Asia-Pacific Economic Cooperation

APERC Asia Pacific Energy Research Centre

CO_2 emissions in the 7th edition of the APEC Outlook

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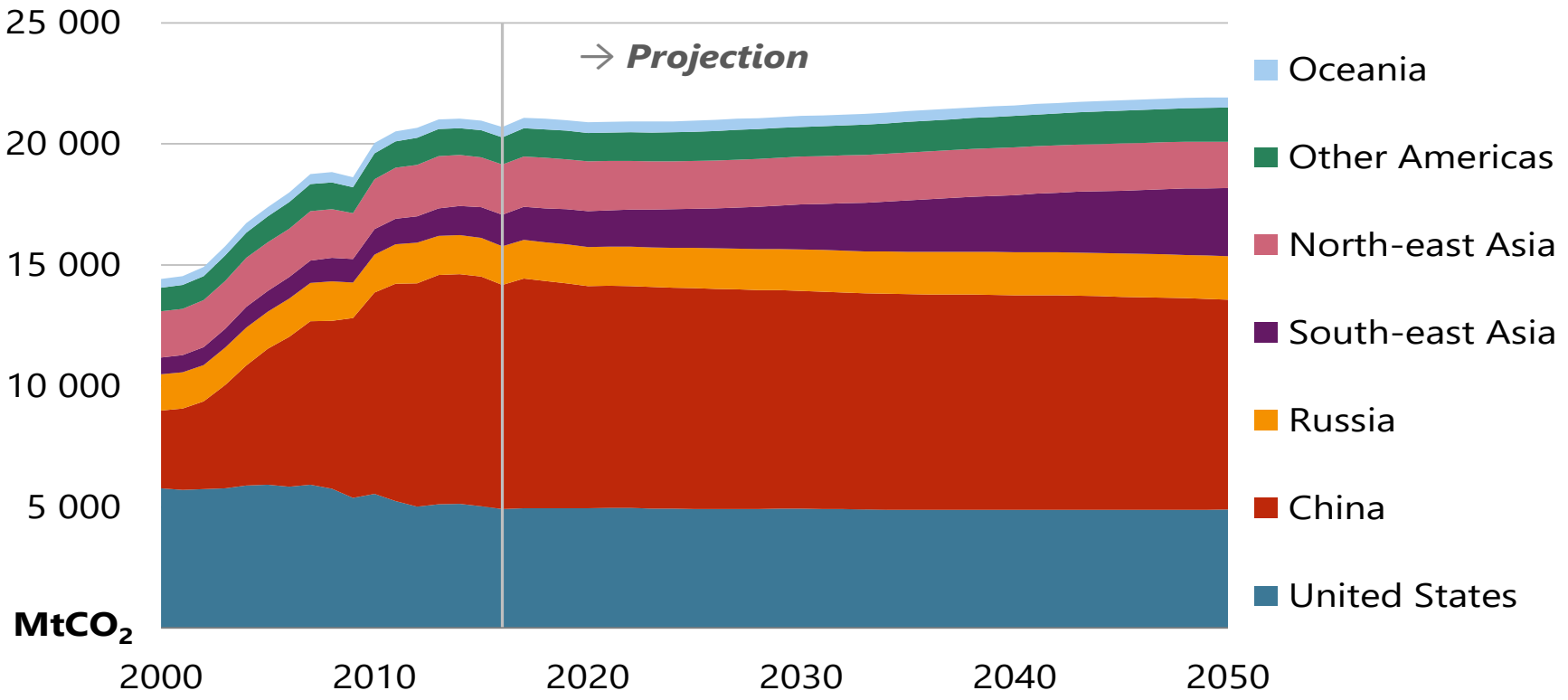
Scenarios

Business-as-Usual (BAU)	APEC Target (TGT)	2-Degrees Celsius (2DC)
Recent trends and current policies.	Pathway that achieves APEC-wide goals to • reduce energy intensity 45% by 2035 • double the share of renewables by 2030.	Pathway that provides a 50% chance of limiting the average global temperature rise to 2°C.
Provides a baseline for comparison.	Explores implications of alternative scenarios and identifies gaps to overcome.	

In the BAU, APEC CO_2 emissions increase

Total CO_2 emissions by sector in the 2DC, 2016-50

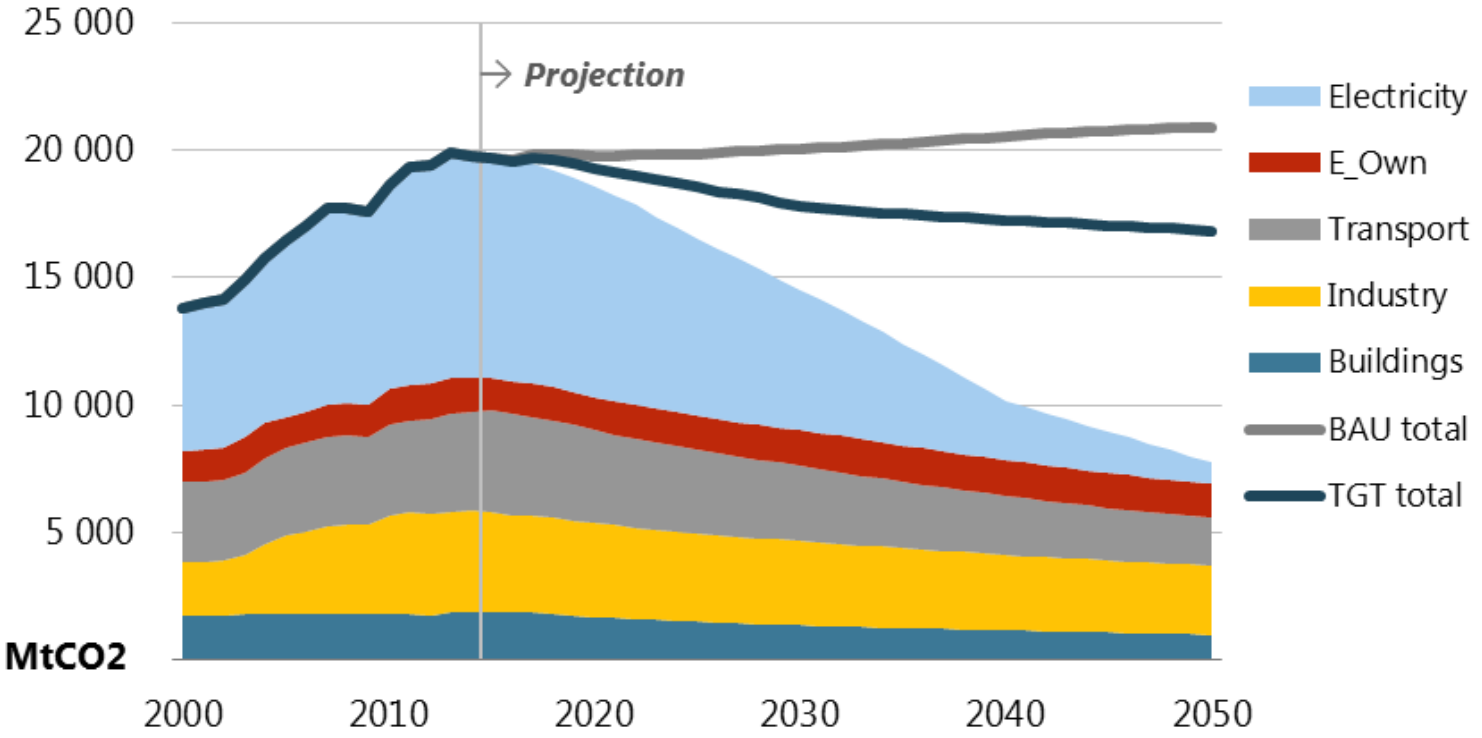


Sources: APERC analysis, IEA (2016 and 2018), IPCC (2018) and UNFCCC (2018).

China and the United States account for the highest share of CO_2 emissions throughout the projection period; South-east Asia shows the strongest increase in CO_2 emissions.

In 2DC, CO_2 emissions fall below 2016 levels

Total CO_2 emissions by sector in the 2DC, 2016-50

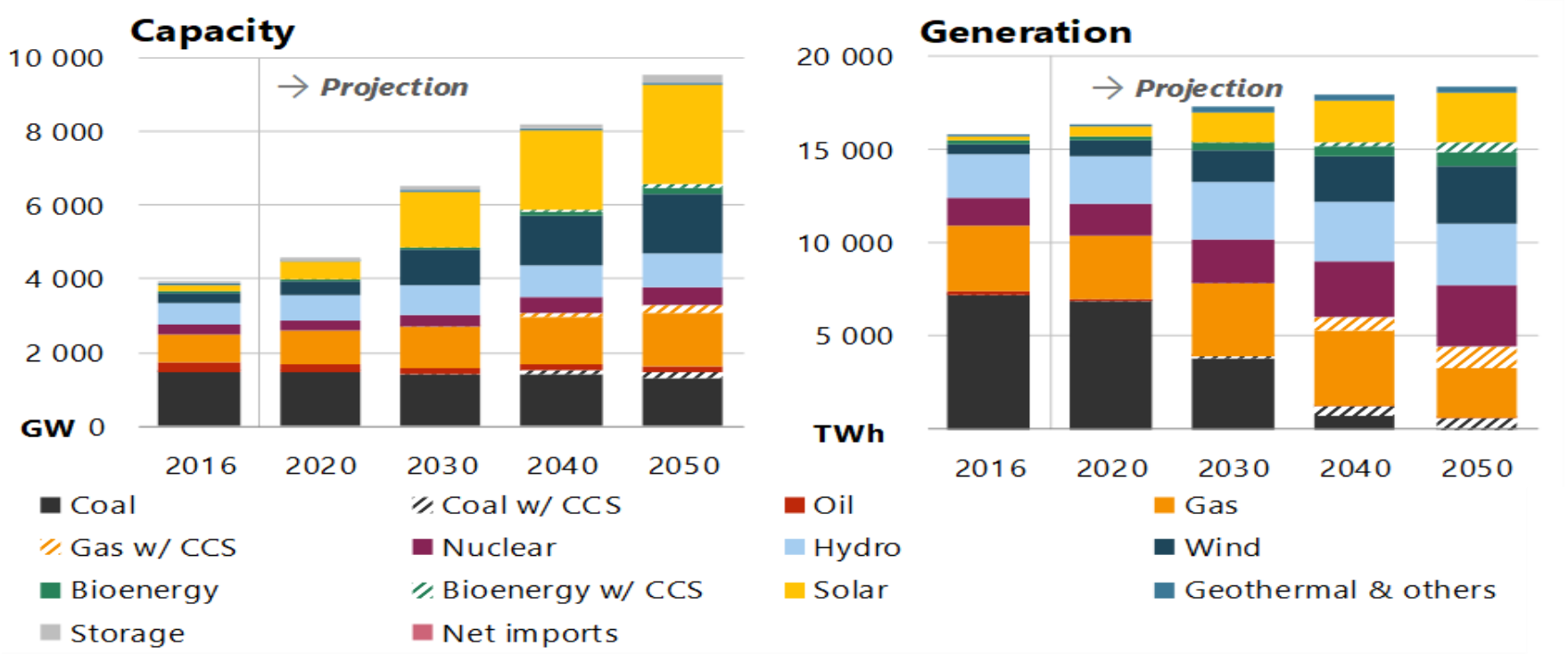


Sources: APERC analysis, IEA (2016 and 2018), IPCC (2018) and UNFCCC (2018).

APEC CO_2 emissions decline to 59% lower by 2050; driven by deep decarbonisation from the electricity sector, transport and buildings lead the substantial CO_2 emissions reduction from the demand sector.

CO_2 emissions from the electricity sector fall substantially in the 2DC

APEC power capacity and electricity generation in the 2DC by fuel, 2016-50

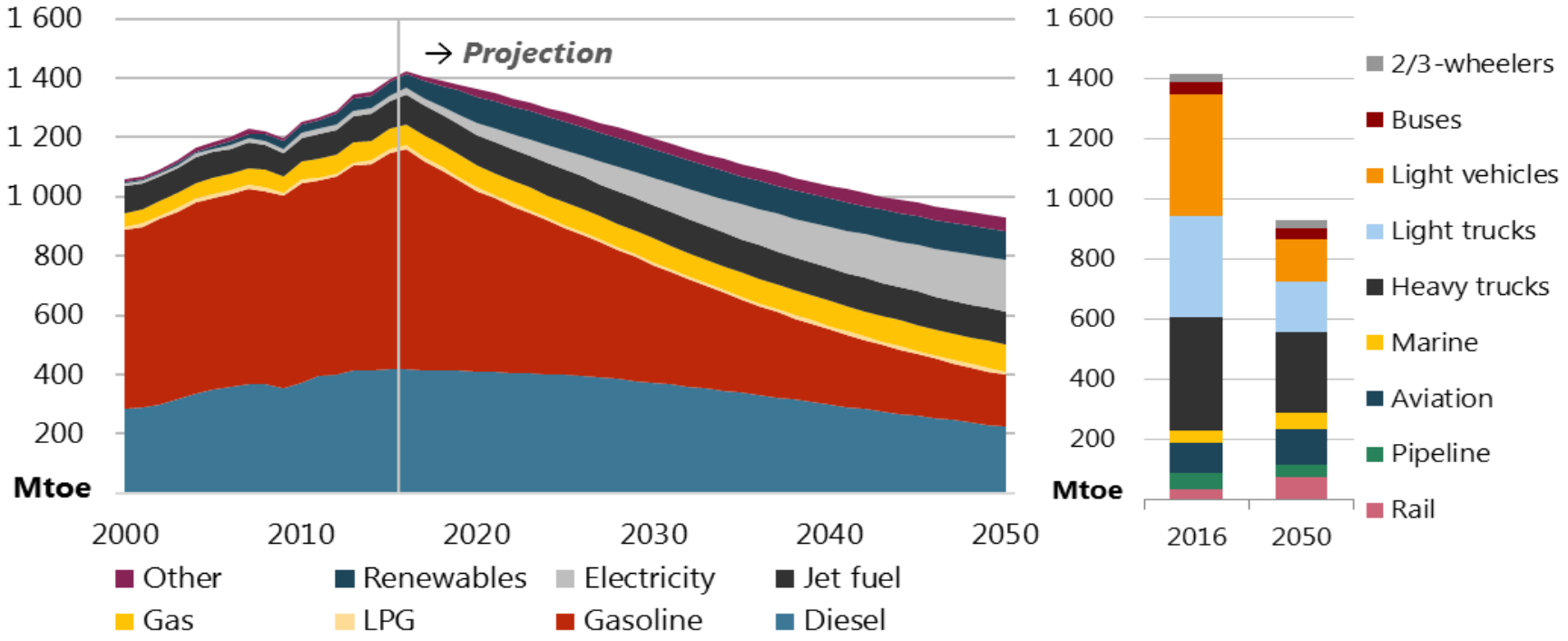


Source: APEC Energy Demand and Supply Outlook 7th Ed.

Electricity sector evolves from being dominated fossil fuels to being dominated by renewables, nuclear, and CCS; achieving commercial viability of CCS fossil fuel and biomass is paramount in the 2DC.

Total CO_2 emissions from domestic transport decrease substantially in the 2DC

Domestic transport final energy demand in the 2DC Scenario by end-use, 2000-50

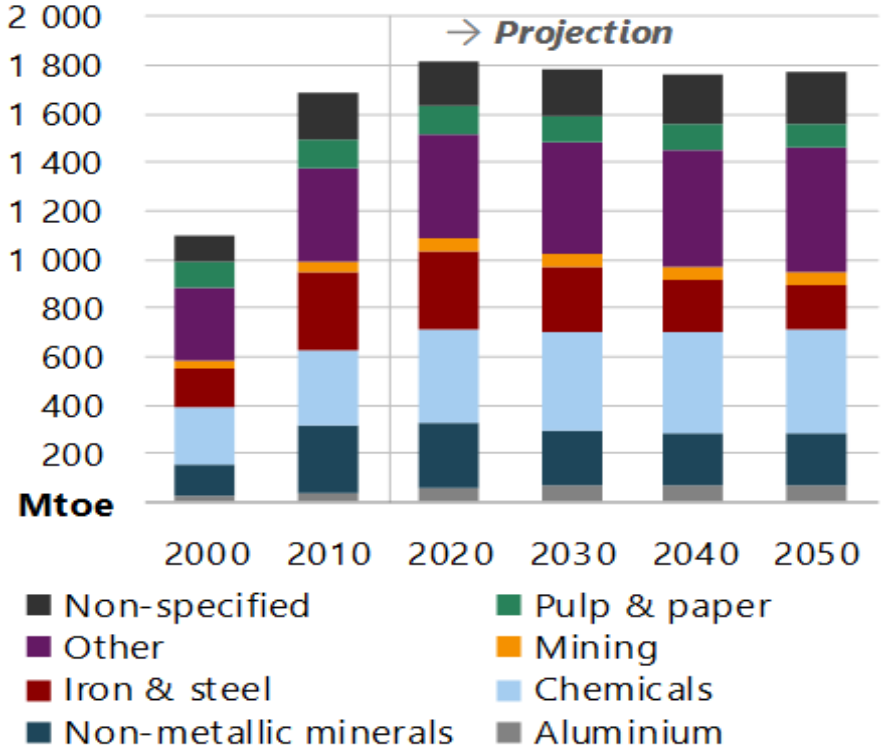


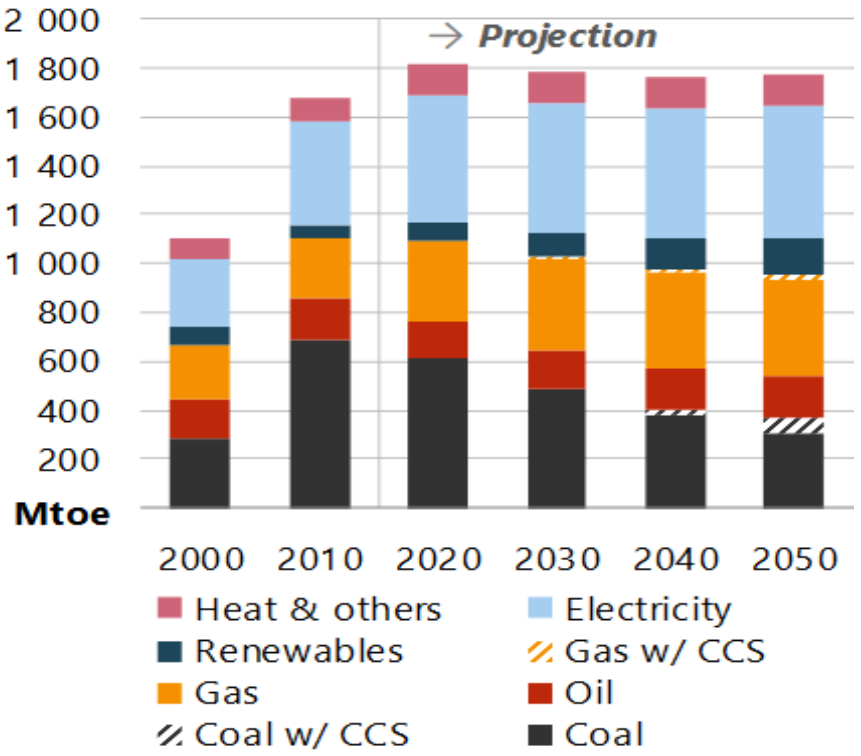
Sources: APEC Energy Demand and Supply Outlook 7th Ed. and IEA (2018).

Key drivers of CO_2 emission reductions: fuel efficiency, the electrification of vehicles, a stronger shifting toward public transport, and decoupling economic growth and freight activities.

Industry accounts for the largest share of total CO_2 emissions

Industry final energy demand in the 2DC by end-use and fuel, 2000-50



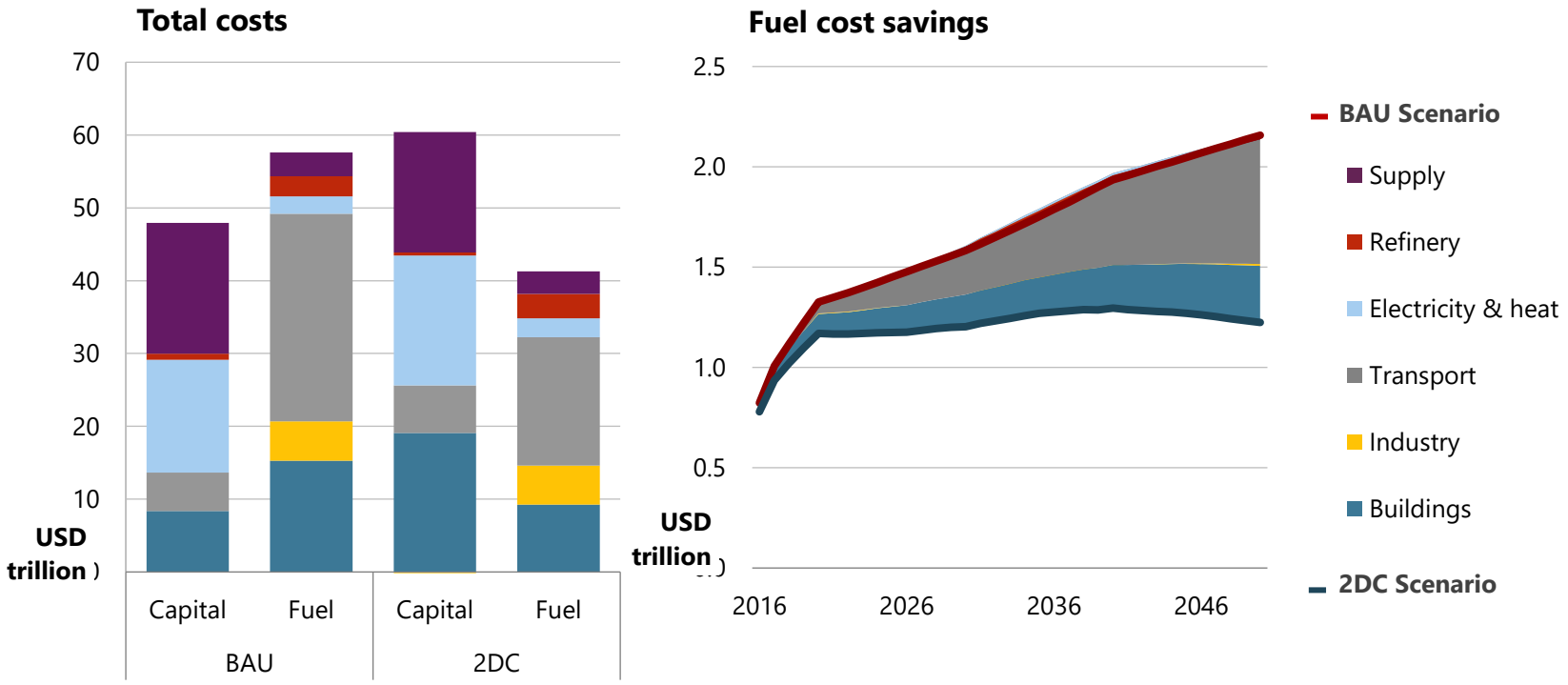


Sources: APEC Energy Demand and Supply Outlook 7th Ed. and IEA (2018).

Chemical and petrochemical has the largest industry subsector energy demand; CO_2 emissions reduction is driven by deploying BATs, improving material efficiency, and adopting CCS technologies.

The 2DC requires the highest capital investment

Total investment and fuel cost savings by sector in the BAU vs 2DC, 2017-50

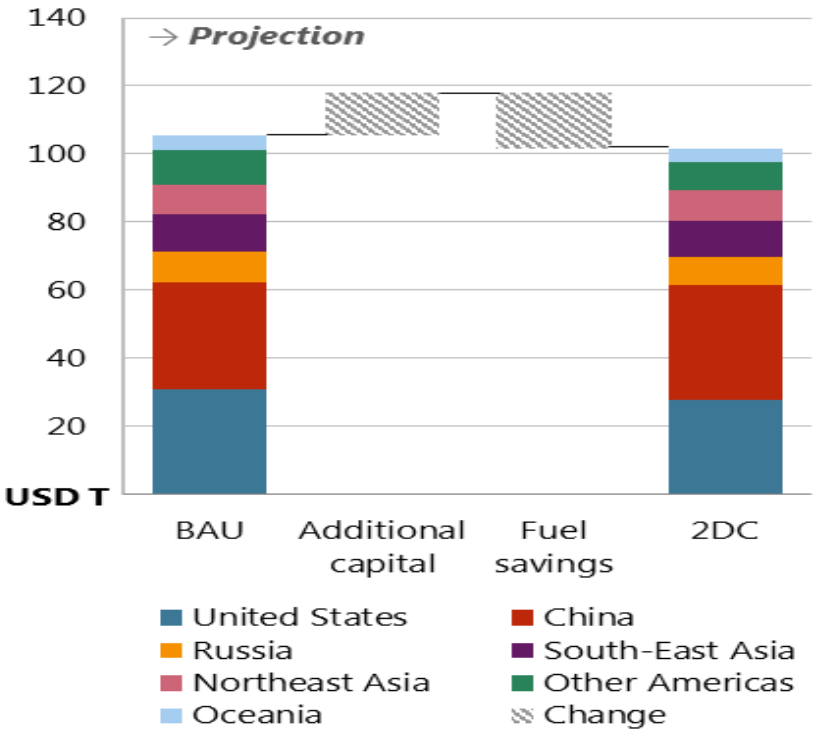


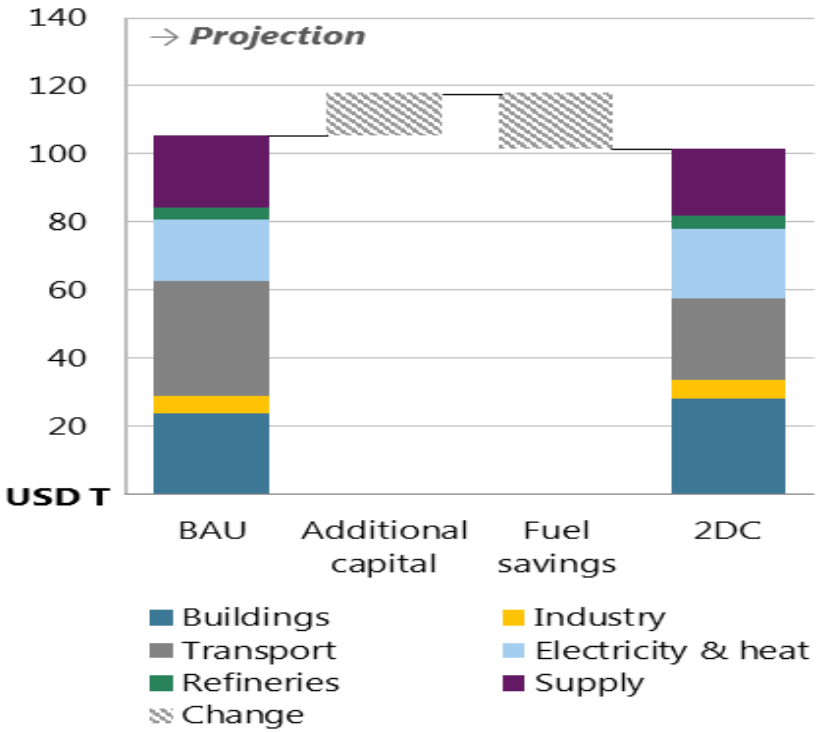
Source: APEC Energy Demand and Supply Outlook 7th Ed.

Buildings, electricity and transport require more capital investment in the 2DC although fuel savings reduce total investment requirements to 3.7% lower than in the BAU.

Capital increase is primarily in China, the United States, north-east Asia, and south-east Asia

Total capital investment and fuel cost savings by region and sector, BAU vs 2DC, 2017-50





Source: APEC Energy Demand and Supply Outlook 7th Ed.

Projected growth in capital investment requirements in electricity, buildings and transport occurs in most APEC regions while China and the United States account for the largest growth. Most regions show declines in capital requirements for refineries, supply and industry.

Summary

- While CO_2 emissions in APEC continue to grow in the BAU, APERC modelling shows in the 2DC Scenario a pathway to reduce CO_2 emissions sufficiently to create a 50% chance of constraining global temperature increases to less than 2°C.
- Electrification in buildings, transport, and industry increases and is key to reducing demand and CO_2 emissions.
- Efficiency, renewables, and CCS are required to achieve deep emissions reductions in the electricity and industry sectors.
- Energy capital investments over the Outlook period (2017-50) in APEC reach USD 60 trillion in the 2DC Scenario, although higher capital investments are partially offset by fuel savings.
- Public funding and private financing may be challenged to meet the scale of the low carbon energy investment.

Thank you!

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