APEC Energy Demand and Supply Outlook 6th Edition

2-1 Introduction and Business as Usual

Cecilia Tam, Special Adviser

May 2016, EWG 51 Canberra

APERC
Asia Pacific Energy Research Centre

APEC
Asia-Pacific Economic Cooperation

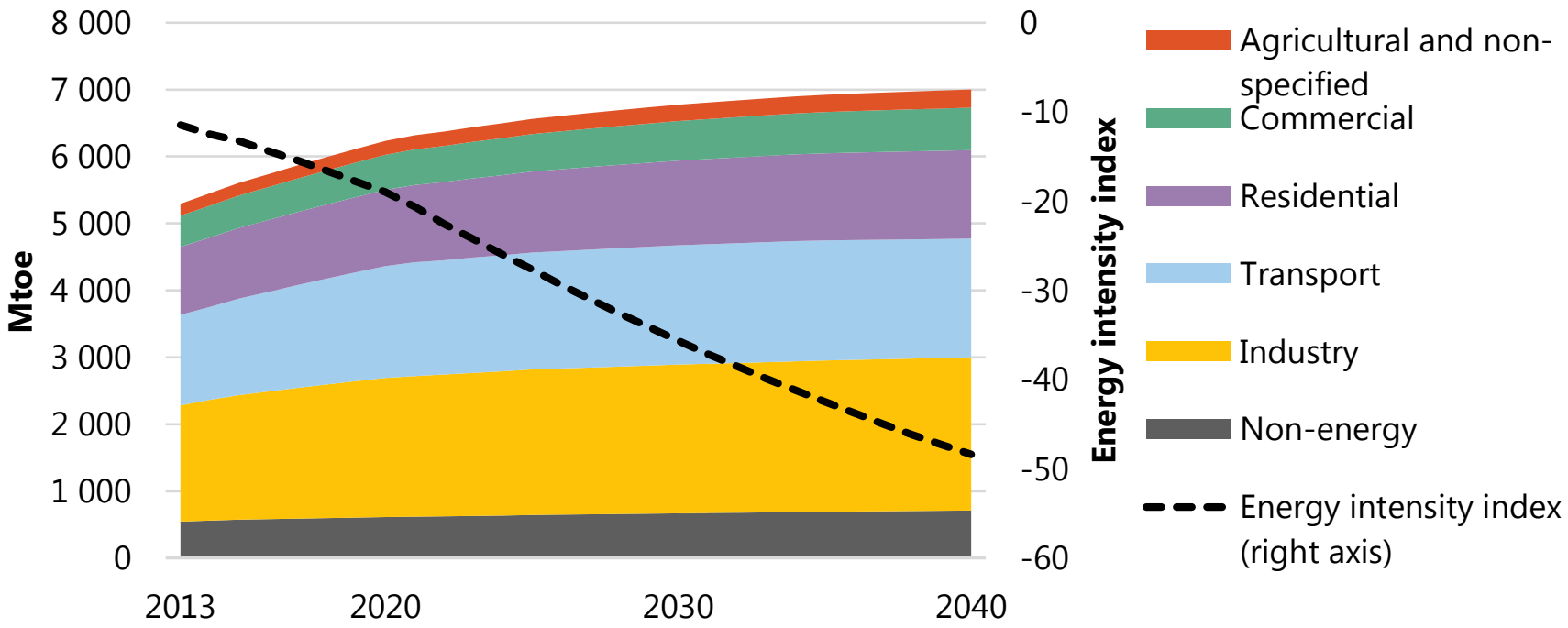
Table of Contents

Volume I

Volume II: Economy Reviews

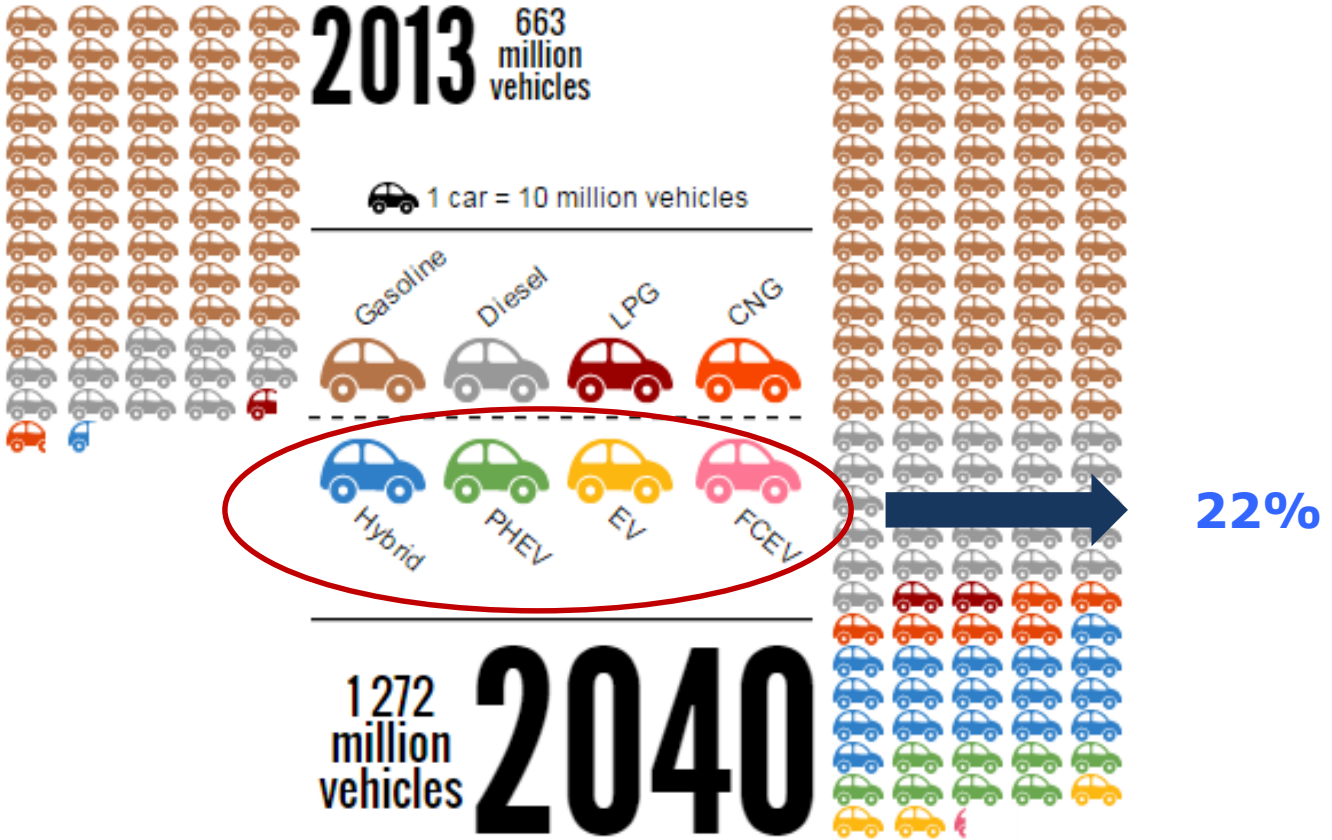
Outlook for APEC Energy Demand

Final energy demand in APEC



Final energy demand rises 32% from 2013 level by 2040. APEC's energy intensity reduction target of 45% cannot be met by 2035 in the BAU scenario.

Vehicle stock by technology

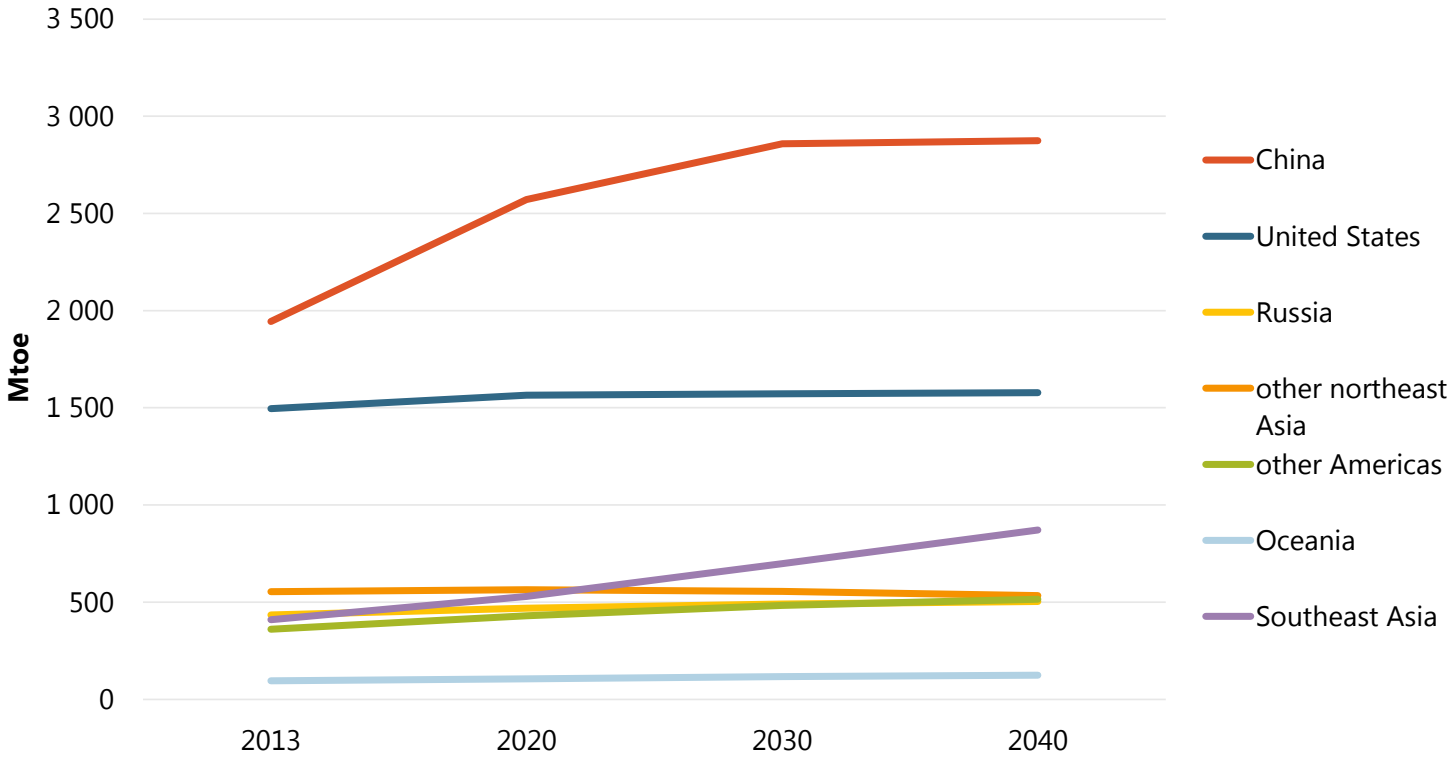


Vehicle stock doubles with more than 400 million vehicles added in China and Southeast Asia;

Share of efficient vehicles rise from 1% in 2013 to 22% by 2040.

China and US Dominate Demand in APEC

Final energy demand by sub-region

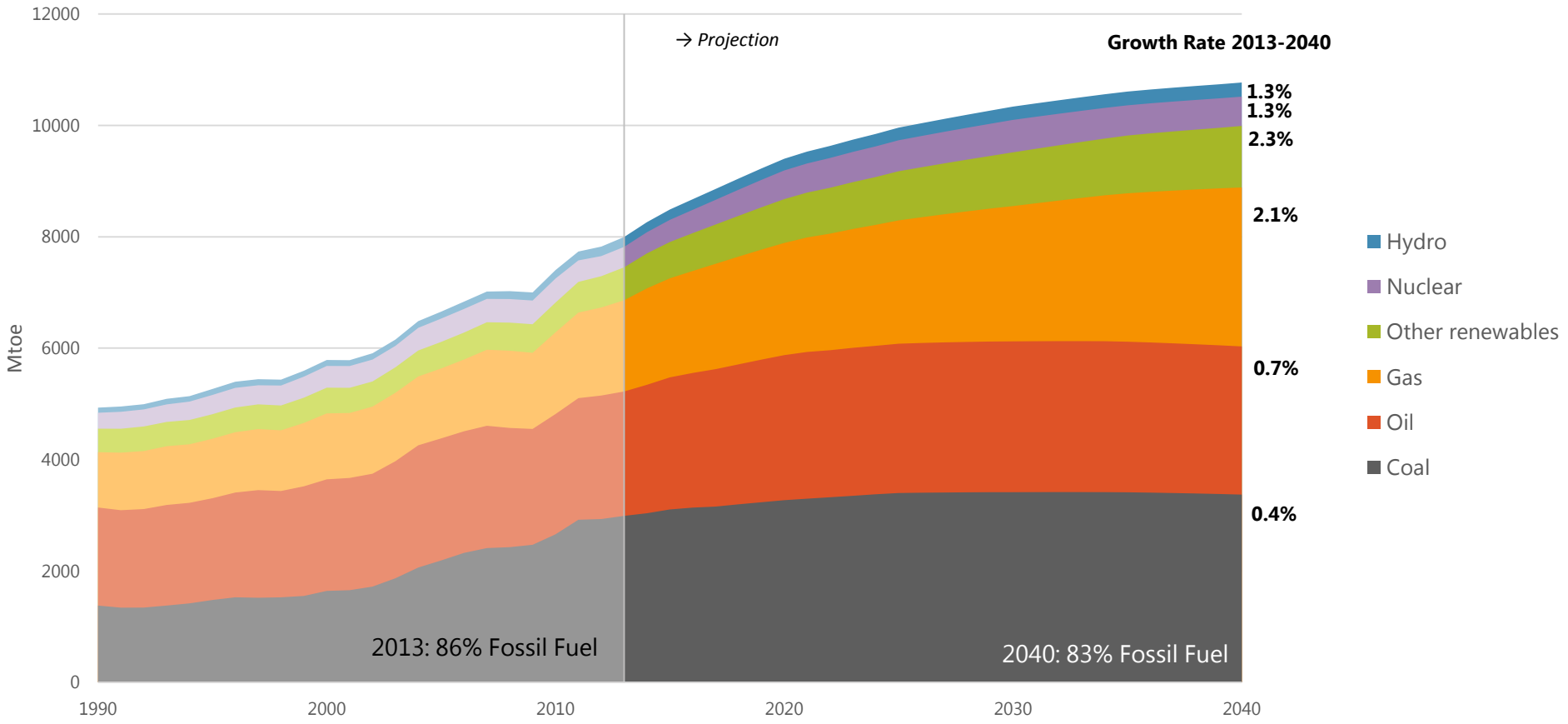


Energy demand for China and South East Asia increases 50% and 110%, respectively.

Note: **Oceania** (Australia, New Zealand and PNG), **Other Americas** (Canada, Chile, Mexico and Peru), **Other Northeast Asia** (Hong Kong, Japan, Korea and Chinese Taipei), **Southeast Asia** (Brunei Darussalam, Indonesia, Malaysia, Philippines, Singapore, Thailand and Viet Nam)

Fossil-fuels continue to dominate energy supply

APEC Total Primary Energy Supply

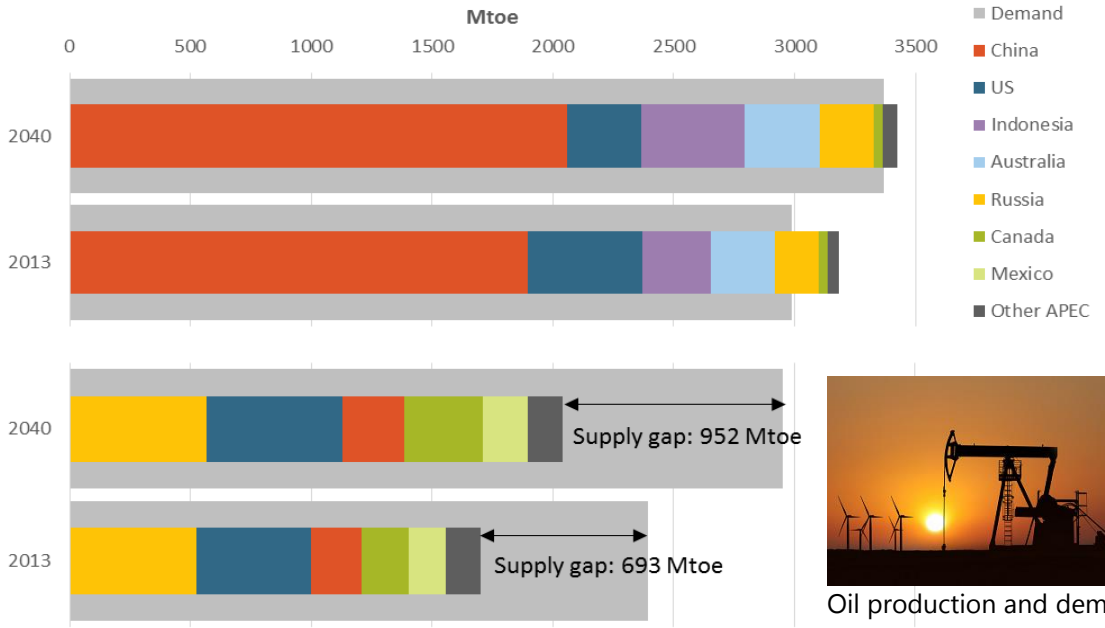


Energy supply in APEC region will more than double by 2040 from 1990 level.

Fossil fuel production will continue to increase…

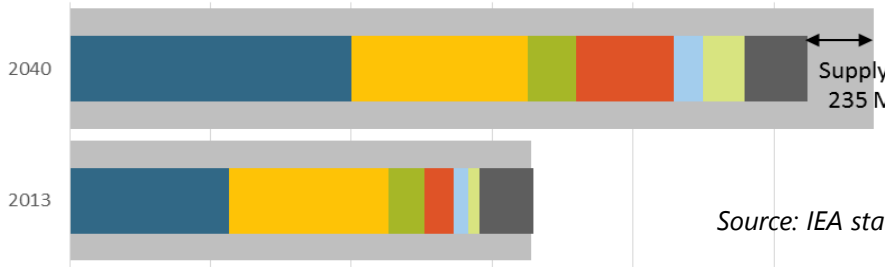
Fossil fuel production and demand, 2013 and 2040

Coal production and demand



Oil production and demand

Gas production and demand



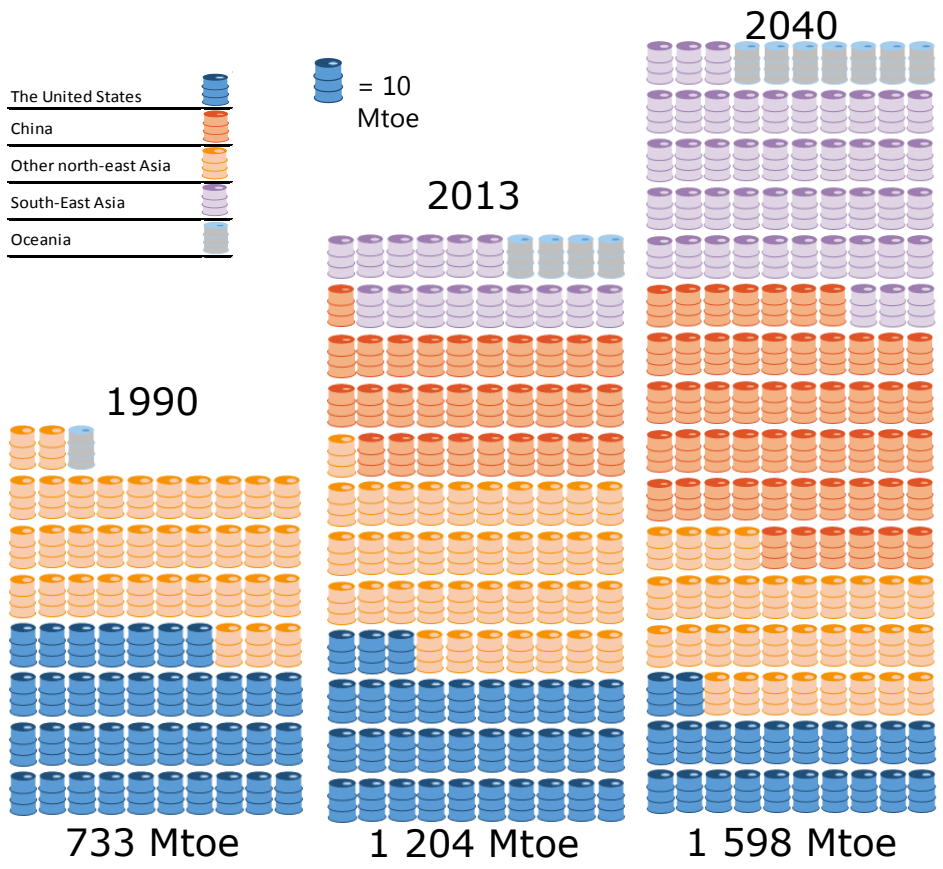
Source: IEA statistics 2015 and APERC analysis

…but not enough to meet oil and gas demand

Note: Oil demand includes international transport.

By 2040, 60% of oil import demand comes from China and SEA

Net oil imports by regional grouping, 1990-2040



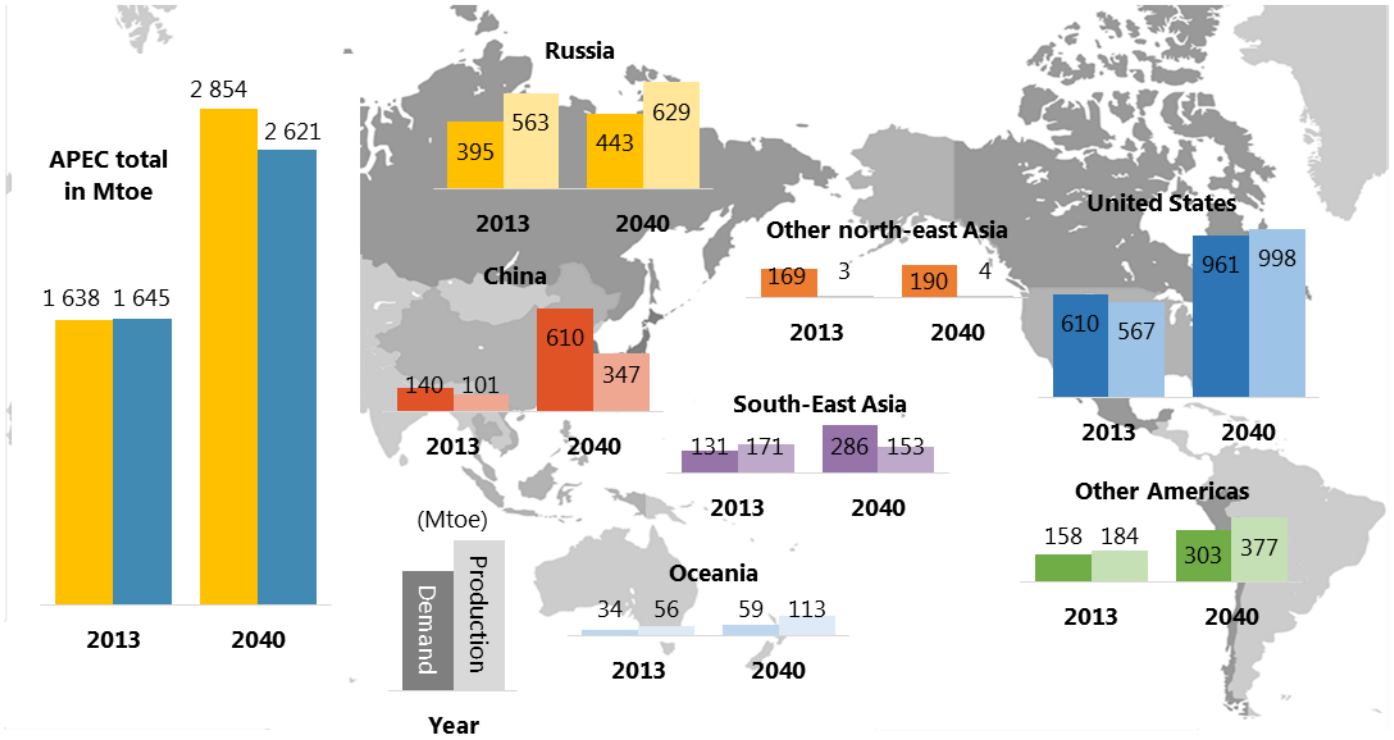
Source: IEA statistics 2015 and APERC analysis

Russia and Other Americas are the only regions with net oil production while Southeast Asia net oil imports will more than double in 2040

Notes: Total oil import and not net oil import

APEC: From net gas exporter to net gas importer

Natural gas supply gap by regional grouping, 2013-2040



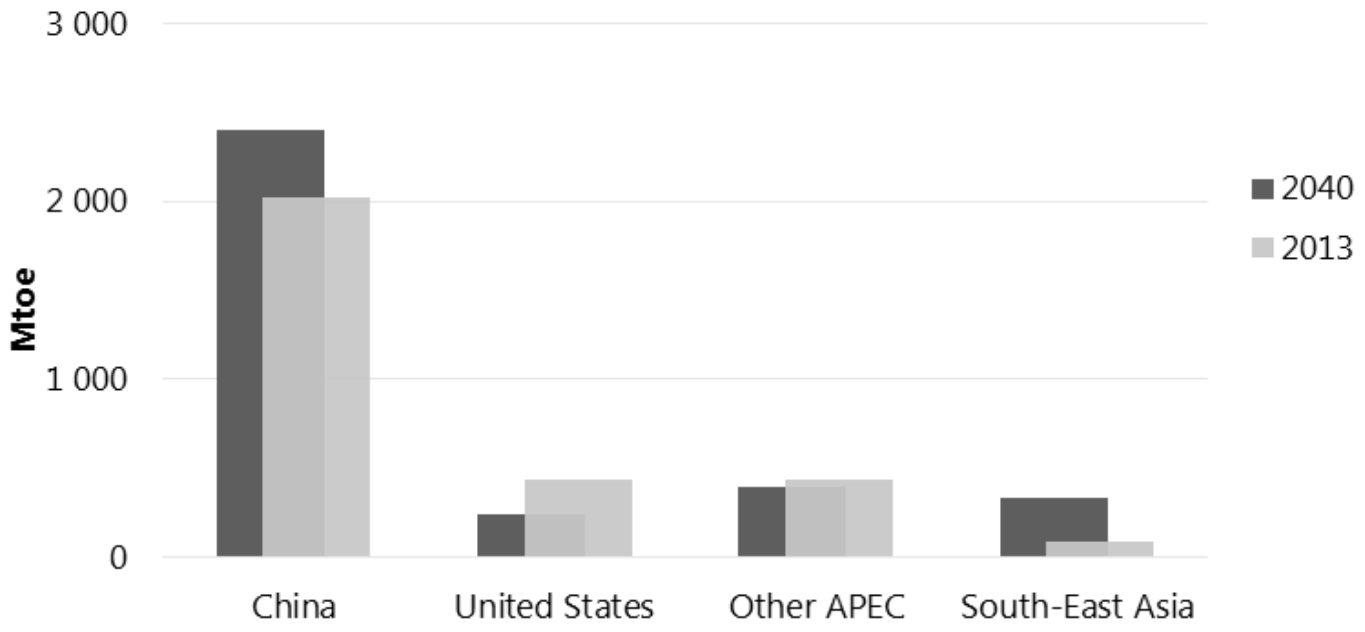
Source: IEA statistics 2015 and APERC analysis

China to overtake Other NE Asia as largest gas importer, while US becomes a net exporter and SEA becomes a net importer

Notes: Oceania (Australia, New Zealand and PNG), **Other Americas** (Canada, Chile, Mexico and Peru), **Other north-east Asia** (Hong Kong, Japan, Korea and Chinese Taipei), **South-East Asia** (Brunei Darussalam, Indonesia, Malaysia, Philippines, Singapore, Thailand and Viet Nam).

Electricity demand will expand coal supply in Asia

Coal demand by regional grouping, 2013 and 2040



Source: IEA statistics 2015 and APERC analysis

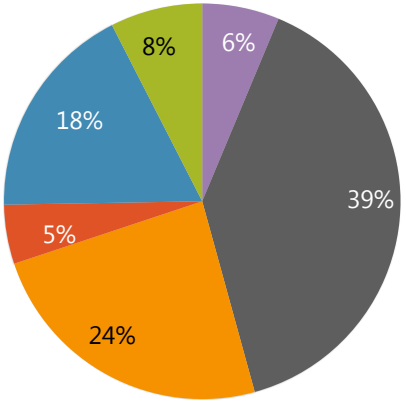
… But coal is expected to show the weakest growth among primary energy sources at 0.4% annually

Notes: Oceania (Australia, New Zealand and PNG), **Other Americas** (Canada, Chile, Mexico and Peru), **Other north-east Asia** (Hong Kong, Japan, Korea and Chinese Taipei), **South-East Asia** (Brunei Darussalam, Indonesia, Malaysia, Philippines, Singapore, Thailand and Viet Nam).

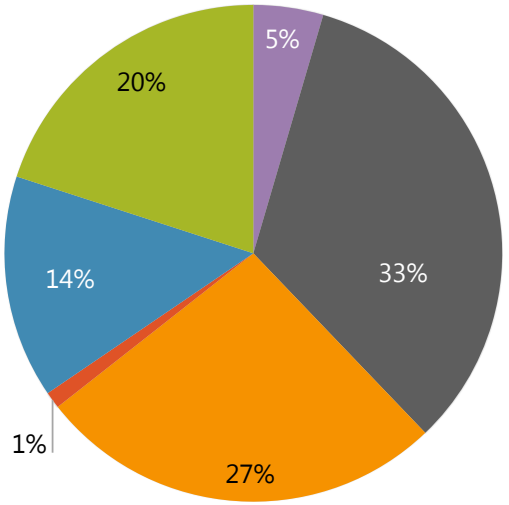
Outlook for electricity sector

APEC installed capacity

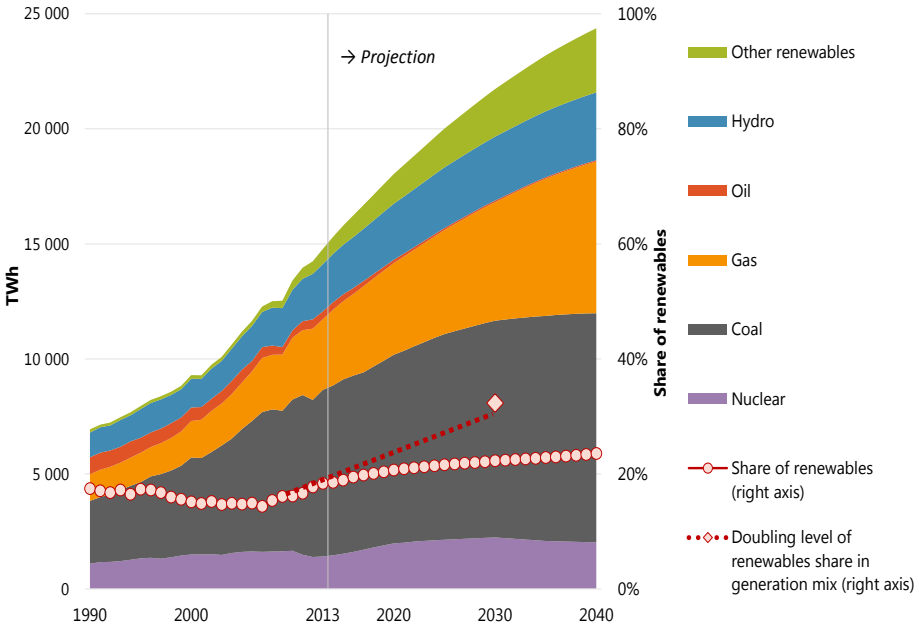
2013 Capacity: 3 564GW



2040 Capacity: 6 415GW



APEC electricity generation

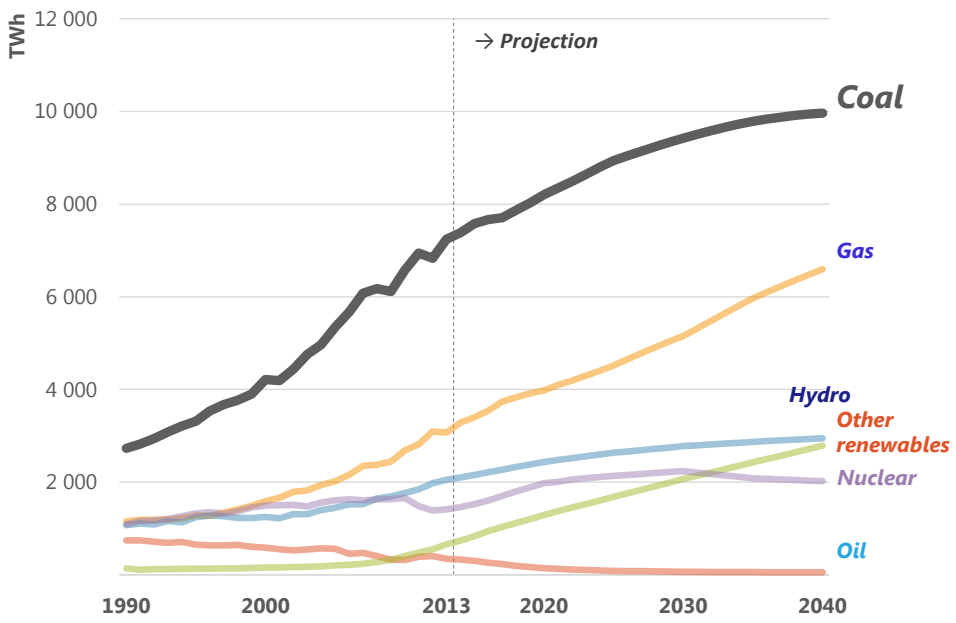


RE capacity expand to 34% by 2040, but fossil fuels dominate generation due to relatively lower RE capacity factors. Doubling not achieved by 2030 nor 2040 in BAU

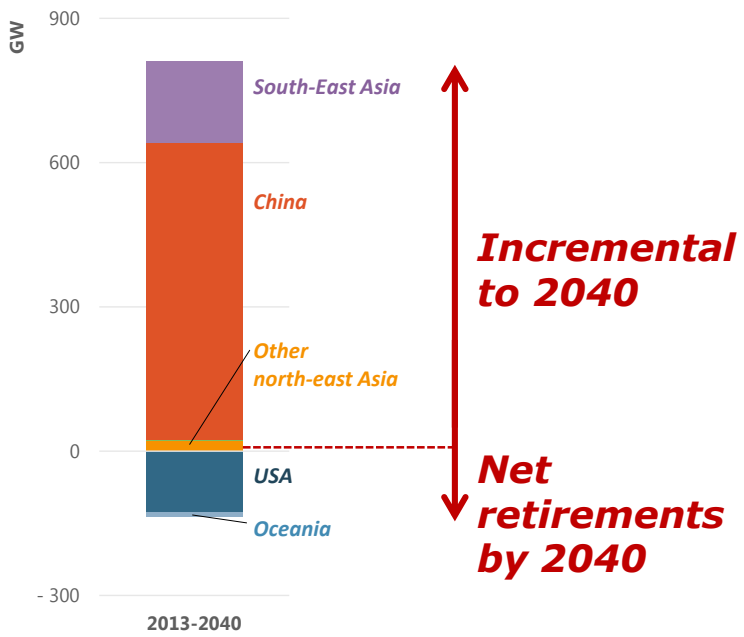
Note: **Other renewables** include solar PV, CSP, onshore wind, offshore wind, biomass, geothermal and marine.

Coal remains fuel of choice for power

APEC generation by fuel type



Coal capacity changes by 2040

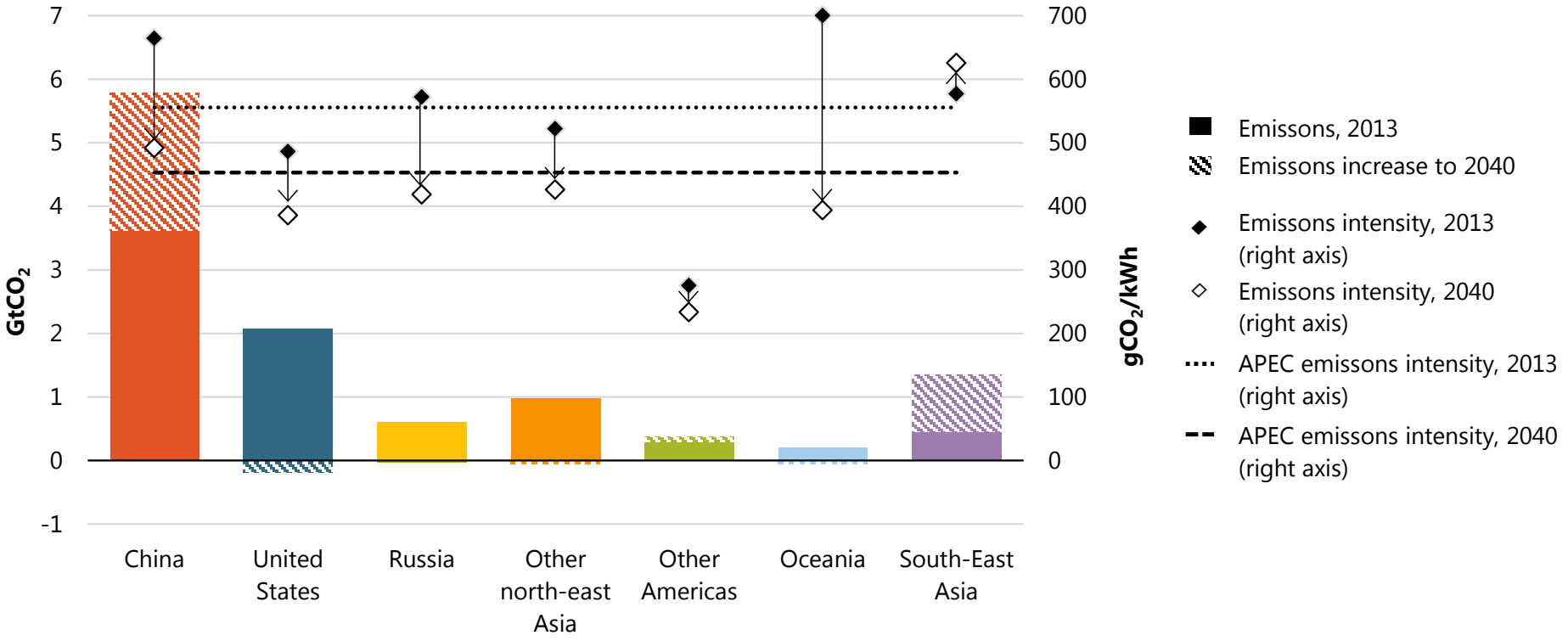


Note: **Other renewables** include solar PV, CSP, onshore wind, offshore wind, biomass, geothermal and marine.

Coal increases mainly in China and South-East Asia (SEA). Shifts to cleaner power is not enough to rein coal growth in China, and lower fuel cost pushes SEA to coal generation.

CO_2 emissions in power sector

Annual emissions and emissions intensity



Emissions intensity falls by 18% on average in APEC, however, in absolute terms, annual APEC emissions increase by 2.8 $GtCO_2$ by 2040.

Note: **Oceania** (Australia, New Zealand and PNG), **Other Americas** (Canada, Chile, Mexico and Peru), **Other Northeast Asia** (Hong Kong, Japan, Korea and Chinese Taipei), **Southeast Asia** (Brunei Darussalam, Indonesia, Malaysia, Philippines, Singapore, Thailand and Viet Nam)

Key trends

- China and Southeast Asia drive energy demand in APEC, with future demand growth slowing compared to last decades.
- Fossil fuels will continue to dominate energy supply in APEC, accounting for over 80% of TPES.
- Although energy production rises, high demand growth lead the energy supply gap in APEC to rise by more than 40% in 2040 which will need to be sourced from outside APEC.
- Economies need to enhance renewable promotion policies in order to double renewables in power mix.
- BAU scenario is not environmentally sustainable; further policy actions to decarbonise electricity systems are needed.

Thank you for your support!

http://aperc.ieej.or.jp/

APERC
Asia Pacific Energy Research Centre