

Progress on APEC Energy Goals and Development in APEC Region

EGNRET 60 Meeting

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Today's agenda

- **What are the APEC energy goals?**
- **How are APEC energy goals measured?**
- **How are the APEC energy goals progressing?**
 - Energy intensity reduction goal
 - Renewable energy doubling share goal
- **Summary and potential developments**

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What are the APEC energy goals?

- **Energy Intensity reduction goal**

- **APEC's Leader's Declaration 2007:** To reduce APEC's aggregate energy intensity by [25% by 2030](#).
- **Honolulu Declaration 2011:** To reduce APEC's aggregate energy intensity by [45% by 2035](#).
- **EWG 41:** APERC has been reporting progress since [EWG41](#) in 2011.
- **EWG 53:** Agreement was reached to analyze [final energy consumption intensity \(excluding non-energy\)](#), using [APEC \(EGEDA\) data](#).

- **Renewable energy doubling share goal**

- **EWG 47:** 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](#).
- **EMM 11:** "Doubling the share of renewables in the APEC energy mix, including in [power generation](#), from [2010 levels by 2030](#)."
- **EWG 54:** 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](#).

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How are APEC energy goals measured?

Energy intensity (EI)

$$\text{EI} = \frac{\text{Energy Demand}}{\text{GDP(PPP)}}$$

Target: reducing energy intensity by [45%](#) by [2035](#)
Baseline year: [2015](#)

- Total final energy consumption (TFEC) and Total Primary energy supply (TPES) can be regarded as **Energy Demand**
- Final energy intensity excludes “**non-energy**” consumption. (EWG 53)
- Primary energy intensity should be showed in the meeting (EWG 62).

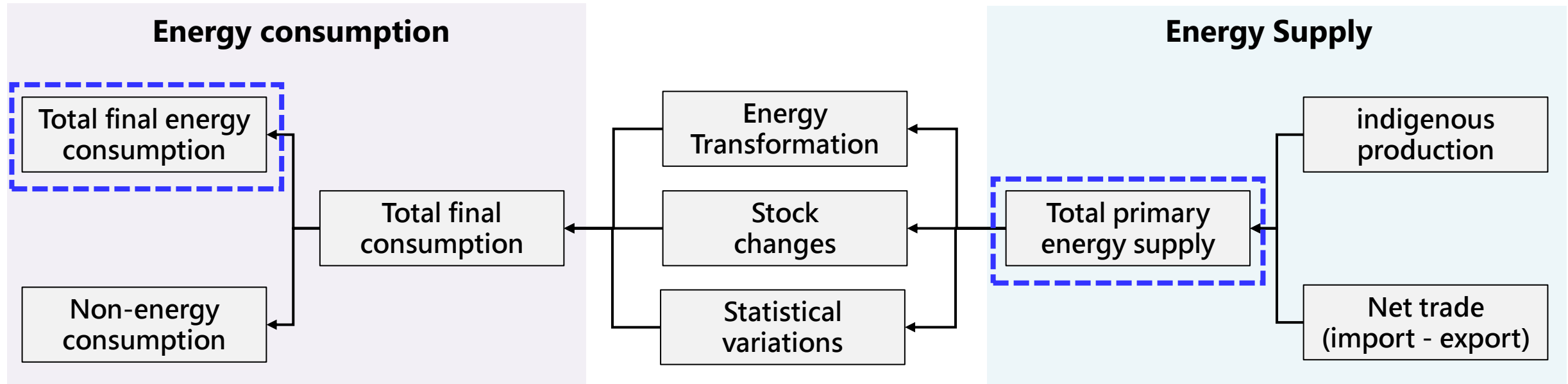
Renewable energy share (RE share)

$$\text{RE share} = \frac{\text{Renewables}}{\text{Energy Demand}} \times 100\%$$

Target: [doubling](#) renewable energy share by [2030](#)
Baseline year: [2010](#)

- Total final energy consumption (TFEC) and Total Primary energy supply (TPES) can be regarded as **Energy Demand**
- **Traditional biomass** will not be counted in Modern renewable energy. (EWG 54)
- IRENA’s definition of renewable energy is recommended. (EWG 54)

Two different energy demands will be used in goal-track analysis



- **Total final energy consumption** is the sum of consumption by the different end-use sectors (industry, transport, commercial residential, agriculture, and other sectors), **excluding the energy own-use and non-energy use** (e.g. petrochemical feedstocks)
- **Total primary energy supply** is made up of indigenous production + imports – exports – international marine and aviation bunkers and \pm stock changes.

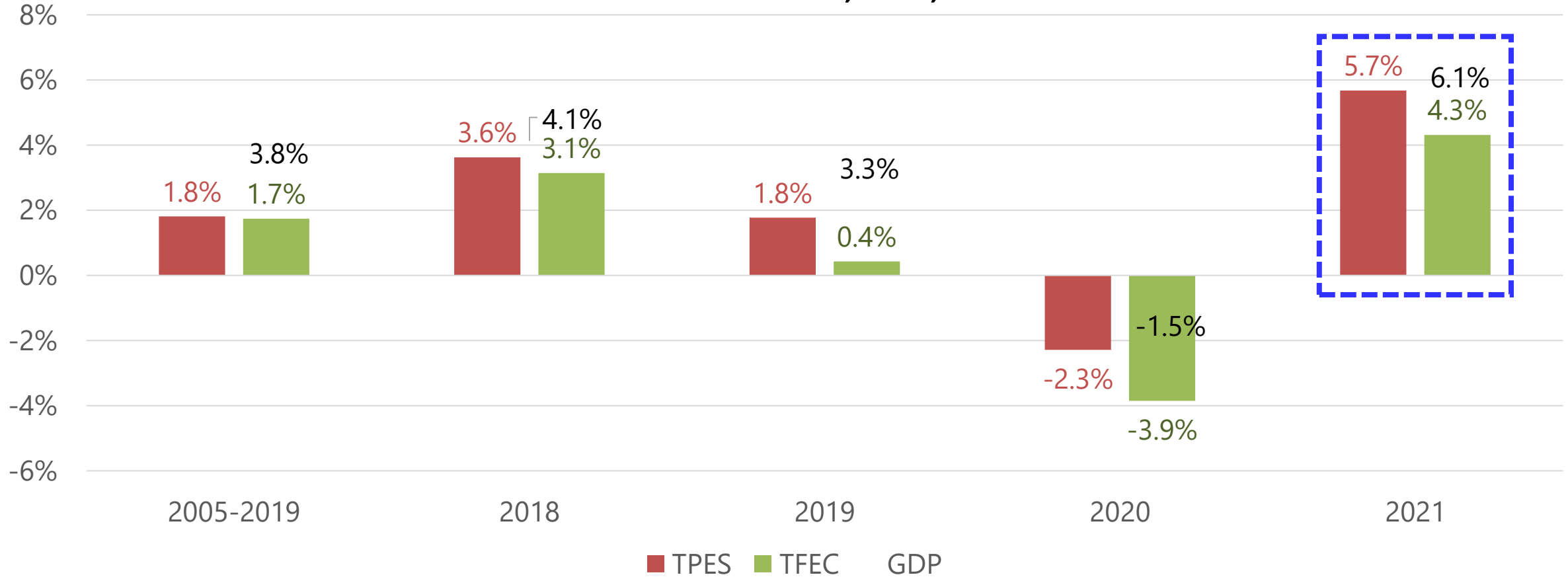
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Energy demand rebounded in 2021 alongside with GDP growth

Annual change (%)

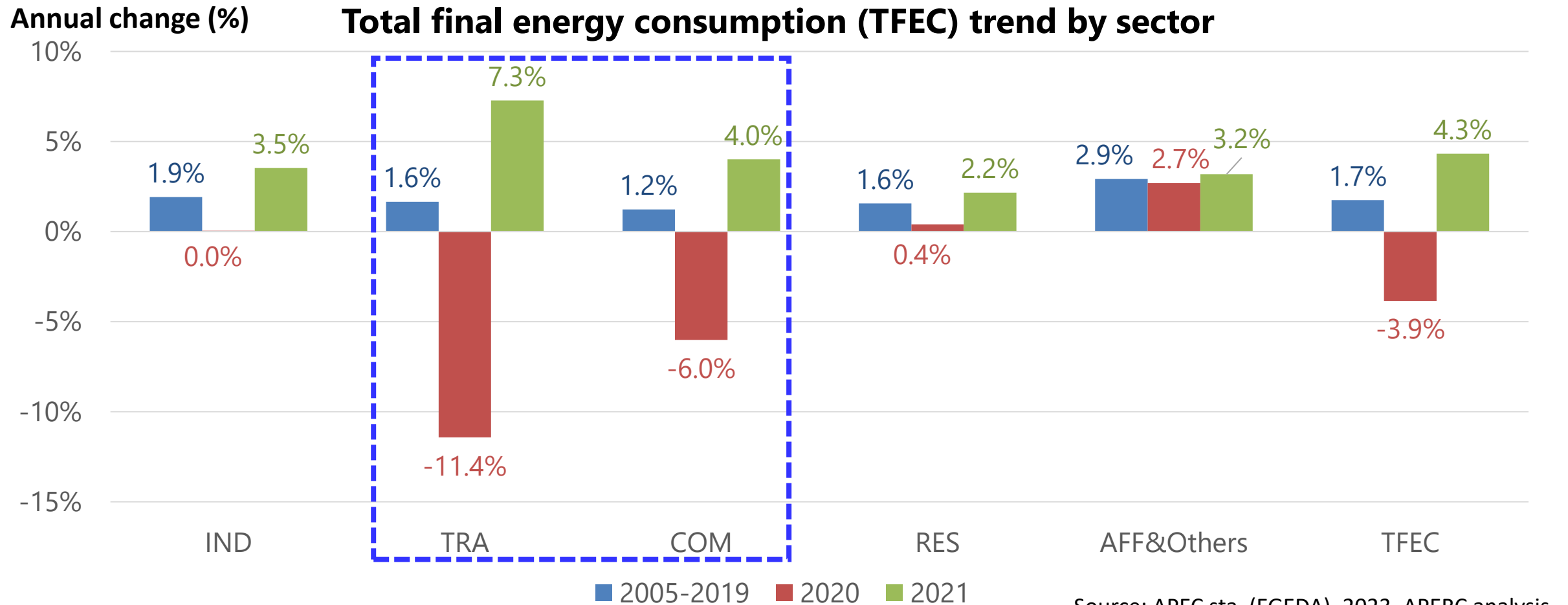
Historical trend of TPES, TFEC, and GDP



Source: APEC sta. (EGEDA), 2023, APERC analysis

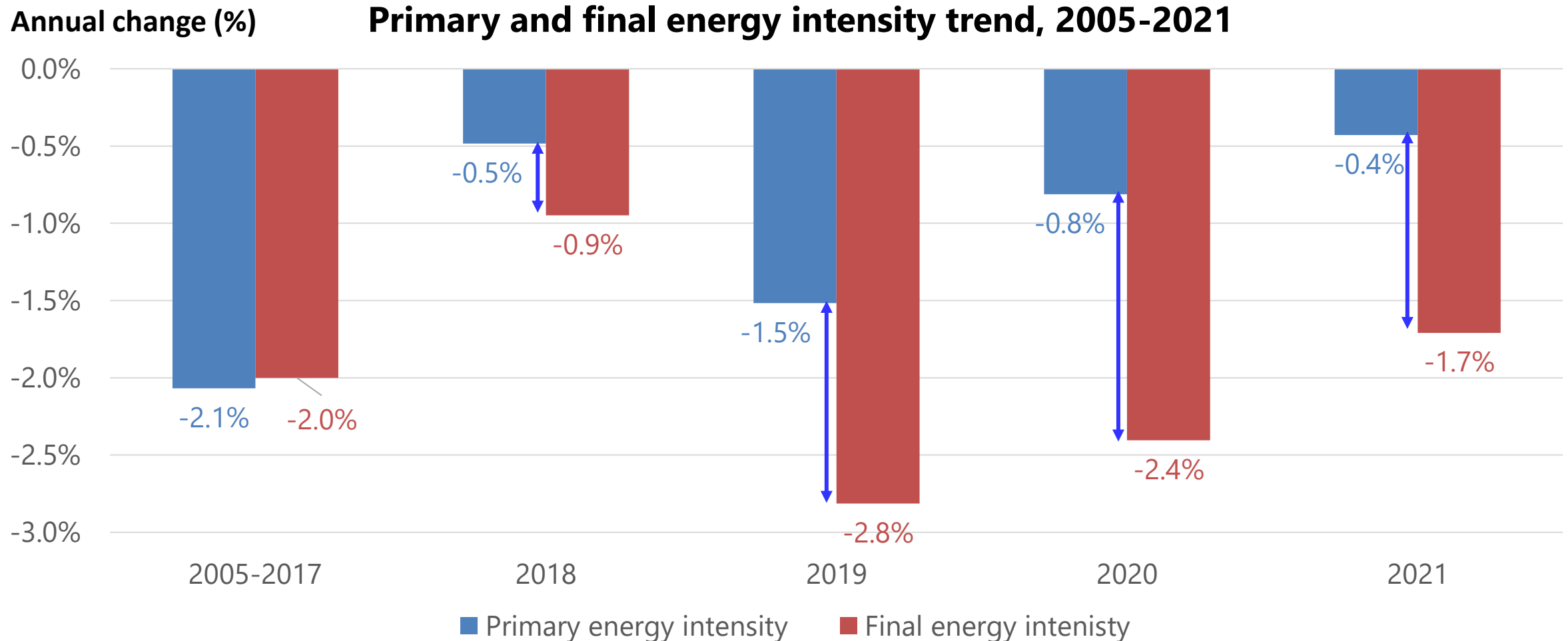
Energy demand (TPES and TFEC) rebounded in 2021, driven by a higher GDP growth rate of 6.1%

Transport and commercial sectors rebounded in 2021



Most demand rebounded sector is transportation (7.3%), followed by commercial sector (4.0%) and industry (3.5%)
An uneven rebound may be attributed to the ongoing lockdown measures by governments in 2021

Since 2018, two intensity indicators have been decompiling...



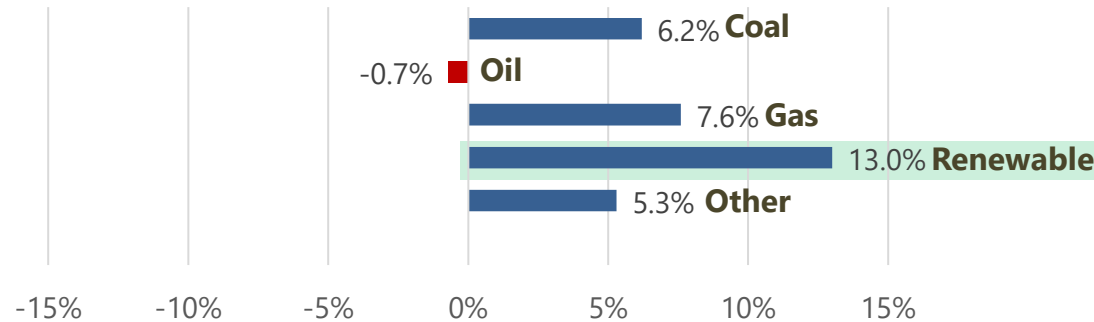
Source: APEC sta. (EGEDA), 2023, APERC analysis

Final energy intensity has been declining notably faster than primary energy intensity since 2018

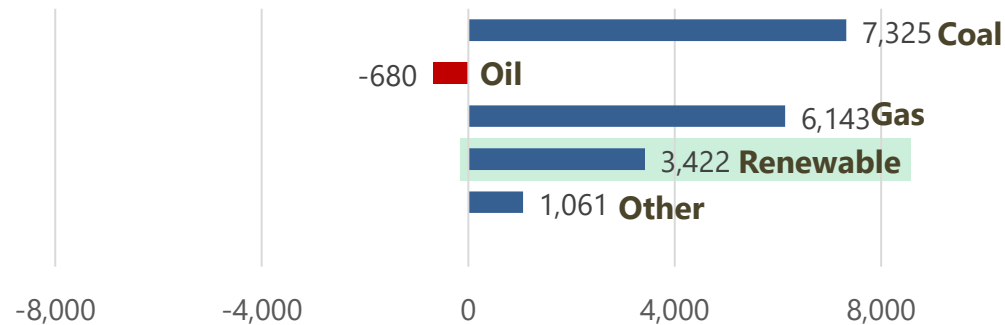
From 2018 to 2021, renewables grew faster -- but from a smaller base

TPES

% change: 2018 to 2021

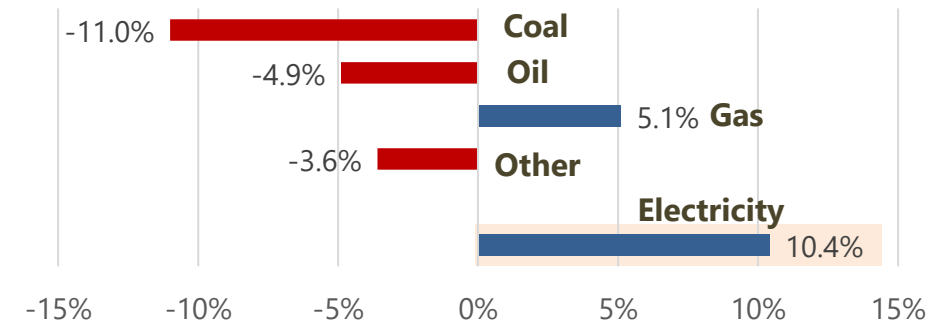


PJ change: 2018 to 2021

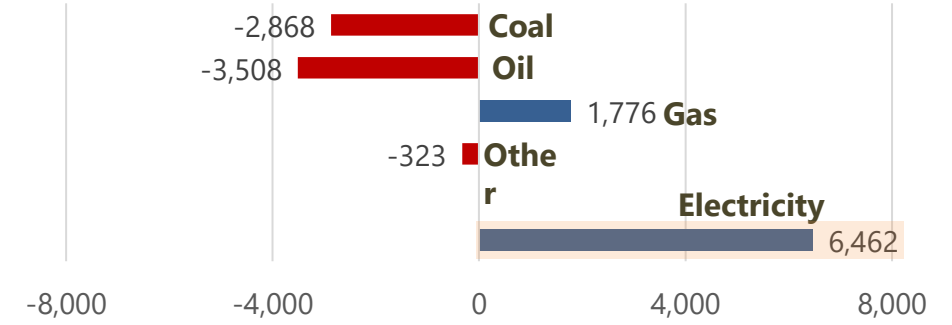


TFEC

% change: 2018 to 2021



PJ change: 2018 to 2021



Source: APEC sta. (EGEDA), 2023, APERC analysis

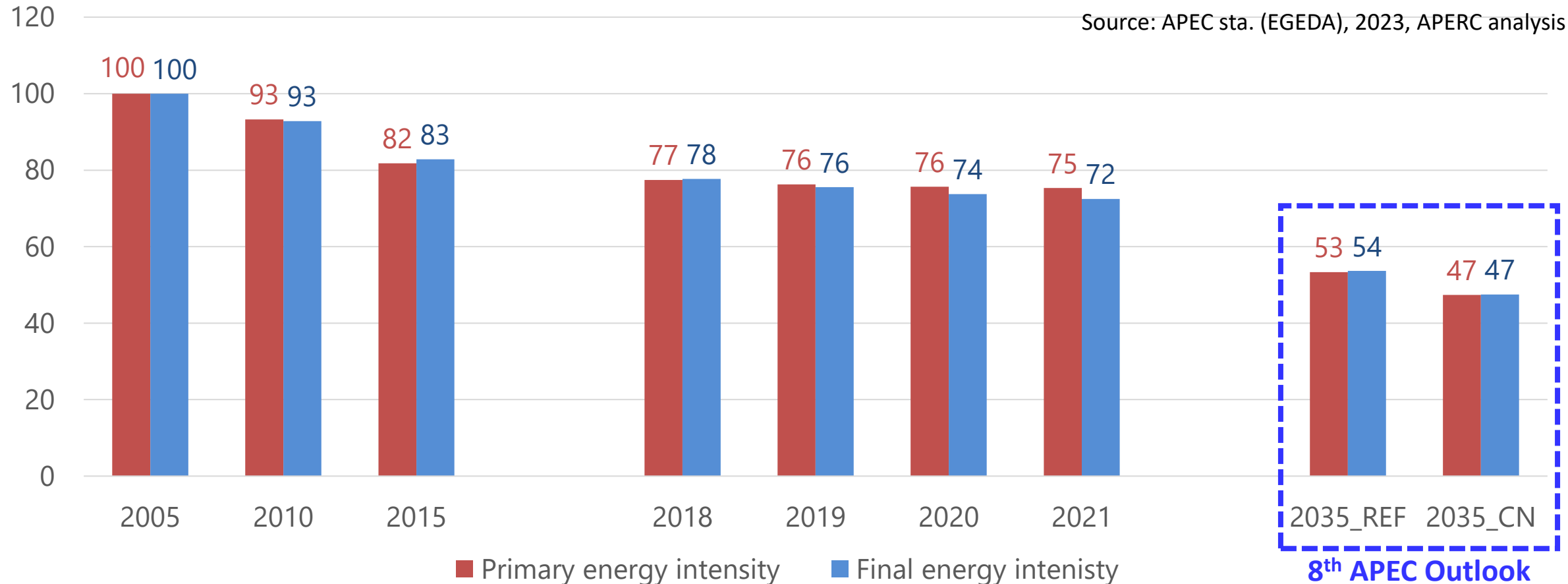
- In terms of percentage change, TPES renewables grew twice as fast as coal or gas; but in terms of the quantity of energy, TPES coal and gas both grew twice as much as renewables.
- For TFEC, electricity grew faster than all other fuels both in terms of percentage and absolute quantity.

Declined energy intensity is expected to be on track to meet the goal

2005 = 100

Primary and final energy intensity trend and Outlook scenario by 2035

Source: APEC sta. (EGEDA), 2023, APERC analysis



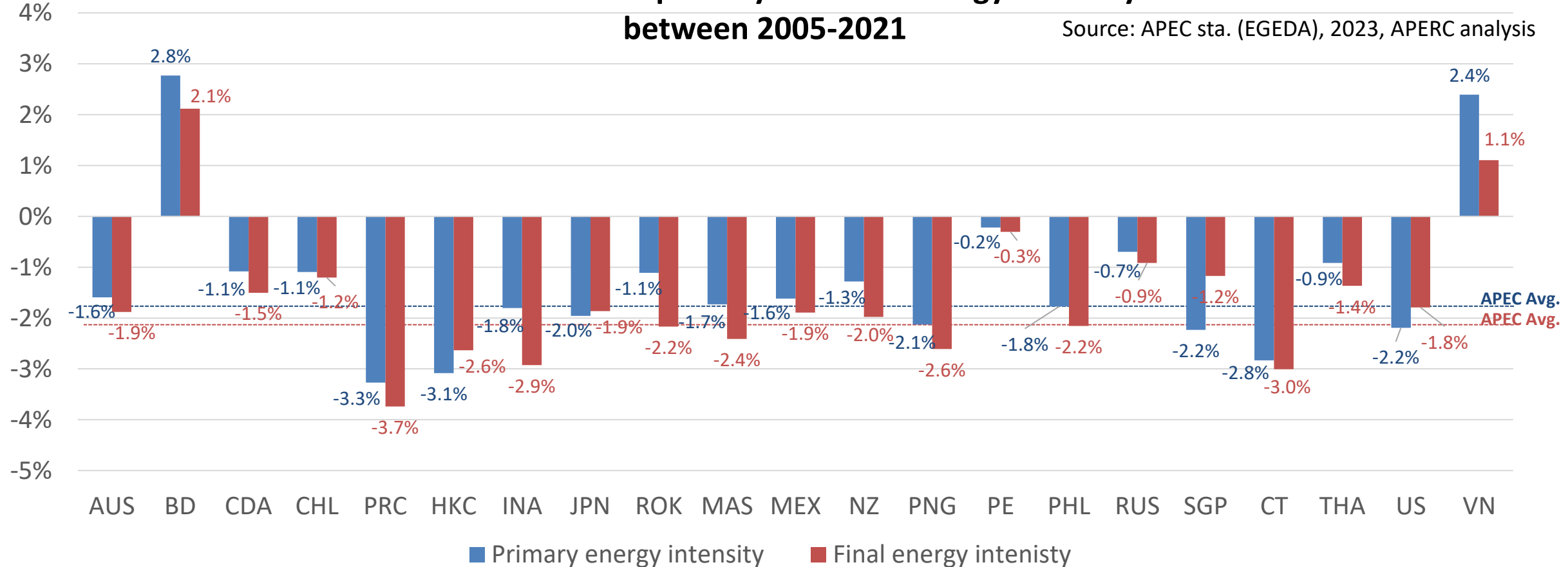
The improvement in energy intensity has been ongoing, with the goal expected to be achieved by 2035. However, there is still a potential risk of deviating from the goal.

Two EI indicators show varying degrees of decline in several economies

Annual change (%)

Historical trend of primary and final energy intensity
between 2005-2021

Source: APEC sta. (EGEDA), 2023, APERC analysis

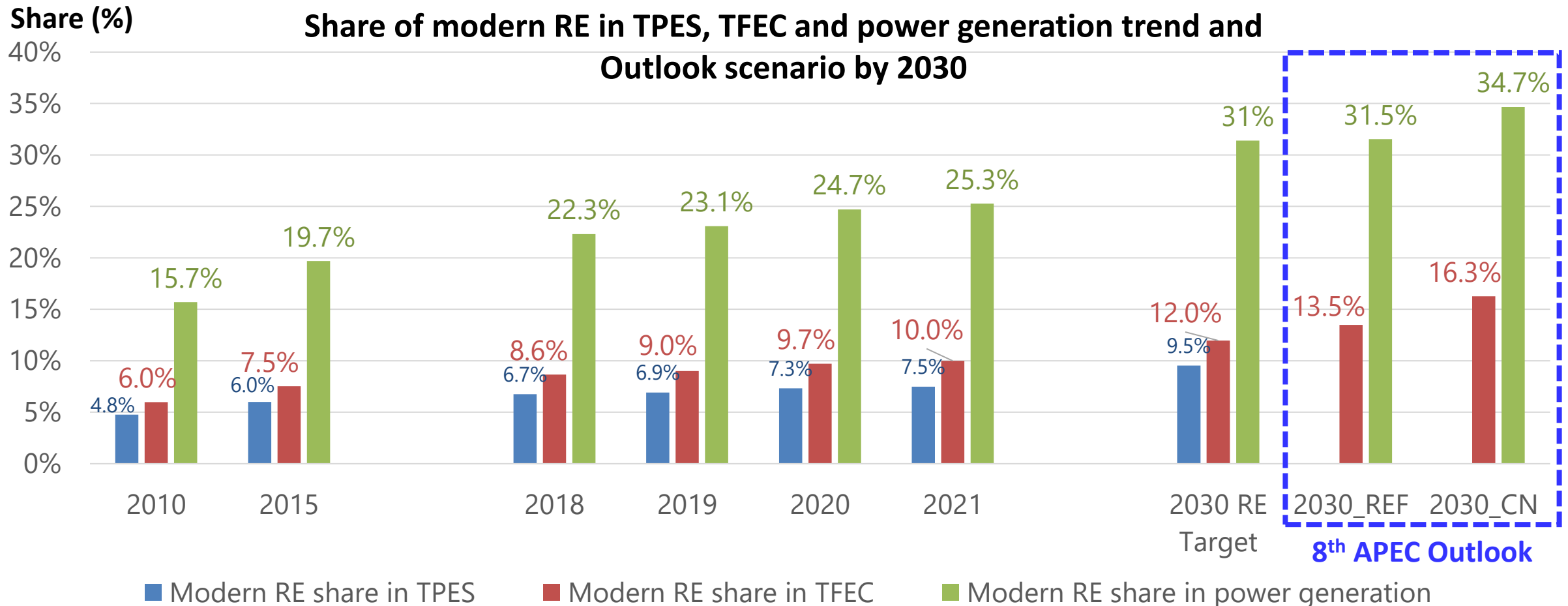


From 2005 to 2021, all APEC members experienced PEI changes ranging from 2.8% to -3.3 %, FEI from 2.1% to 3.7%, and APEC overall's PEI -1.8 % and -2.2 % of FEI.

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Modern RE share is steadily rising, expected to reach the doubling goal



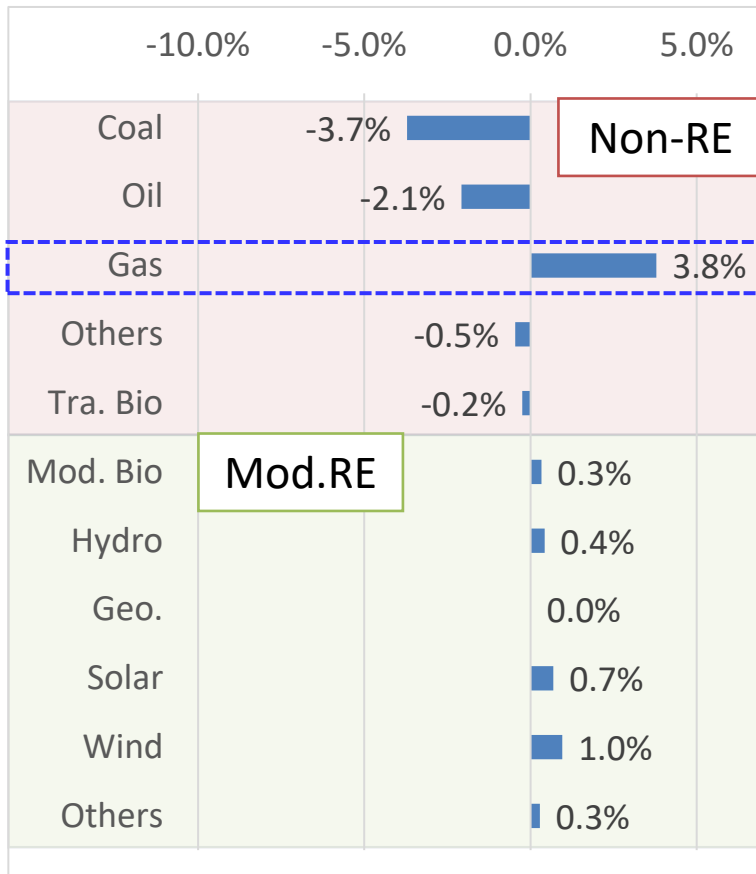
Source: APEC sta. (EGEDA), 2023, APERC analysis

The share of modern renewables in power generation is much higher than the share in TPES and TFEC

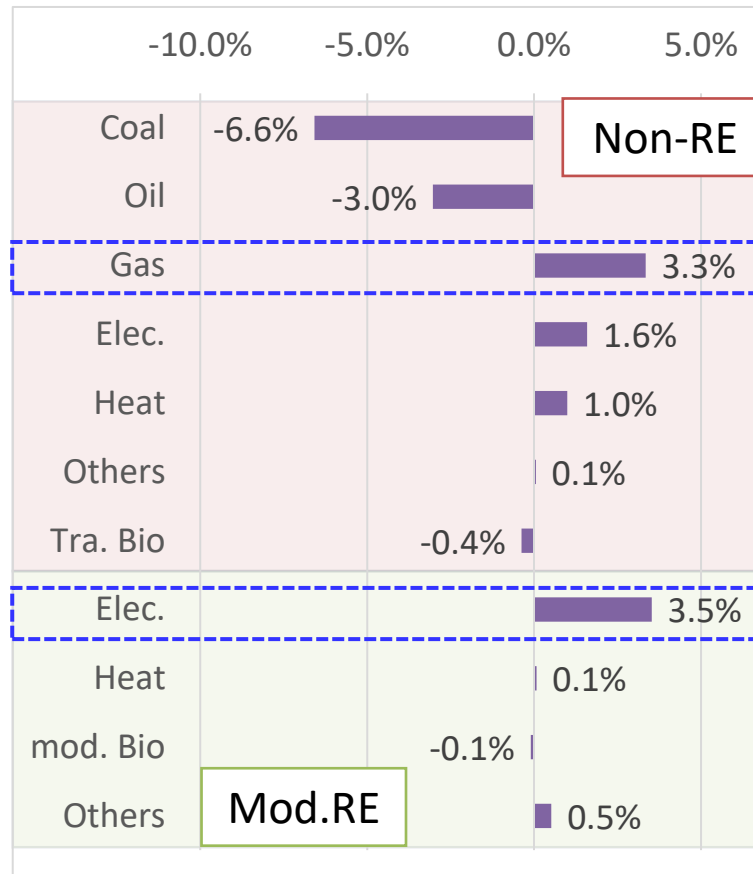
Coal and oil lost shares to gas and renewables with electrification

Percentage point change in fuel shares in TPES, TFES, and power generation between 2010 and 2021

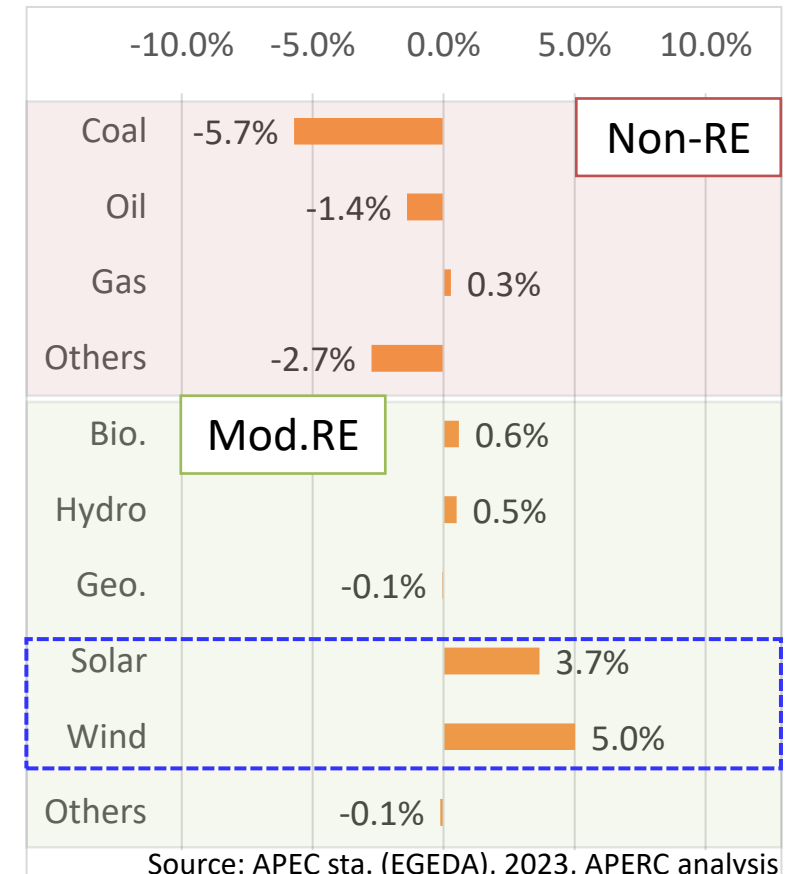
Total primary energy supply



Total final energy consumption



Power generation

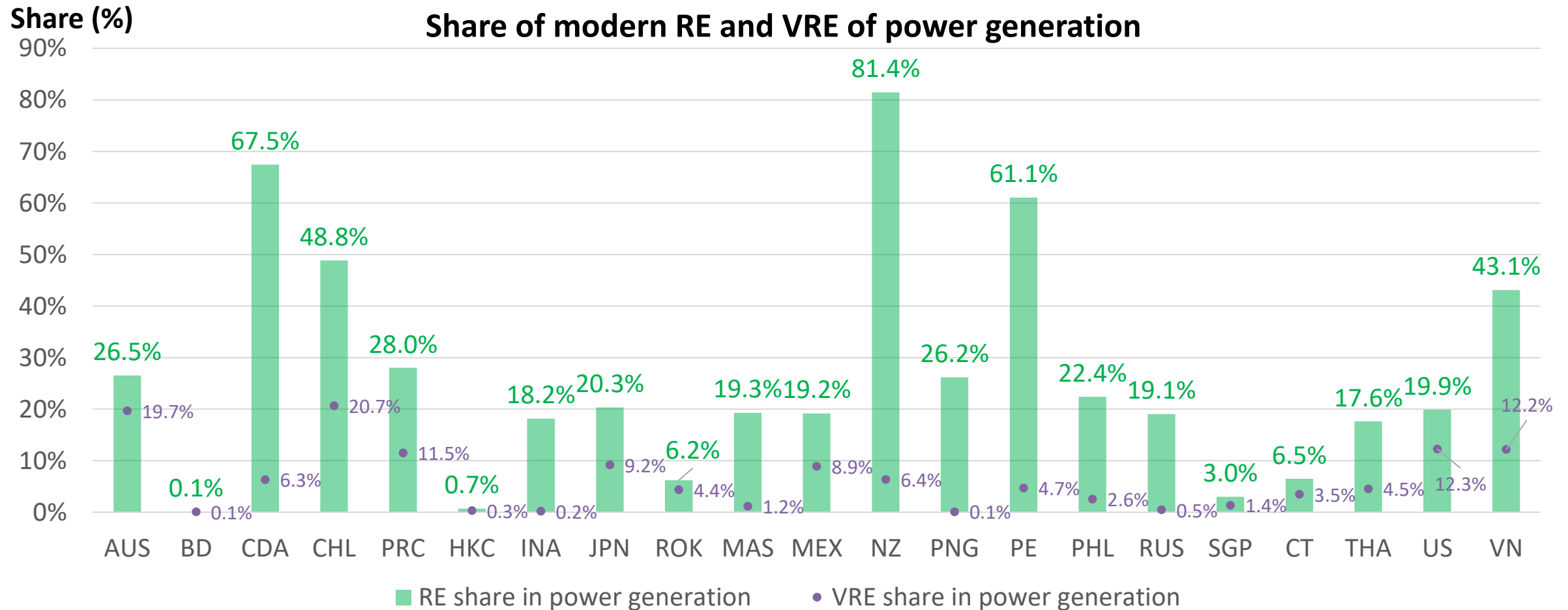


Source: APEC sta. (EGEDA), 2023, APERC analysis

Gas and RE have replaced coal and oil in supply while coal and oil are shifting to gas and electricity.

The share of wind and solar in power generation has increased rapidly.

Most economies have a low VRE share in their power mix



**In 2021, the Share of VRE for APEC members was ranging from 0.1% to 20.7%
Current renewable energy in power generation still mainly comes from hydro.**

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Summary and potential developments

- Following the pandemic, APEC's GDP and energy consumption (especially in the [transport and commercial sector](#)) [rebounded](#).
- Since 2018, [TPES and TFEC intensity have been decompiling](#) due to the supply of [primary fossil fuel](#) more than renewables; despite [renewables remain a faster growing trend](#).
- Energy intensity reduction is ongoing and expected to remain [on track with the 2035 goal](#).

- APEC continues to make substantial progress in increasing [renewable energy production](#) (especially in power generation), and is [on track to meet its 2030 doubling share goal](#).
- Since 2010, [coal and oil have lost their share to gas and renewables](#) in TPES and TFEC, with significant contributions from solar and wind power.
- Most economies have [low VRE shares with varying electrification](#), and how to [integrate VRE into the power system while stabilizing the supply and demand of power](#) is a critical issue.

Thank you.

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