

2-5. APEC Goals and CO₂ Emissions

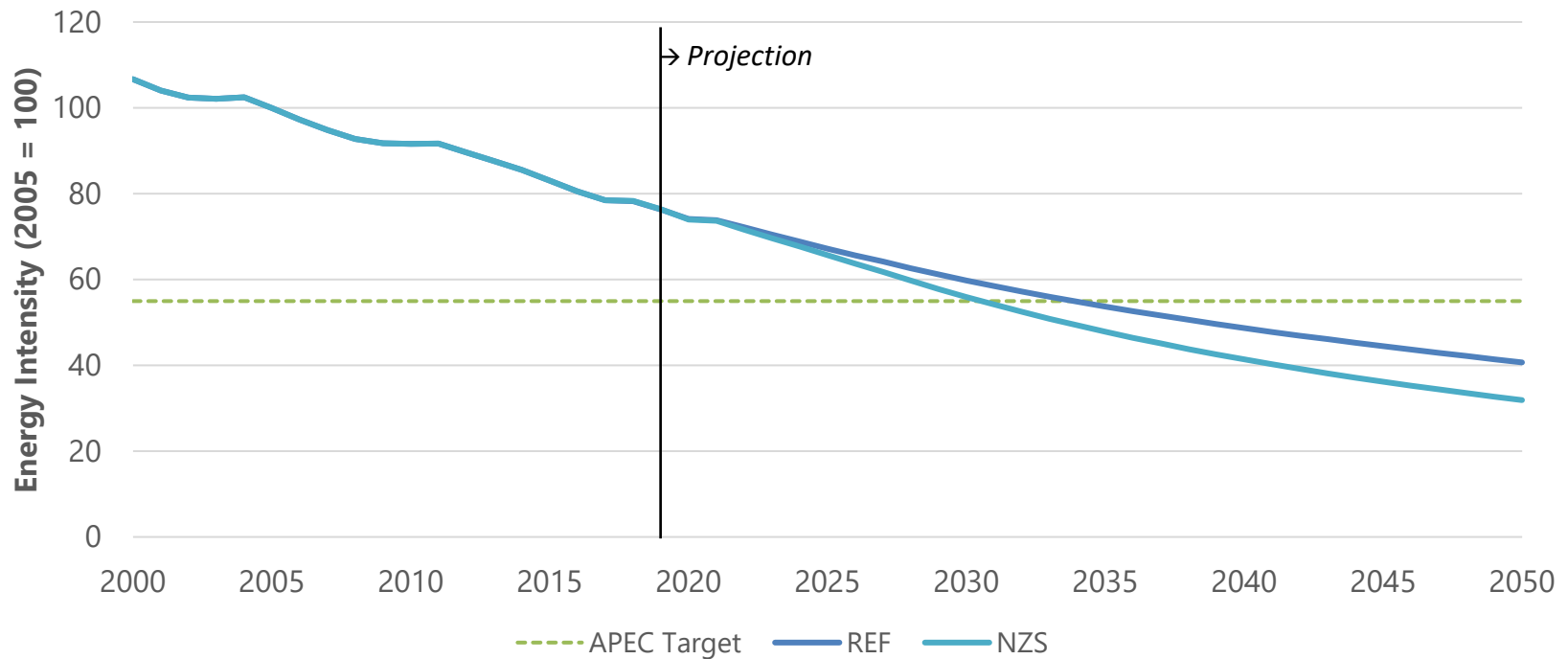
APERCC Workshop

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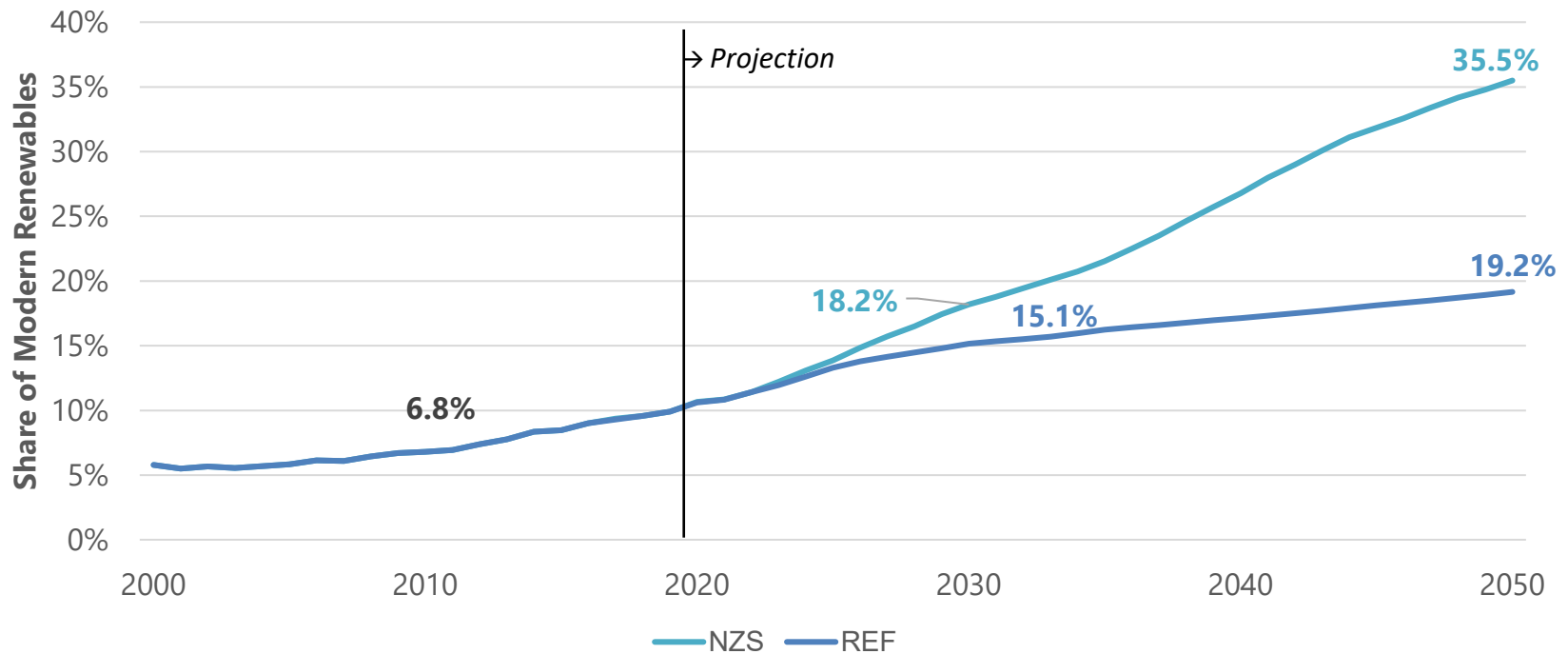
Based on preliminary results, APEC is on track to achieve its energy intensity goal early



Source: APERC analysis

- In the 8th edition preliminary results, APEC is expected to achieve the energy intensity goal ahead of the 2035 target:
 - 2034 in the Reference scenario (REF)
 - 2030 in the Net Zero Scenario (NZS)

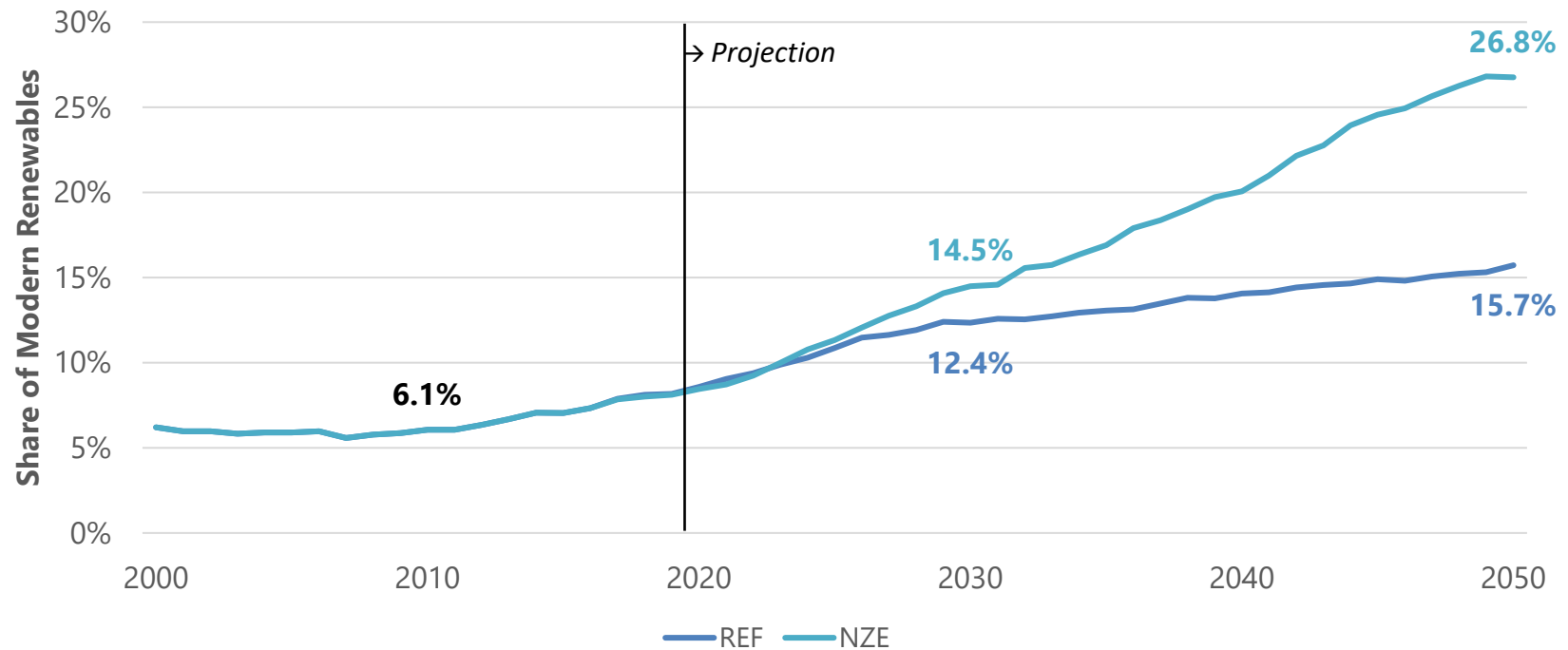
Energy consumption: APEC surpasses the modern renewables doubling goal



Source: APERC analysis

- Relative to the 2010 level, preliminary total final energy consumption results show APEC achieves its modern renewables share doubling goal before 2030 in both scenarios:
 - 15.1% in 2030 in REF
 - 18.2% in 2030 in NZS

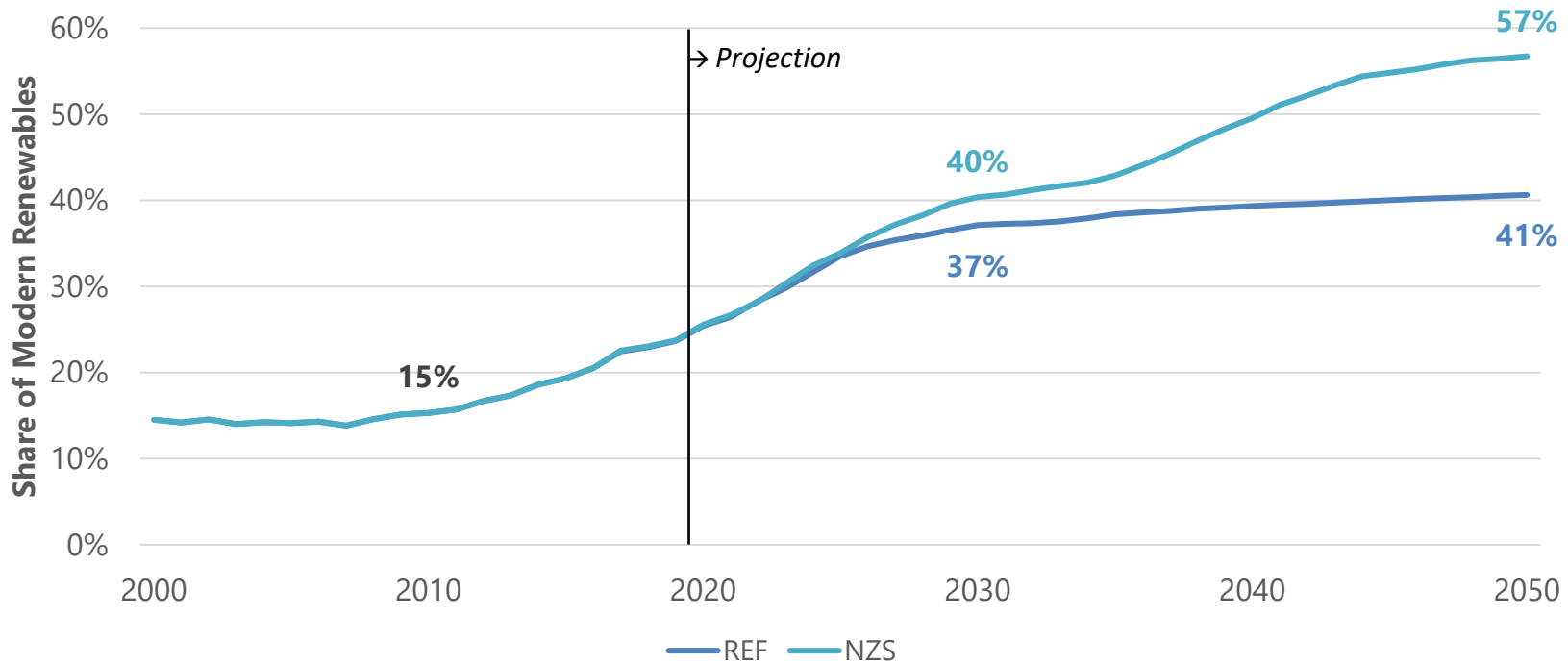
Modern renewables share more than doubles in 2030 in primary energy supply



Source: APERC analysis

- The share of modern renewables in APEC's primary energy supply to double before 2030:
 - 12.4% in 2030 in REF
 - 14.5% in 2030 in NZS

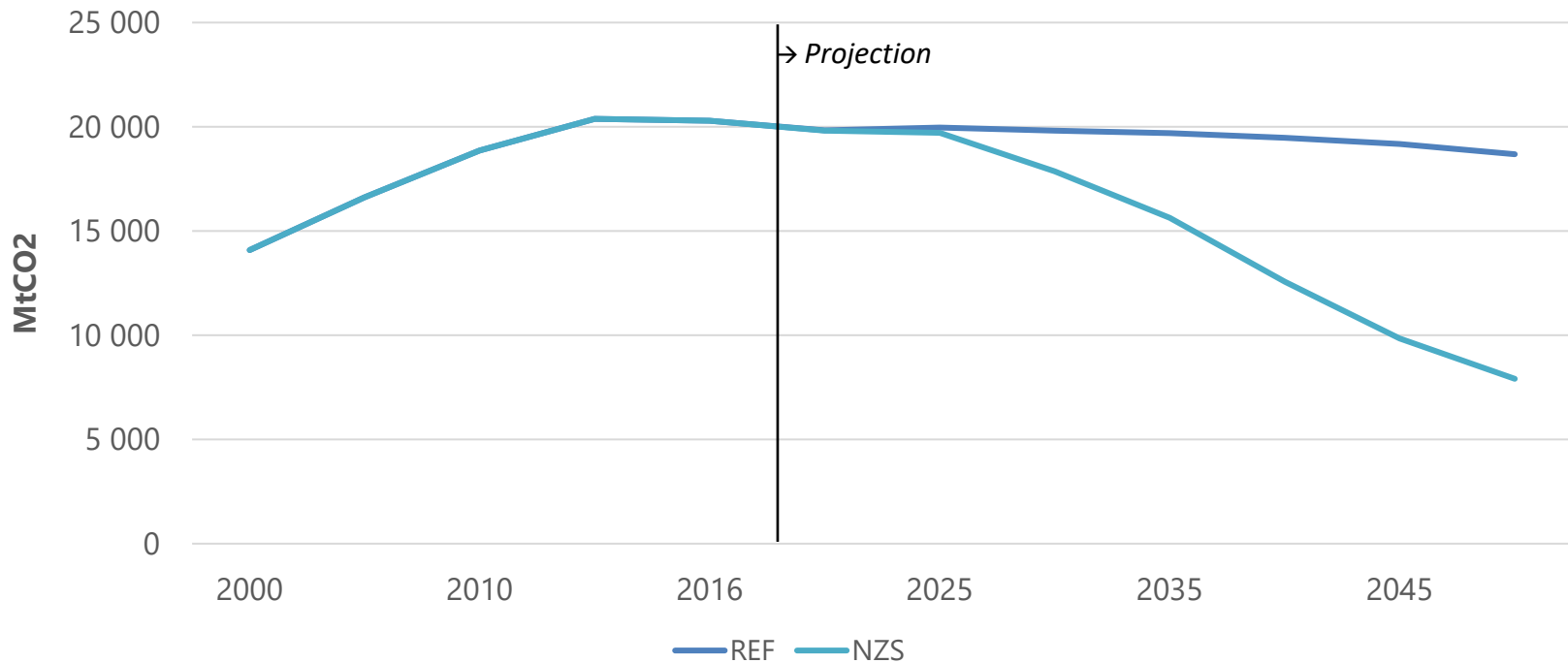
Modern renewables share more than doubles in 2030 in power generation



Source: APERC analysis

- 37% share in REF, and 40% share in NZS by 2030.
- Solar, wind and hydro lead the growth in renewables power in both scenarios.

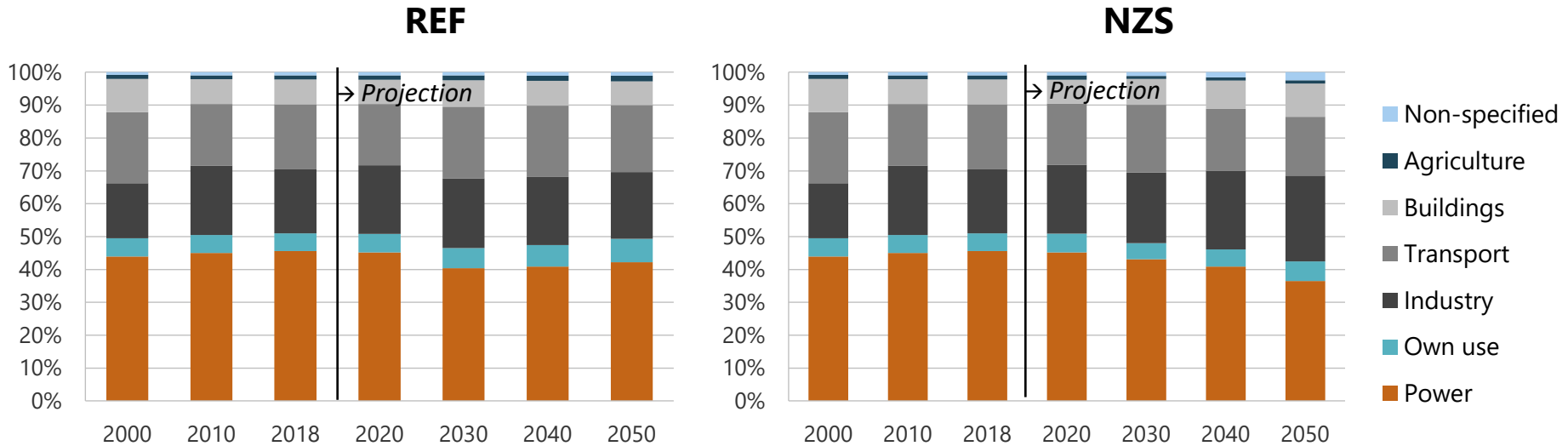
CO2 emissions reduced slightly in REF



Source: APERC analysis

- Relative to 2018 levels, by 2050, gross emissions are reduced by 11% in REF and by 62% in NZS.
- APERC emission models do not consider negative emissions technologies.

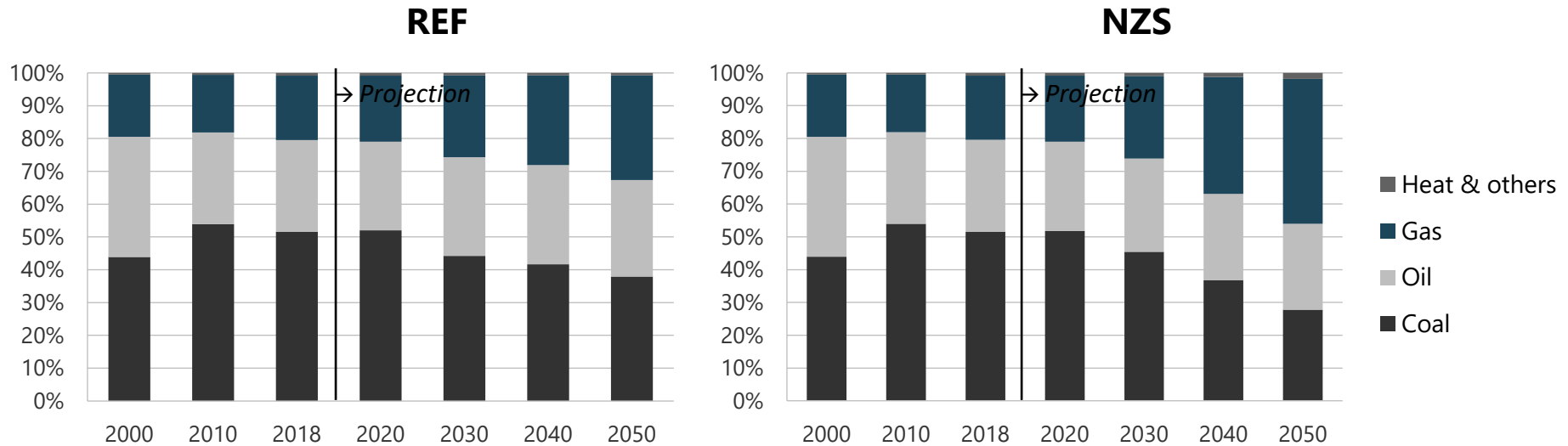
The power sector remains the dominant source of emissions



Source: APERC analysis

- By 2050, both scenarios show that the power sector accounts for 42% of the overall sectoral emissions share, followed by industry and transport sectors at 20% each.
- Power sector emissions (absolute) to plateau from 2026 onwards in REF. Renewables and use of CCS units in gas-fired plants contribute to the decrease in emissions and eventual decrease in the power sector share of emissions.

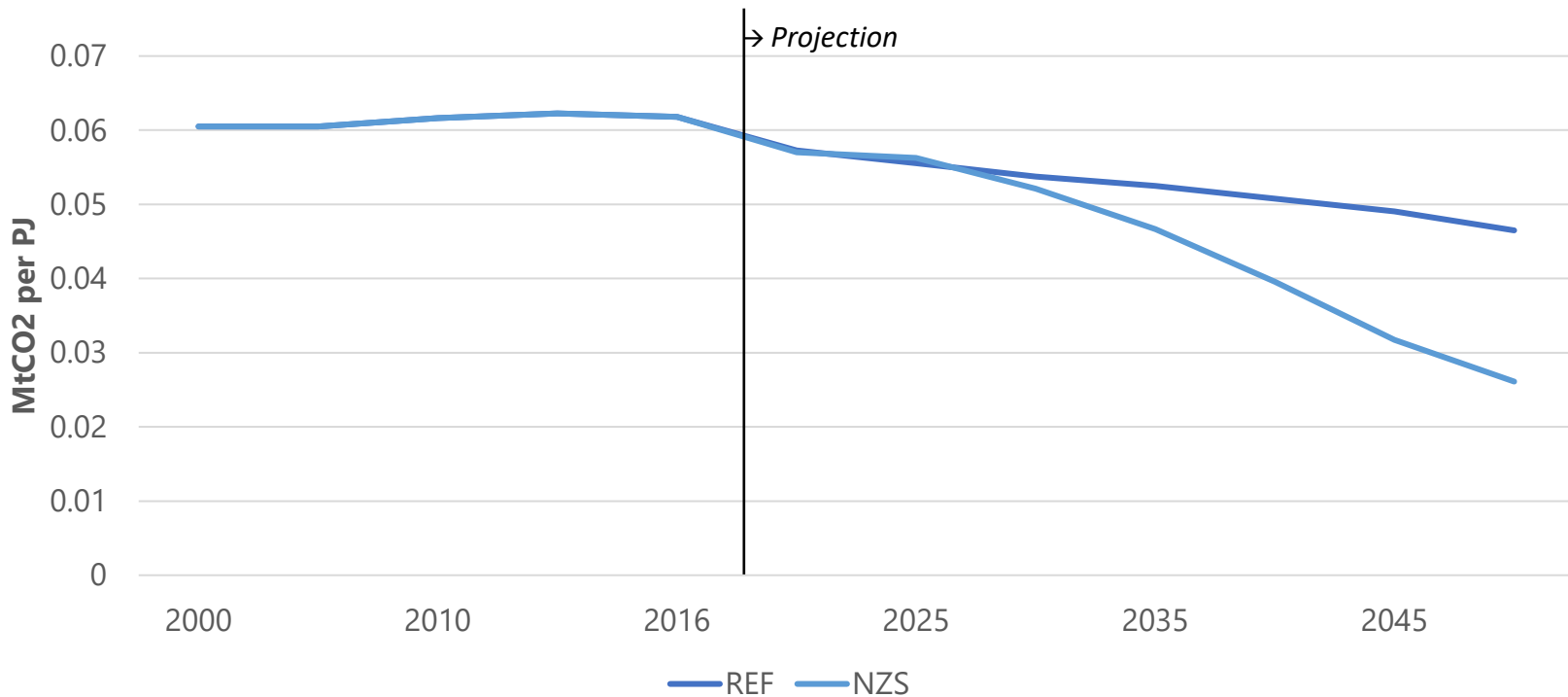
Gas becomes the biggest contributor to emissions as coal use declines in the NZS



Source: APERC analysis

- In REF, coal remains the dominant emissions contributor, followed by gas and oil in 2050.
- Gas, however, overtakes coal's share in NZS due to the significant reduction in coal consumption in the power sector. Gas becomes the most dominant fossil fuel for power generation.

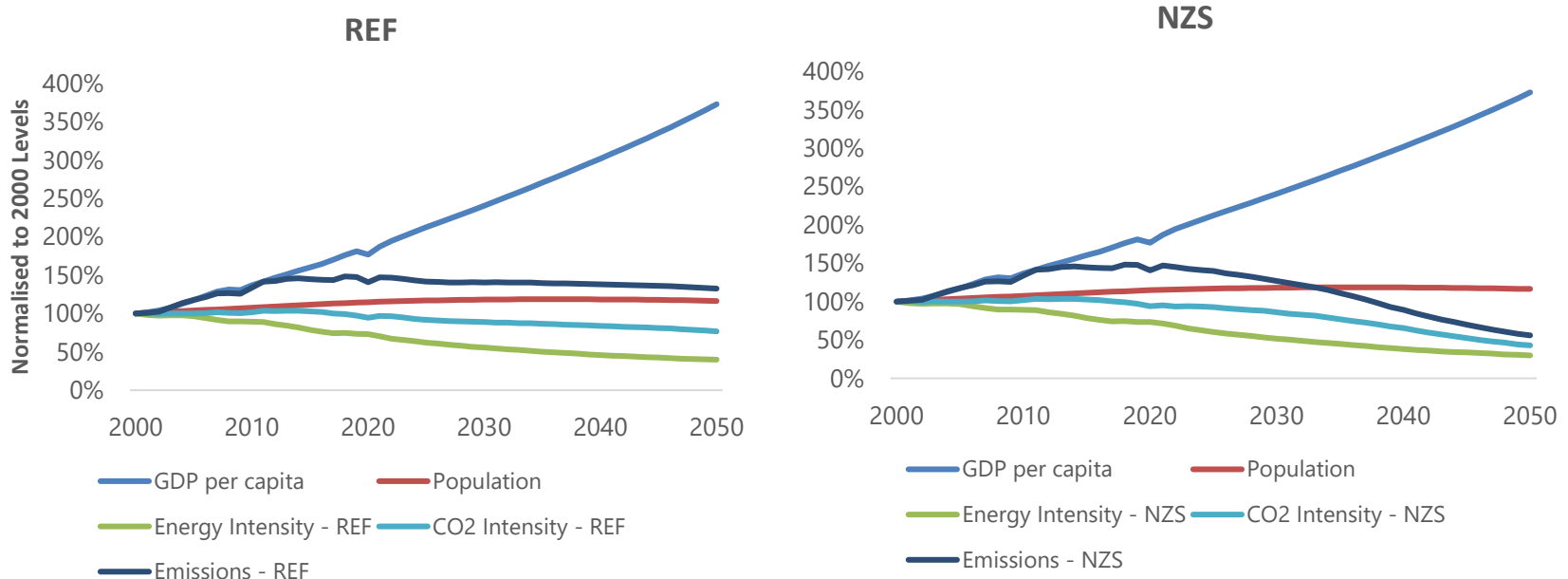
CO2 Intensity, 2000 – 2050



Source: APERC analysis

- CO2 Intensity = CO2 emissions ÷ Energy supply (MtCO2 per PJ)
- Intensity decreases by 23% in REF and 57% in NZS in 2050 relative to 2018 levels.

The Kaya Identity: Emission drivers, 2000 – 2050



Source: APERC analysis

- The Kaya Identity: $CO_2 \text{ emissions} = CO_2 \text{ intensity} \times \text{Energy intensity} \times \text{GDP per capita} \times \text{Population}$
- Between 2000 and 2011, emissions followed the path of GDP per capita. Decoupling can be seen occurring from 2011 onwards.
- Reduced CO2 intensity is the most significant factor limiting the growth of emissions, as it's improvement in NZS further reduces the emissions in NZS.

Summary

- Preliminary results for REF indicate that the current policies of APEC economies enable APEC to achieve both its energy intensity and doubling of modern renewables goals before 2035 and 2030, respectively.
- The power sector is the largest contributor of emissions in the APEC region and is expected to remain the largest through 2050. Renewables will continue to play a significant role in decarbonising the power sector, along with the use of CCS.
- Coal and gas remain the two main sources of emissions, with the latter being the most dominant fossil fuel in NZS as the former declines.
- Reductions in both energy intensity and CO₂ intensity contribute to a reduction in carbon emissions and offset the emissions growth that would otherwise accompany GDP growth.
- A larger reduction in CO₂ intensity is a primary difference between REF and NZS and causes APEC carbon emissions to be substantially lower in NZS.



Thank you for your kind attention.

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