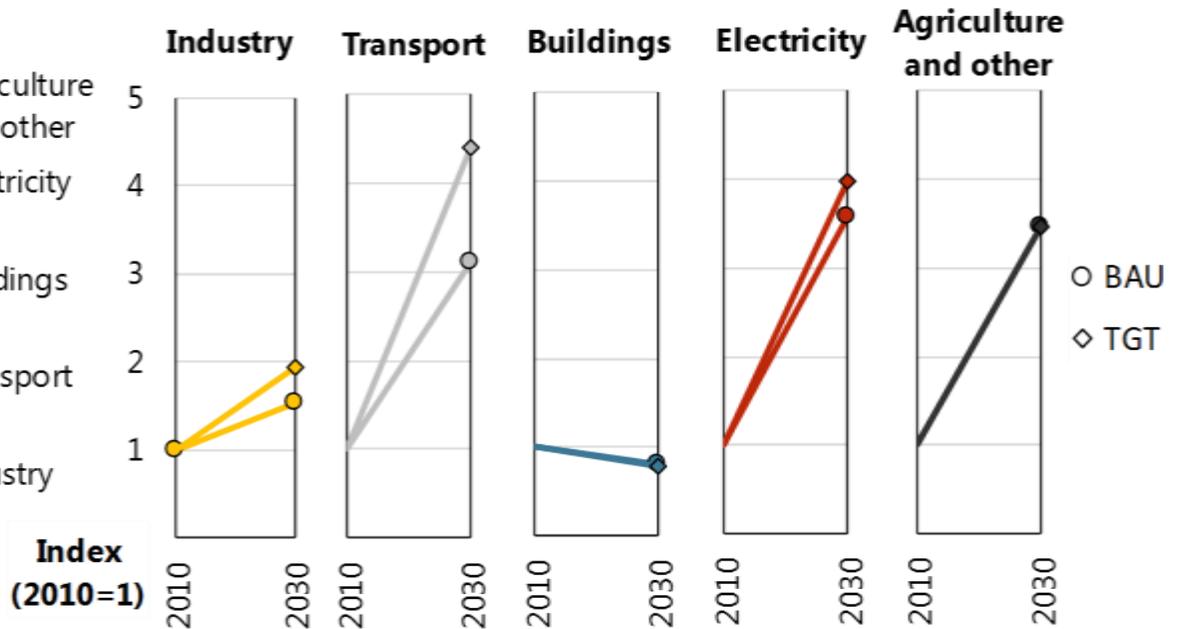
*Final energy demand falls (mainly transport), but renewable supply increases (mainly solar), which has a two-fold impact on the doubling goal.*

# Power is key to reaching renewables target

Renewable demand by sector, 2010-30



Sectoral renewables index, 2010-30



Sources: APERC analysis and IEA (2018).

*Renewables in buildings shrink as traditional biomass decreases, but grow in all other sectors as modern renewables increase.*

# Closing thoughts

- The use of modern renewables grew rapidly during 2010-2017.
  - Brought about by rapid decline in costs and favourable government policies.
- APERC modelling shows that business-as-usual is unlikely to reach the goal, though a straight line extrapolation exceeds the goal.
- Additional efforts are necessary to address the barriers to renewable development such as:
  - Effect of intermittent renewables on grid stability,
  - Cost of electricity storage,
  - Policies persistently favouring fossil and nuclear energy, and
  - Large upfront renewable costs and higher financial risk.
- More can be done to identify economy-by-economy barriers and to formulate policy responses as part of a comprehensive road map.
- Past energy 'transitions' have shown that vigorously increasing modern renewables, while holding non-renewables constant, might be the most likely way to increase the renewable share.



**Thank you for your kind attention.**

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