Asia-Pacific Economic Cooperation

APERC Asia Pacific Energy Research Centre

2-2. Energy Demand

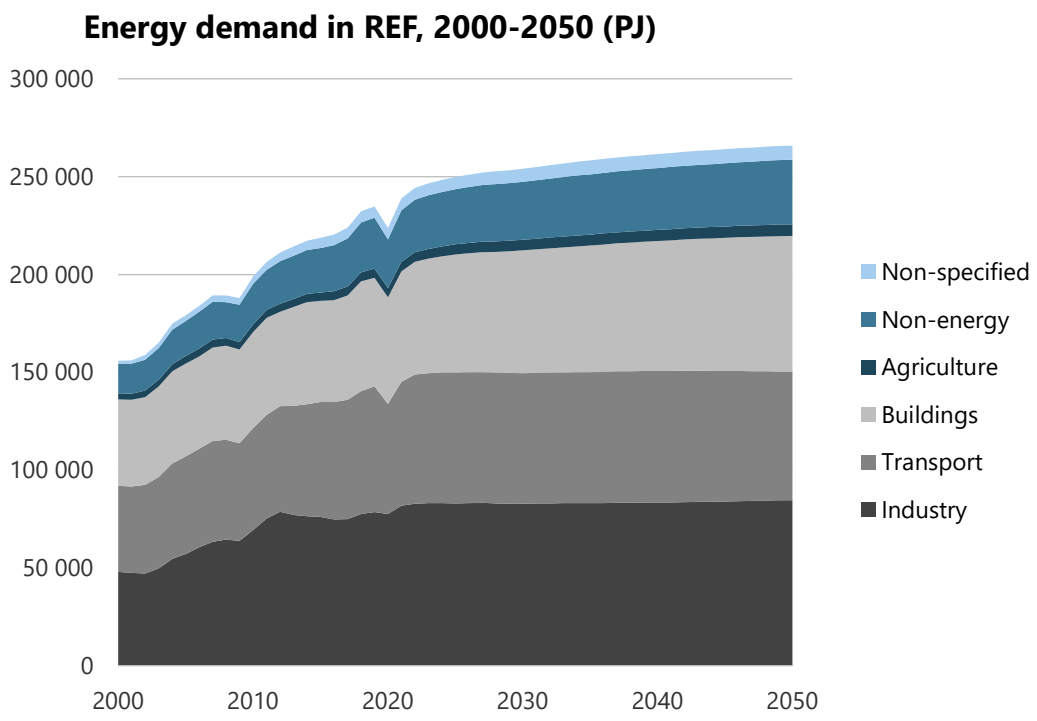
APERC Workshop
The 63rd Meeting of APEC Energy Working Group (EWG)
13 June 2022 (GMT+8)

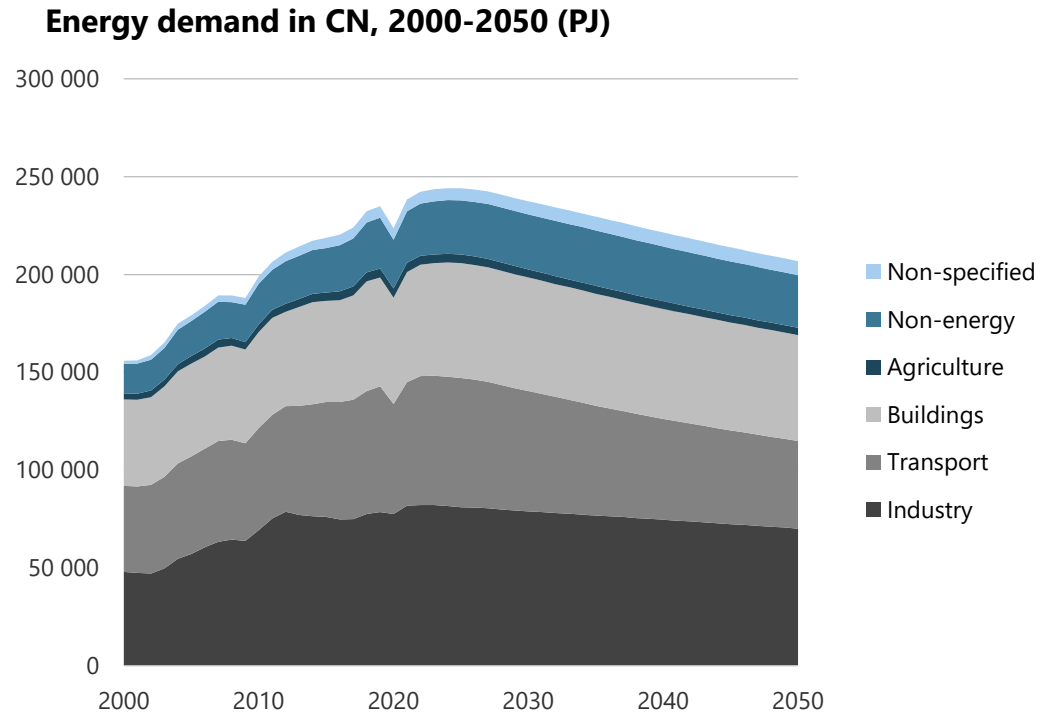
Dr Manuel Antonio Heredia Munoz, Senior Researcher

Outline

- APEC final energy demand
- Buildings
- Industry
- Transport
- Summary

Final energy demand grows slowly in REF, but declines in CN



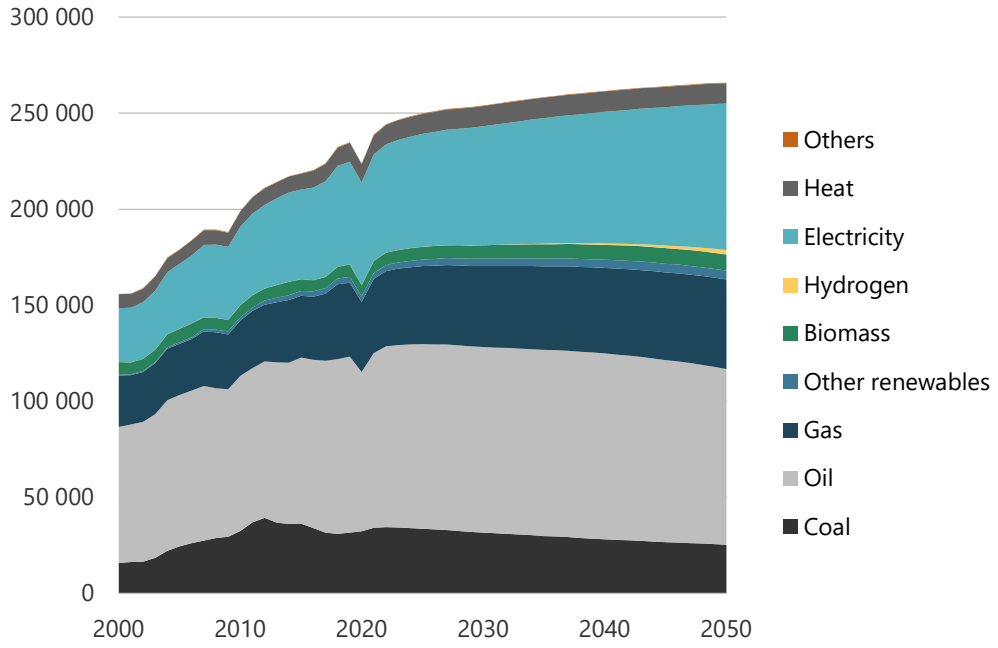


Sources: EGEDA, APERC analysis

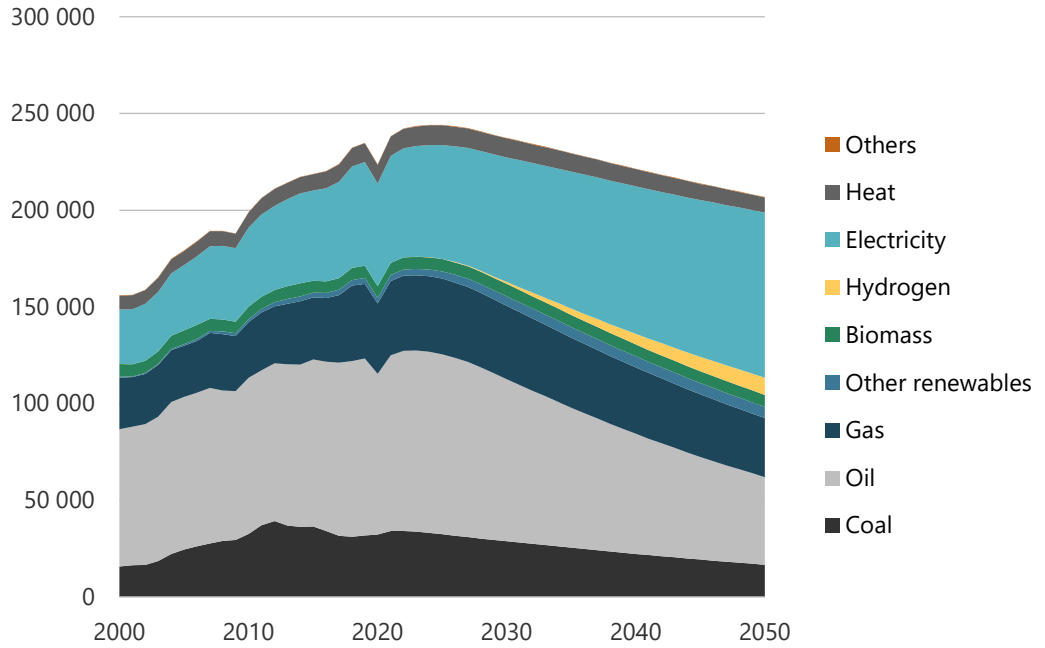
- Final energy demand keeps growing although at slower rate in REF increasing around 15% from 2018 to 2050. In CN, energy demand peaks in mid-2020s and the declines. By 2050, final energy demand drops more than 20%.
- Transport leads the decline in energy demand in CN. Energy intensive industries adopt new technologies, improved processes and other fuels.

Fossil fuels continue to play an important role

Energy demand by fuel in REF, 2000-2050 (PJ)



Energy demand by fuel in CN, 2000-2050 (PJ)

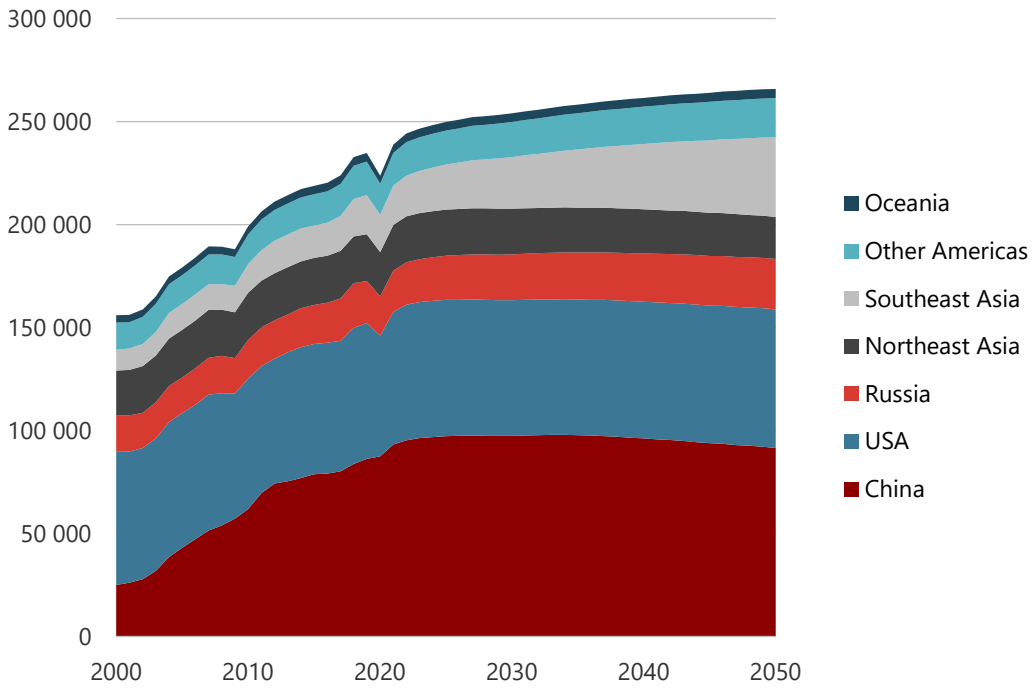


Sources: EGEDA, APERC analysis

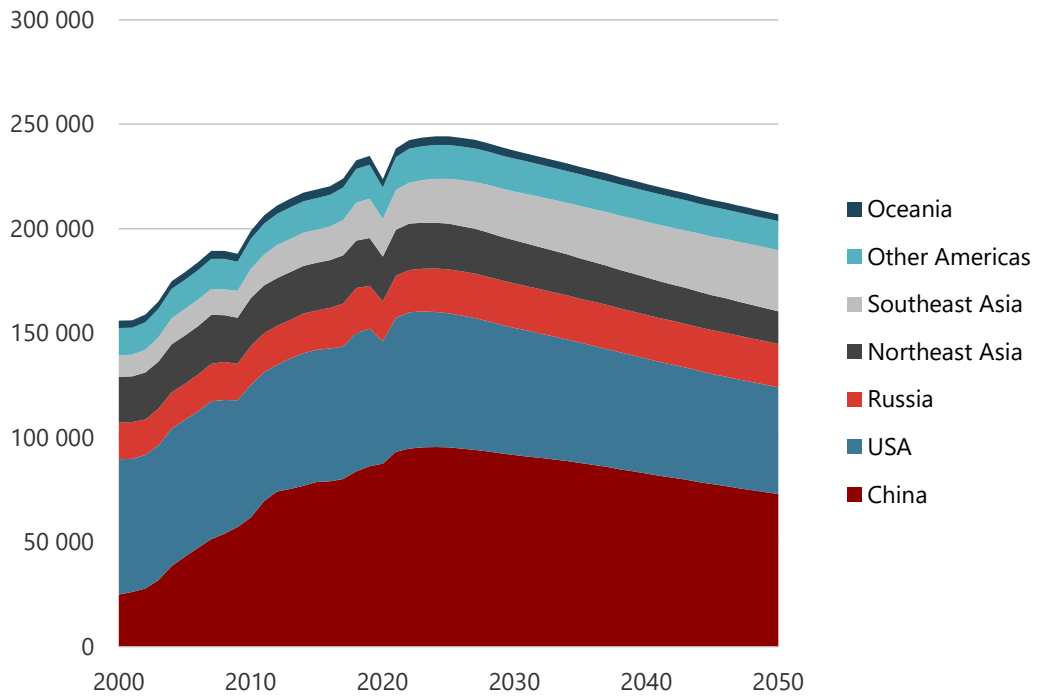
- Fossil fuels demand is almost stagnant in REF and decreases 45% from 2018 to 2050 in CN.
- Increasing electrification is a key trend in both scenarios but is more intensive in CN.

China and USA are the largest energy consumers; Southeast Asia grows fastest

Energy demand by region in REF, 2000-2050 (PJ)



Energy demand by region in CN, 2000-2050 (PJ)

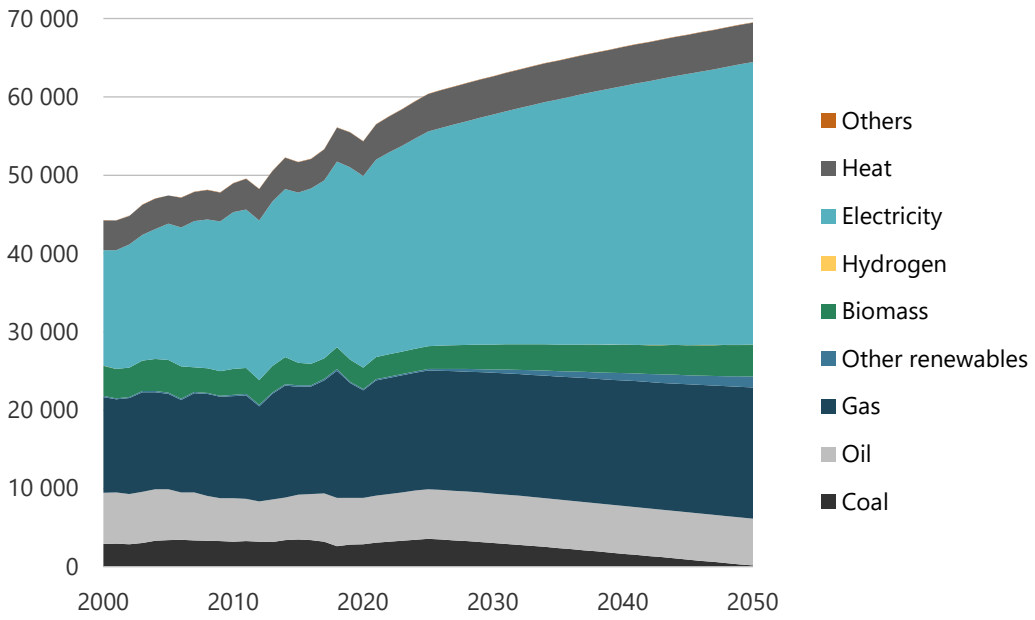


Sources: EGEDA, APERC analysis

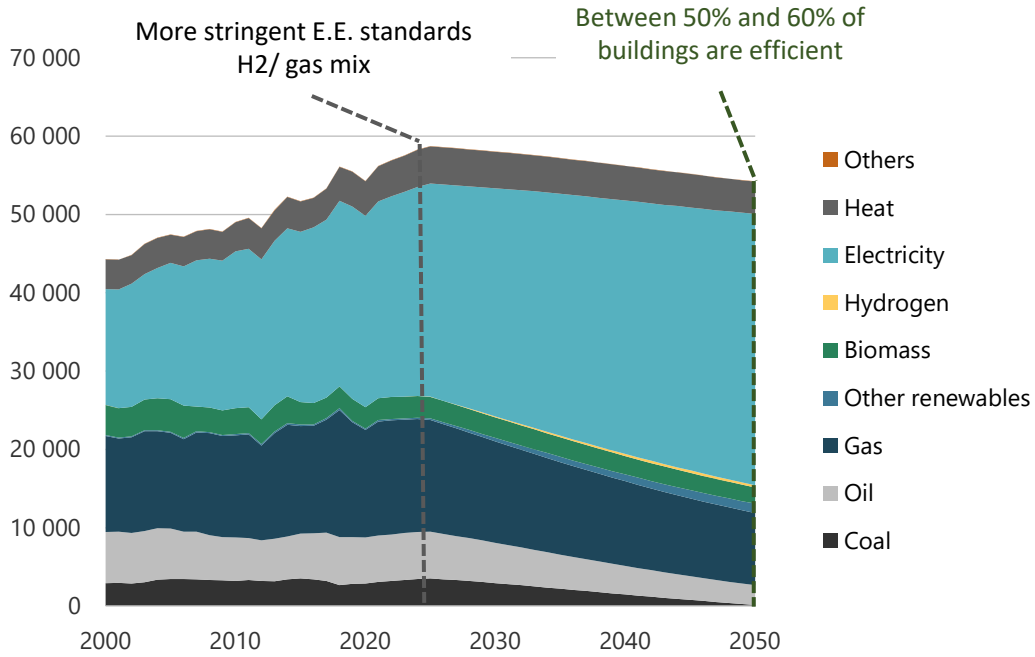
- China and US remain the largest energy consumers in both scenarios; although demand decreases after 2030 in both scenarios. Efforts to reduce energy demand are important, however, combined action of all APEC's regions are necessary to achieve CN.
- Southeast Asia economic growth drives an increase of energy demand, to become the third largest consumer in APEC by 2050 in both scenarios.

Buildings: electrification is key but challenging

Buildings energy demand in REF, 2000-2050 (PJ)



Buildings energy demand in CN, 2000-2050 (PJ)

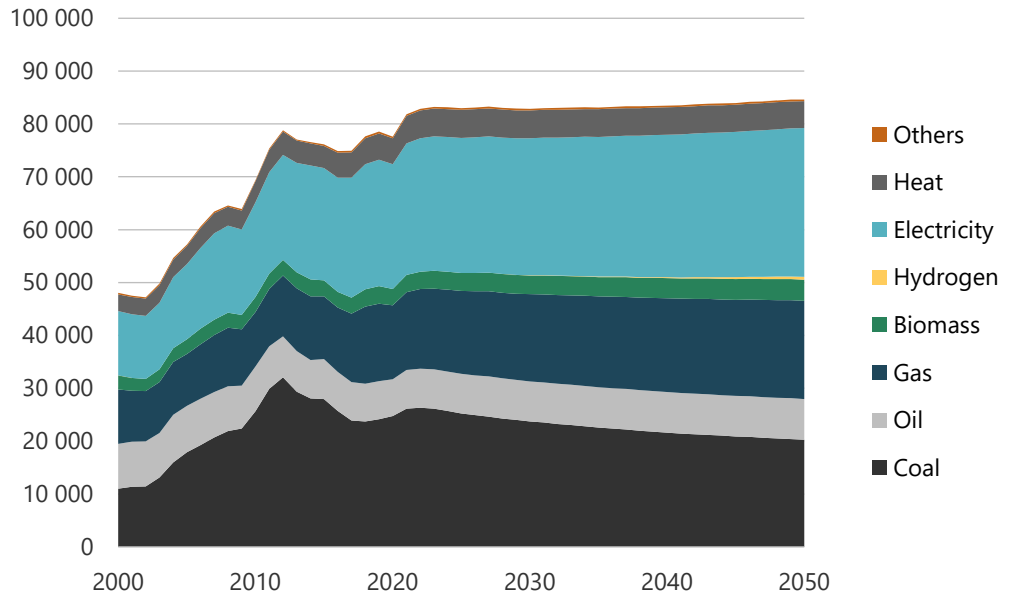


Sources: EGEDA, APERC analysis. Note: Biomass in buildings refers to traditional biomass

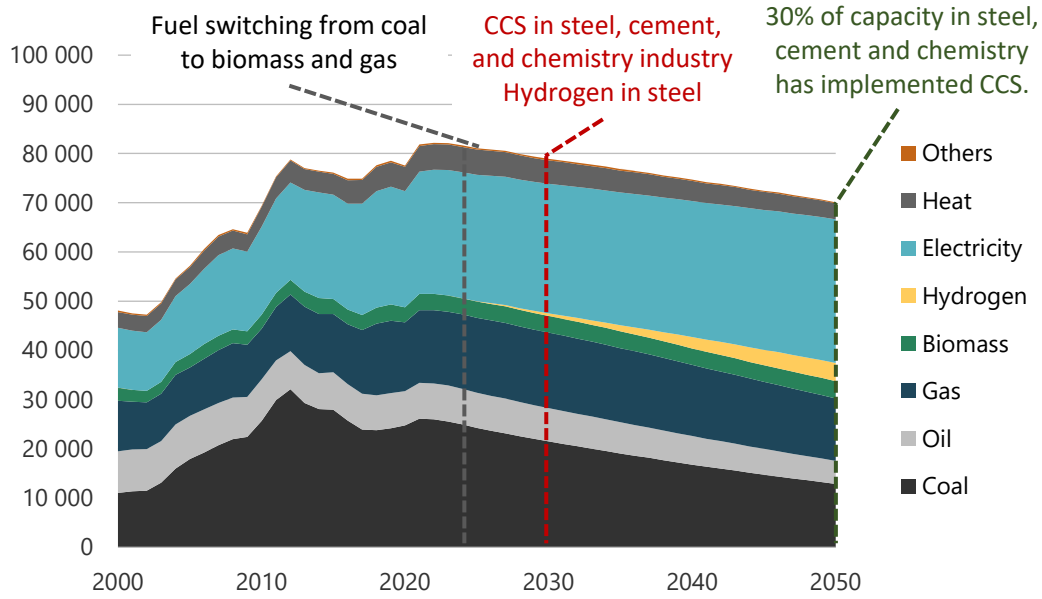
- Electricity increases in the fuel mix in both scenarios: 52 % in REF and 64% in CN by 2050.
- Natural gas plays an important role as a substitute for petroleum products for water heating and cooking.
- Consumption of traditional biomass is reduced because there is increasing access to modern fuels.
- Improved quality of life and greater access to services are driving forces behind the increased buildings energy demand in REF.

Industry: energy demand growth decelerates

Industry energy demand in REF, 2000-2050 (PJ)



Industry energy demand in CN, 2000-2050 (PJ)

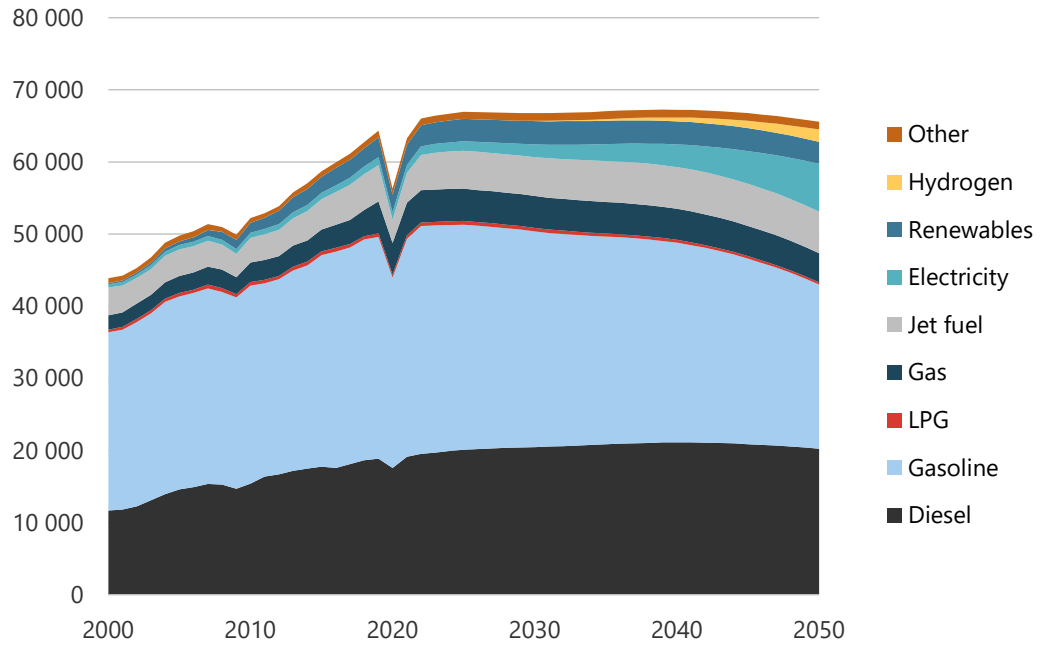


Sources: EGEDA, APERC analysis

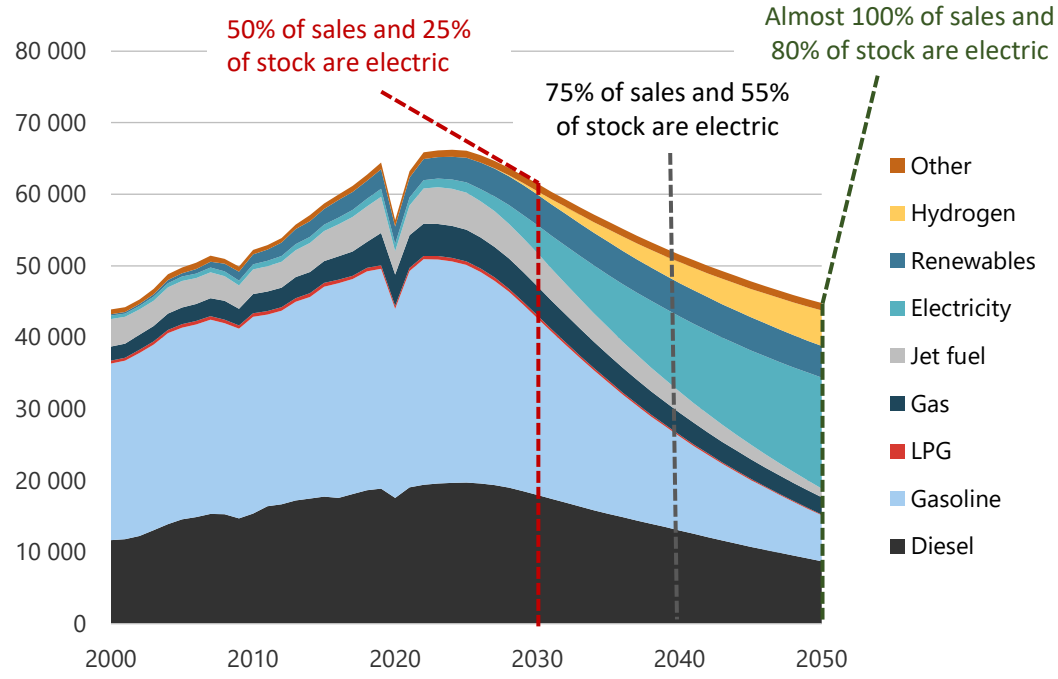
- China transitions to less energy-intensive and more service-based industries and implements energy and material efficiency measures.
- Southeast Asia's economic growth is supported by a more dynamic industrial sector driving an increase of energy demand.
- Industrial energy demand in CN is 17% lower than in REF, because of greater fuel switching to electricity, hydrogen, and biomass. Almost one-third of the fossil fuels used by heavy industry are subject to some form of carbon capture process in 2050

Transport: New technologies and behavioral changes have a large impact

Transport energy demand in REF, 2000-2050 (PJ)



Transport energy demand in CN, 2000-2050 (PJ)



Sources: EGEDA, APERC analysis

- EV adoption and higher use of public transport drives the share of electricity up significantly from 1.7% in 2018 to over 10% in the REF and almost 35% in the CN. The switch from gasoline and diesel to electricity and hydrogen causes the largest decline in energy demand.
- Transportation activity is 5% less in CN versus REF in 2050. Switching to public transport and the optimisation of freight delivery enables a decline in energy use.

Summary

- There is a deceleration of APEC's energy demand growth in REF. In CN, APEC's energy demand peaks in the mid-2020s and then decreases. APEC's energy demand in 2050 in CN is around 20% less than REF.
- China and the US continue to be the largest energy consumers in APEC; Southeast Asia becomes the third largest energy consumer in APEC by 2050.
- Switching away from gasoline and diesel to electricity and hydrogen has the biggest impact on the decline of energy demand in transport.
- Energy efficiency first, then electrification are key to the reduction in fossil fuel demand.
- Potential risks include different stages of economic development, requirements for new technologies (some still under development) and costs uncertainty.

Asia-Pacific
Economic Cooperation

APERC
Asia Pacific Energy Research Centre

Thank you.

https://aperc.or.jp