

The Asian perspective: thermal coal and renewables

ESPO: PORTS IN A CHANGING CLIMATE, A CHANGING WORLD

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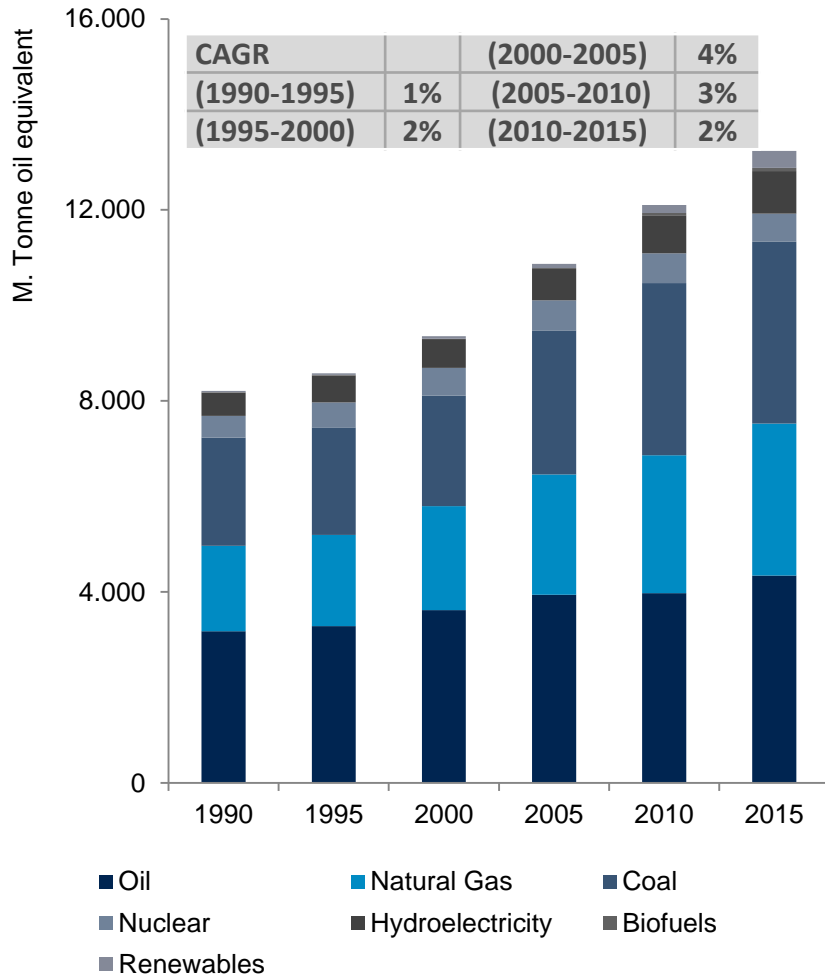
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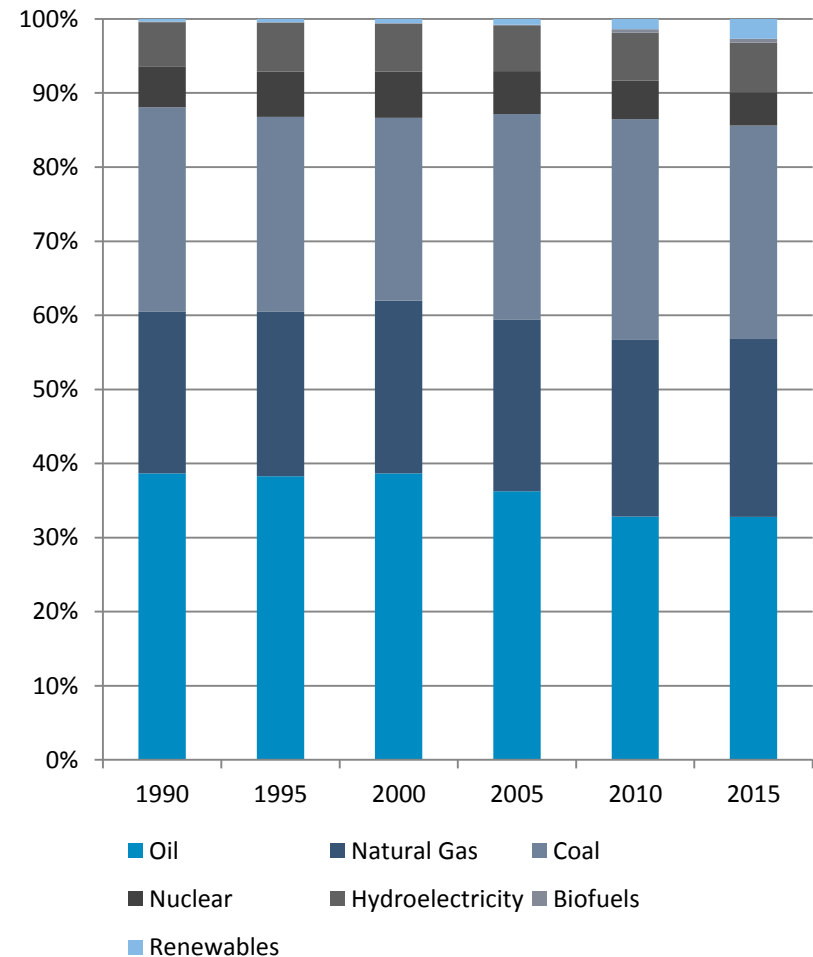
Historical development

Global energy use: historical

Global energy use by source (1990-2015)



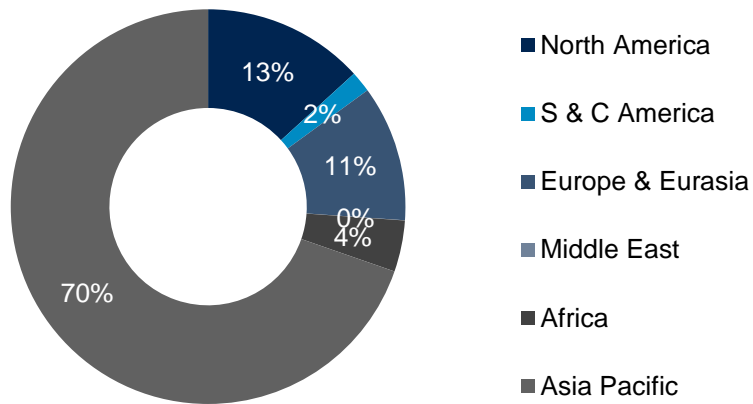
% split by source (1990-2015)



• Source:- BP Statistical Review of World Energy 2016

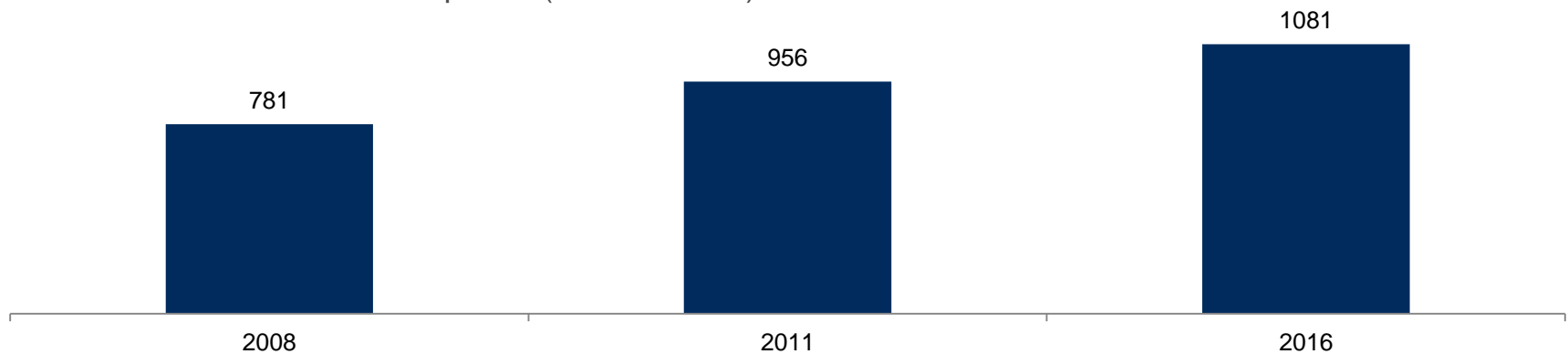
Global coal production and trade

Thermal coal production (million tonne oil equivalent)



- Seaborne total coal trade increased at a CAGR of 7% from 2005-2010 and 3% from 2011-2016
- In 2016, thermal coal production in Asia Pacific region constitutes about 70% of the total global production

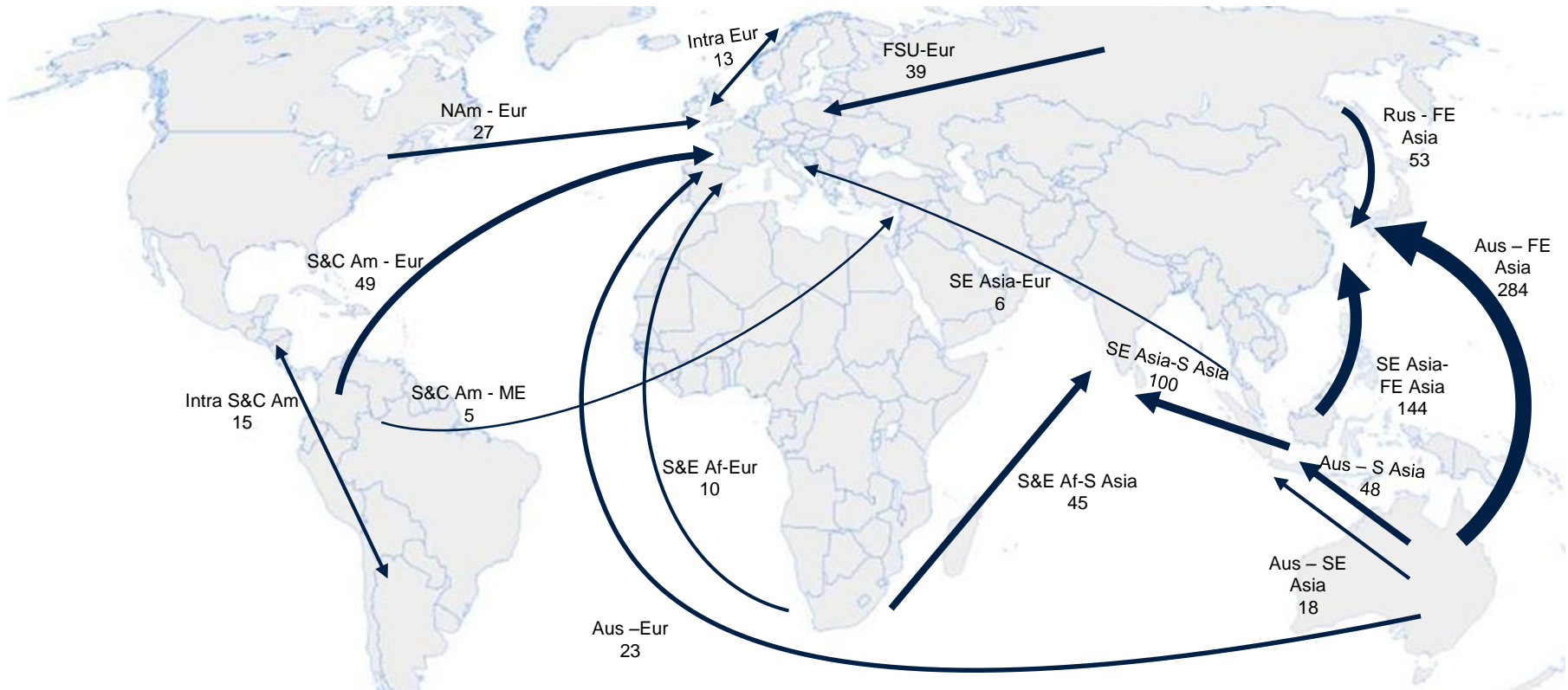
Seaborne total coal trade development (million tonnes)



Source: Drewry Maritime Research, BP Statistical Review of World Energy 2016

Global coal trade: total

Seaborne coal trade totalled 1,081 million tonnes in 2016 with trade of 770 million tonnes of thermal coal, 271 million tonnes of metallurgical coal and 40 million tonnes of anthracite coal

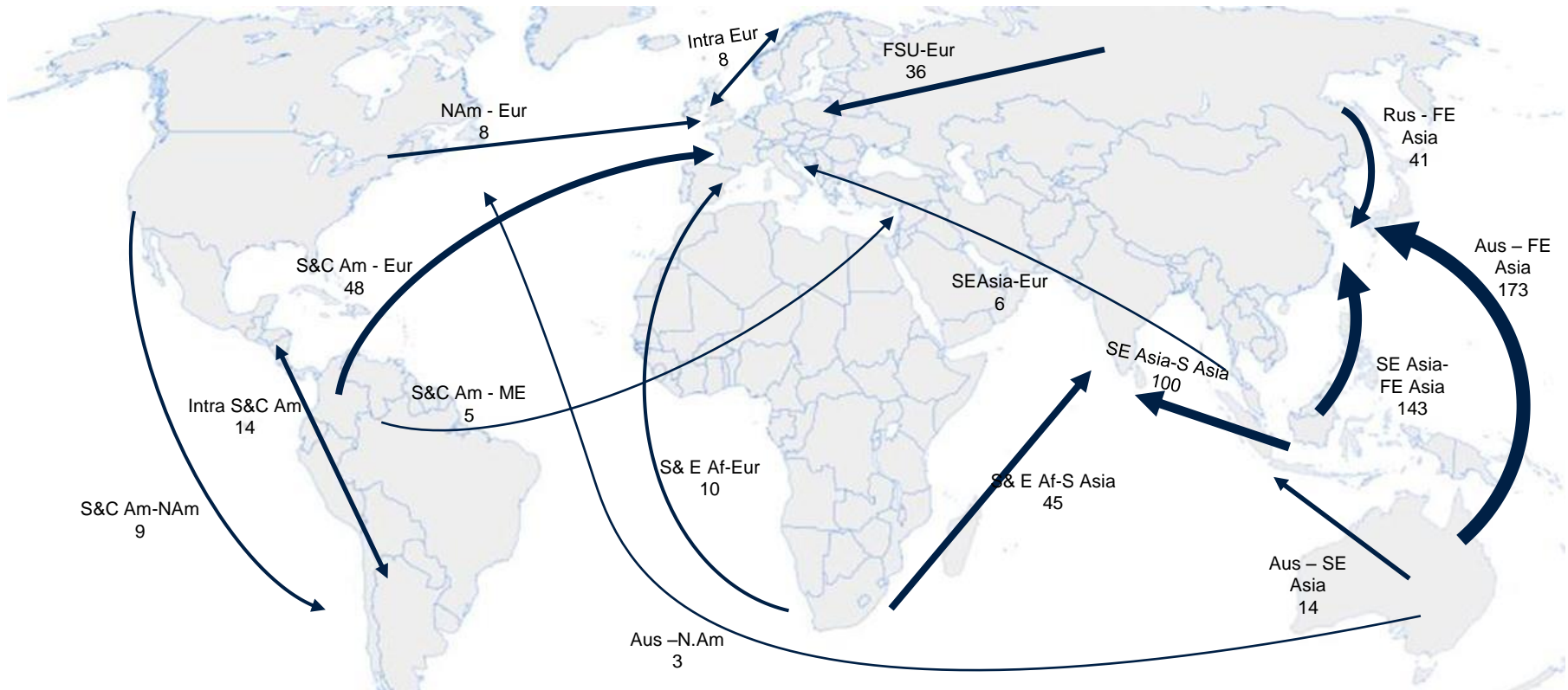


- More than one-fourth of the total seaborne trade is confined to Australia-Far East Asia, with China being one of the largest importer of coal. With expectation of rising steel production in China , the demand for metallurgical coal is expected to rise.

Source: Drewry Maritime Research

Global coal trade: thermal

Global seaborne thermal coal trade in 2016 totalled 770 million tonnes. Total seaborne thermal coal trade constitutes more than 70% of the total coal trade



- The major trade lanes include Australia-Far East Asia (mainly China) route, South East Asia-Far East and South East Asia to South Asia route
- Strict environmental regulations in China and rising share of clean energy sources will cap thermal coal imports over the coming years

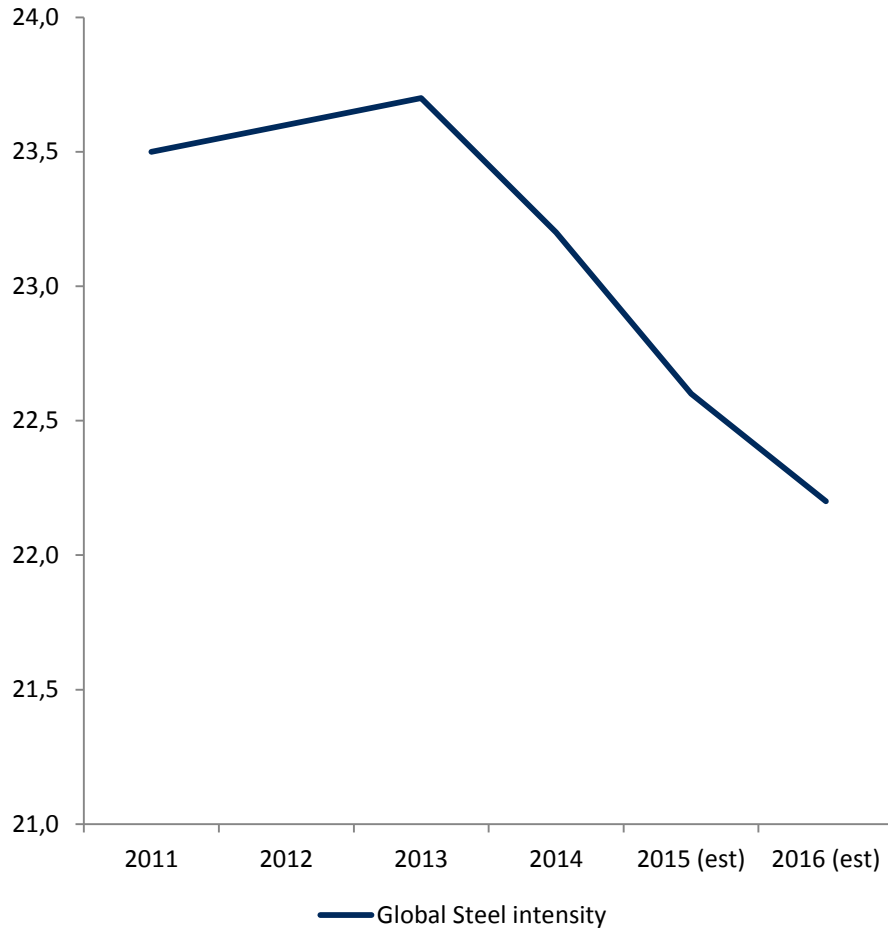
Source: Drewry Maritime Research

Key trends and issues

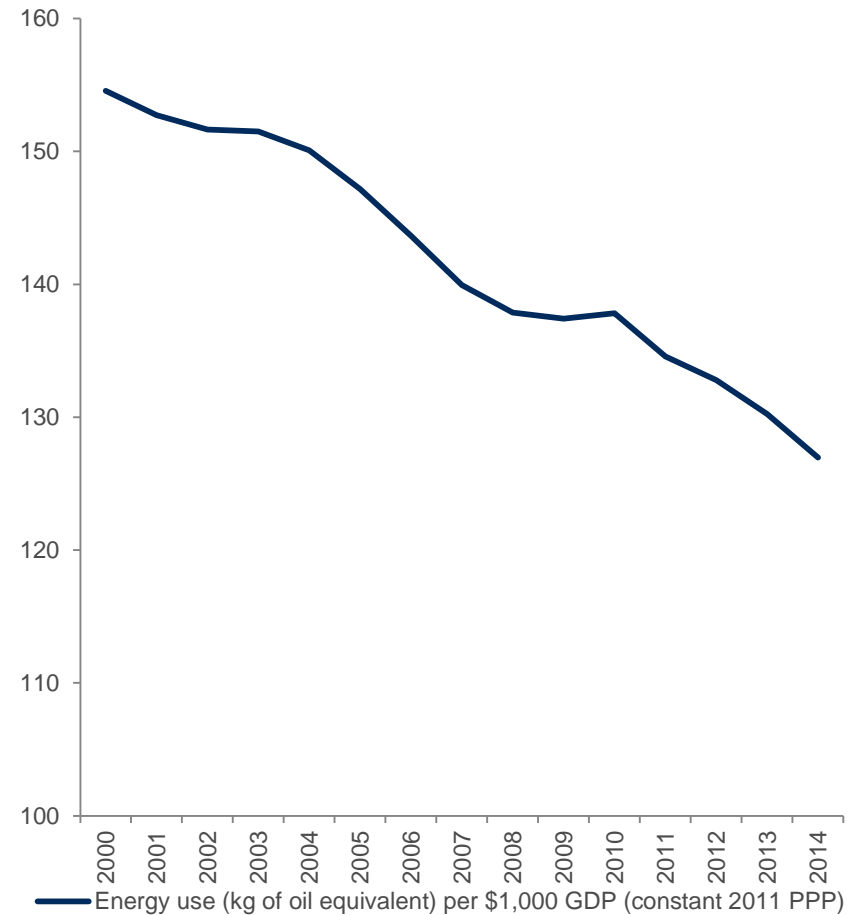
Steel and energy intensity: dropping

Moderating steel and energy intensity

Decline in steel consumption per unit of GDP



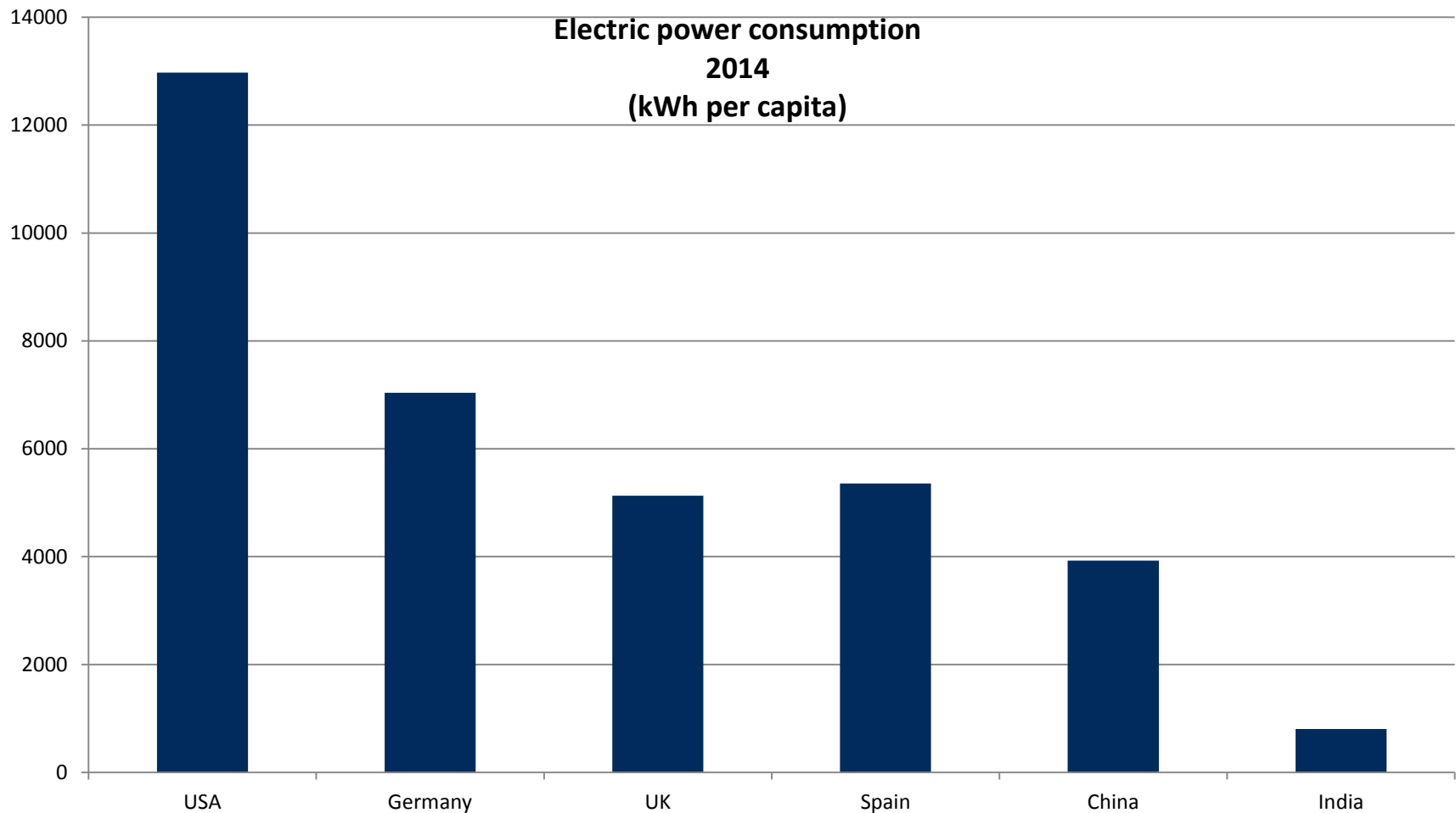
Falling energy intensity in GDP: World



Source: berc.berkeley.edu; World Bank, IMF, World Steel Association

Inequalities: power consumption per capita

Variations in per capita consumption are vast



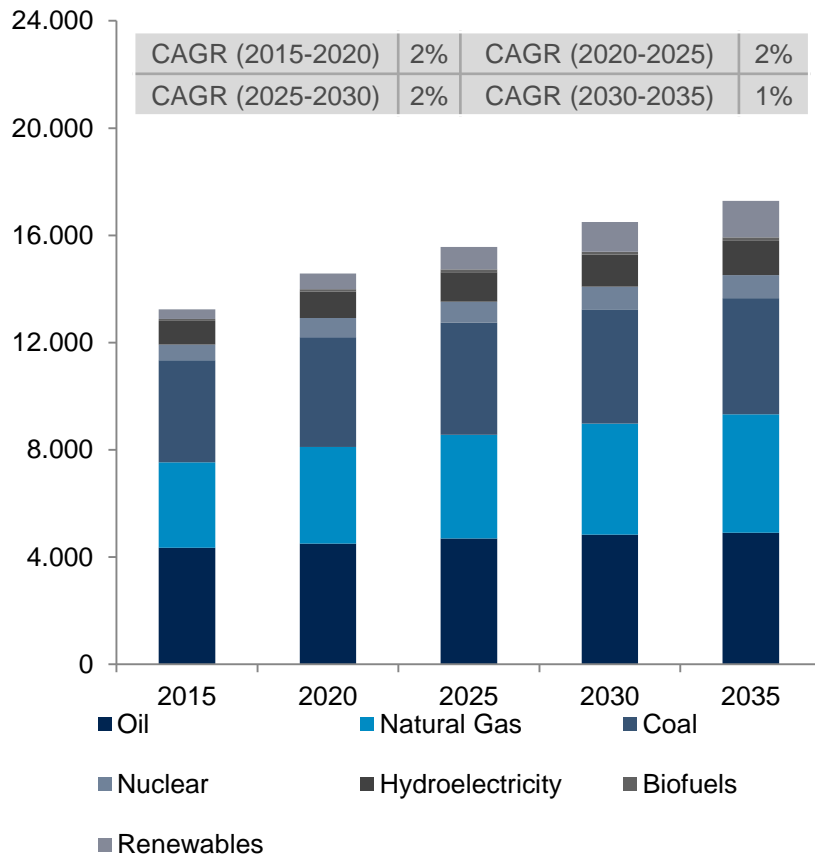
Source: World Bank

Outlook

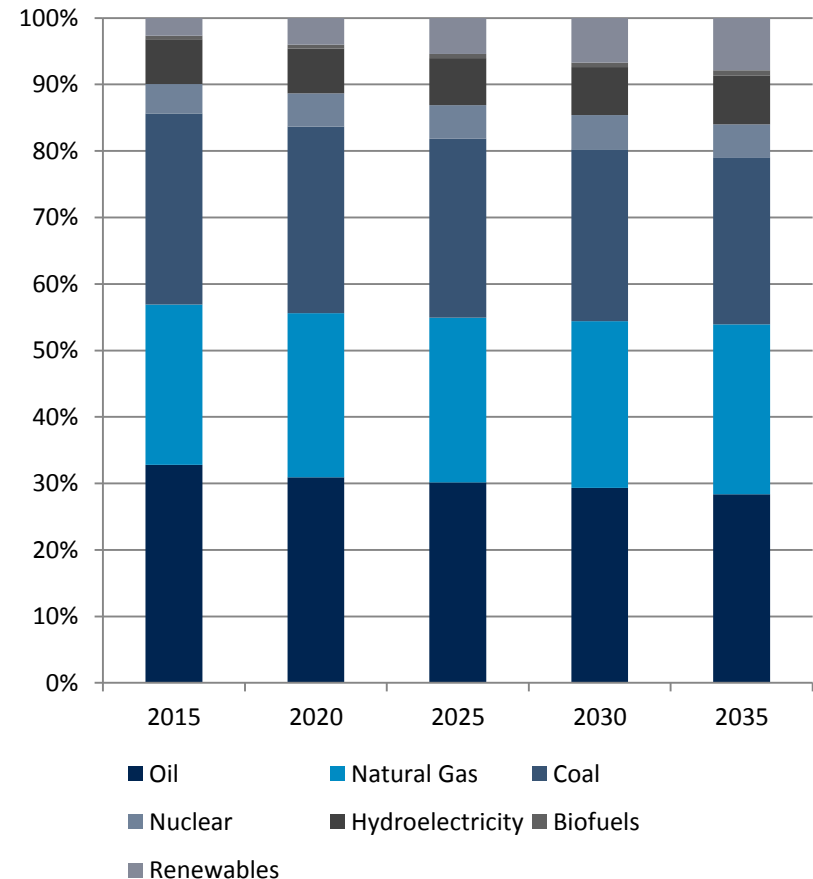
Global energy by source: outlook

Energy consumption growth continues to moderate and renewables share grows steadily

Global energy use by source, 2015-2035



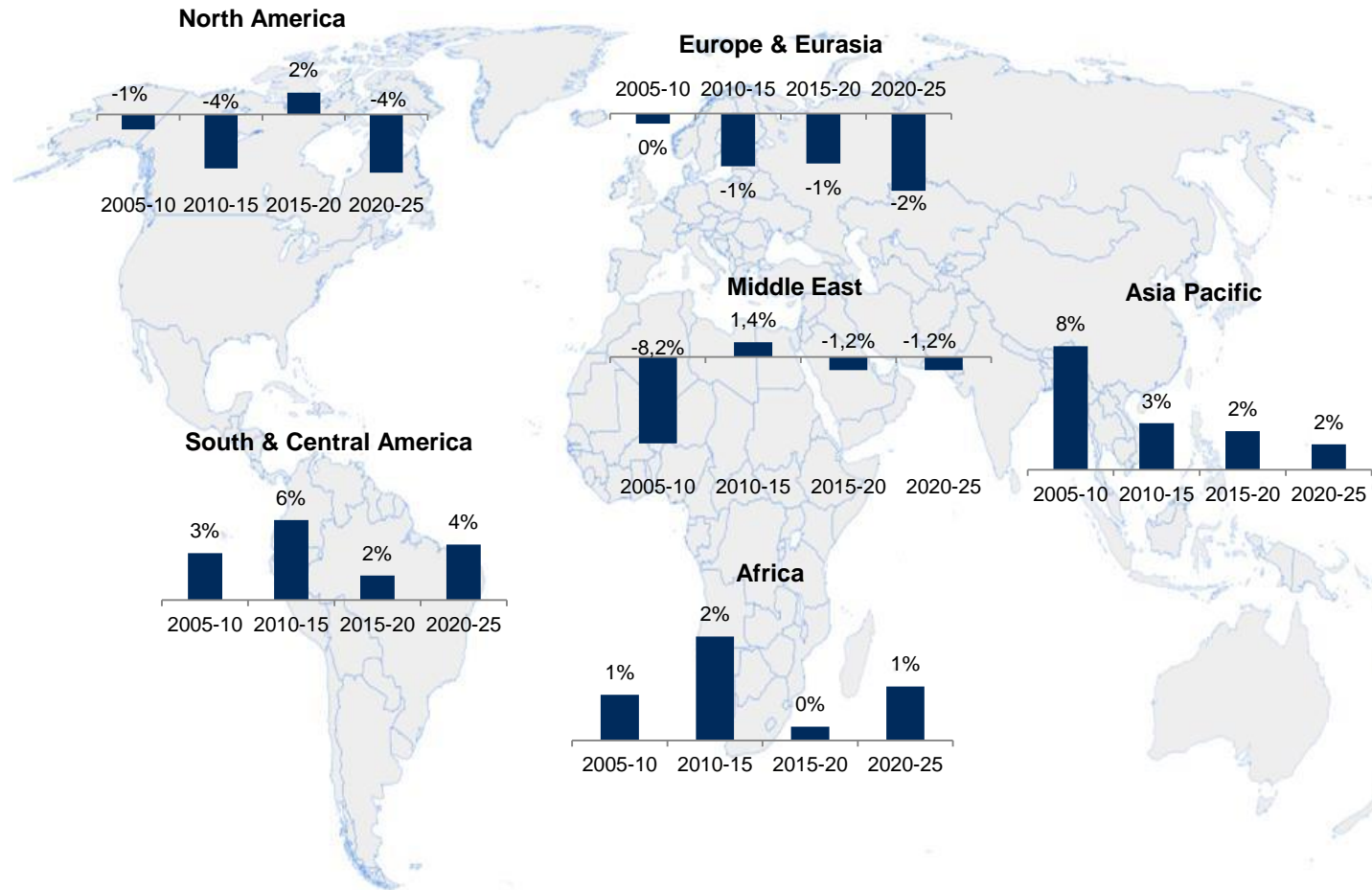
% split by source



• Source:- BP Statistical Review of World Energy 2016

Coal in power generation: regional outlook

Use of thermal coal will continue to rise in Asia, Africa and Latin America

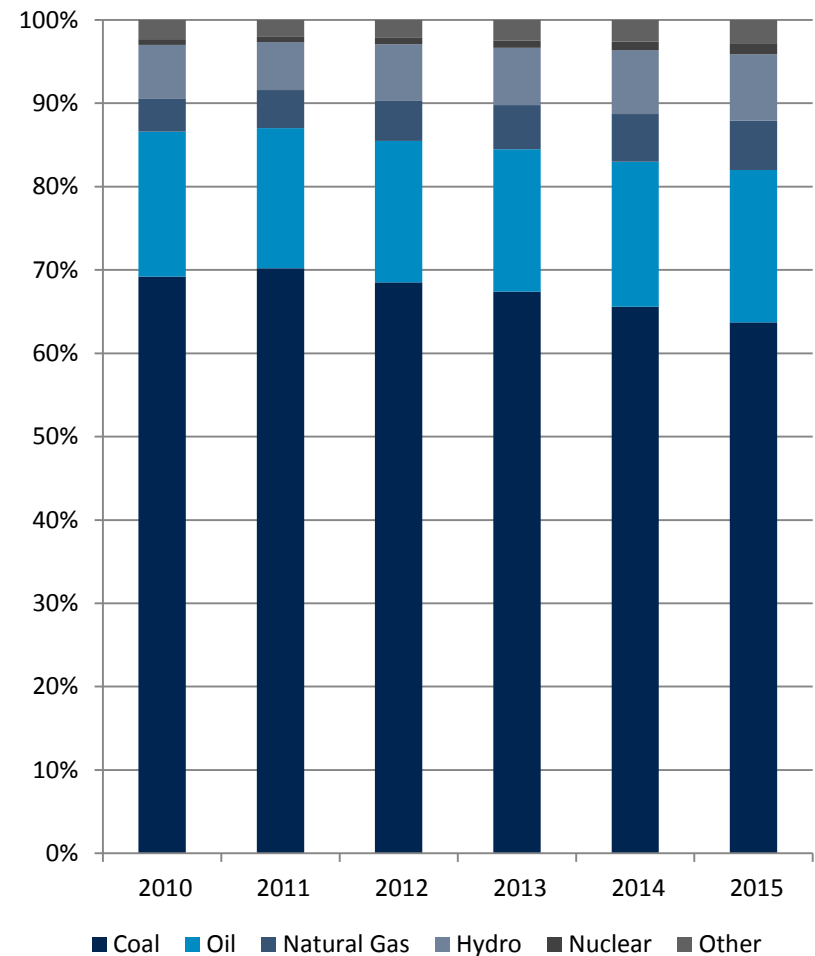
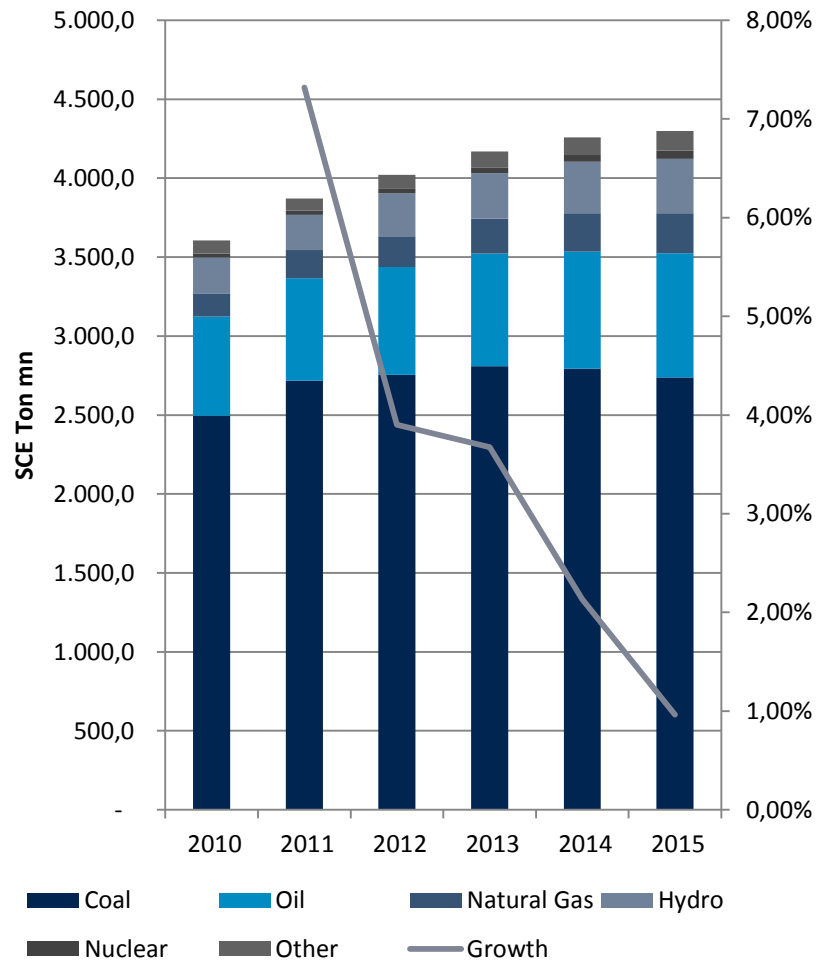


- In the period 2010-2015, thermal coal power generation declined at a CAGR of 1% while power generation using renewables increased by 17%.
- IEA expects the global thermal coal demand will continue to increase, but the share of coal in power generation will decline gradually in the medium to long term
- Energy production using thermal coal is expected to fall in European countries with rising share of renewables and natural gas.

Source:- BP Statistical Review of World Energy 2016, IEA

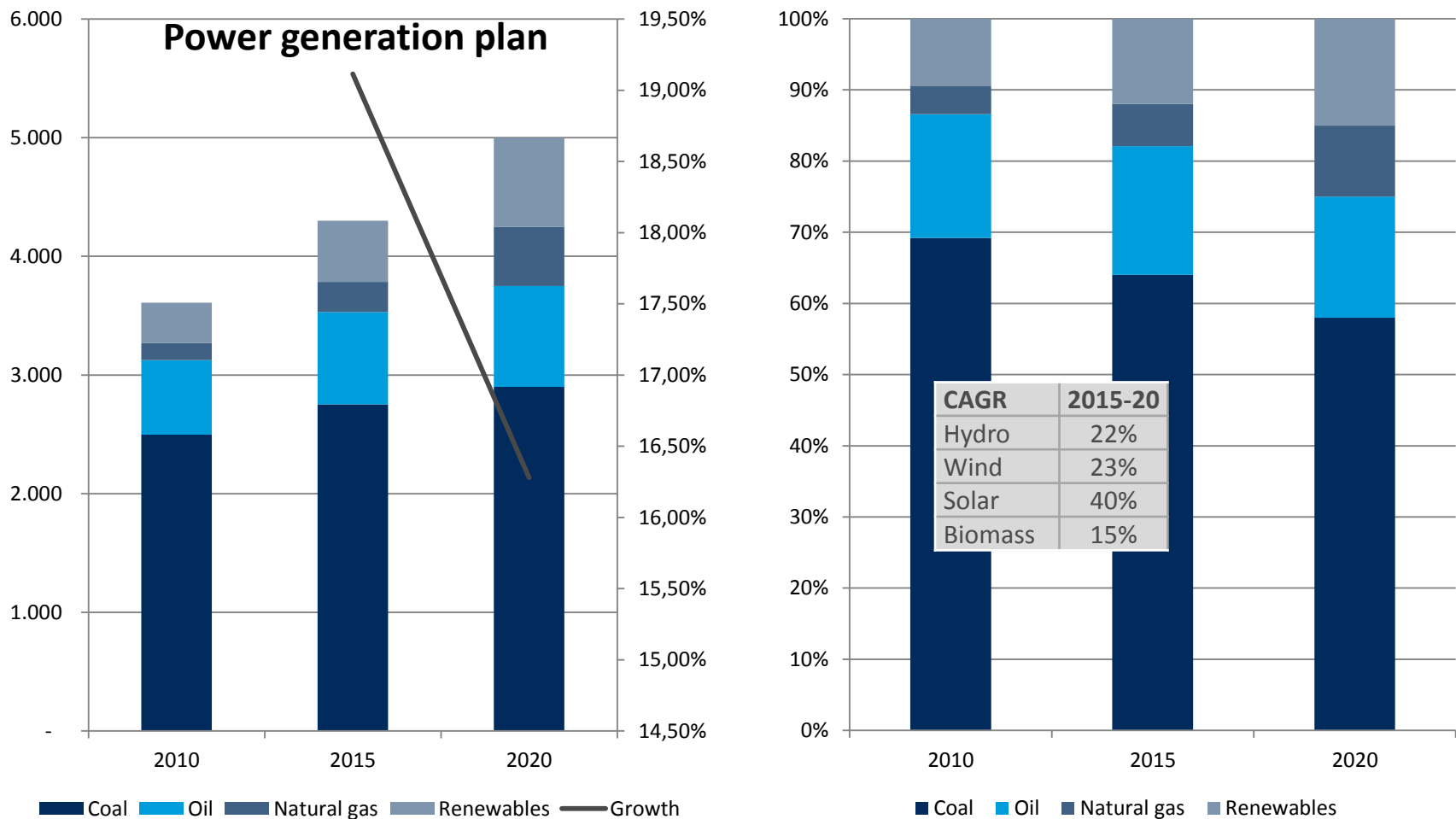
China: historical

Energy consumption growth slowing; coal growth stopped; steady growth in renewables



China: outlook

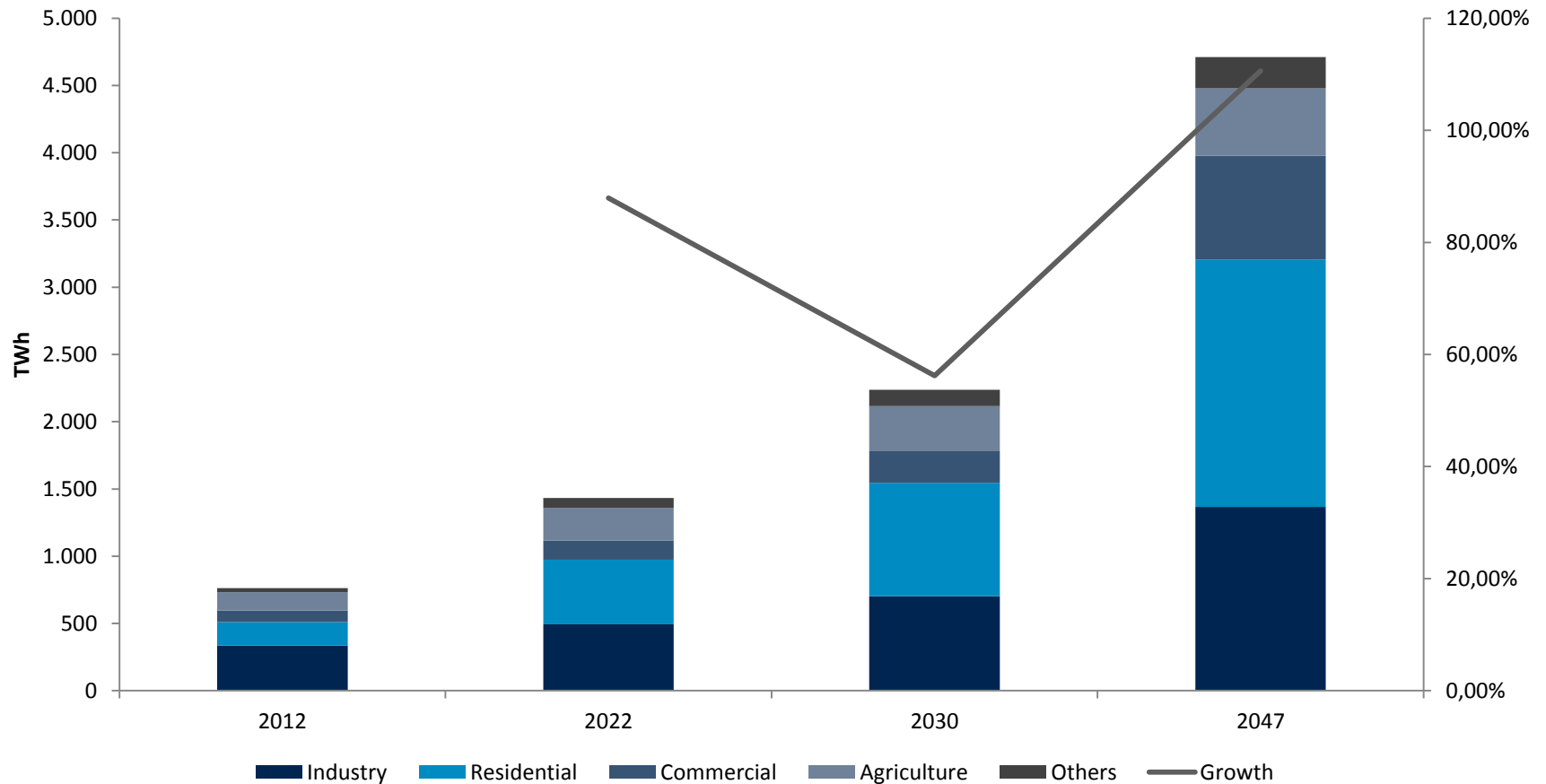
Consumption growth moderating and renewables share increasing; China plans to increase the share of renewables from 12% in 2015 to 15% in 2020



India electricity demand

India's demand for electricity is set to grow at a frantic pace: by 17% annually from 2012-2022 and 12% annually from 2022-2030

India's electricity demand by sector

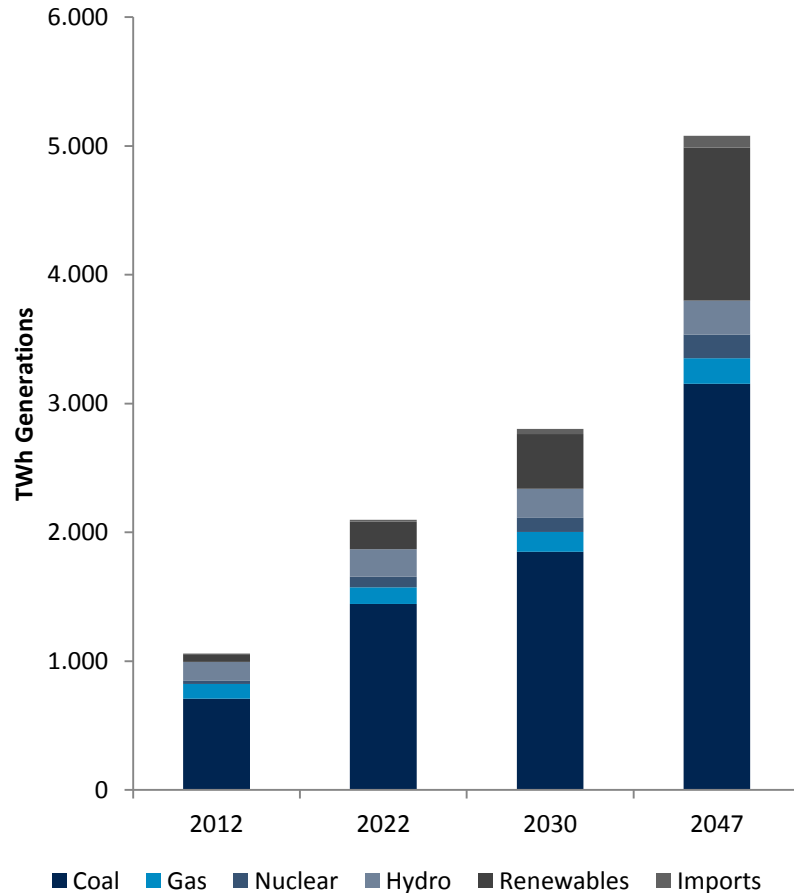


Source: Niti Aayog

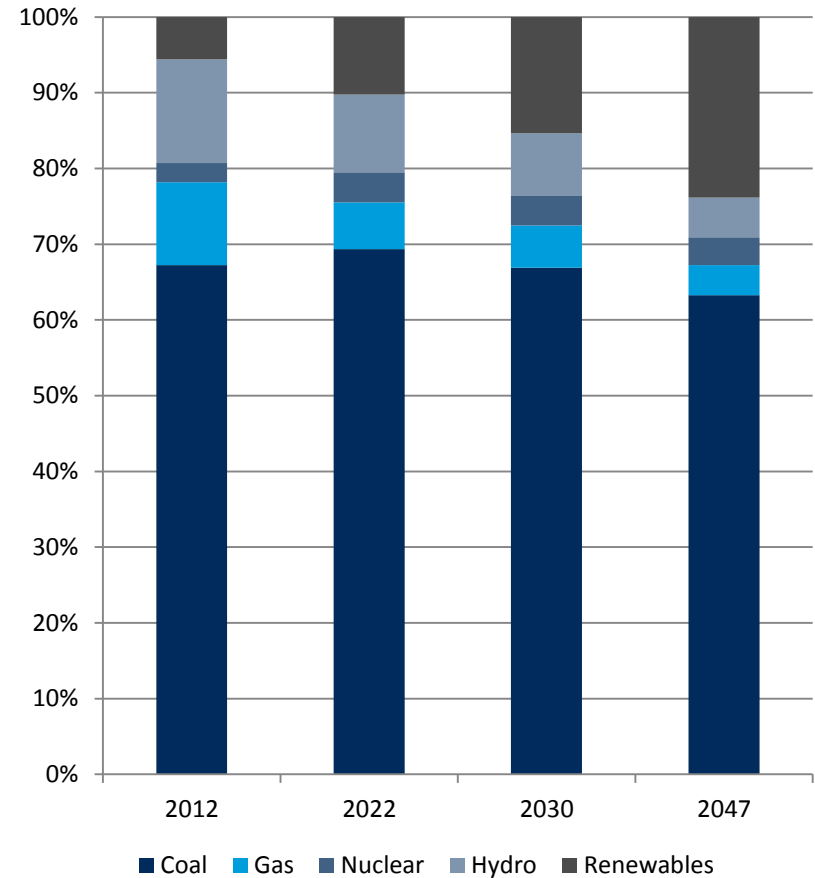
India power generation

Renewables share grows to 23%, but rising demand means that thermal coal consumption will quadruple from 2012 levels

India's energy production by source



% split by source



Source: Niti Aayog

Summary

Summary

- Growth in share of renewable energy will slow down growth in demand for thermal coal, but thermal coal use will still grow.
- Energy production using renewables is expected to grow at a CAGR of 13% between 2015-2020.
- Energy production using coal is expected to rise at a CAGR of 1.8% between 2015-2020.
- Coal demand will contract in Europe and North America.
- In Asia Pacific countries, thermal coal demand will continue to grow. India will be a large contributor