



**Asia-Pacific  
Economic Cooperation**



## 2-4. Energy Supply (revised)

### **APERC Workshop**

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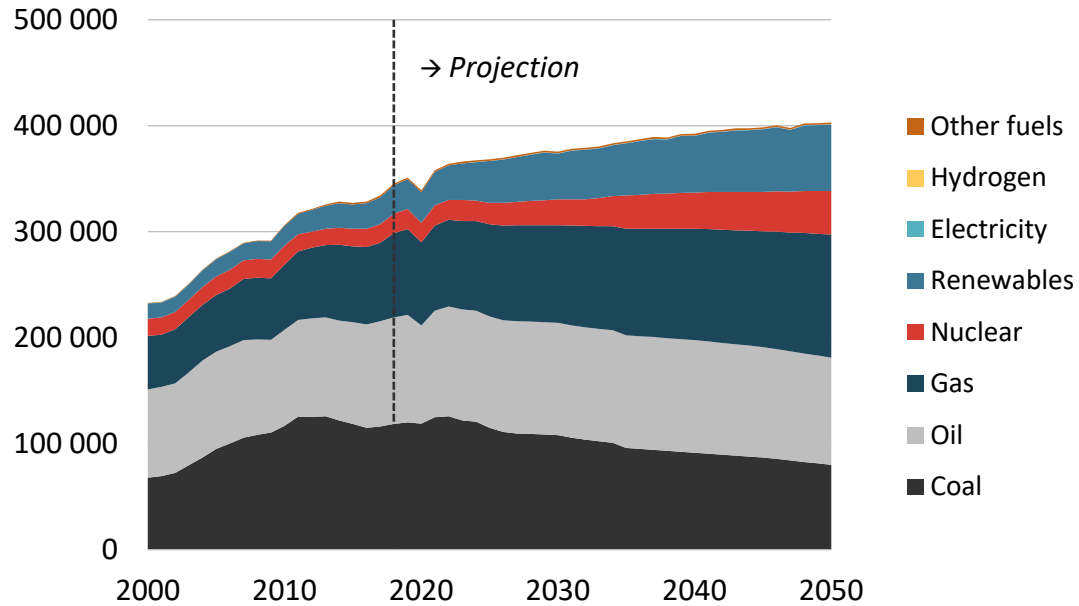
# Outlines

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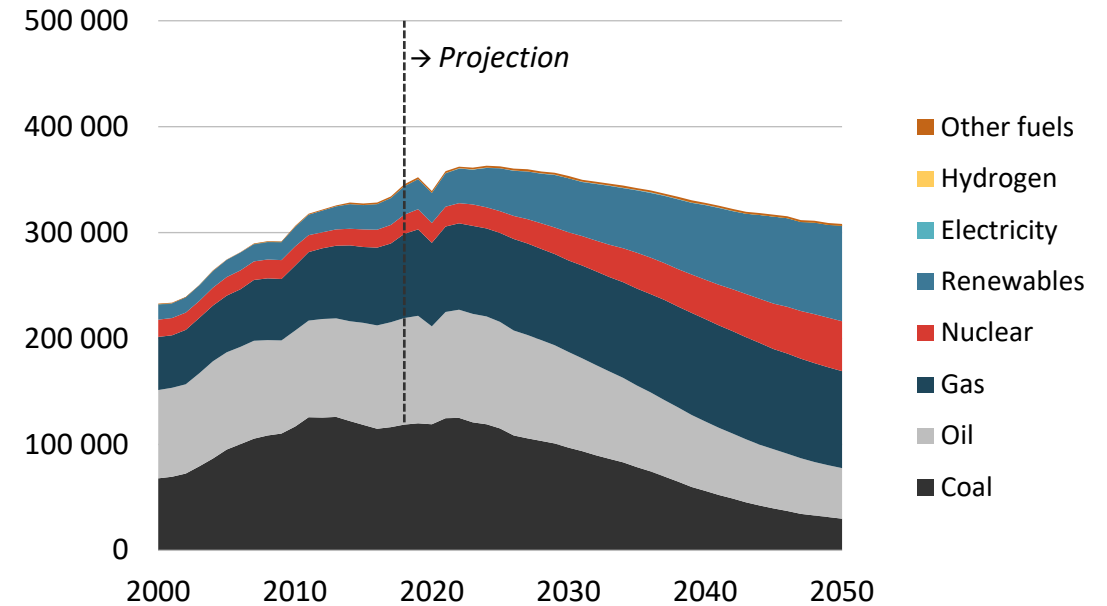
- APEC energy supply outlook
  - Total energy supply
  - Coal supply
  - Natural gas supply
  - Crude oil and NGLs supply
  - Refined products supply
  - Hydrogen supply
- Key takeaways and challenges

# Fossil fuels remain a large share of APEC energy supply while renewables grow significantly through 2050 in both scenarios

Total energy supply by fuel in REF, 2000-2050 (PJ)



Total energy supply by fuel in CN, 2000-2050 (PJ)

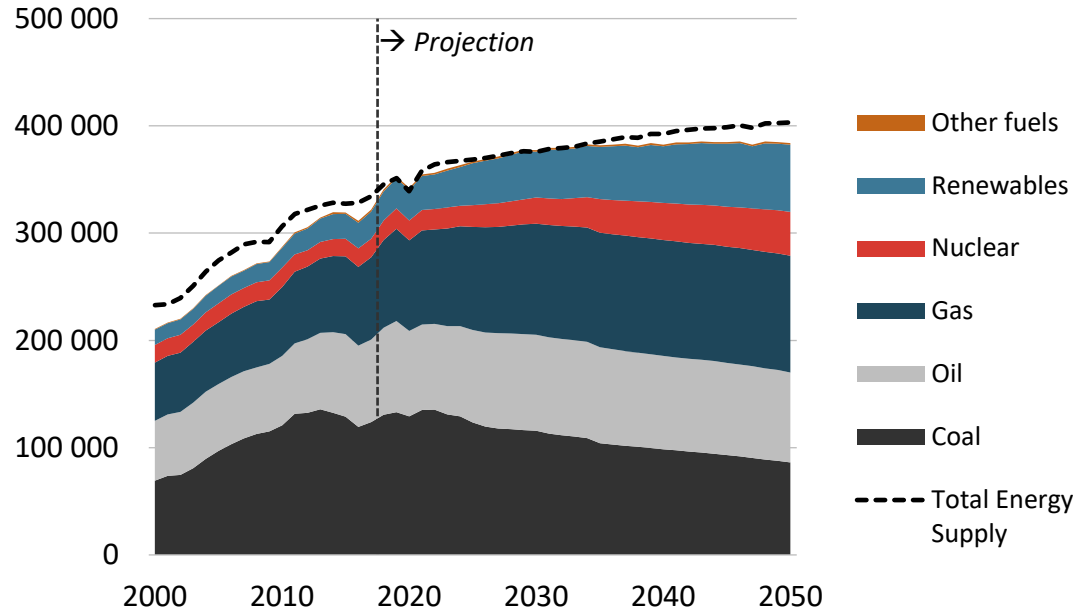


Sources: EGEDA and APERC analysis

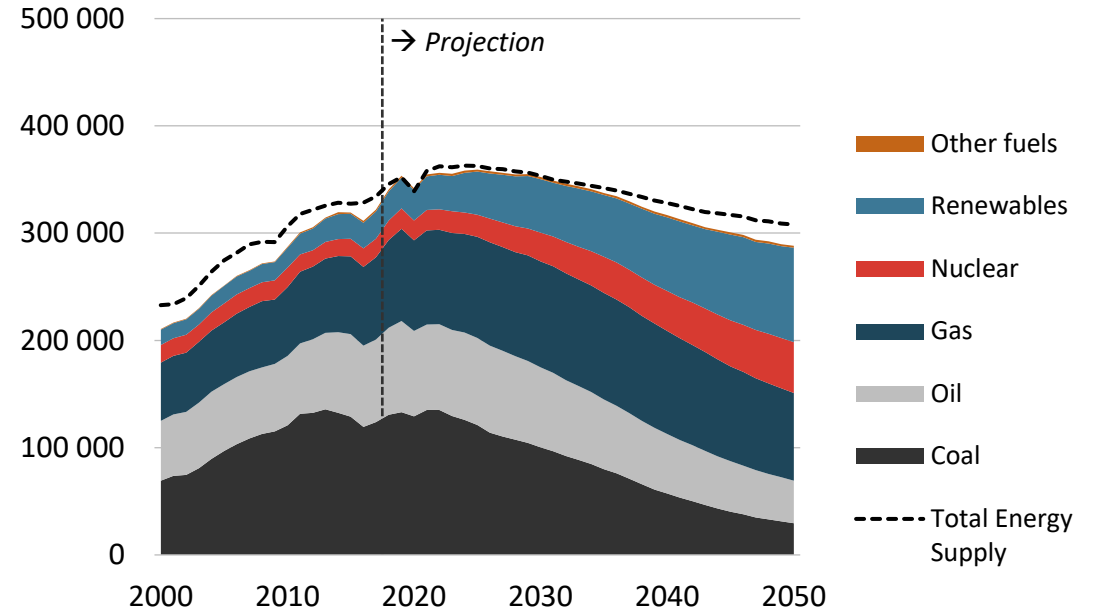
- In REF, the total APEC energy supply increases by 17% in 2050 from the 2018 level to meet rising energy demand and power requirements.
- In CN, the total APEC energy supply falls by 11% in 2050 from the 2018 level due to electrification and energy efficiency across sectors.
- The fossil fuels share in the total energy supply declines in both scenarios, falling to 74% in REF and 55% in CN, while renewables grow more than 134% in REF and 347% in CN.

# APEC fossil fuel production declines in both scenarios

Total energy production in REF, 2000-2050 (PJ)



Total energy production in CN, 2000-2050 (PJ)

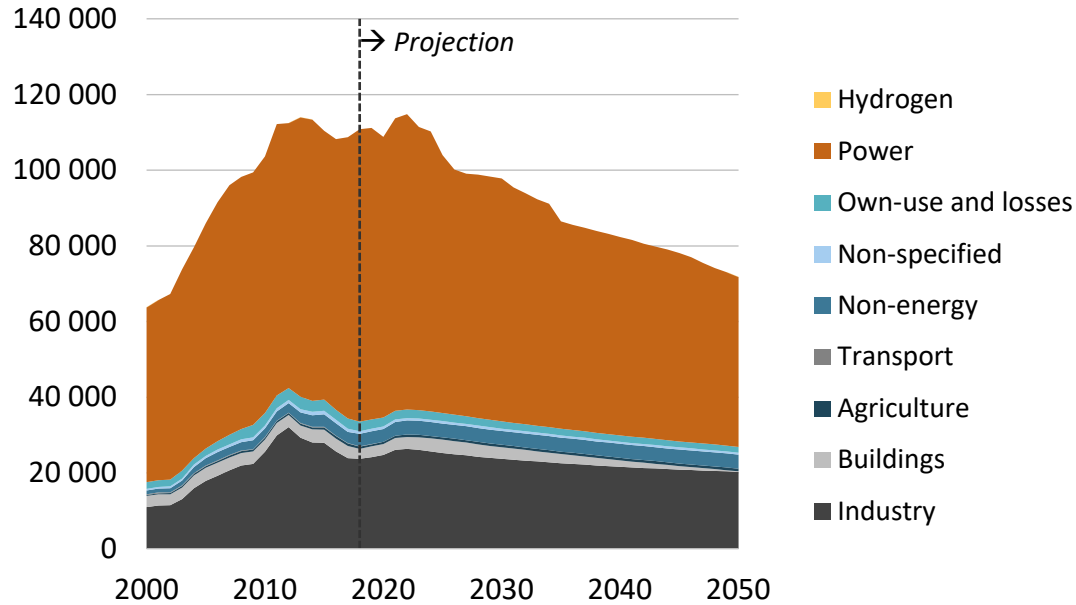


Sources: EGEDA and APERC analysis

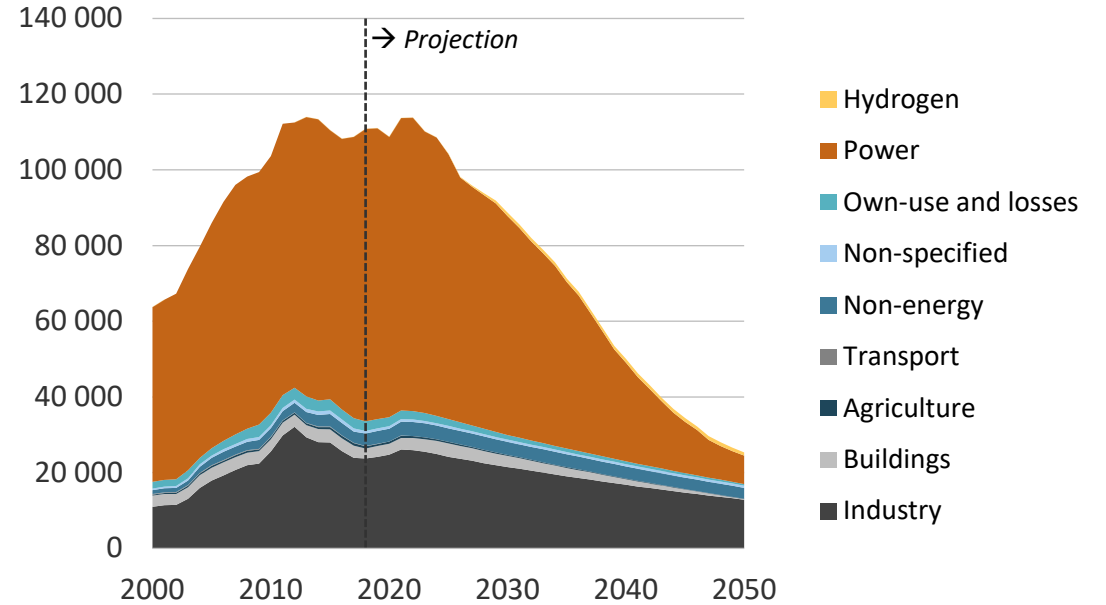
- Total energy production in APEC increases by 13% through 2050 in REF but declines by 15% in CN.
- Total energy production is lower than total energy supply, and the difference is met by higher energy imports.
- Fossil fuel production's share in APEC declines more in CN than REF due to declining APEC and non-APEC fossil fuel demand as decarbonisation efforts are implemented globally.

# Coal consumption declines as decarbonisation efforts take effect

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



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

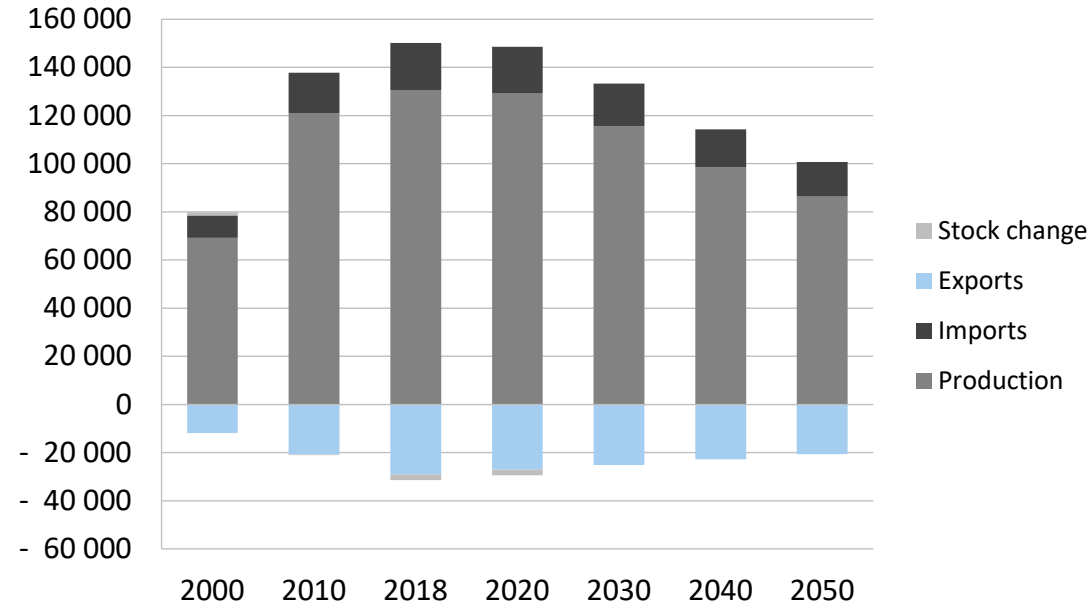


Sources: EGEDA and APERC analysis

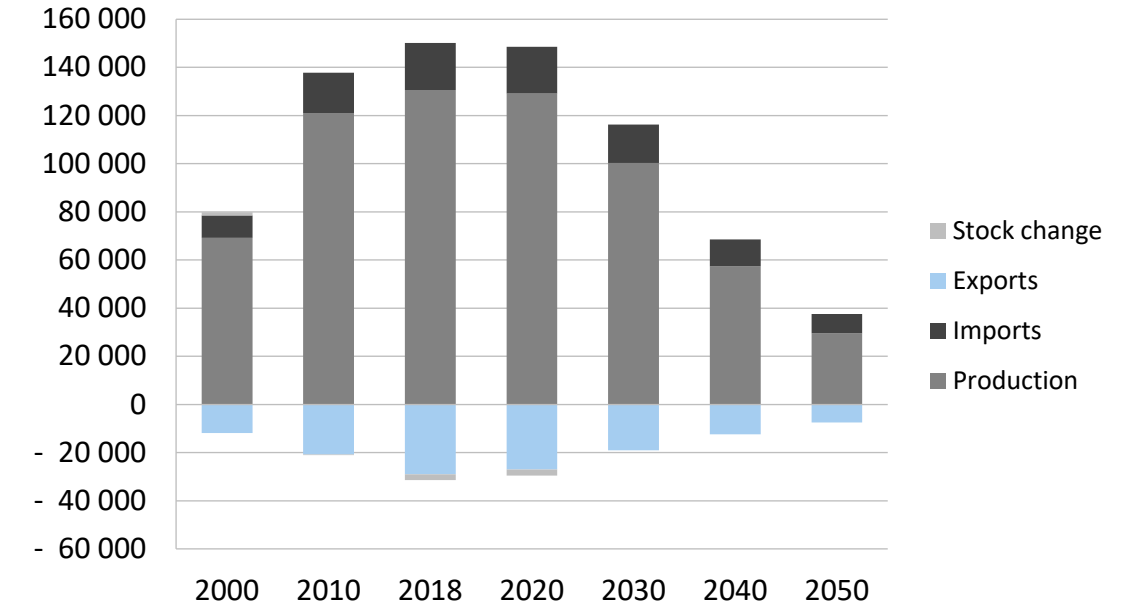
- Coal consumption falls by one-third in REF primarily due to the adoption of coal phase-down or phase-out policies.
- In REF, coal consumption in the industry sector decreases marginally by 2050 as coal remains important in the smelting process.
- Coal consumption falls more than 90% from the 2018 level in CN, driven by a higher rate of fuel switching and a stringent coal phase-out policy in a few economies.

# Coal production and trade decline as coal demand falls

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



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

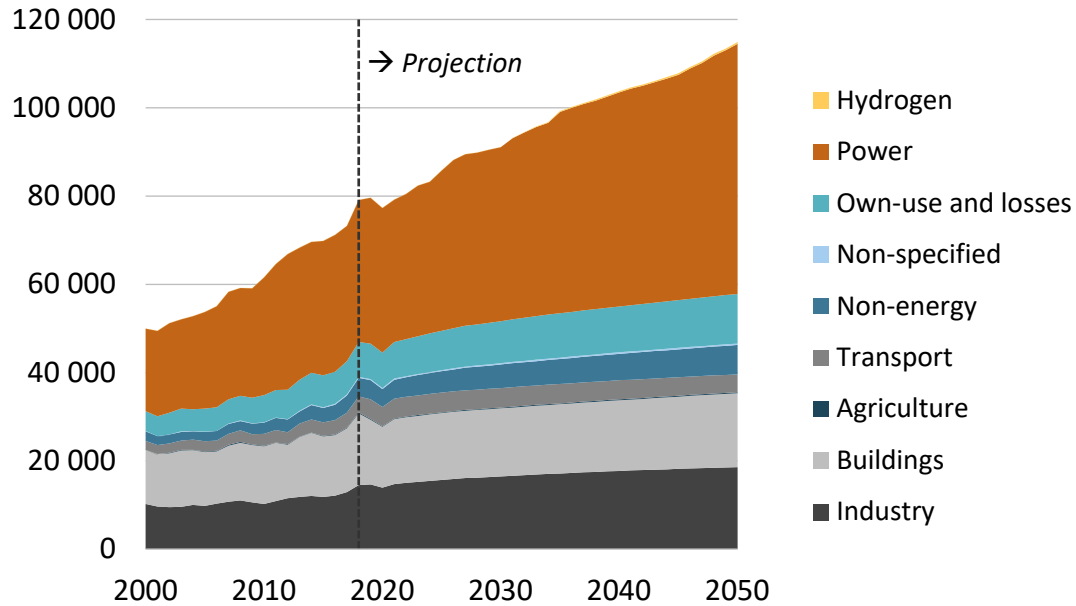


Sources: EGEDA and APERC analysis

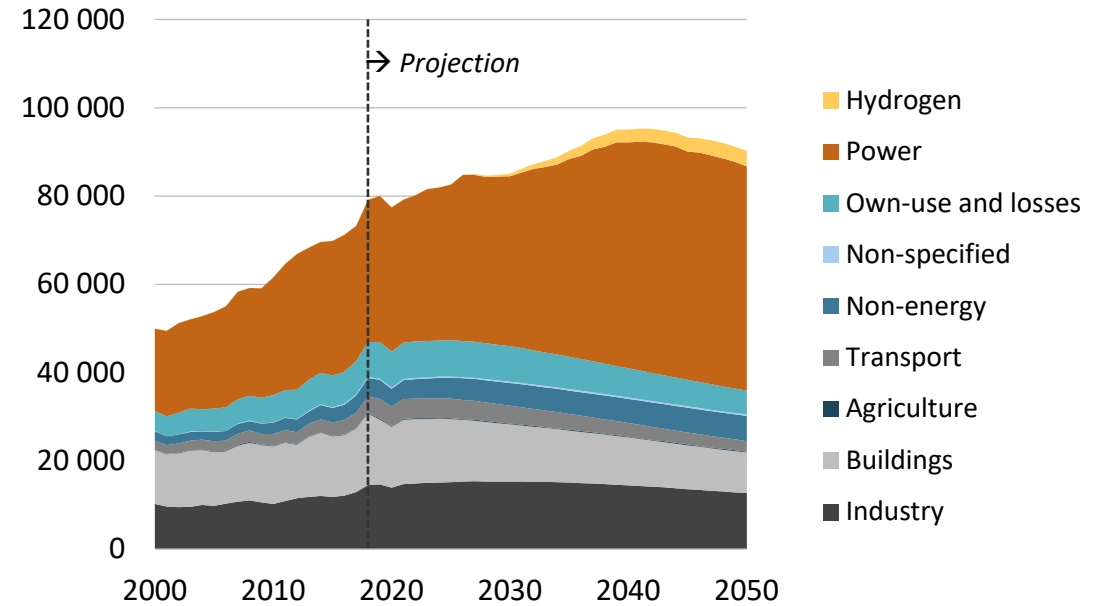
- In REF, APEC coal production, imports, and exports all decline.
- As APEC and global coal demands drop significantly in CN, production will be prioritised to meet domestic demand resulting in a two-thirds fall in coal trade through to 2050.
- APEC remains a net coal exporter in REF but becomes a net coal importer near 2050 in CN.

# Natural gas consumption increases in both scenarios

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



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

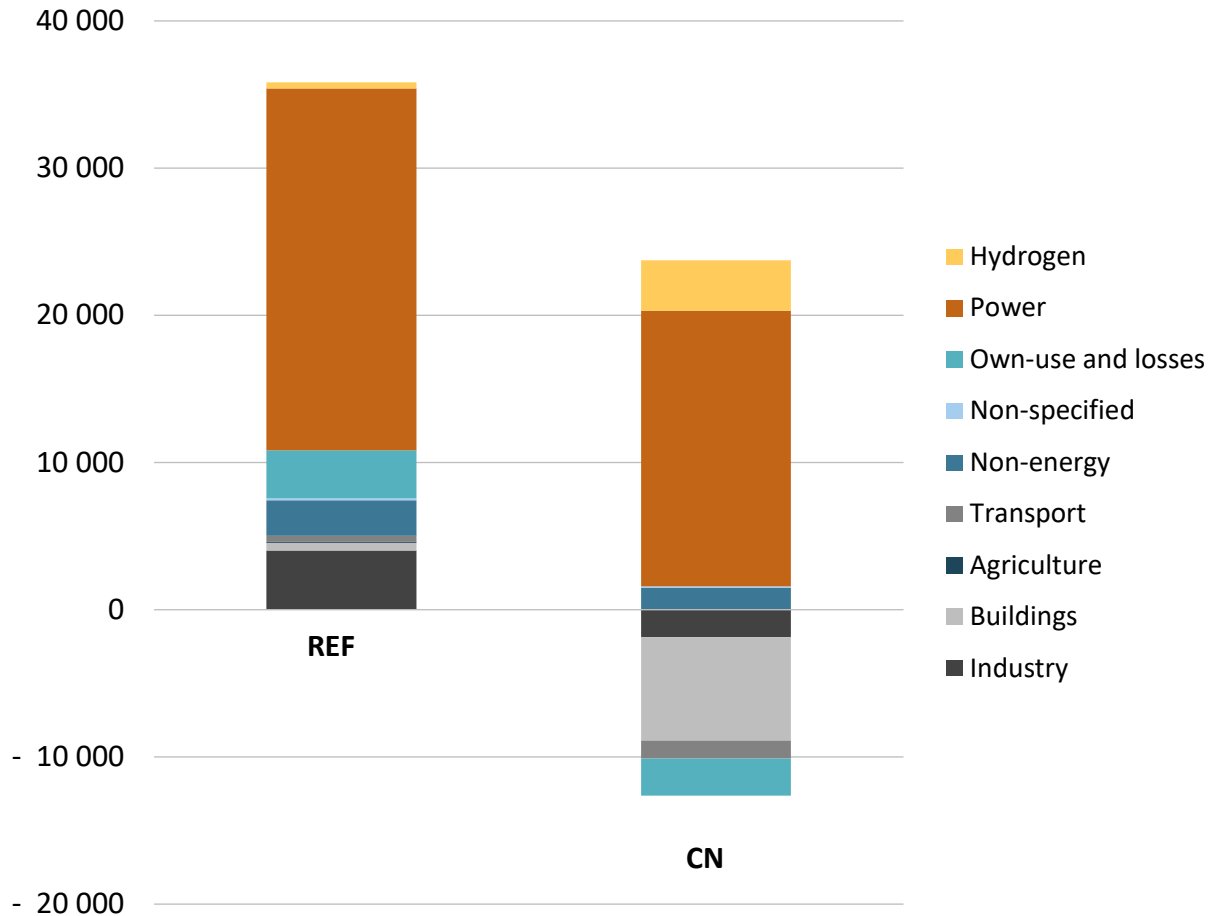


Sources: EGEDA and APERC analysis

- Natural gas consumption increases by 45% by 2050 in REF and 14% in CN.
- Power sector's share in total natural gas consumption grows in both scenarios.
- Introduction of CCS technology in gas-fired plants and industry to reduce CO<sub>2</sub> emissions, but it increases natural gas consumption in both scenarios.

# The power sector accounts for most of the growth in natural gas consumption

Changes of natural gas consumption by sector in REF and CN, 2018-2050 (PJ)



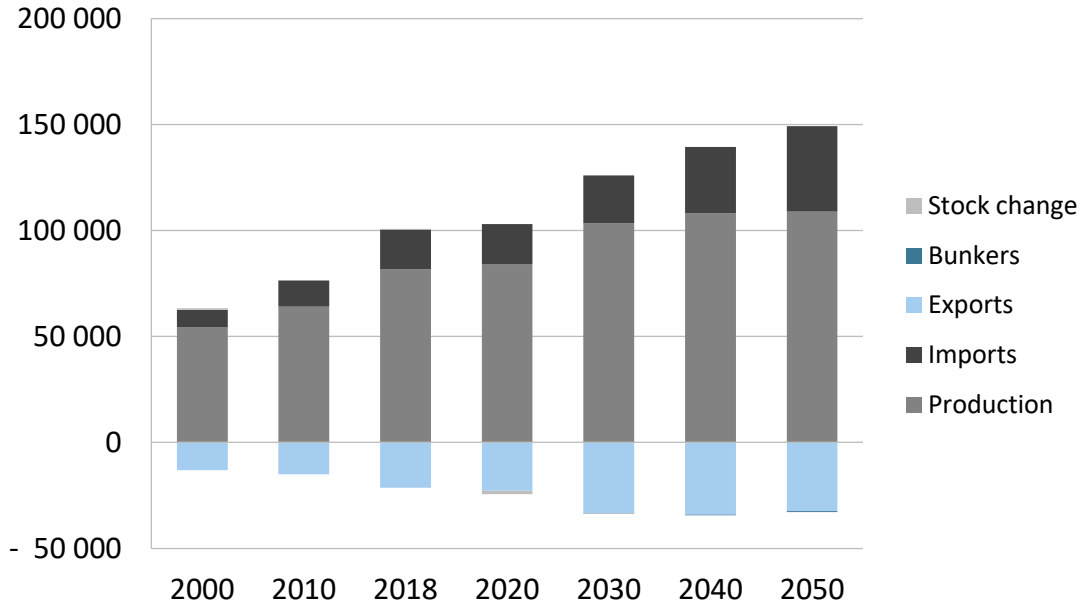
Sources: EGEDA and APERC analysis

- Natural gas consumption in all sectors increases through 2050 in REF.
- Power sector drives the increase of natural gas consumption in both scenarios.
- Natural gas consumption by the hydrogen sector in CN is more than 8.4 times higher than REF as hydrogen demand increases.
- Stringent efficiency policies, improvements in technology, and electrification lead to the decline of natural gas consumption in CN.

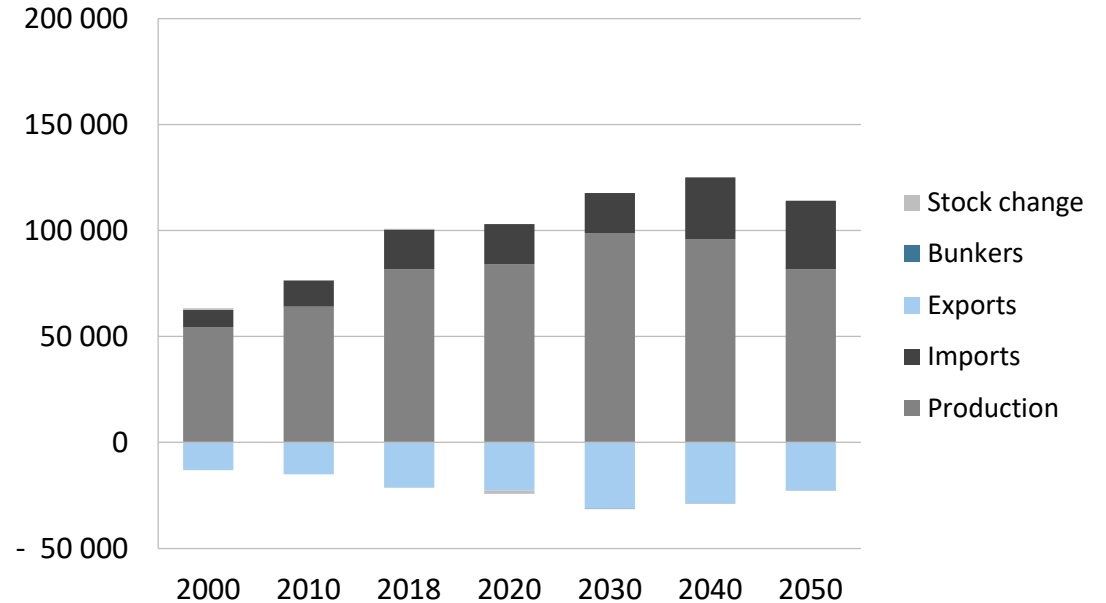


# APEC becomes a net natural gas importer in both scenarios in 2040s

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



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

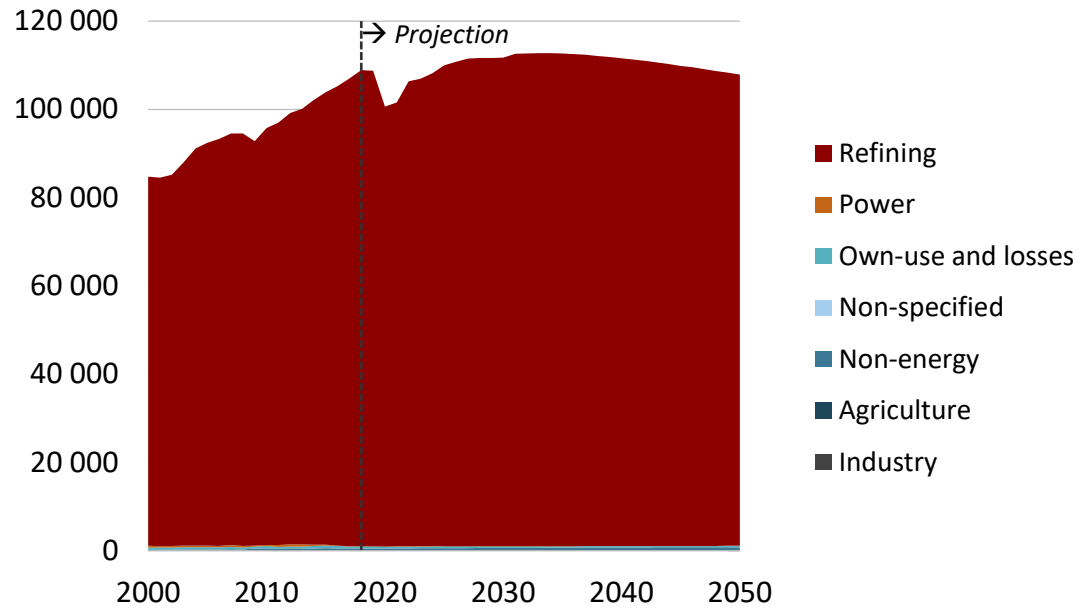


Sources: EGEDA and APERC analysis

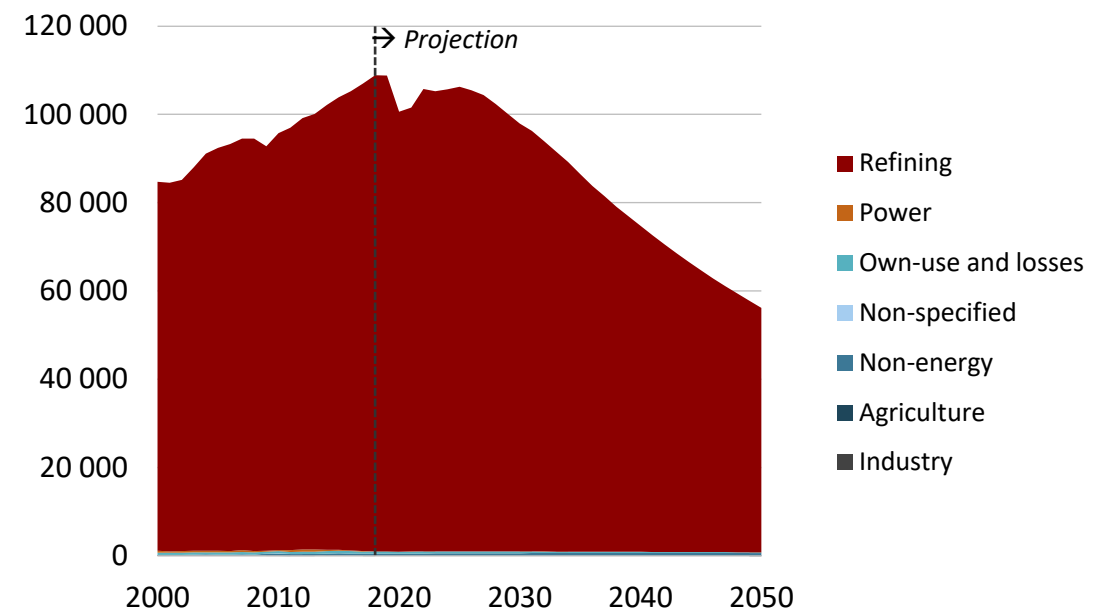
- USA, China, Russia, and Canada account for essentially all the production growth in REF.
- Natural gas production declines at a higher rate than the trade in the 2040s.
- APEC becomes a net natural gas importer in 2044 in REF and 2040 in CN.

# Decarbonisation trends have a major impact on oil consumption

Crude oil and NGLs consumption by sector in REF, 2000-2050 (PJ)



Crude oil and NGLs consumption by sector in CN, 2000-2050 (PJ)

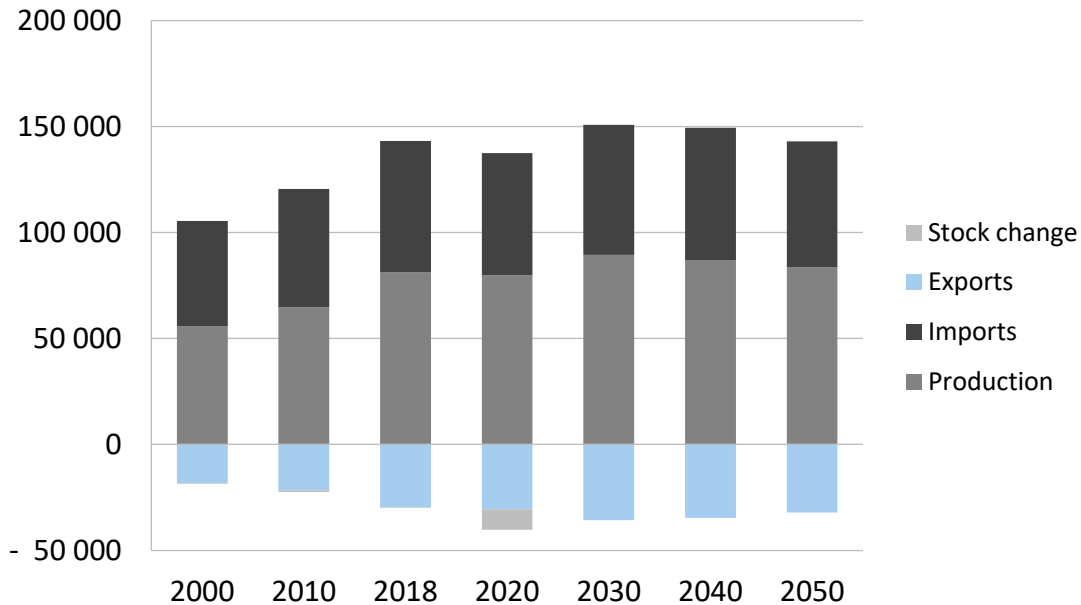


Sources: EGEDA and APERC analysis

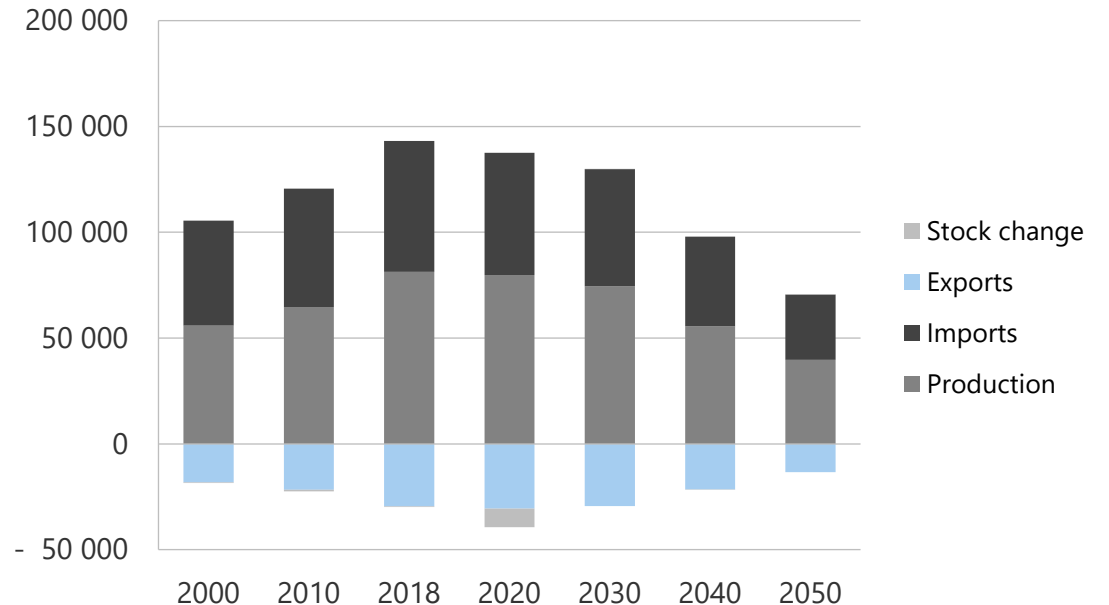
- In REF, oil consumption recovers after 2020 and peaks in the mid-2030s but declines by 1% in 2050, below the 2018 level.
- Oil consumption in REF rebounds after 2020 with production increases in the USA, Russia and Canada. It begins to fall in the 2030s due to declines in production in the USA, Russia and southeast Asia.
- In CN, oil consumption does not recover to the pre-pandemic level and falls by 48% in 2050. Oil production in CN declines by 51% in 2050, with net import dependence declining from 24% in 2018 to 17% and 16% in REF and CN, respectively.

# USA, other Americas, and Russia account for over 80% of APEC oil production

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



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

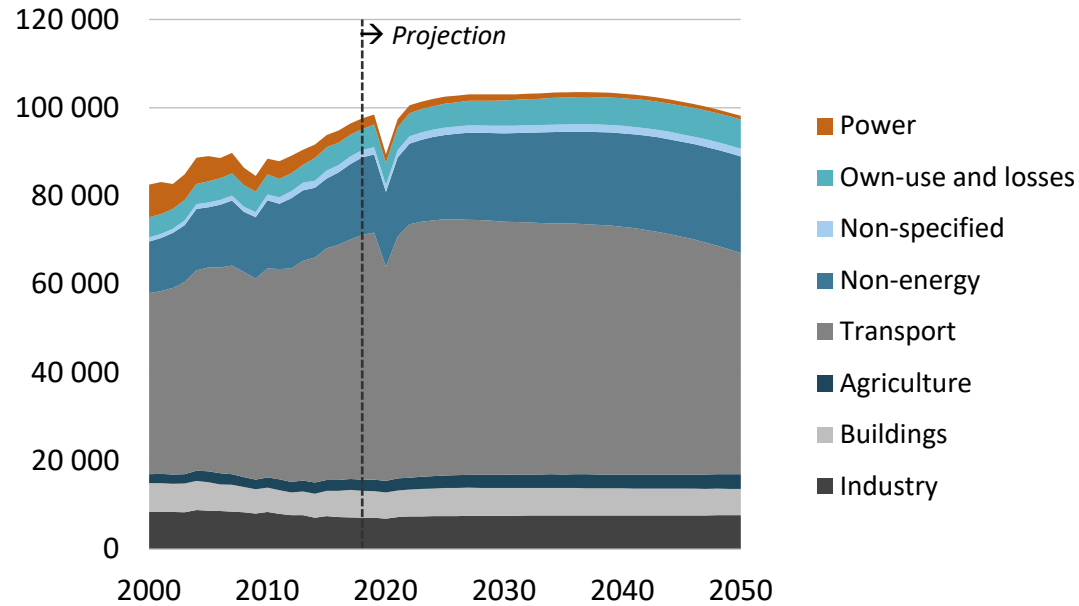


Sources: EGEDA and APERC analysis

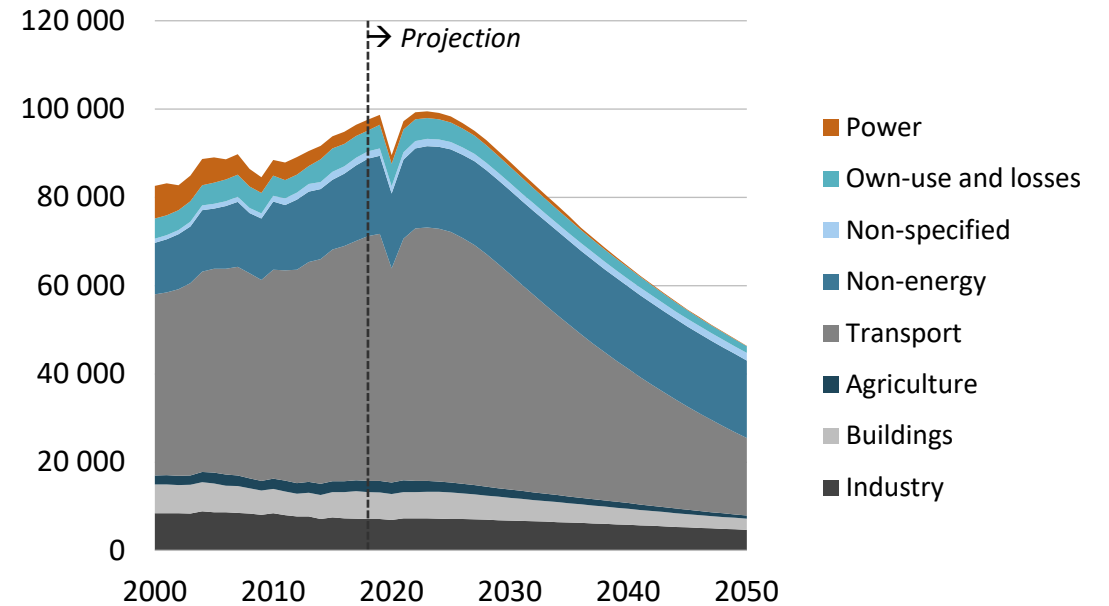
- In REF, oil production surpasses pre-pandemic production levels in 2025 but begins to fall in the 2030s, mainly affected by the level of production in USA, Russia, Canada, and southeast Asia.
- Imports and exports reduce slightly through 2050 in REF due to higher production in USA and declining Russia exports partially offset by increasing exports from Canada and USA.
- In CN, oil production, imports and exports decline about 50% by 2050 due to falling global oil demand.

# Refined products consumption declines rapidly in CN

Refined products consumption by sector in REF, 2000-2050 (PJ)



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

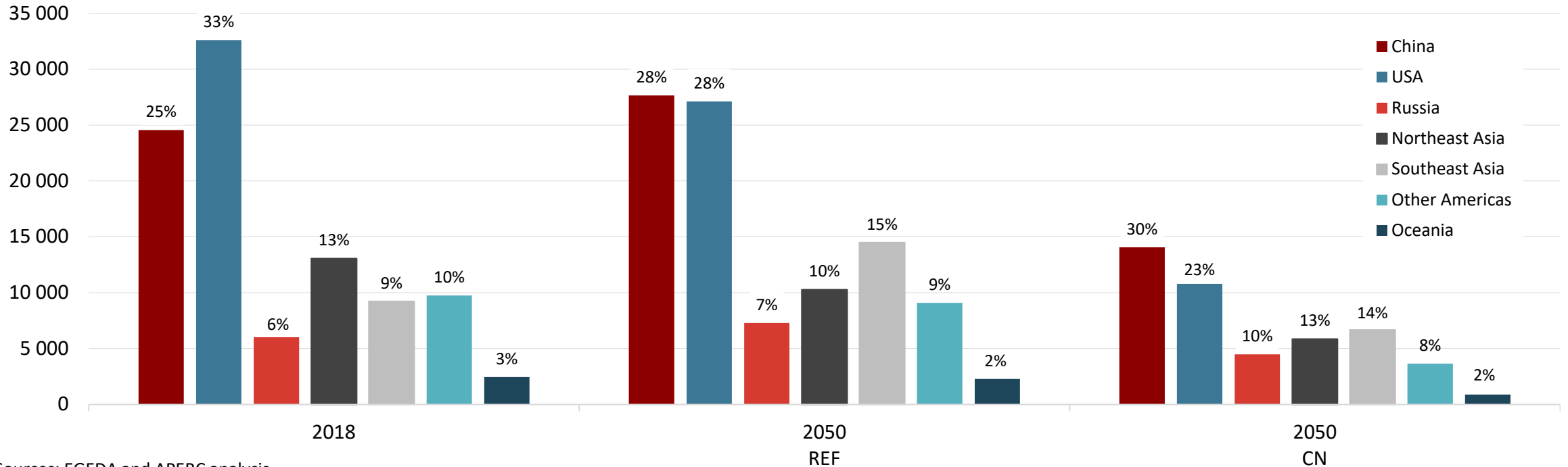


Sources: EGEDA and APERC analysis

- Refined products consumption increases marginally to the mid-2030s and declines through the 2040s in REF.
- In CN, refined products consumption drops significantly towards 2050 after peaking in 2023, driven by declining demand in transport sector.
- Non-energy share remains high in both scenarios as the demand for petrochemicals grows.

# Refined products consumption varies by region

Changes in refined product consumption by region in REF and CN, 2018-2050 (PJ)

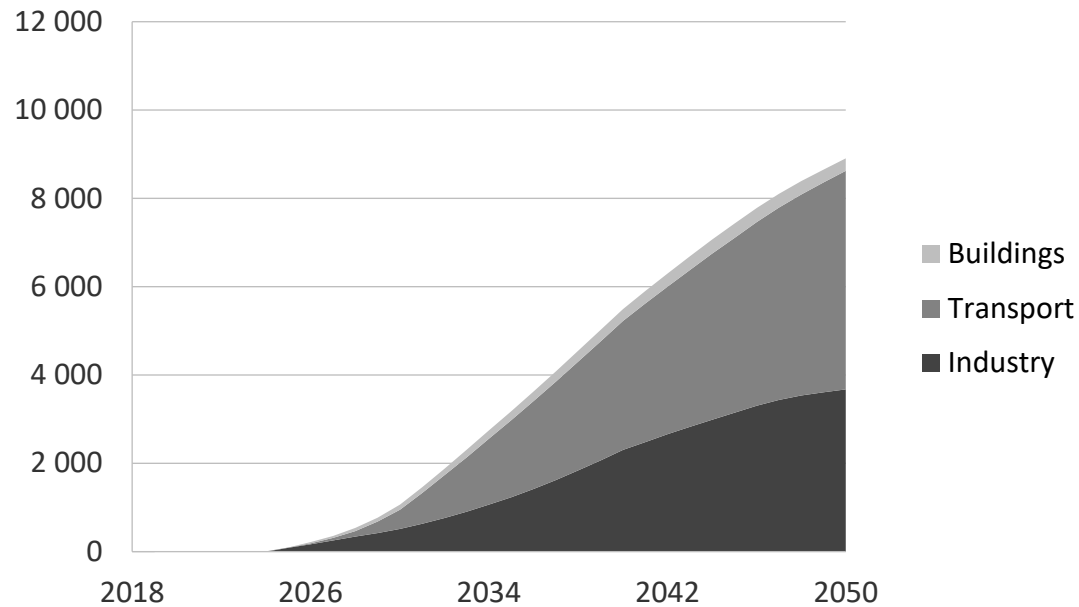


Sources: EGEDA and APERC analysis

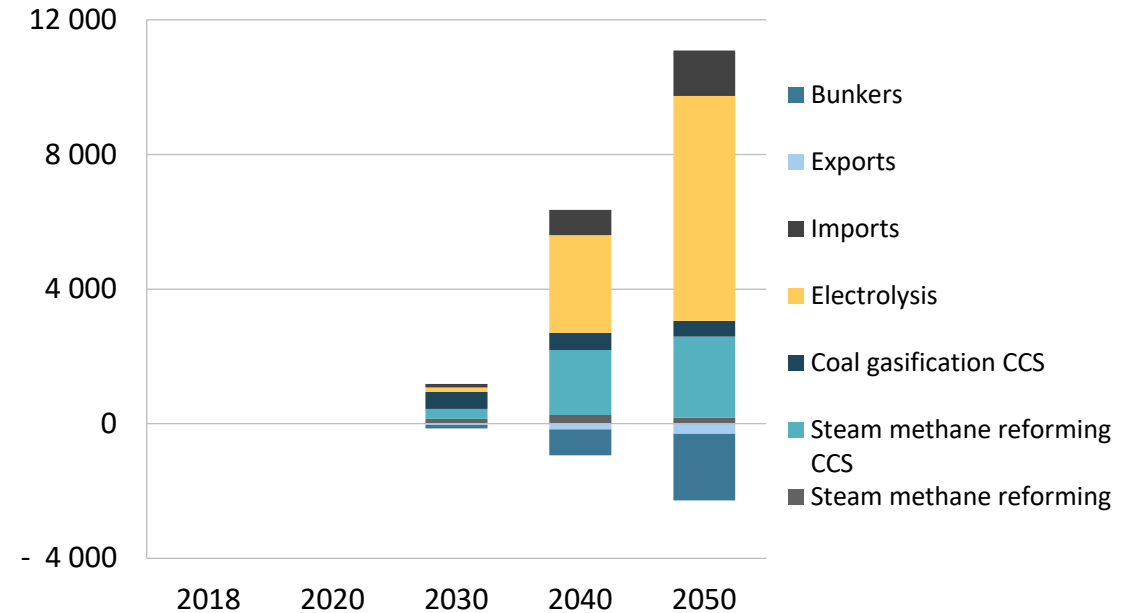
- In REF, China, Russia, and southeast Asia increase refined products consumption in APEC through 2050 as refined products remain the primary fuel in their transport sectors.
- In CN, China and USA account for over 60% of the reduction of refined products consumption in 2050, relative to 2018.
- China remains the largest refined products consumer in APEC in both scenarios.

# Hydrogen supply for energy is mainly produced by electrolysis

Hydrogen consumption by sector in CN, 2018-2050 (PJ)



Hydrogen production, imports and exports in CN, 2018-2050 (PJ)



Sources: EGEDA and APERC analysis

- Hydrogen consumption in CN increases significantly throughout the Outlook period, but accounts for only 4% of total energy consumption in 2050.
- Higher sales of fuel cell vehicles and application of hydrogen in chemicals and iron and steel subsectors contribute to higher hydrogen demand in CN.
- In addition to increasing hydrogen production through electrolysis and CCS based production domestically, APEC increases hydrogen imports.

# Key takeaways and challenges

- **Fossil fuels' share in total energy supply declines towards 2050, but fossil fuels remain an essential fuel in REF and CN.**
  - Coal supply declines in both scenarios, especially in CN in the power sector
  - Despite increased gas production relative to 2018, APEC's status changes from gas exporter to gas importer in the 2040s in both scenarios.
  - In CN, limited investment in oil projects causes a substantial decline in oil production, but due to falling consumption, oil import dependence also declines from 24% to 16%.
- **Renewables supply doubles in REF and triples in CN to meet significant demand growth in APEC.**
  - Grid reliability issues might limit the progress of renewables consumption in the APEC region.
- **Hydrogen supply for energy grows significantly in CN.**



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**Thank you.**

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