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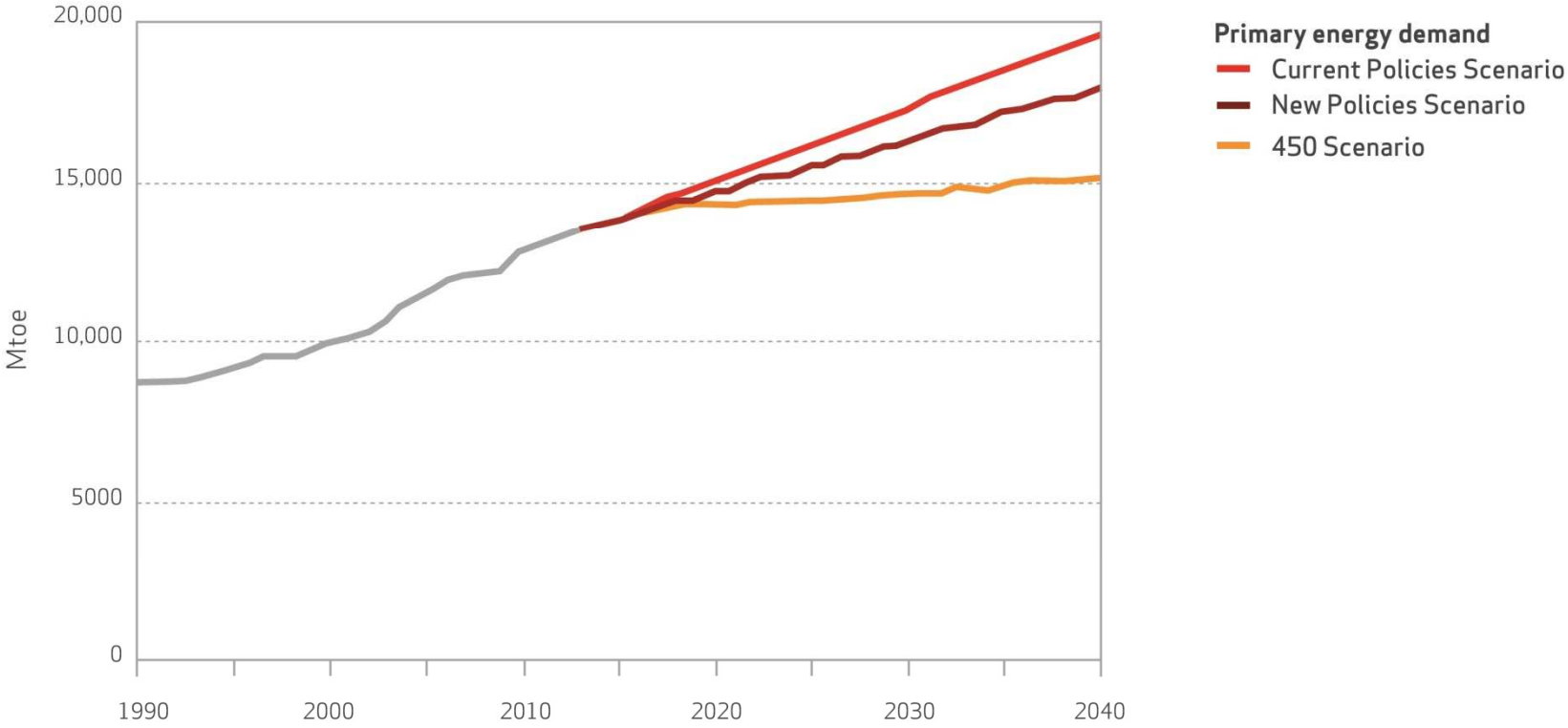
What role for coal after COP21?

Benjamin Sporton
Chief Executive

World energy demand is growing at a rapid pace

World total primary energy demand by scenario



Source: IEA, WEO 2015

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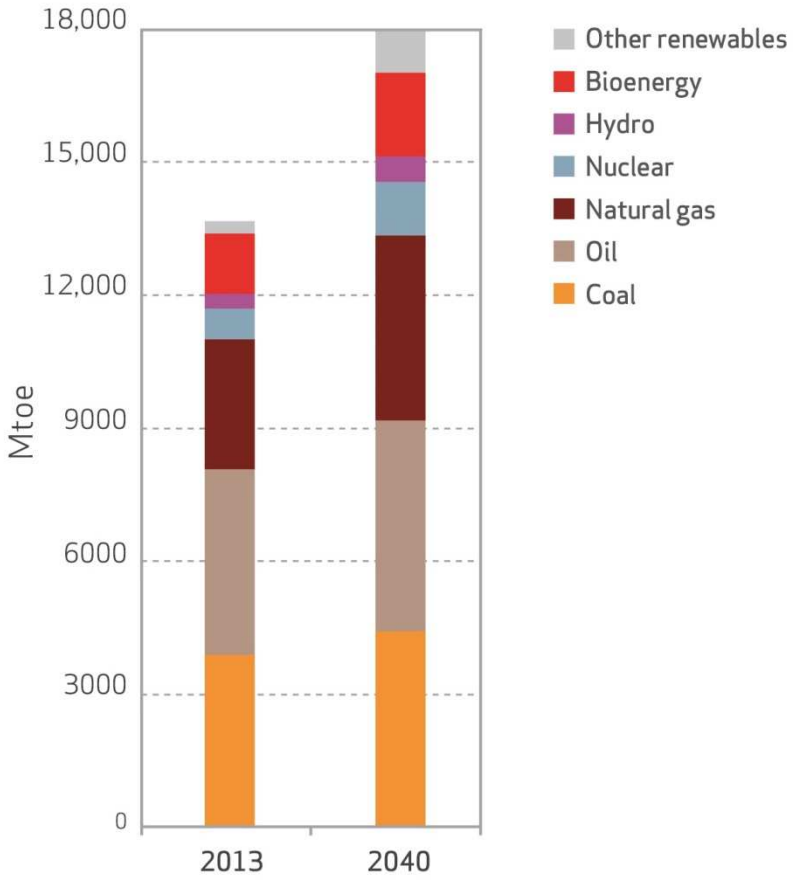
Coal will continue to play a major role

Primary energy demand by fuel in the New Policies Scenario



Even with the IEA's ambitious growth projection for renewables and significant international climate action, coal will still be a major source of energy in 2040

In electricity while coal's share declines to 30% (from 41% today) power generation from coal will increase by 24% in absolute terms

Source: IEA, WEO 2015

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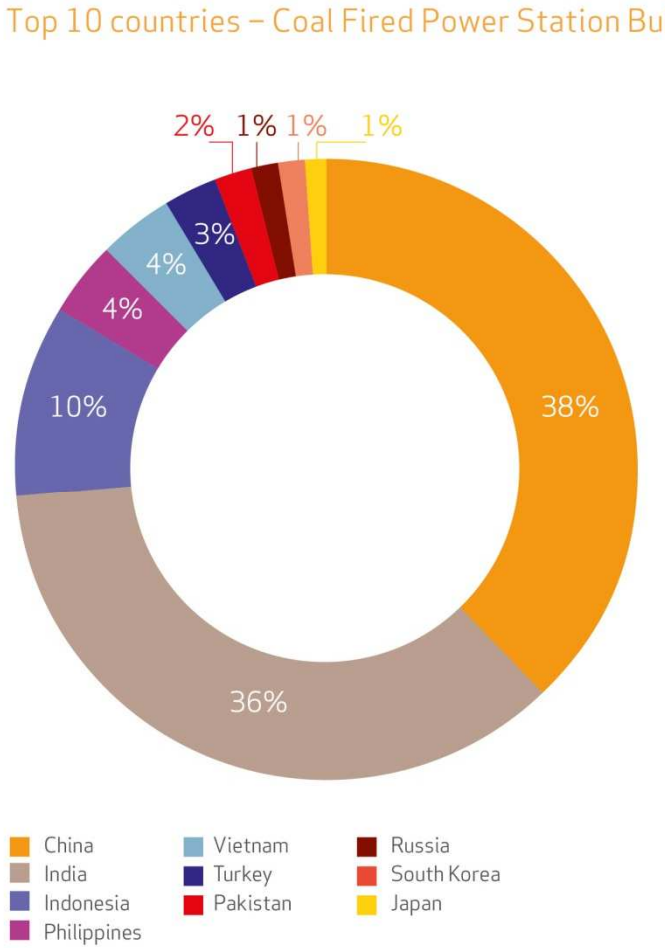
Current coal plant build is significant

- Globally there are 510 coal-fired power plant units under construction, with a further 1,874 planned, a total of 2,384
- China, India, Indonesia dominate making up 71% of the total
- Philippines, Vietnam, Turkey and Pakistan bring the total up to 81%
- Europe and North America play a very small role



Source: Platts Database

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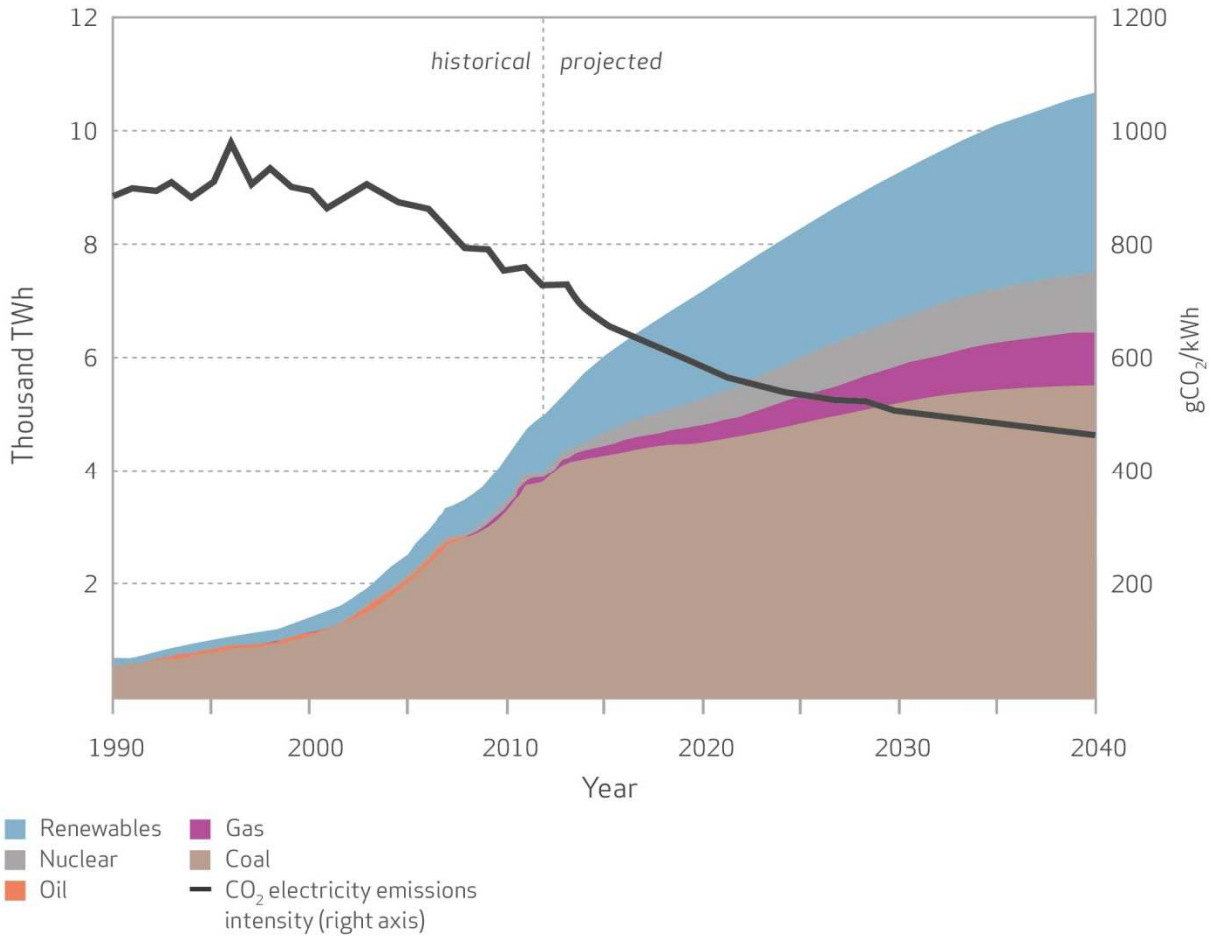
Despite rumours, coal isn't going away in China

- China's electricity demand growth will be around 4.8% to 2020, then decline to around 2% through to 2040
- Electricity generation from coal will be 45% higher in 2040, despite its share of generation reducing from 75% to 52%
- Non-hydro renewables are expected to increase 1200% over the same period (25% of world generation)

China electricity generation by source and CO_2 intensity in the New Policies Scenario



Source: IEA, WEO 2014

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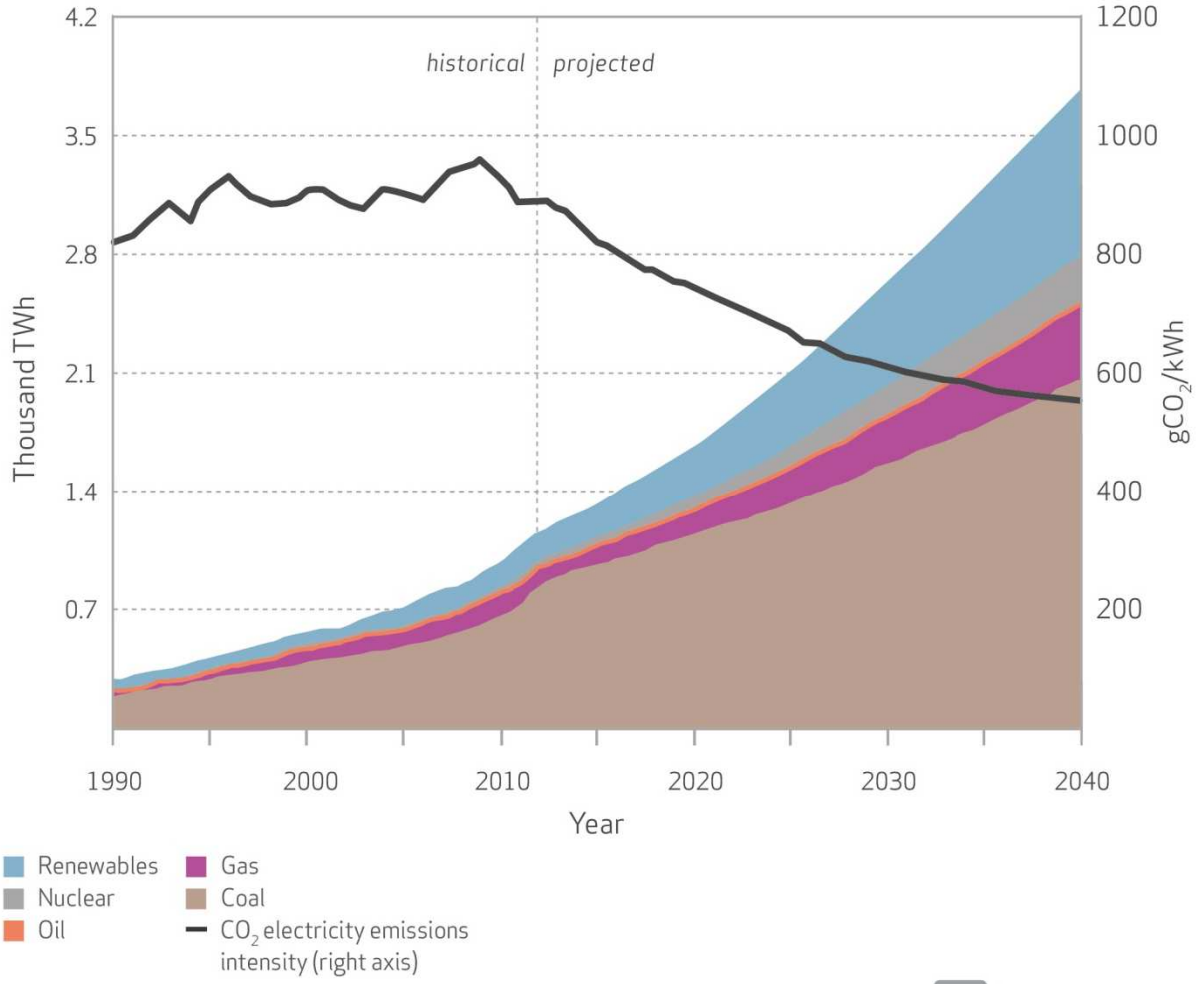
Large-scale power generation will be a critical enabler of growth in India

- Electricity demand in India is expected to average 4.4% pa over the next 25 years
- While coal generation capacity more than doubles, renewables are required to increase exponentially (non-hydro renewables over 10 times) to meet demand
- IEA indicates that maintaining an adequate electricity supply represents a significant investment challenge requiring $2 trillion (in 2013 dollars)

India's electricity generation by source and CO_2 intensity in the New Policies Scenario



Source: IEA, WEO 2014

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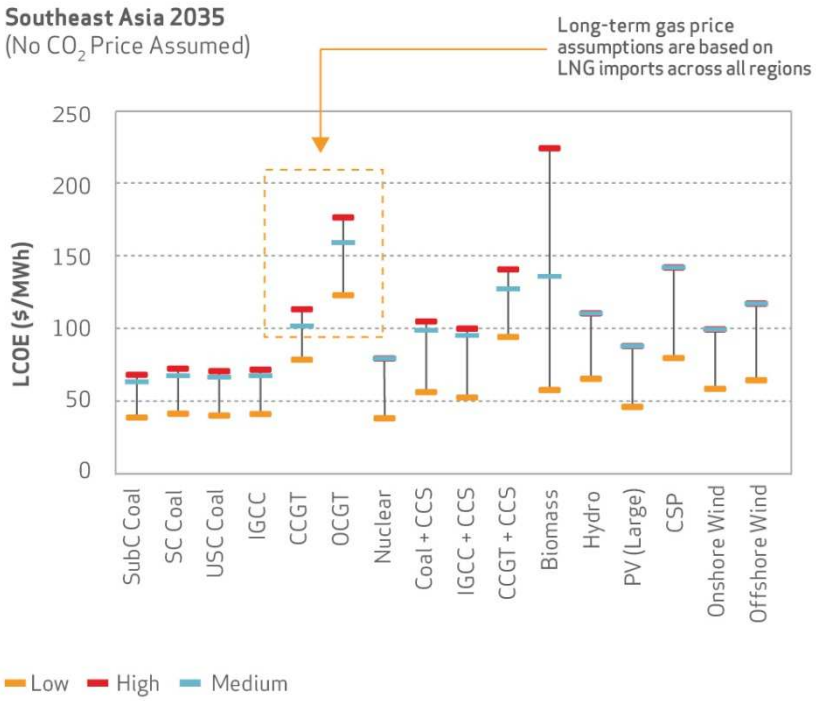
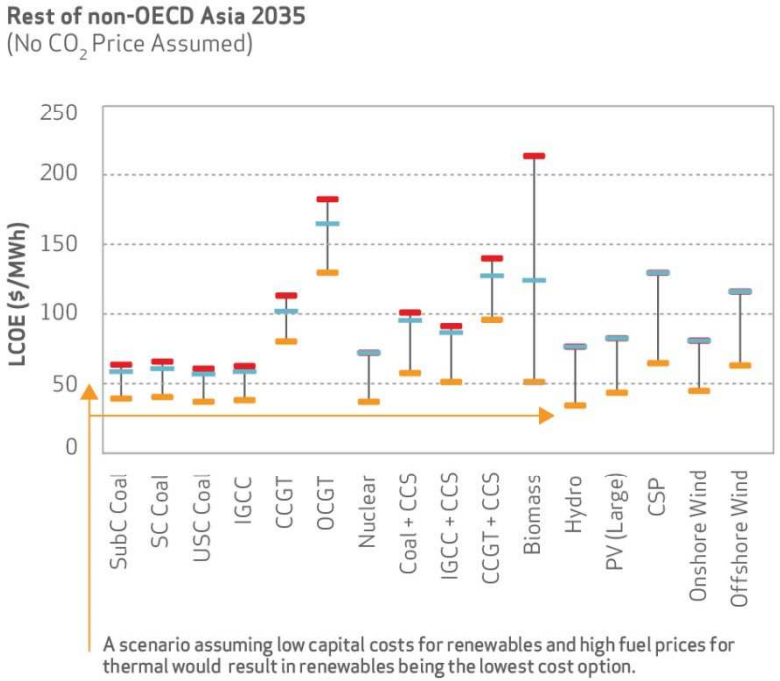
Why is coal an attractive power generation technology?

Lifetime Cost of Electricity per MWh across Generation Technologies in 2035





Source: World Coal Association analysis, 2015

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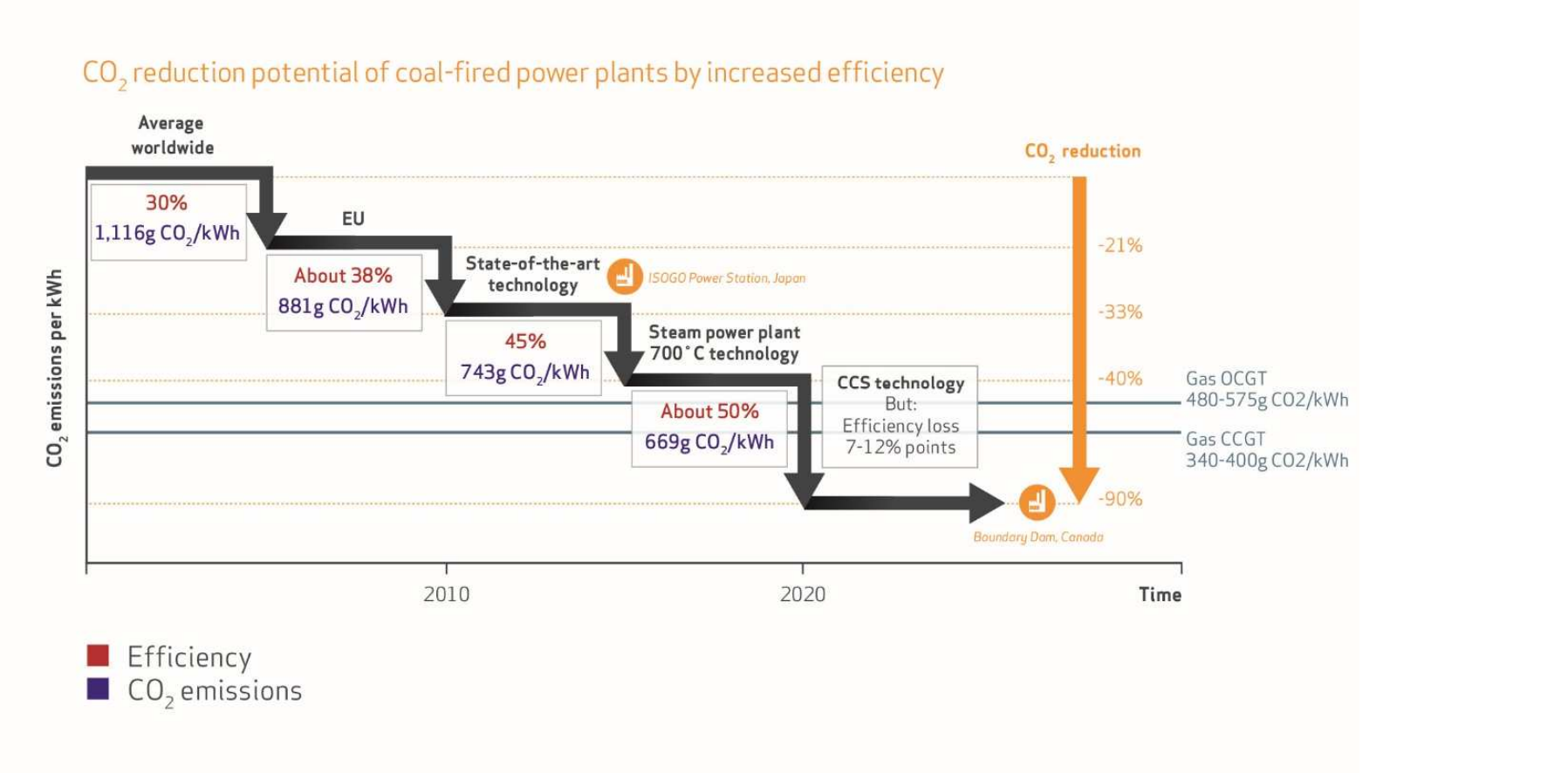
Efficiency improvements can significantly contribute to CO2 emission reductions



- The most important near-term action to reduce CO2 emissions is to increase the efficiency of coal-fired power plants
- 1% increase LHV efficiency = 2–3% points decrease in CO2 emissions

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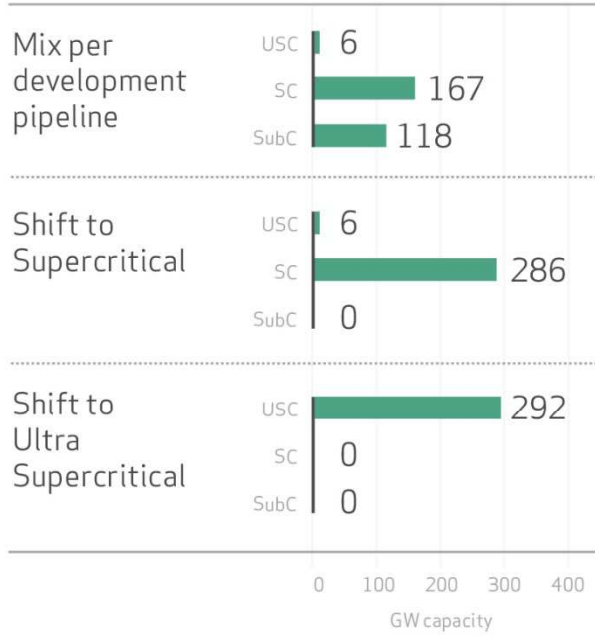
Technology choice has significant CO2 implications

The environmental benefits of deploying cleaner coal technology in India

Scenario	Capacity mix	CO_2 emissions (tCO_2) (over 40 years)	CO_2 abated equivalent to		
			Subcritical plant closure	Number of new wind turbines	Cars removed from the road
Mix per development pipeline	USC 6, SC 167, SubC 118	84 Billion			
Shift to Supercritical	USC 6, SC 286, SubC 0	80 Billion	28	26,000	200 million
Shift to Ultra Supercritical	USC 292, SC 0, SubC 0	73 Billion	69	65,000	500 million



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HELE is the best way to delivery energy and abatement in India

Deploying cleaner coal technology promotes energy access, while managing emissions of carbon dioxide

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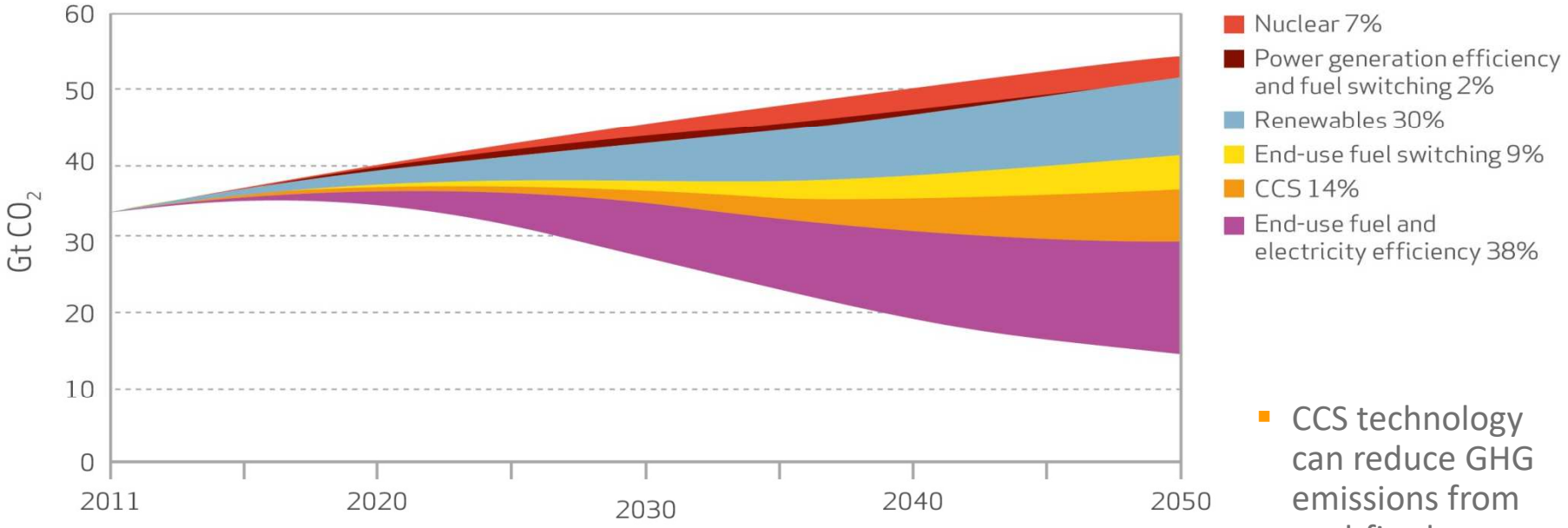
CCS is critical to global climate objectives

Contributions of different technologies to annual emissions reductions



Source: IEA Energy Technology Perspectives 2014

- CCS technology can reduce GHG emissions from coal-fired power plants by up to 90%

- CCS is expected to deliver 14% of cumulative GHG emissions cuts through to 2050. It is therefore a key low-carbon technology
- The world's first large scale integrated CCS project capturing CO2 from a coal-fired power plant – Sask Power's Boundary Dam – has just started full scale operation at the end of September 2014

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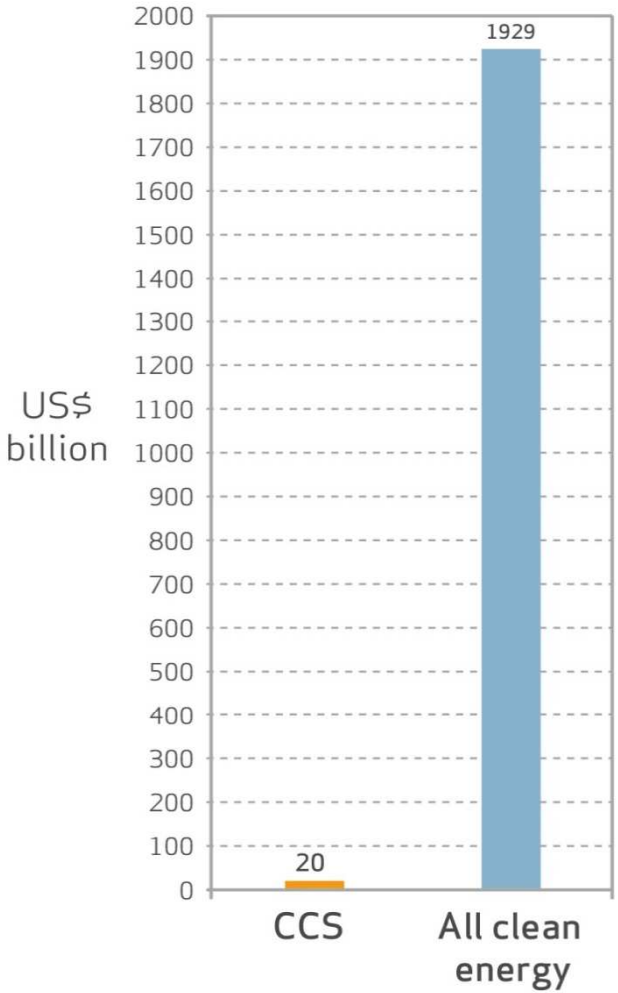
Why CCS has been slow to progress

Clean energy investment* between 2004 – 2013 (billion US$)

CCS:
$20
billion

All clean energy:
$1929
billion



1%

** includes technology development, projects, M&A*

Source: IEA

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The WCA view

- We must recognise that coal is an important driver of affordable, reliable energy to support economic development and competitiveness
- Coal plays a major role in industrialising and urbanising economies
- In any scenario coal is still going to play a major role in the world's energy mix – especially across Asia
- We can significantly reduce emissions from coal with commercially available technology today – we should encourage and support deployment of HELE technologies in preference of less efficient technologies
- More public support is needed to facilitate increased commercial demonstration of CCS to drive costs down so that we can begin a transition toward near-zero emission fossil fuels

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www.worldcoal.org
info@worldcoal.org