

Prospect of APEC Energy Goals for Energy Intensity and Renewable Energy

43rd IAEE International Conference 2022, Tokyo, Japan

Session: APERC 1

August 2, 2022

Nabih Matussin, Researcher, APERC

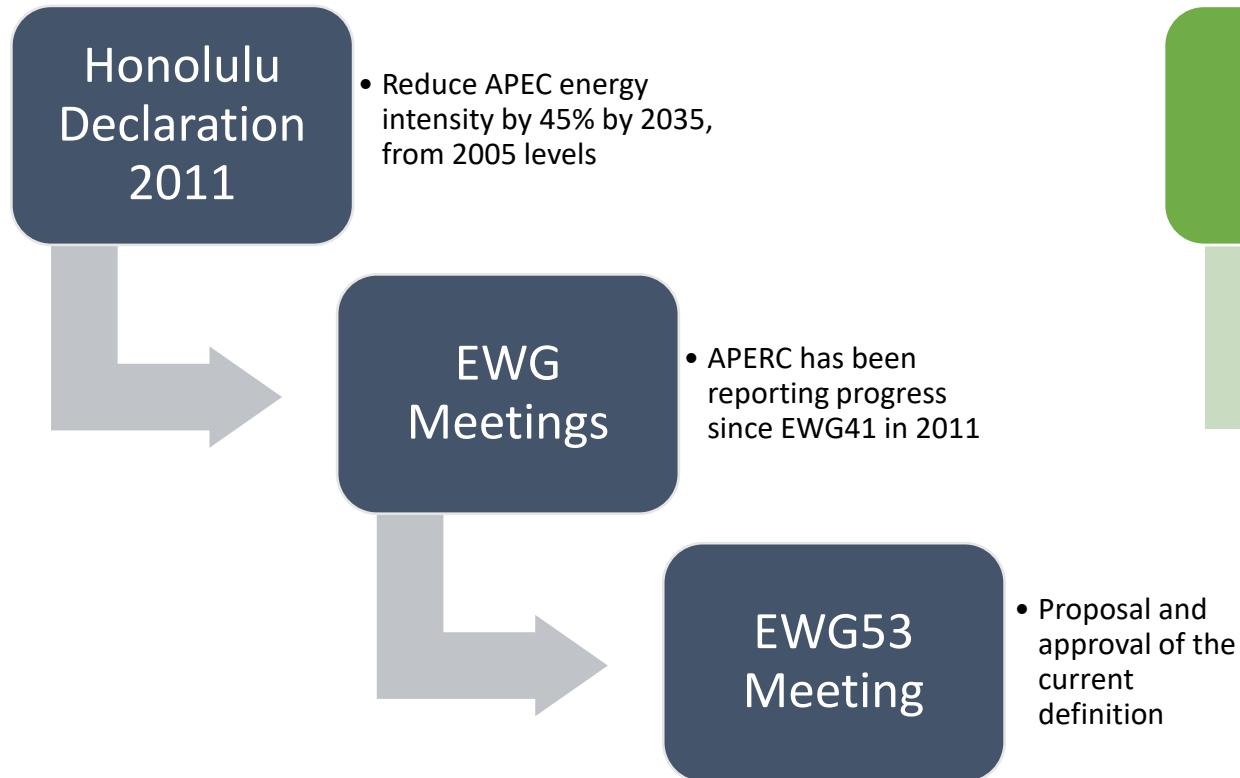


- Milestones of APEC Energy Intensity and Renewable Energy Doubling Goals
- Methodology
- APEC Energy Intensity Current Trends
- Reaching the APEC Energy Intensity Reduction Goal
- Current Renewable Energy Development in APEC
- Towards the Modern Renewable Energy Share Doubling Goal
- Conclusion

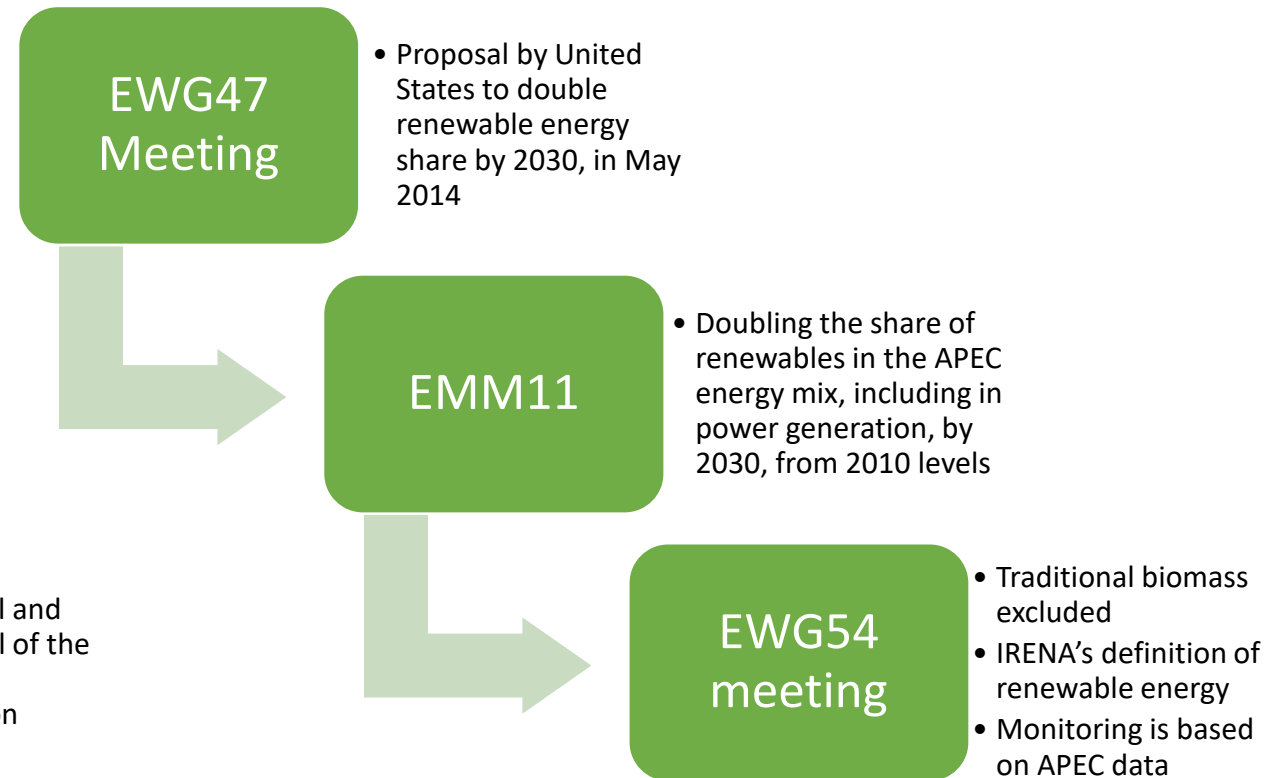
Milestones of APEC Energy Intensity and Renewable Energy Doubling Goals

- APEC has always been a net-energy importer, and this is associated with elevated risks of security of energy supply arising from geopolitical issues.

Energy Intensity



Renewable Energy



Methodology

- The Asia Pacific Energy Research Centre (APERC) has been tracking both the energy intensity and renewable energy share of APEC economies.
- Energy intensity is a proxy measure of the level of efficiency of an economy's energy use. It is mathematically expressed in the following equation:

$$\text{Energy intensity} = \frac{\text{Final energy demand}}{\text{GDP}}$$

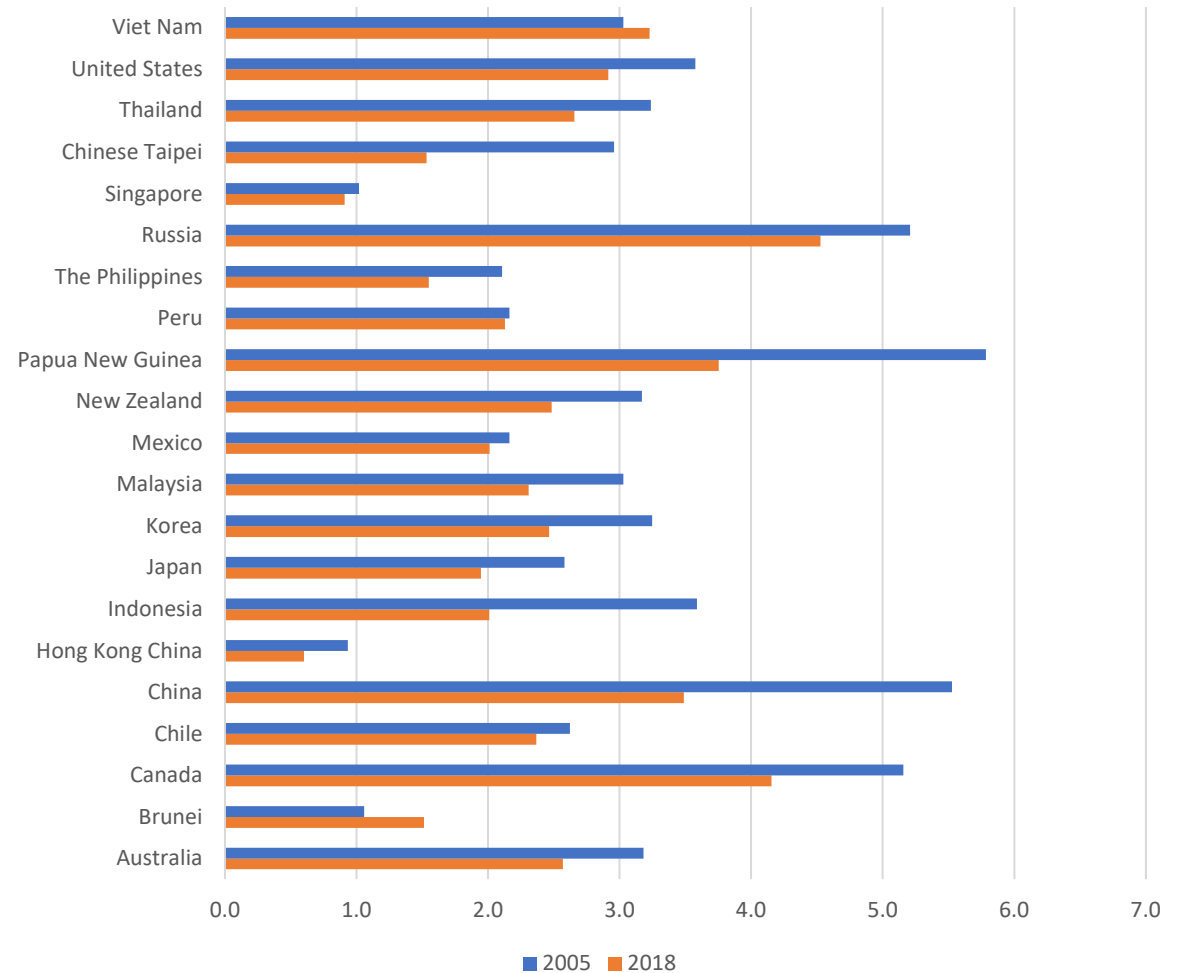
- Sectoral energy consumption in industry, transport, buildings, and agriculture sectors are included, excluding non-energy consumption.
- The modern renewable energy share calculation does not consider traditional biomass for cooking, heating, and drying in end-use sectors, as shown in the following equation:

$$\text{Modern renewable energy share} = \frac{\text{Renewable energy demand} + \left(\frac{\text{Renewable electricity demand}}{\text{Total electricity demand}} \right)}{\text{Final energy demand}}$$

APEC Energy Intensity Current Trends

- APEC energy intensity has been historically decreasing at a rate of 1.9% per year between 2005 and 2018.
- Energy intensities vary between APEC economies, owing to different economic and energy efficiency structures.
- Indonesia and Chinese Taipei have recorded reductions greater than 40% in their energy intensity.
- China; Hong Kong, China; and Papua New Guinea have recorded reductions between 30% and 40%.

Figure 1: APEC final energy intensities, 2005 and 2018.



Reaching the APEC Energy Intensity Reduction Goal

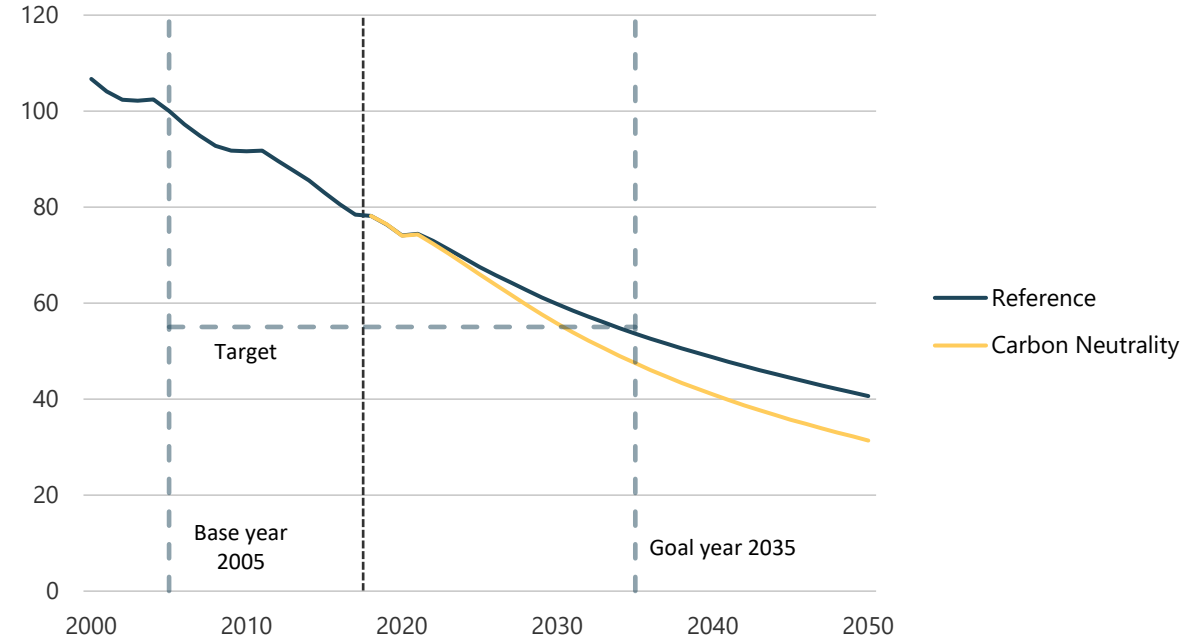
REF

- APEC is envisaged to achieve the energy intensity goal by 2034 in REF, one year ahead of schedule.
- This achievement suggests that the current policies, measures and trends are sufficient for the goal to be achieved.
- Moving beyond 2035, APEC continues to reduce energy intensity, eventually reaching 60% below 2005 levels in 2050.

CN

- APEC reaches the energy intensity goal four years earlier in 2031.
- Economies expected to move towards more stringent and robust policy interventions that positively impact energy efficiency across end-use sectors.
- By 2050, APEC economies are expected to achieve a 70% reduction relative to 2005 levels.

Figure 2: Final energy intensity in REF and CN, 2000 – 2050



Current Renewable Energy Development in APEC

Figure 3: Growth of renewable electricity in APEC since 2000.

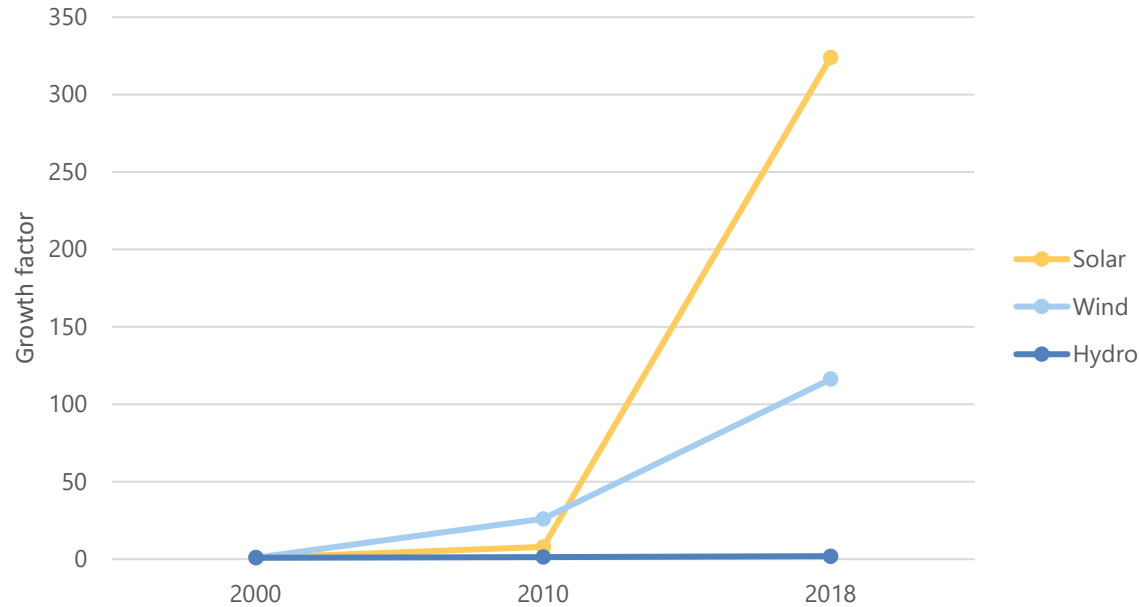
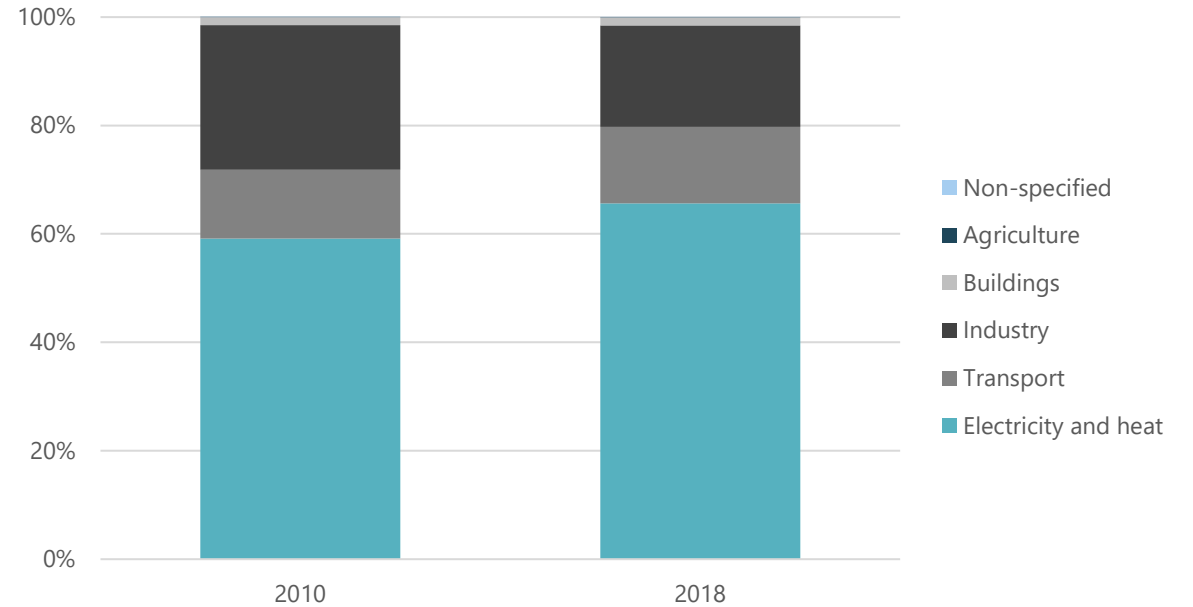


Figure 4: Modern renewable energy share in end-use sectors, 2010 and 2018.



- The share of APEC renewables electricity grew from 13% in 2000 to 21% in 2018, signifying rapid development of renewable energy in the region.
- Solar and wind are the most prominent sources of renewables electricity growth, expanding by over 300 times and 110 times, respectively in 2018 from 2000 levels.
- The share of modern renewables in end-use sectors increased from 6.1% in 2010 to 8.7% in 2018, representing an increase of 42%.
- Renewables electricity and heat consumption accounted for the largest share of modern renewables in 2010 and 2018, followed by direct modern renewables consumption in the industry and transport sectors.

Towards the Modern Renewable Energy Share Doubling Goal

Figure 5: Aggregated modern renewable energy share in REF and CN, 2000 – 2050

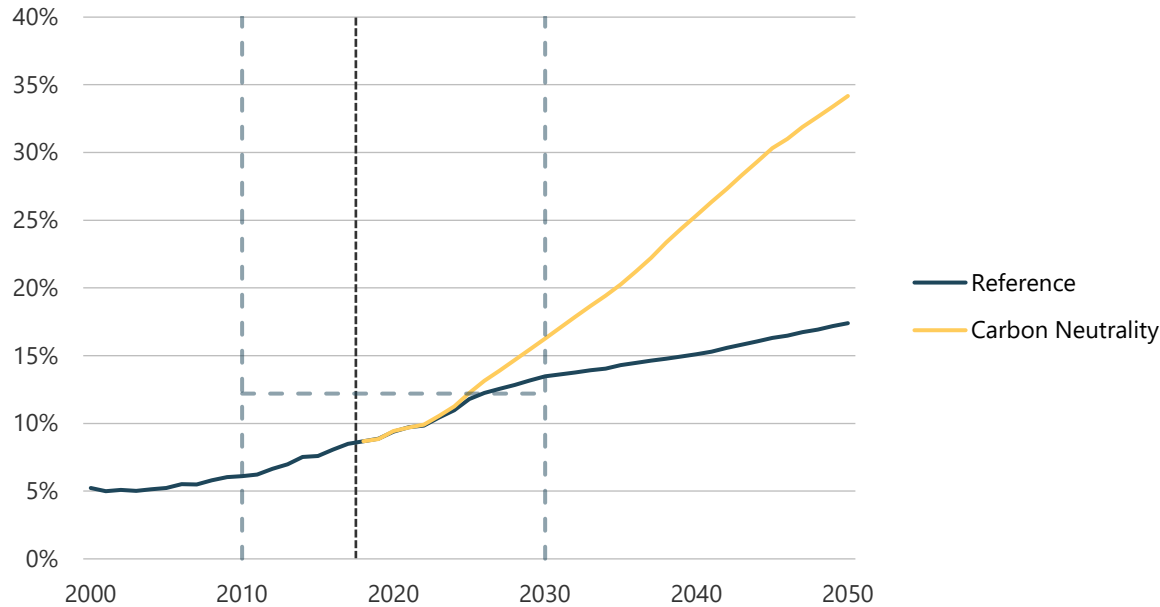
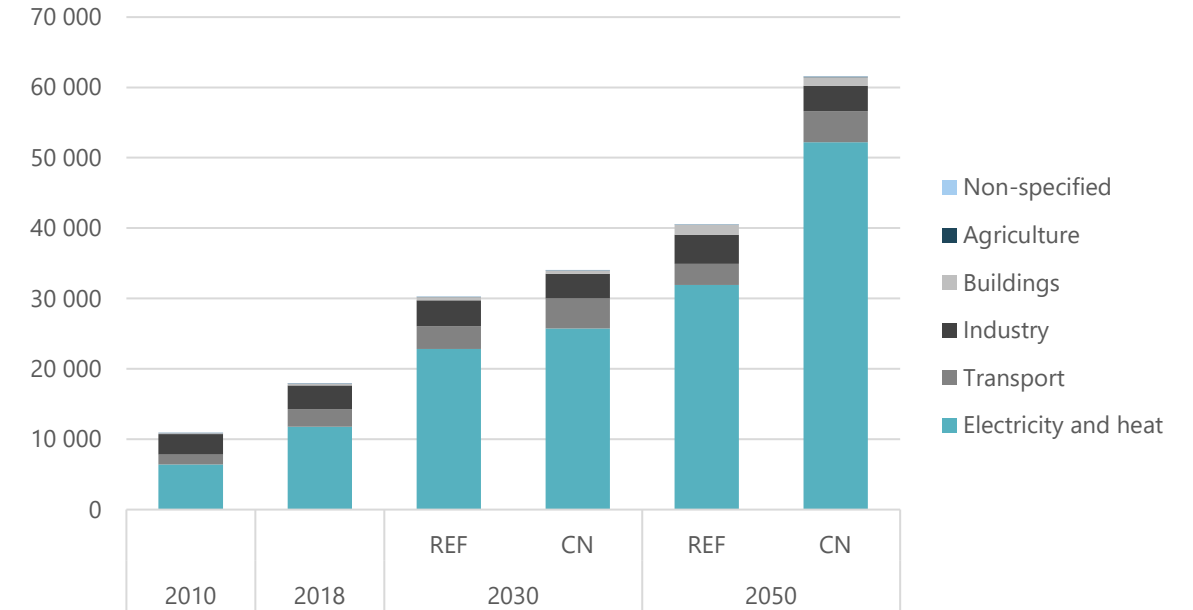


Figure 6: Modern renewable energy consumption in end-use sectors, 2010 – 2050



REF

- APEC is expected to meet the doubling goal by 2026, four years ahead of schedule, implying APEC economies have enhanced their policies and measures in accelerating renewables deployment.
- Three-quarters of modern renewables consumption is expected to come from renewable electricity and heat in 2030. By 2050, this will account for 79%.

CN

- The goal is achieved five years earlier, in 2025.
- 85% of the overall modern renewable consumption will be coming from renewable electricity and heat.

Conclusion

- APEC is on track to achieve the two energy goals ahead of target years, highlighting effective existing policies and measures.
- Energy intensity continues to decline through to 2050 in REF and CN, driven by increased energy efficiency adoption in end-use sectors.
- Renewable electricity and heat, particularly from solar and wind, remain significant in APEC modern renewable energy share.
- Realising the two energy goals requires continuous collaboration and cooperation between APEC economies, considering the current energy crisis and to ensure carbon neutrality goal.

Thank you.

<https://www.aperc.or.jp>

nabih.matussin@aperc.or.jp

