



Asia-Pacific
Economic Cooperation



14.b.i. Progress toward Energy Intensity Reduction Goal and Renewable Energy Doubling Goal

The 63rd Meeting of APEC Energy Working Group (EWG)
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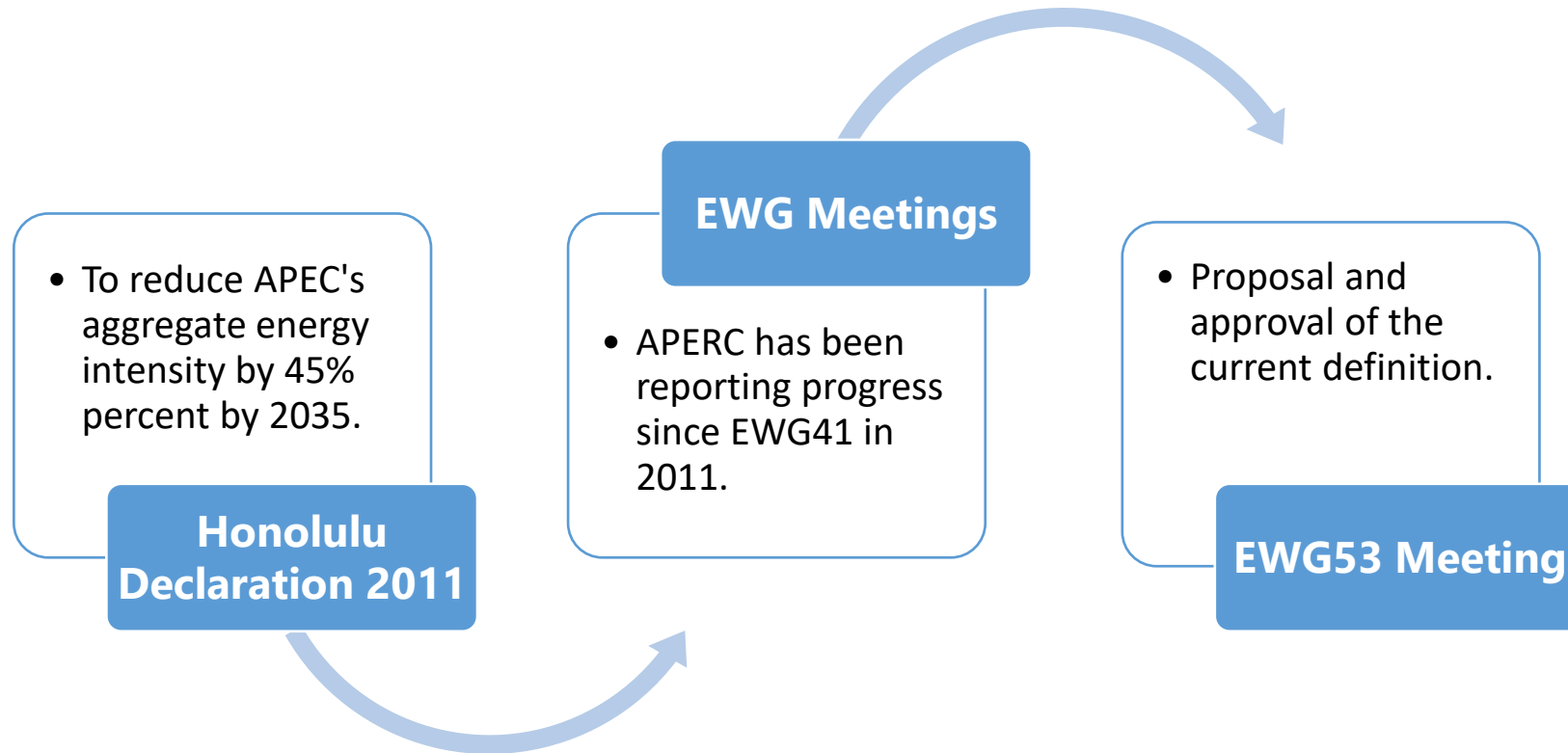


Outline

- Progress toward APEC energy intensity goal
- Progress toward APEC renewable energy doubling goal
- Closing thoughts

Progress toward APEC energy intensity goal

APEC energy intensity indicator milestones



- ❑ Agreement was reached at EWG53 to analyse final energy consumption intensity (excluding non-energy), using APEC data.

Final energy intensity declined significantly in 2019

Annual change in APEC final energy consumption intensity, 2006-19

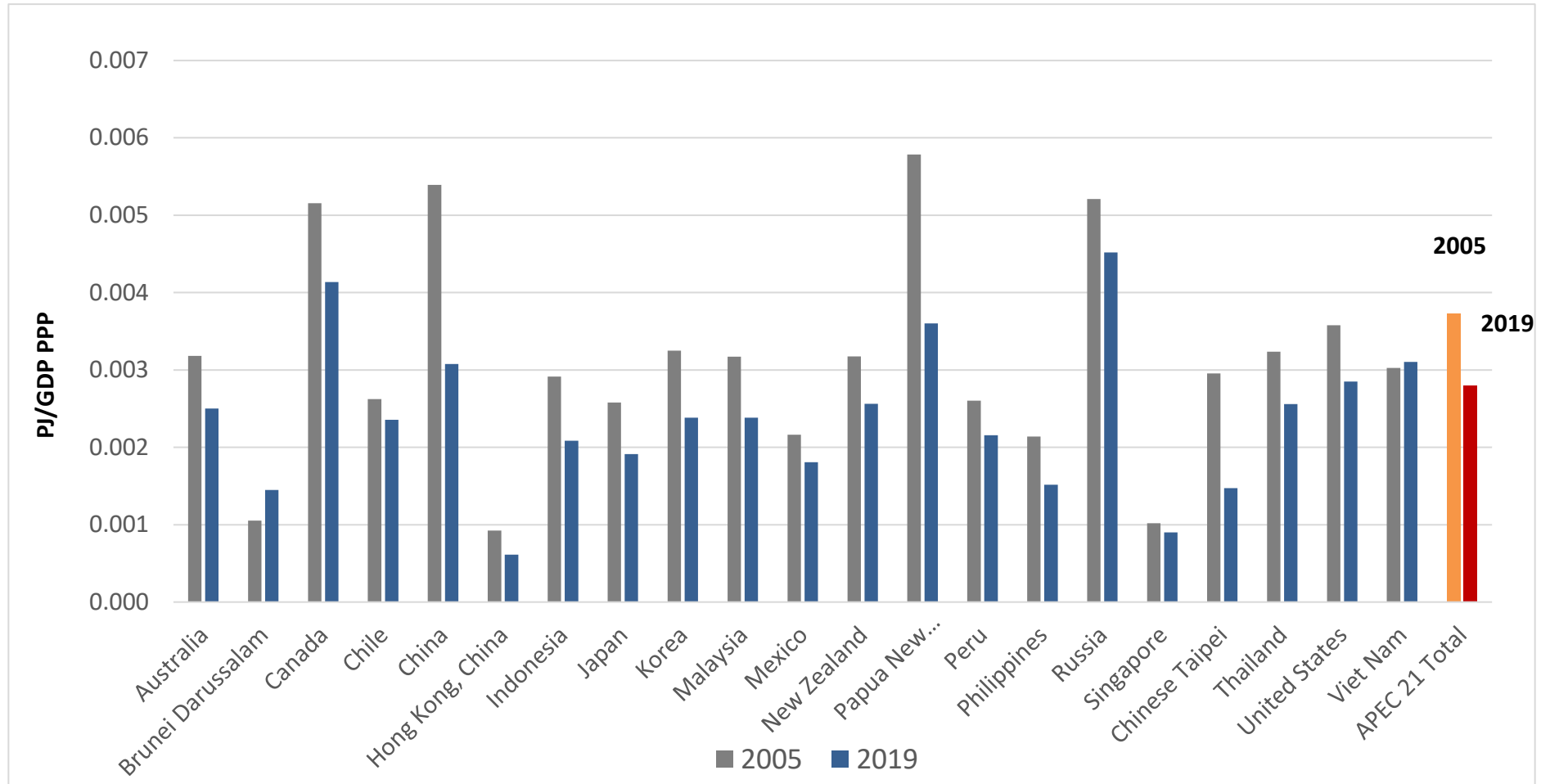
	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2005-19
Change in Final Energy Consumption (FEC)	2.5%	3.5%	0.6%	-1.2%	4.4%	4.2%	2.0%	1.2%	2.6%	0.8%	0.3%	1.5%	3.0%	-0.9%	27.1%
Change in GDP (PPP, constant 2018 US dollars)	5.4%	5.5%	2.9%	-0.2%	5.7%	4.2%	4.2%	3.8%	3.8%	3.6%	3.4%	4.1%	4.1%	3.4%	69.6%
Change in final energy consumption intensity	-2.7%	-1.9%	-2.3%	-1.0%	-1.2%	-0.1%	-2.2%	-2.5%	-1.2%	-2.8%	-3.0%	-2.5%	-1.1%	-4.2%	-25.1%

Sources: APEC statistics (EGEDA), APERC analysis

- Final energy intensity has declined every year.*
- 2019 has the biggest reduction since 2005.*
- Final energy intensity fell 25.1% between 2005 and 2019.*

Energy intensity varies widely between economies

Energy intensity: Petajoules per billion 2018 USD (PPP GDP)



Sources: APEC statistics (EGEDA), APERC analysis.

Primary energy supply intensity improved as well

Annual change in APEC primary energy supply intensity, 2006-19

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2005-19
Change in Primary Energy Supply (PES)	2.4%	3.4%	0.7%	0.0%	4.8%	4.2%	1.1%	1.4%	0.4%	-0.4%	0.8%	1.7%	3.6%	1.6%	28.9%
Change in GDP (PPP, constant 2018 US dollars)	5.4%	5.5%	2.9%	-0.2%	5.7%	4.2%	4.2%	3.8%	3.8%	3.6%	3.4%	4.1%	4.1%	3.4%	69.6%
Change in primary energy supply intensity	-2.8%	-2.0%	-2.1%	0.2%	-0.9%	0.0%	-3.0%	-2.3%	-3.3%	-3.9%	-2.5%	-2.3%	-0.5%	-1.7%	-24.0%

Sources: APEC statistics (EGEDA), APERC analysis

- ❑ *At EWG62, APERC was asked to also show supply intensity.*
- ❑ *The results are very similar to final energy consumption intensity trends, 2015 has the largest improvement by far.*
- ❑ *Primary energy supply intensity fell by 24% between 2005 - 2019.*

Progress toward APEC renewables doubling goal

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 energy supply and consumption

Primary energy supply, PJ

	2010	2019	% change
Non-renewables	286,543	323,994	13.1%
Coal	117,195	120,013	2.4%
Oil	89,835	100,554	11.9%
Gas	60,221	82,688	37.3%
Other non-renewables	19,292	20,738	7.5%
Traditional biomass	3,256	3,015	-7.4%
Modern renewable energy	14,694	24,517	66.8%
Modern biomass	4,190	5,656	35.0%
Hydro	6,396	9,009	40.9%
Geothermal	1,473	1,726	17.2%
Solar	167	1,882	1029.9%
Wind	586	2,891	393.6%
Other renewables	1,883	3,353	78.1%
Total	304,493	351,527	15.4%
Modern RE share	4.83%	6.97%	44.5%

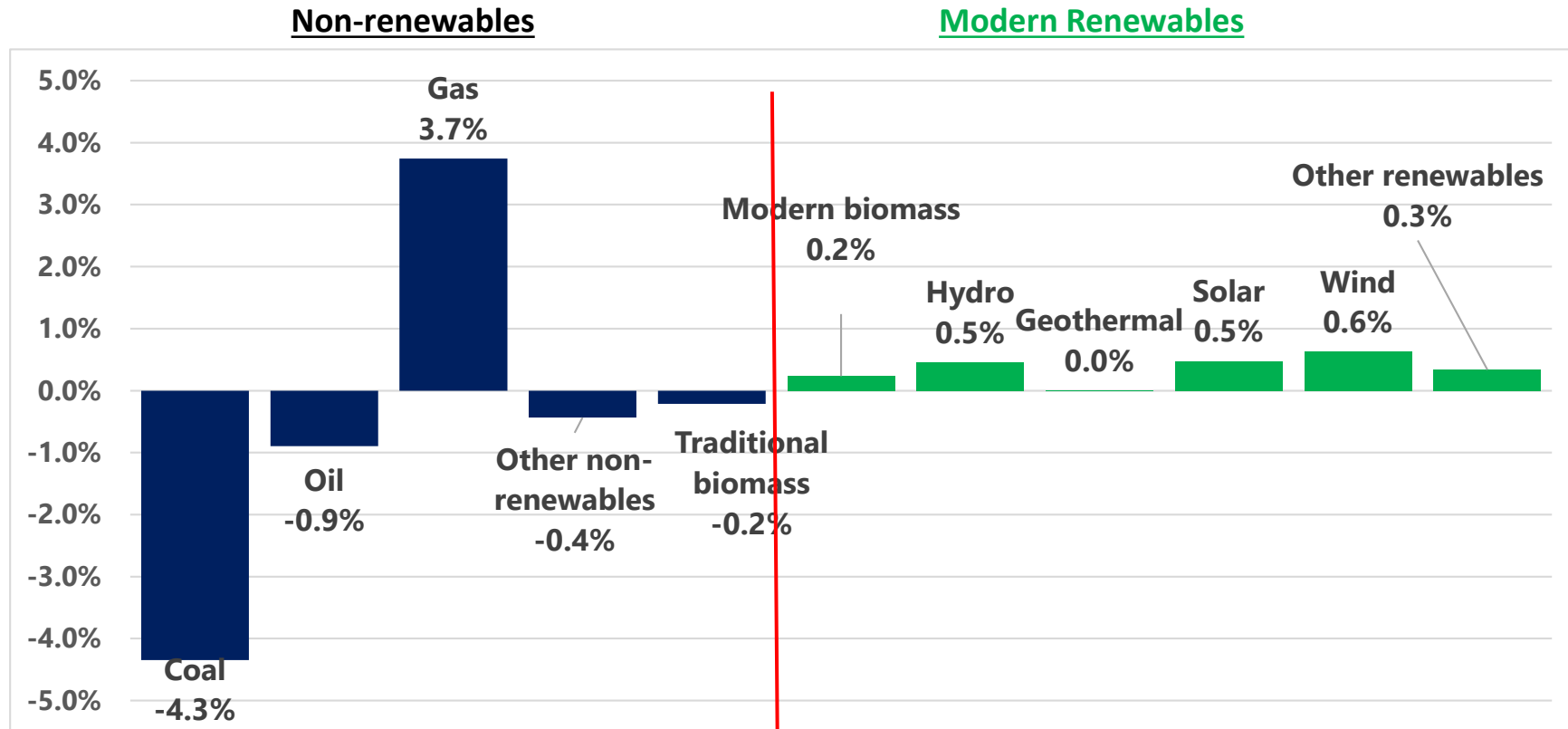
Final energy consumption, PJ

	2010	2019	% change
Non-renewables	161,476	181,295	12.3%
Coal	27,977	20,094	-28.2%
Oil	64,688	74,422	15.0%
Gas	26,152	35,880	37.2%
Electricity	34,563	41,056	18.8%
Heat	7,882	9,502	20.6%
Other non-renewables	213	342	60.2%
Traditional biomass	3,256	3,015	-7.4%
Modern renewable energy	10,751	18,356	70.7%
Electricity	6,229	12,201	95.9%
Heat	64	126	97.1%
Modern biomass	2,875	3,199	11.3%
Other renewables	1,583	2,829	78.8%
Total	175,483	202,666	15.5%
Modern RE share	6.13%	9.06%	47.8%

Note: Consumption of electricity and heat from renewables is calculated from the share of total electricity and heat production.
Data of China for 2018 are estimated based on preliminary information.
Source: APEC data.

Coal and other energy lost shares to gas and renewables

Percent change in fuels in primary energy supply market share, 2010-2019

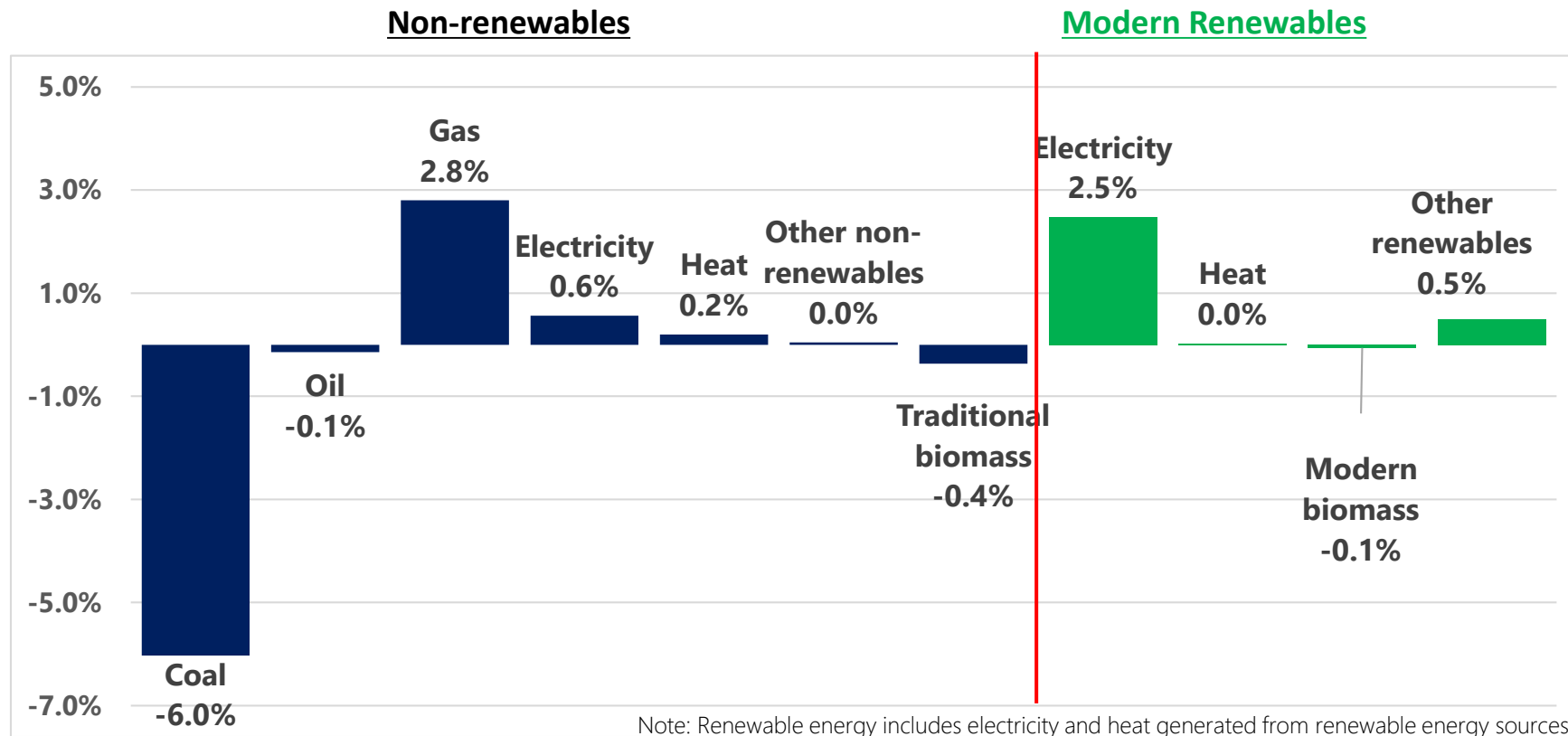


- Note: Renewable energy includes electricity and heat generated from renewable energy sources
- Source: APEC data

From 2010 to 2019, the renewable share increased 2.14 percentage points, 44.5% of the way to the goal.

Coal lost its share in power generation

Percent change in fuels in final energy consumption market share, 2010-2019



Source: APEC data.

From 2010 to 2019, the renewable share increased 2.9 percentage points, 47.8% of the way to the goal.

Electricity Generation

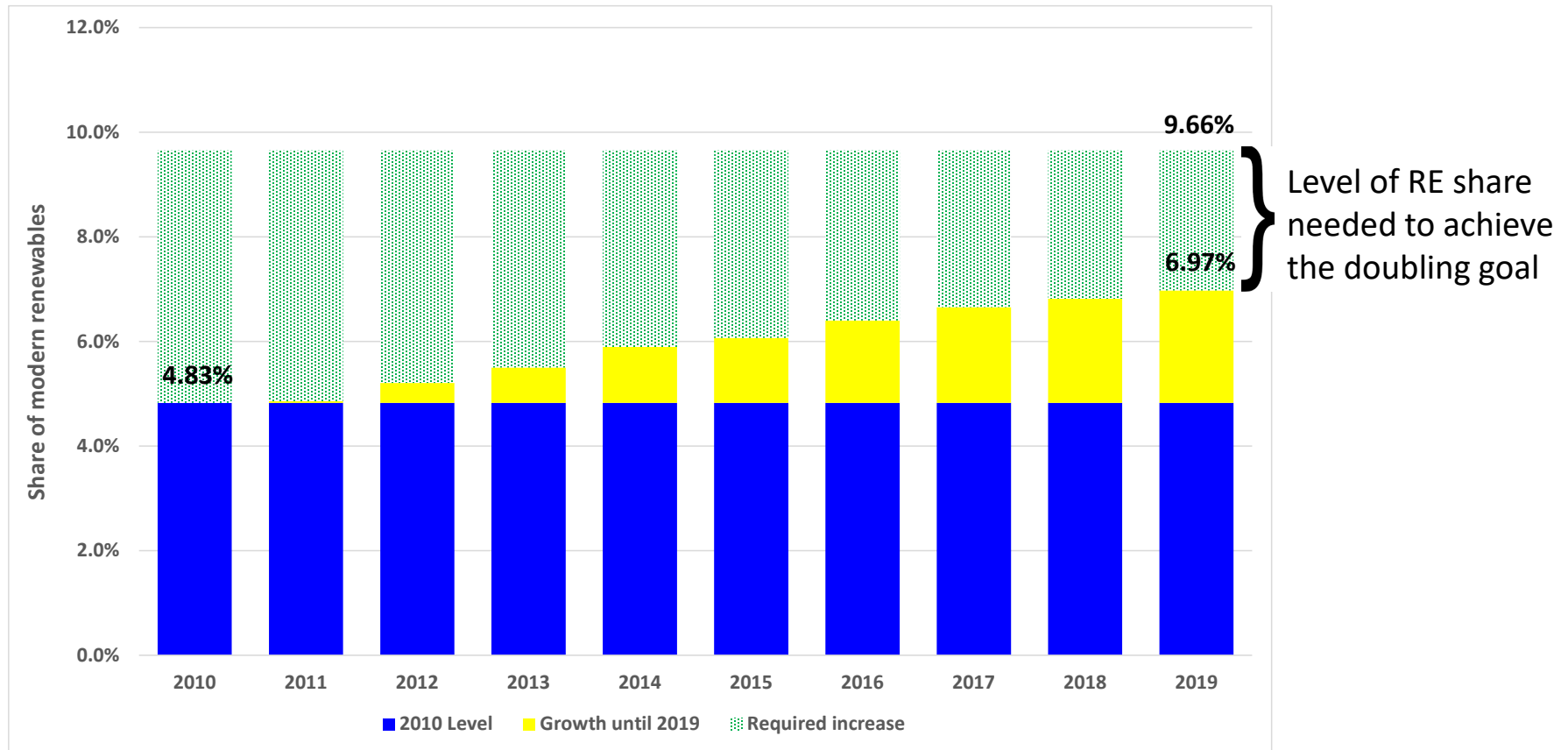
Electricity Generation, TWh

	2010	2019	% change
Non-renewables	11,375	13,417	18.0%
Coal	6,576	7,641	16.2%
Oil	326	186	-42.9%
Gas	2,712	3,716	37.0%
Nuclear	1,658	1,755	5.8%
Other non-renewables	103	119	16.2%
Modern renewable energy	2,099	4,019	91.5%
Modern biomass	67	164	145.6%
Hydro	1,780	2,506	40.8%
Geothermal	53	60	14.2%
Solar	9	456	4962.9%
Wind	163	799	391.0%
Other renewables	27	34	24.9%
Total	13,473	17,436	29.4%
Modern RE share	15.6%	23.0%	48.0%

In electricity generation, for just 45% of the time to 2030, APEC has already increased renewable energy share by 48%

RE share in energy supply needs to increase by 55%

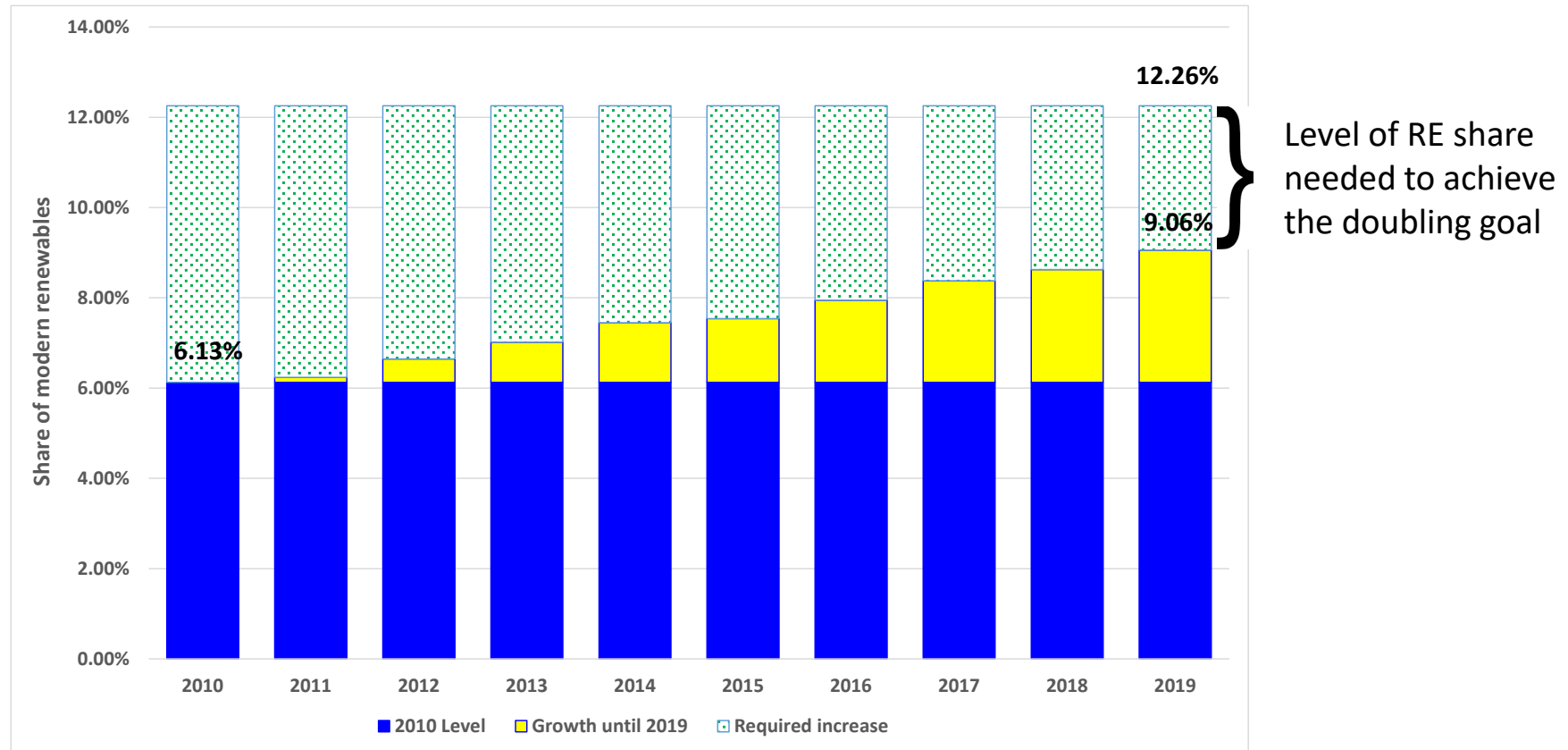
Renewable energy share in total primary energy supply, 2010-2019



Source: APEC data and APERC analysis.

RE share in energy consumption needs to increase by 52%

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



Source: APEC data and APERC analysis.

Closing thoughts

- Over 14 years, final energy demand intensity has declined 25%
- Primary energy supply intensity has declined a similar amount (24%), although the annual variations between the two measures can be significant
- Over 9 years, renewables have increased their share of:
 - primary energy supply by 45%
 - both final energy consumption and power generation by 48%
- The gain in share was achieved primarily by reducing coal's share of the energy mix



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Thank you for your kind attention.

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