

# The role of fossil energy during the energy transition in APEC

## Highlights from the 8th APEC Energy Demand and Supply Outlook

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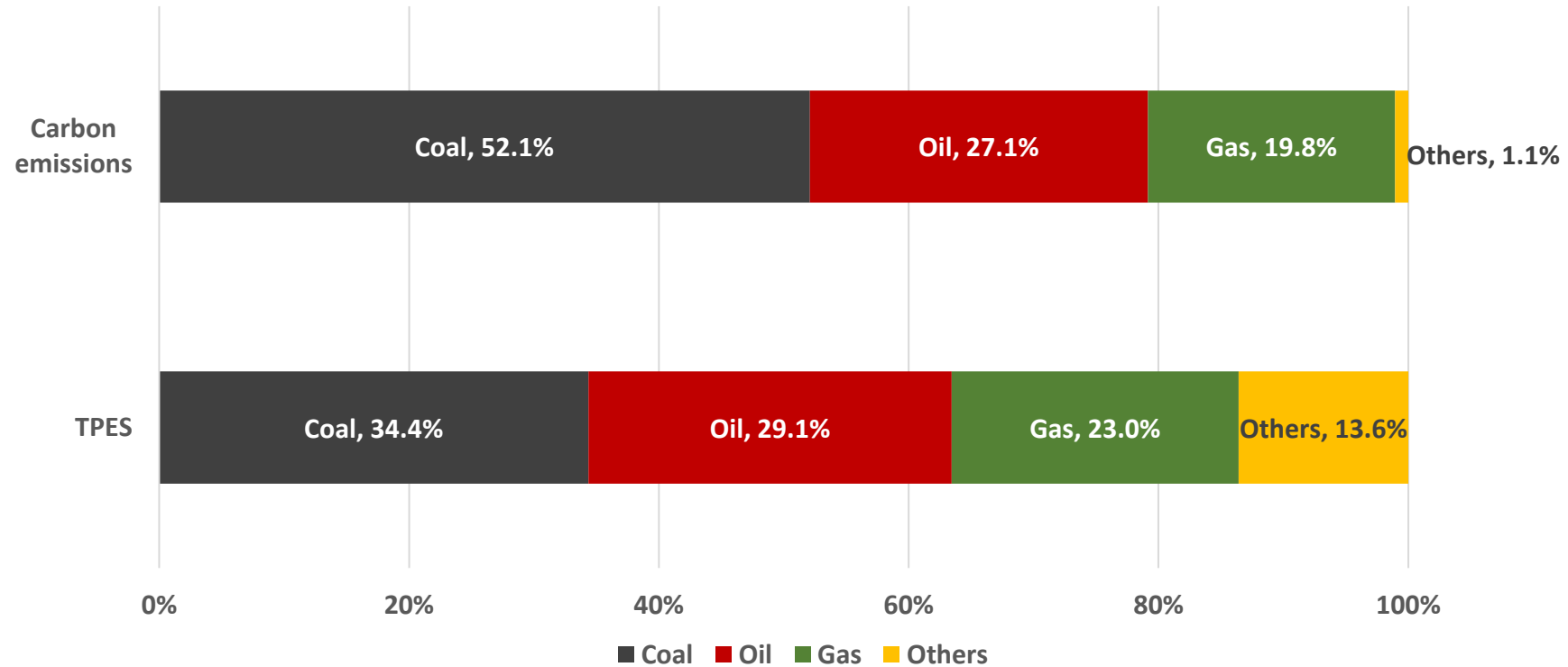


# Outline

- Introduction
- Fossil fuel supply
- Coal consumption and supply
- Regional coal supply
- Natural gas consumption and supply
- Regional natural gas supply
- Refined products consumption and supply
- Regional crude oil and NGLs production and supply
- Emissions by fuel
- Conclusions

# Introduction

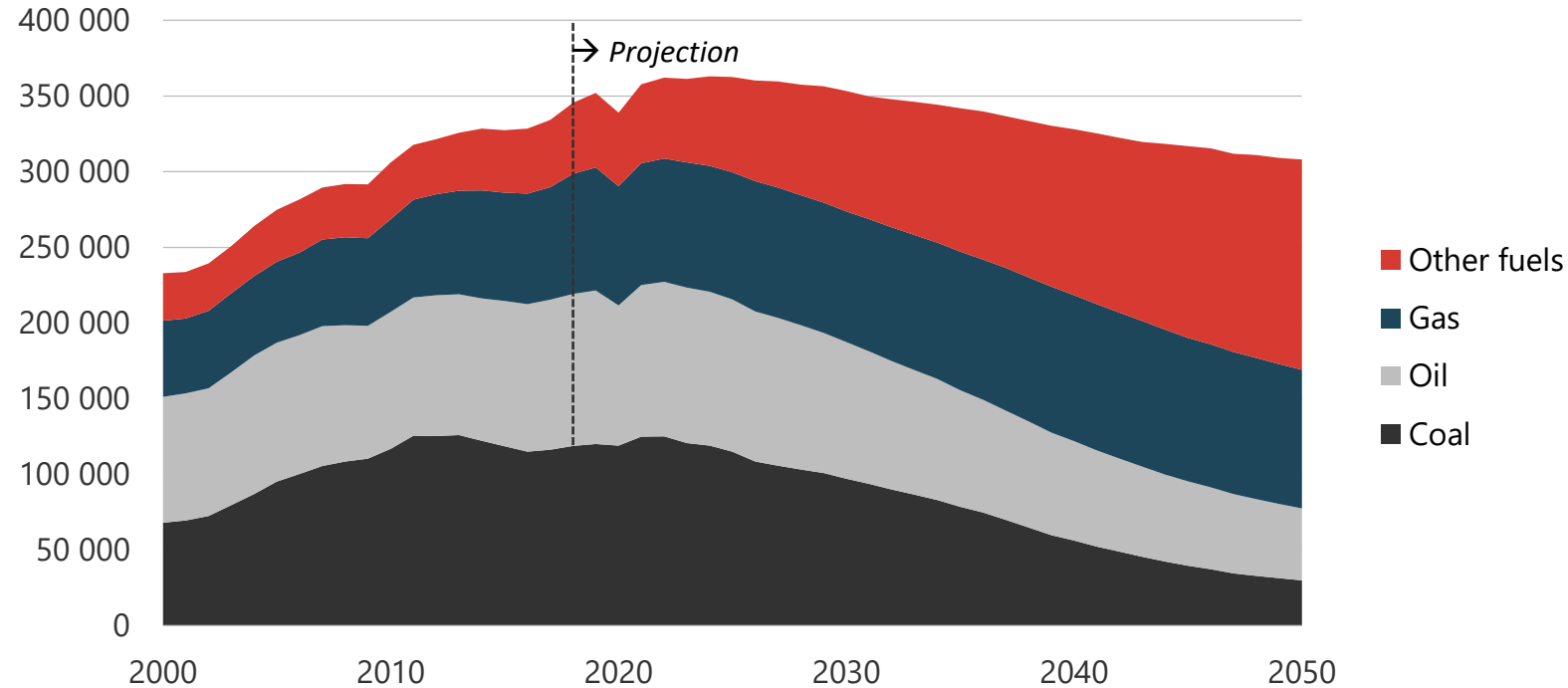
Share of energy supply and CO<sub>2</sub> emissions by fossil fuels in 2018 in APEC



- Fossil fuels play a significant role in fueling the APEC economy, accounting for 86% of TPES.
- With most APEC emissions coming from fossil fuel combustion, exploring the trajectory of APEC fossil fuel use in CN is a useful way to analyse the effectiveness of the hypothetical CN pathway at achieving decarbonization.

# Fossil fuels remain a large share of APEC energy supply

Total energy supply by fossil fuels and other fuels in CN, 2000-2050 (PJ)



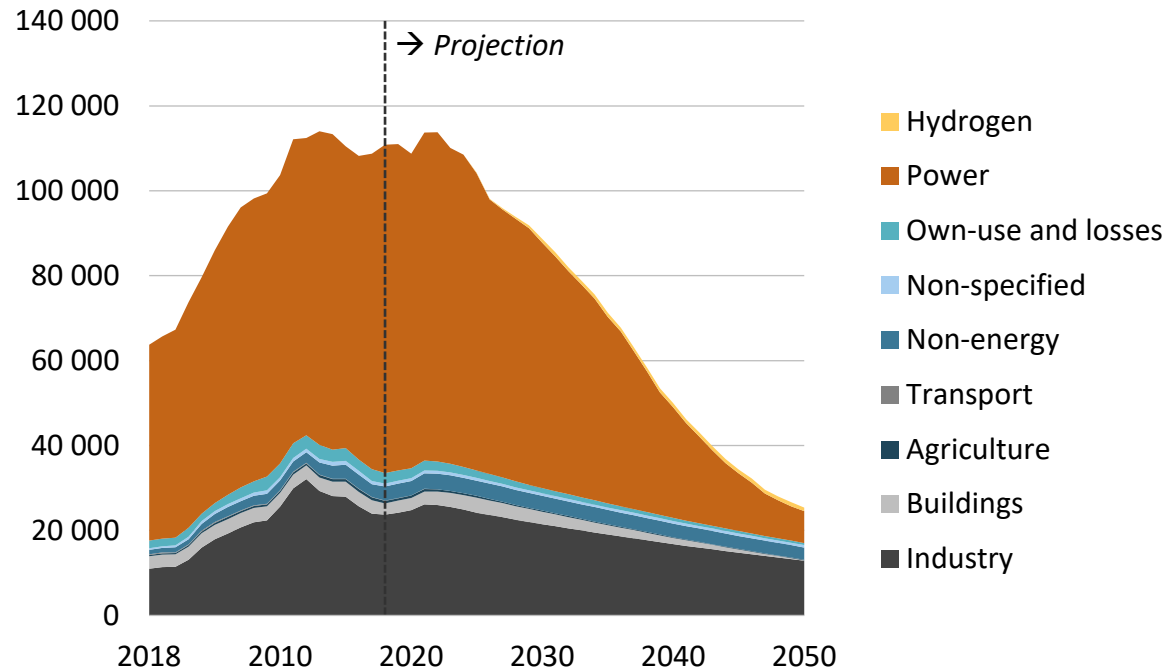
Sources: EGEDA, APERC analysis

- Total fossil fuel supply falls by over two-fifths due to higher efficiencies, electrification and renewable deployment.
- Fossil fuels still account for over half of supply by 2050.
- Oil supply declines in CN as APEC and global oil use declines.

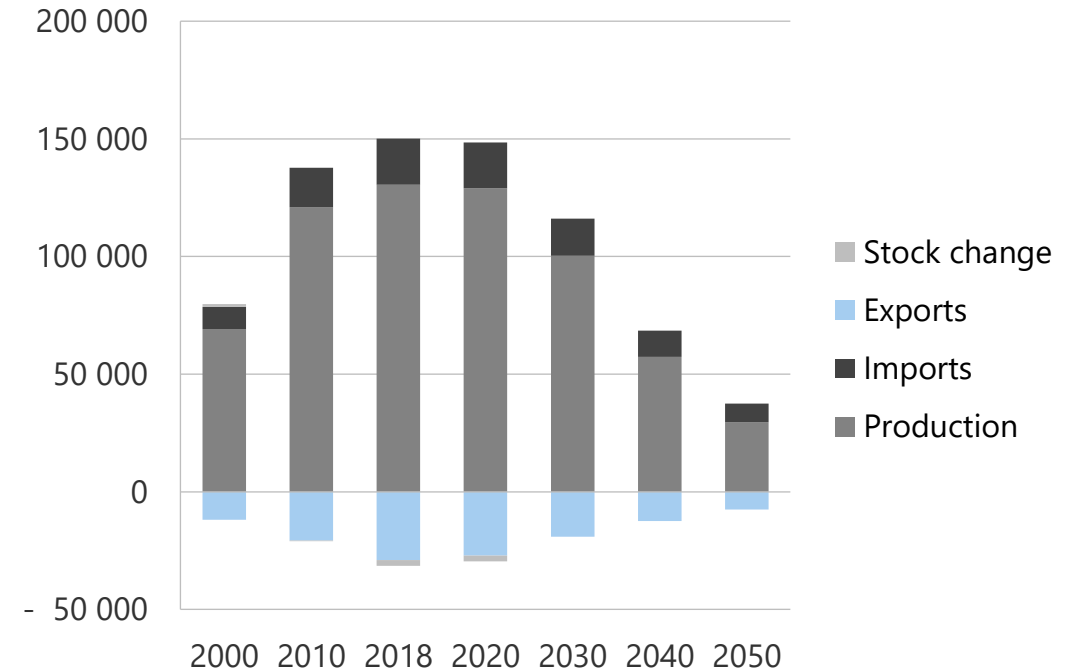
Note: energy supply = production + net imports + bunkers

# Coal supply declines over three-quarters in CN

Coal consumption by sector in CN, 2000-2050 (PJ)



Coal production, imports, and exports in CN, 2000-2050 (PJ)

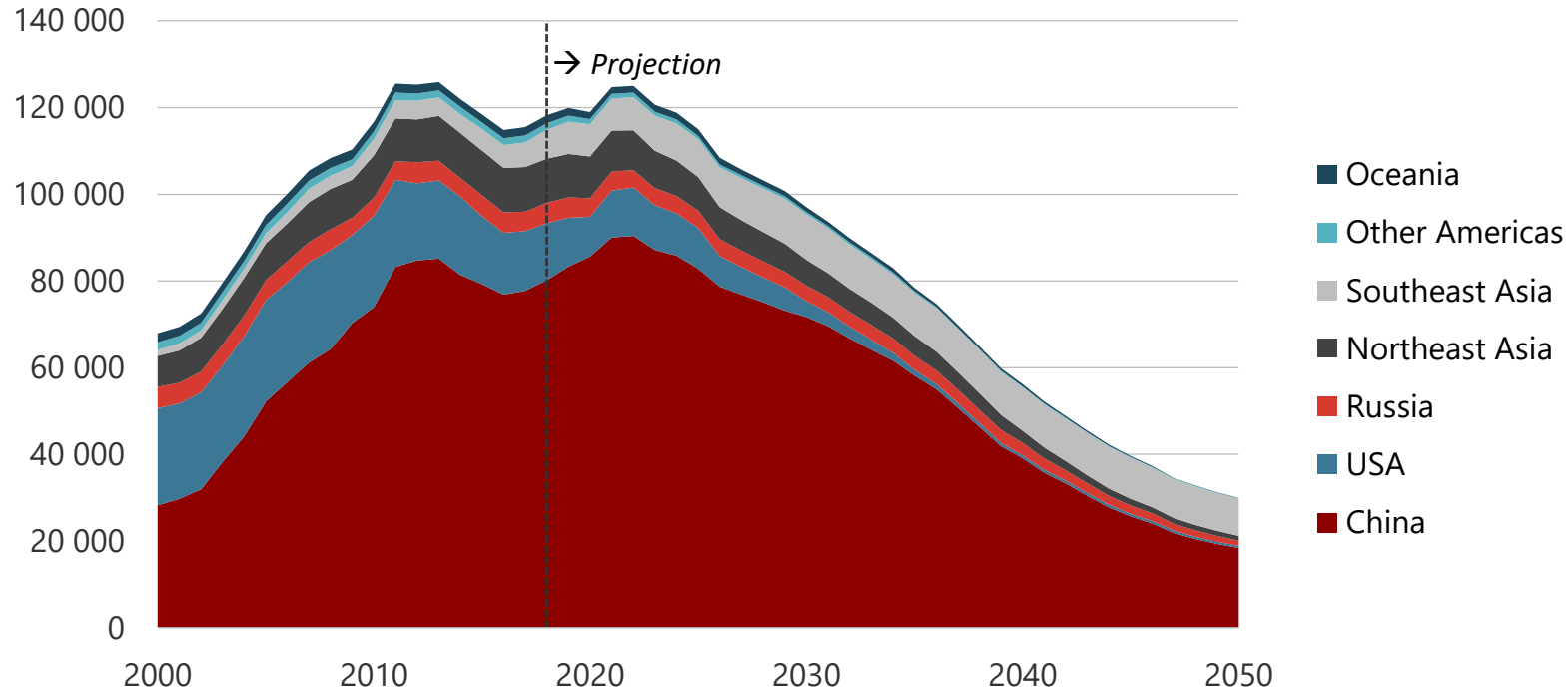


Sources: EGEDA, APERC analysis

- Policies to reduce or phase-out coal increase substantially in CN, led by the power sector.
- Industrial coal use persists, but electric arc furnaces and hydrogen help half use.
- Production falls in line with supply reductions, while coal trade falls two-thirds as the world embraces carbon neutrality.

# Coal supply falls in all APEC regions, except southeast Asia

Coal supply by region in CN, 2000-2050 (PJ)



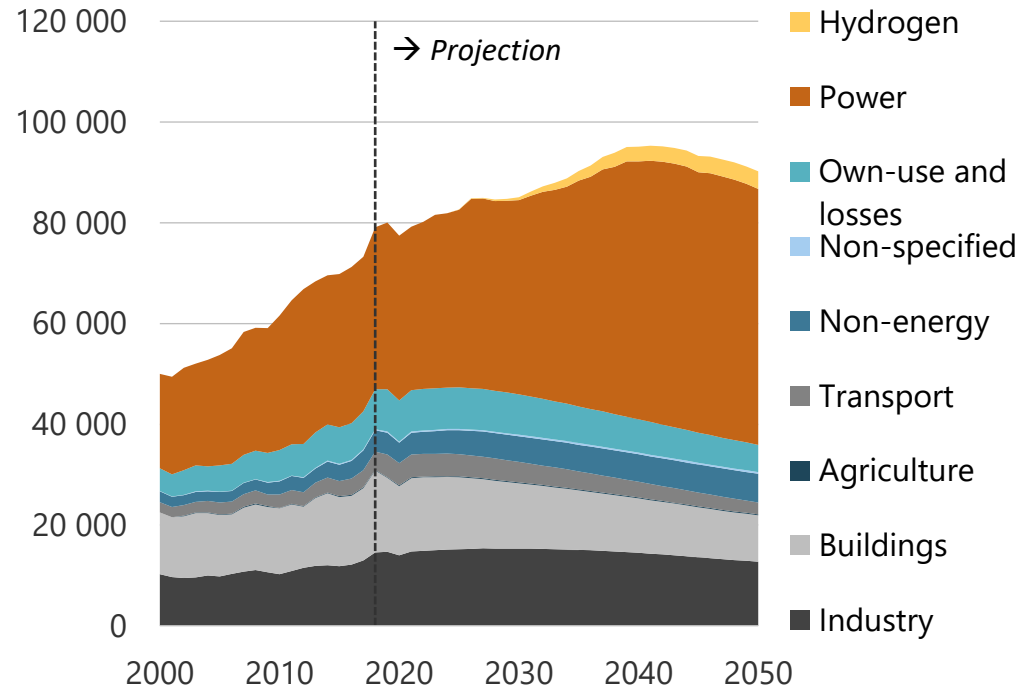
Sources: EGEDA, APERC analysis

- Coal supply falls three-quarters on fuel switching to achieve carbon neutrality.
- Further industrialisation and an embrace of CCS power increases coal use in southeast Asia.
- Deeper reductions will require fuel switching in both heavy industry and power.

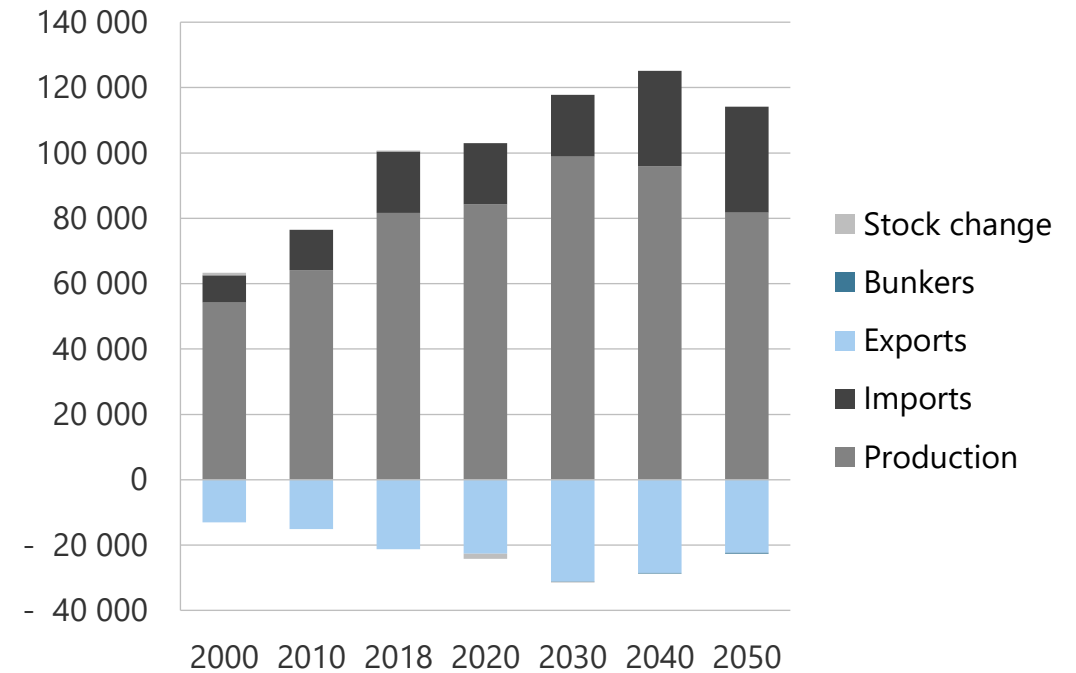
Note: energy supply = production + net imports + bunkers

# Gas use peaks in CN, but grows over current levels

Natural gas consumption by sector in CN, 2000-2050 (PJ)



Natural gas production, imports, and exports in CN, 2000-2050 (PJ)

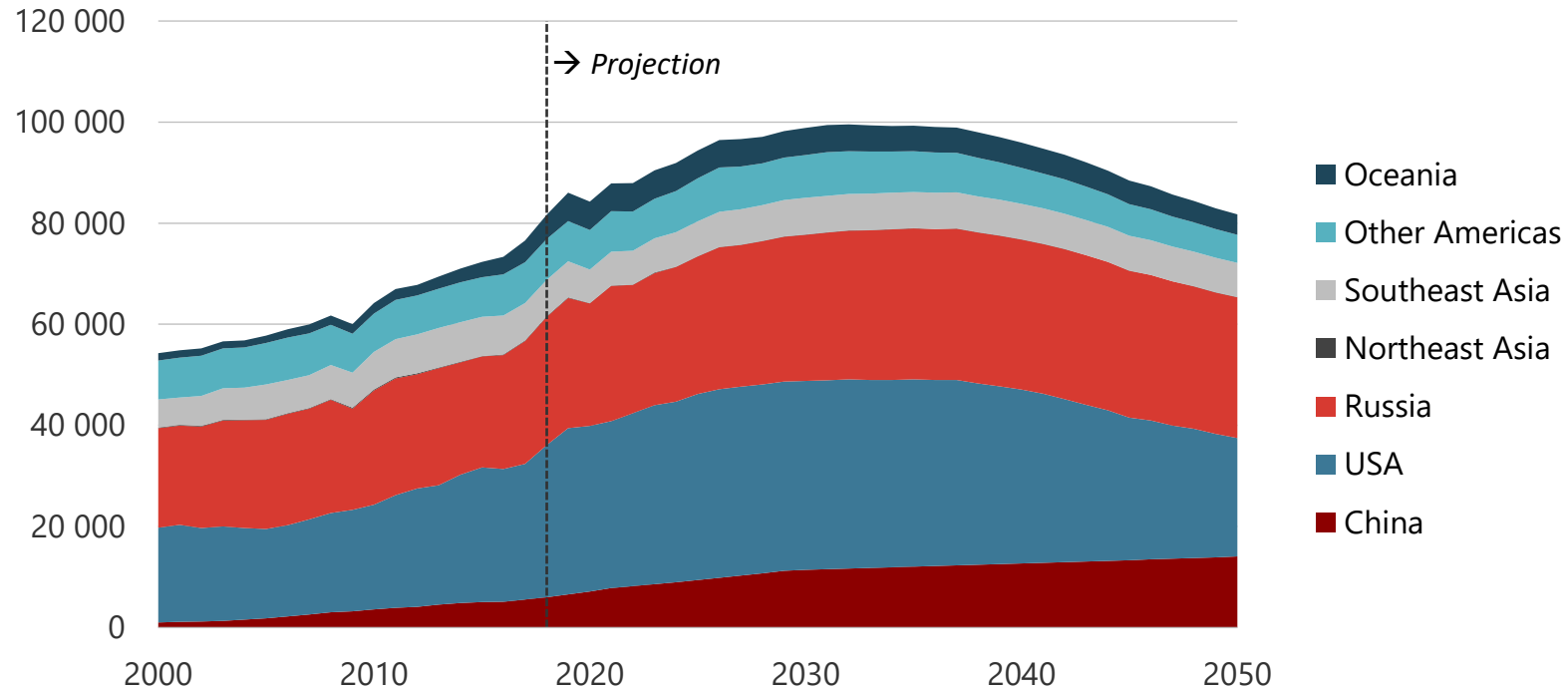


Sources: EGEDA, APERC analysis

- CCS adoption, fuel switching and hydrogen production boost gas use.
- Gas imports rise three-quarters, while exports fall a quarter due to a declining global market.
- APEC becomes a net importer in 2040, earlier than REF, due mainly to higher coal-to-gas switching in China and southeast Asia.

# Natural gas production peaks in 2030s, ends near current levels

Natural gas production by region in CN, 2000-2050 (PJ)



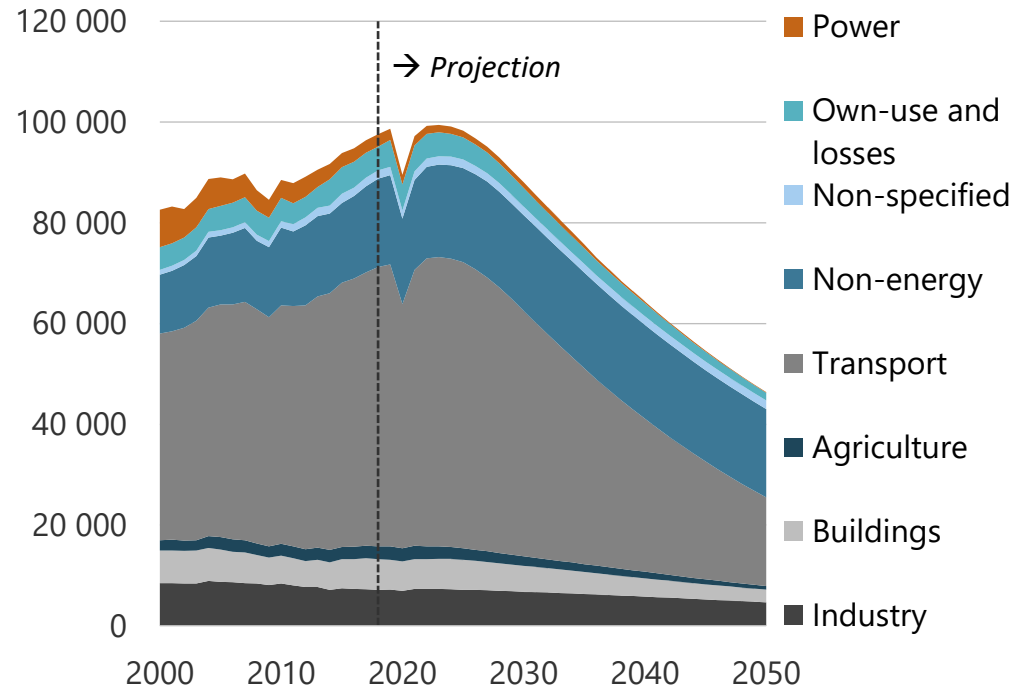
Sources: EGEDA, APERC analysis

- APEC production falls a quarter under REF levels due to declining use in APEC and abroad.
- With production predominantly serving domestic markets, China and southeast Asia's trajectory closely mirrors REF.
- This trajectory is dependent on the successful deployment of CCS technology and the reduction of methane emissions throughout the gas supply chain.

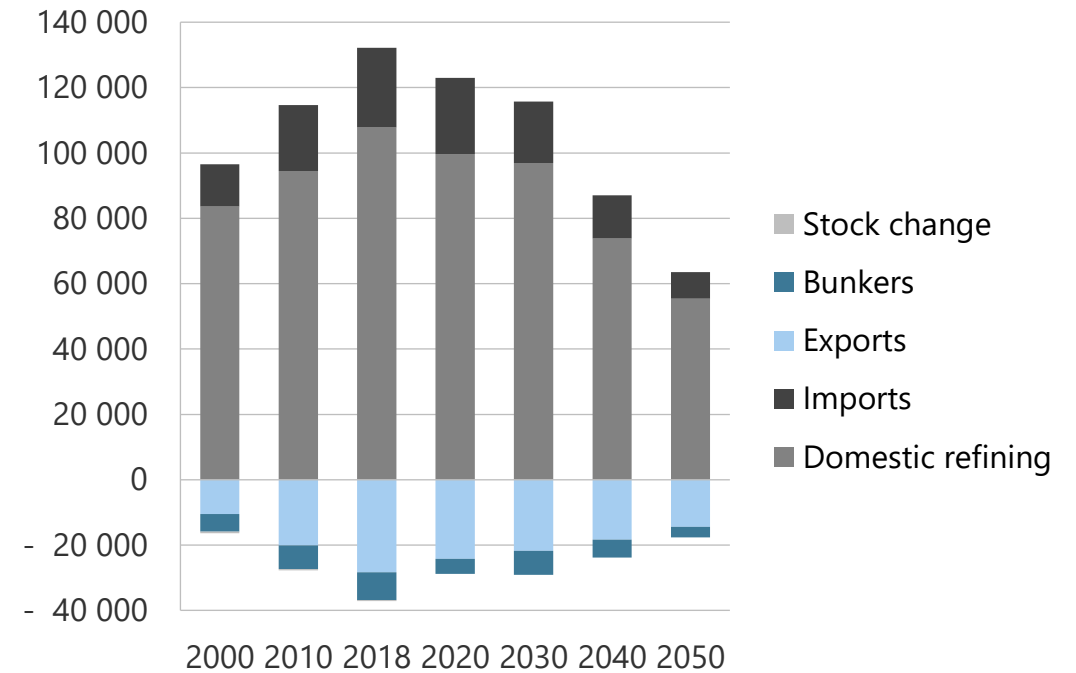


# Transport drives reductions in oil demand, product production in CN

Refined product consumption by sector in CN, 2000-2050 (PJ)



Refinery products production, imports, and exports in CN, 2000-2050 (PJ)

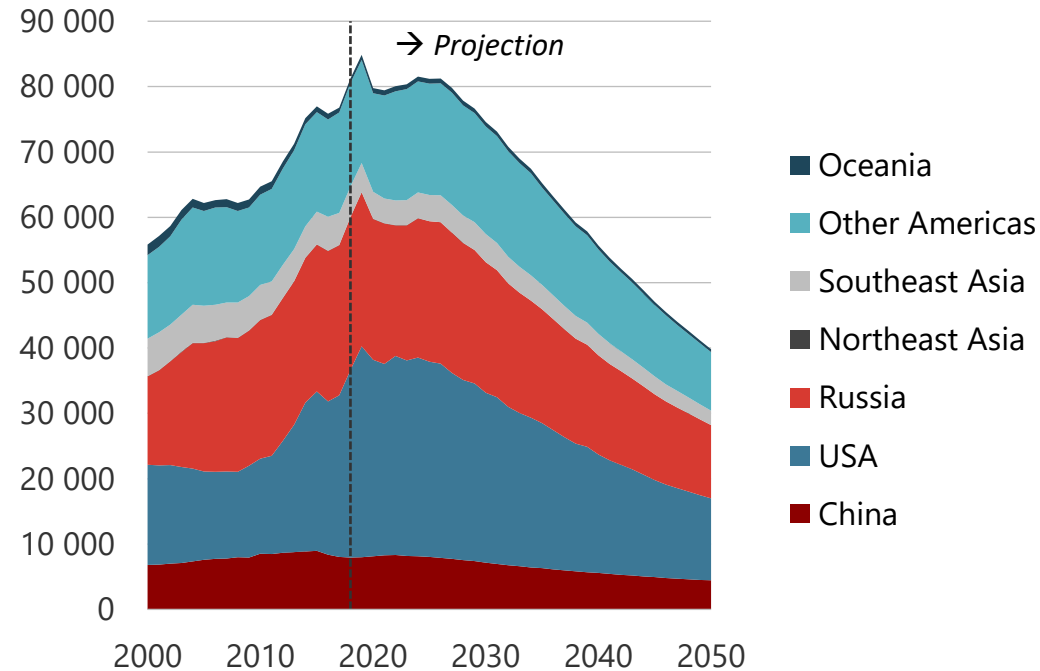


Sources: EGEDA, APERC analysis

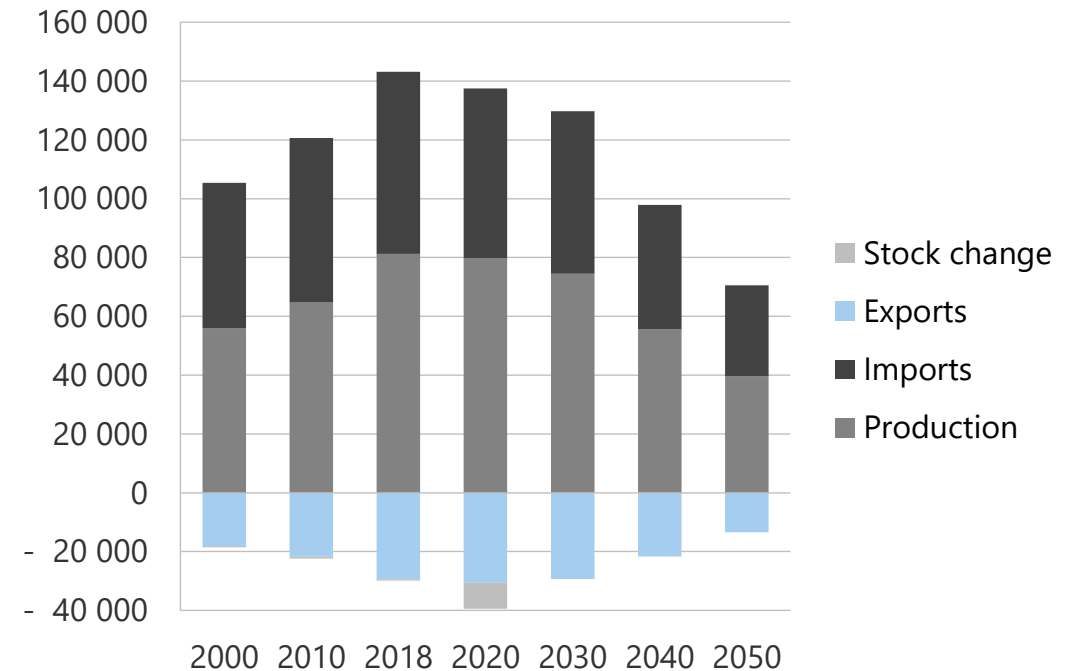
- Transport demand falls two-thirds on electrification, efficiency gains and modal switching.
- Use in power, buildings, own-use and agriculture falls significantly, while use non-energy and industry demand remains robust.
- Refinery capacity falls a third and utilisation under two-thirds as declining demand challenges the product sector.

# Oil trade, production rebound briefly but never reach pre-pandemic peak

Crude oil and NGLs production by region in CN, 2000-2050 (PJ)



Crude oil and NGLs production, imports, and exports in CN, 2000-2050 (PJ)

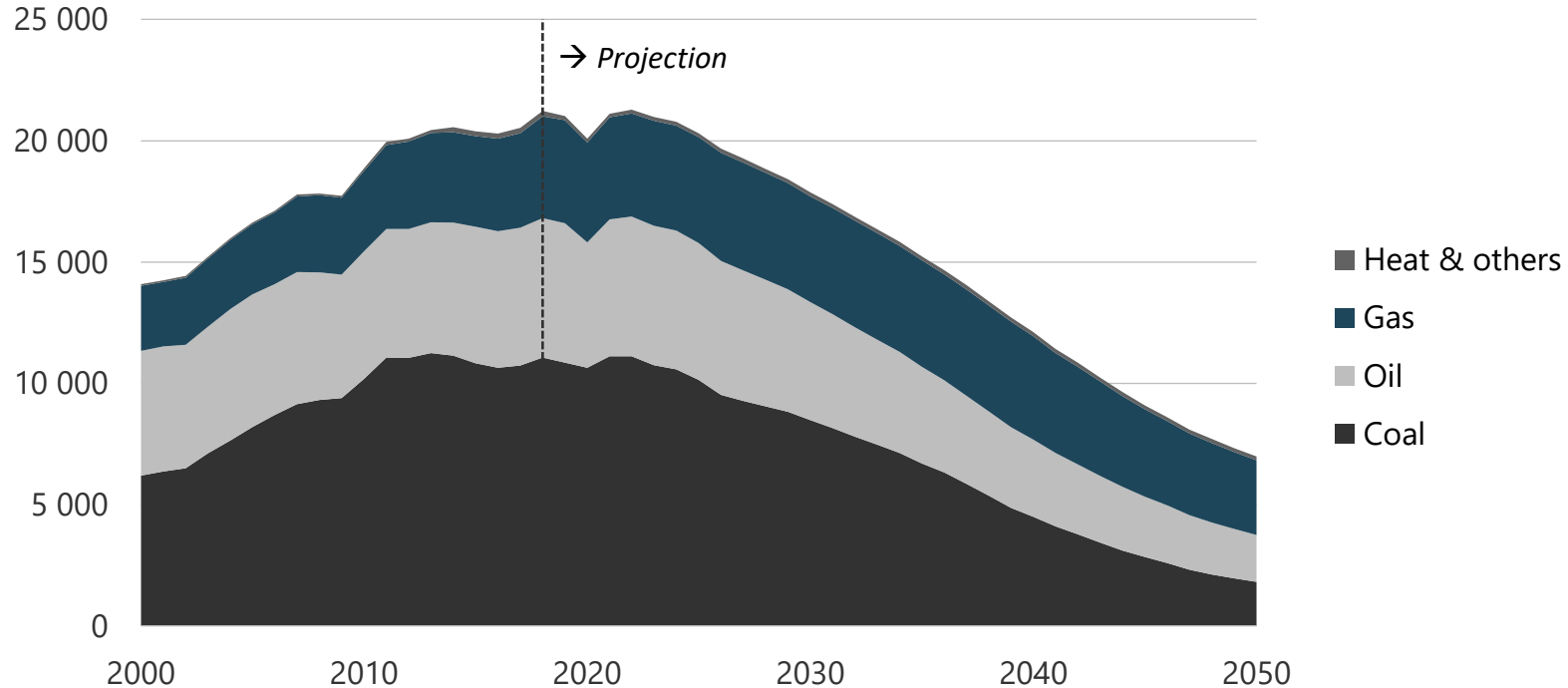


Sources: EGEDA, APERC analysis

- Production and trade are halved below both current and REF levels.
- Other Americas and southeast Asia are the oil economies that see production rebound past pre-COVID levels.
- Falling revenues from a declining oil market could impact the economies of large-scale producer-exporters.

# Decoupling of emissions with economic growth accelerates, but emissions remain

APEC emissions by fuel in CN, 2000-2050 (PJ)



Sources: EGEDA, APERC analysis

- Emissions fall two-thirds from current levels and REF levels by 2050.
- Achieving reduction targets may require more transformation change than this pathway.
- Offsets or developments in carbon markets, including sequestration, use and logistics, is required to mitigate the residual emissions so that emissions are consistent with carbon neutrality.

# Conclusions

- Energy efficiency, electrification, and fuel switching lead to substantial fossil fuel reductions in CN.
- While there is a steady transition away from fossil fuel use, they still account for half of APEC energy supply by 2050.
- APEC coal use remains significant, particularly in China and southeast Asia.
- The transitional role of natural gas in this scenario hinges on APEC members demonstrating an ability to successfully mitigate methane emissions.
- Producer-exporters should investigate the economic implications of declining fossil fuel revenues on their economies.
- With significant fossil fuel use and emissions remaining, this Outlook is heavily dependent on the successful development of a large-scale offset market.
- This projection highlights the risk of stranding recent investment in fossil fuel infrastructure as a world embraces carbon neutrality.

**Thank you.**

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