

Medium Term Outlook for coal

Laszlo Varro

Head of Gas, Coal and Power Markets

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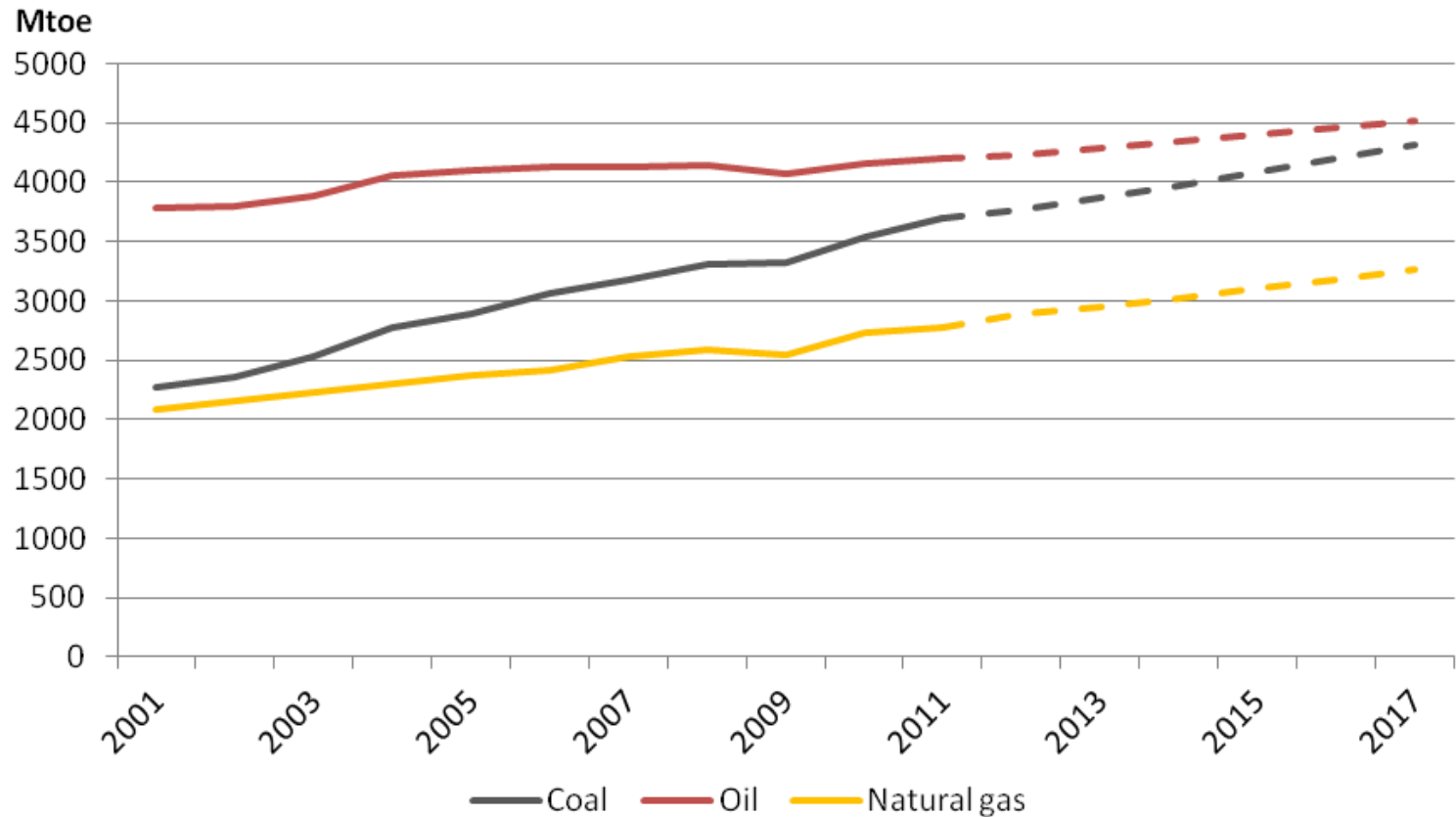


International
Energy Agency

Two key numbers

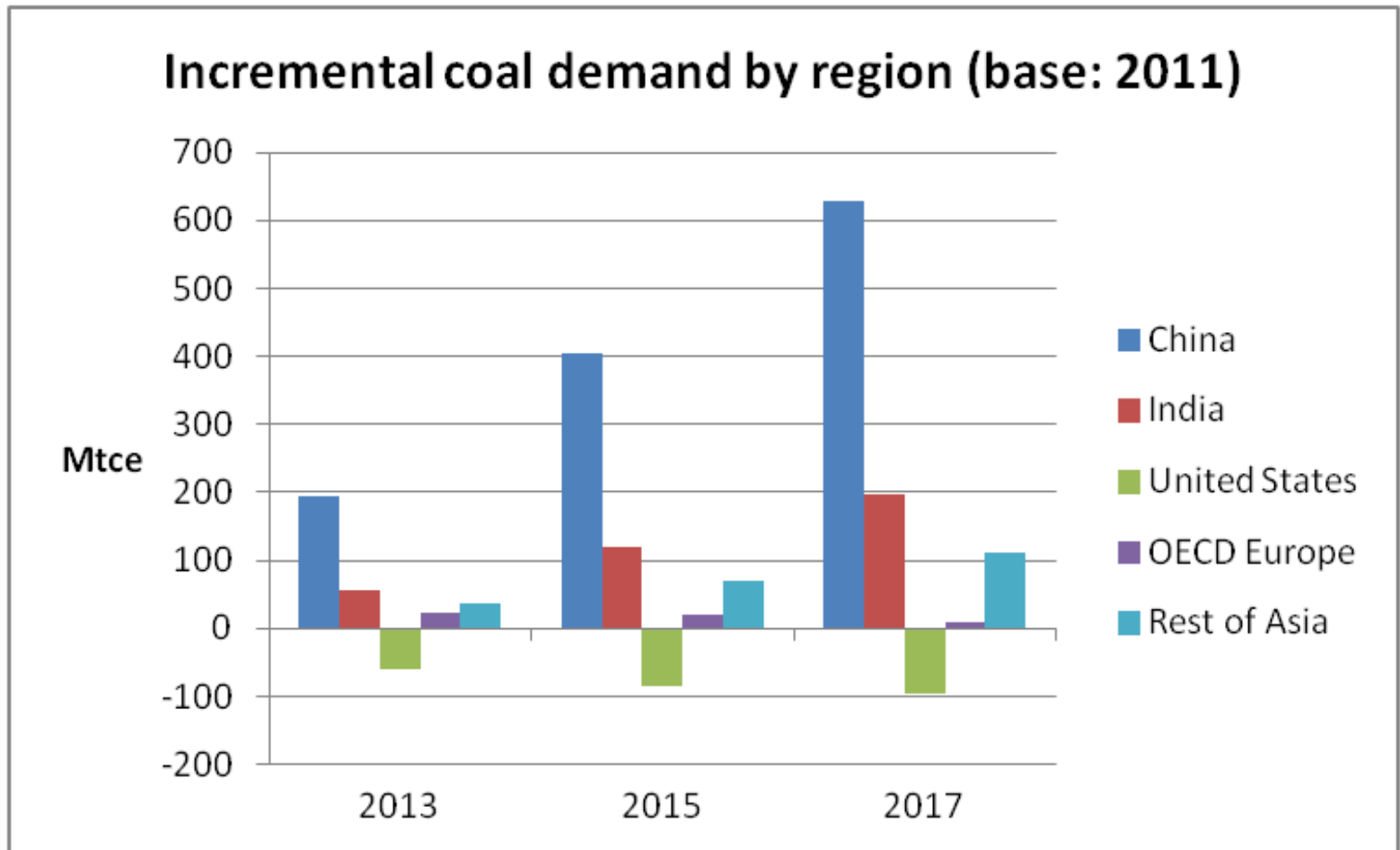
- **500 000** tonnes is the increase in annual global coal consumption every day for the next five years
- **100%** of this is without CCS.

The share of coal grows by 0.4% every year in the global energy mix



- Coal demand growth is more rapid than total energy (2.65% versus 1.2%)
- With current policies, it will catch up with oil in a decade

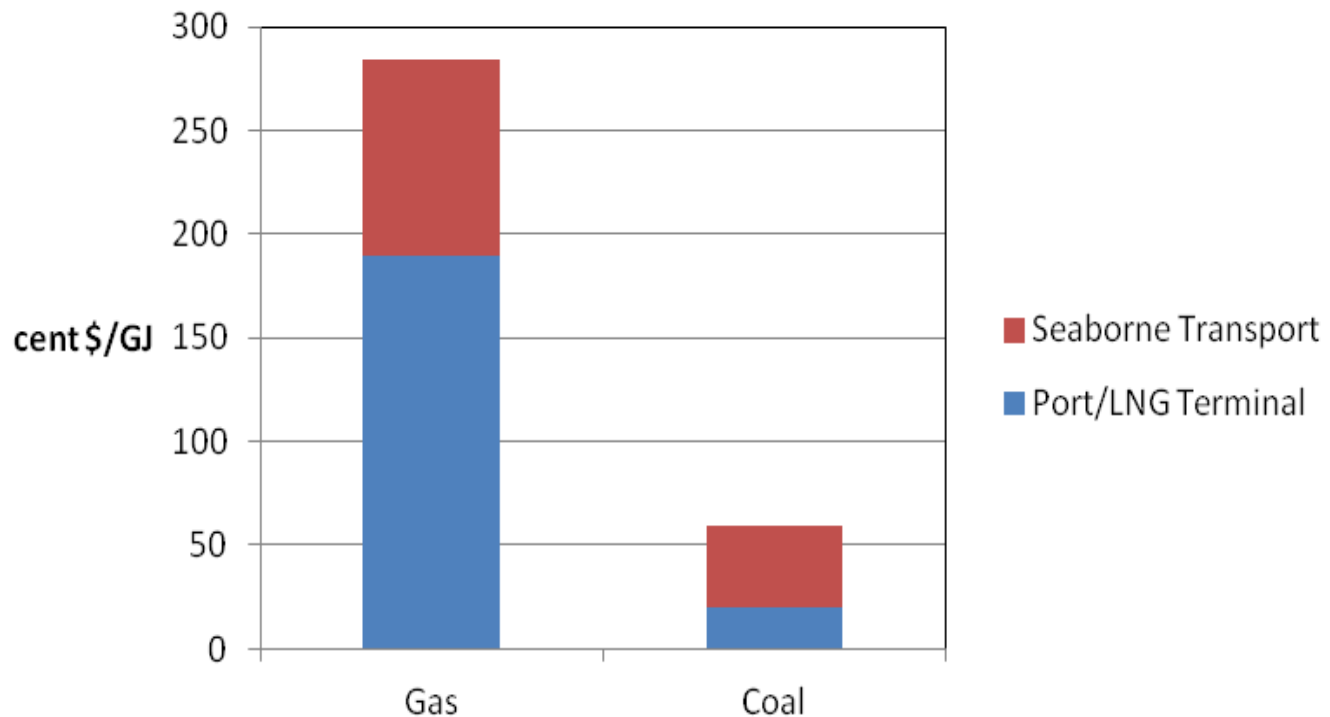
Coal demand growth is dominated by China and India



Decline in the United States compensates for growth in the entire world outside China and India

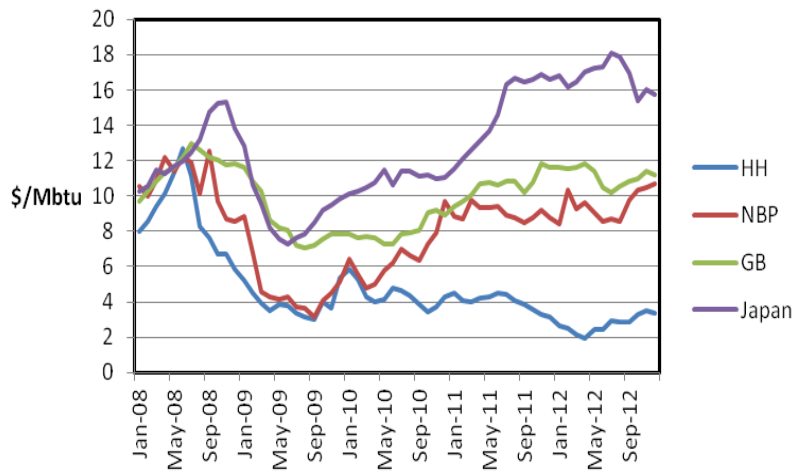
Coal transportation is cheaper than LNG – and does not need long lead time infrastructure projects

Typical cost breakdown for 5000 km transport

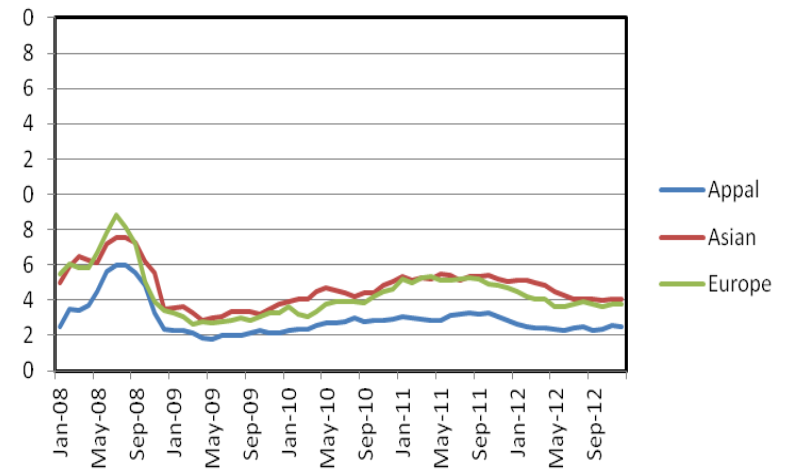


Consequently prices and markets are better integrated

Gas price in different regions



Coal price in different regions



Coal in China: powering (yet another) industrial revolution

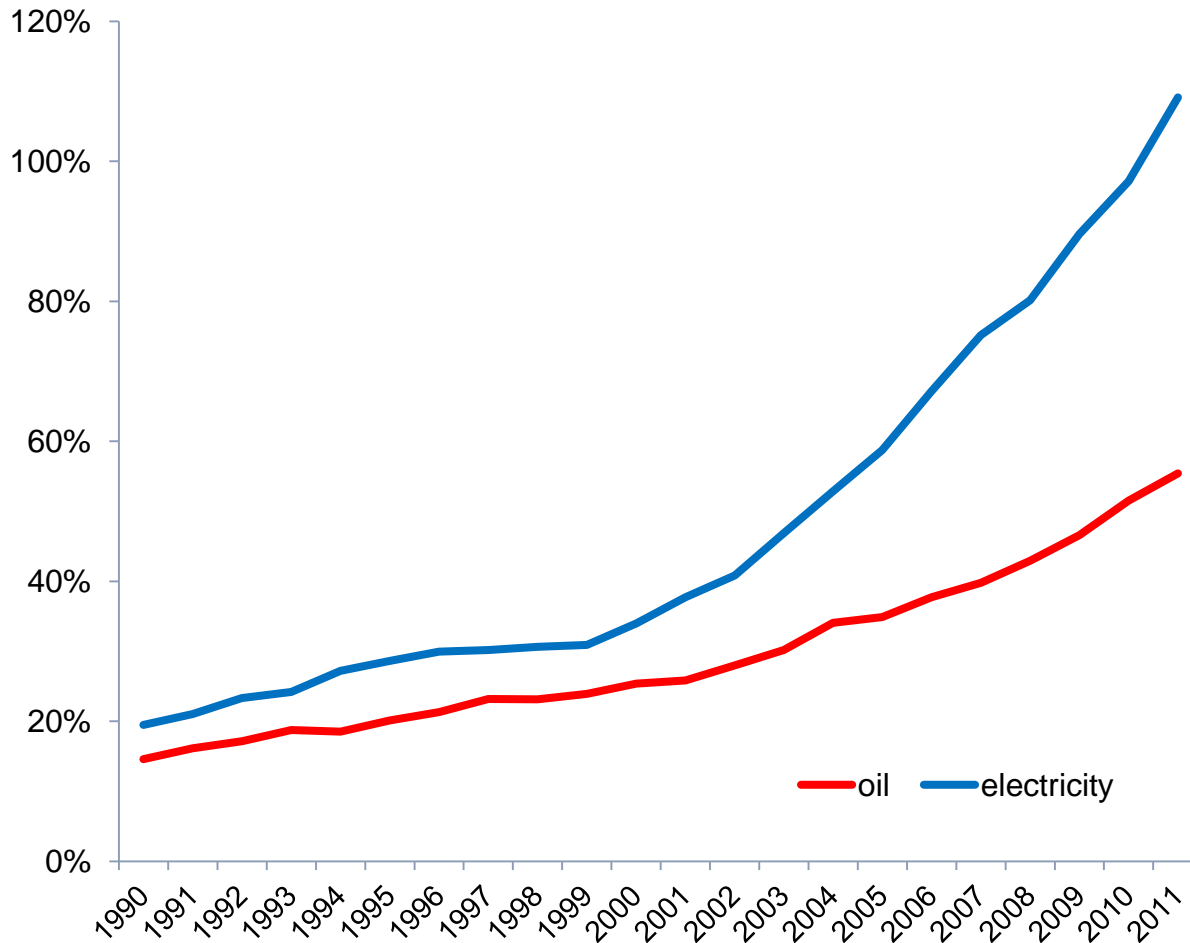


Our image of Chinese energy consumption



So electricity is catching up more rapidly

China's consumption as a percentage of US consumption



China is not running out of coal, but production is moving to remote regions



Leading to massive logistics challenges



Air quality is increasingly an energy policy driver



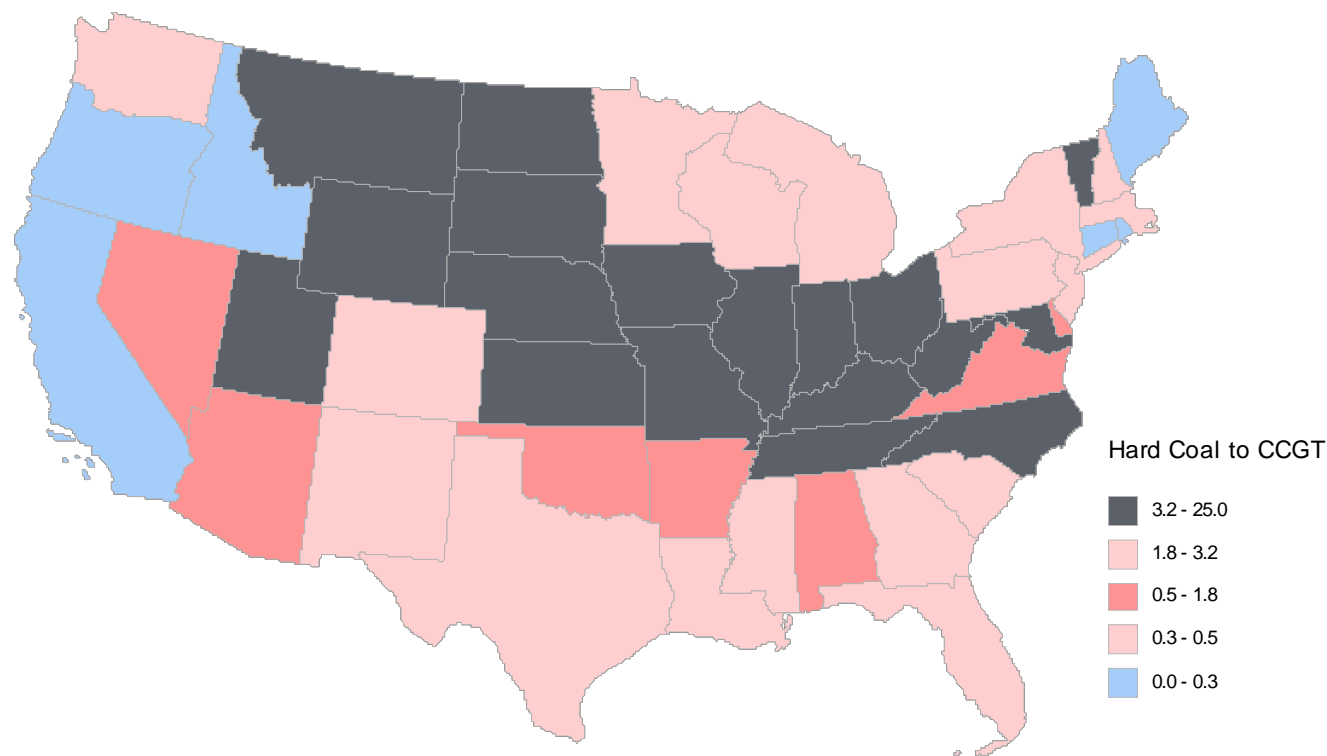
China is heavily investing into clean energy



US: Shale Gas and Coal, the fight of the century

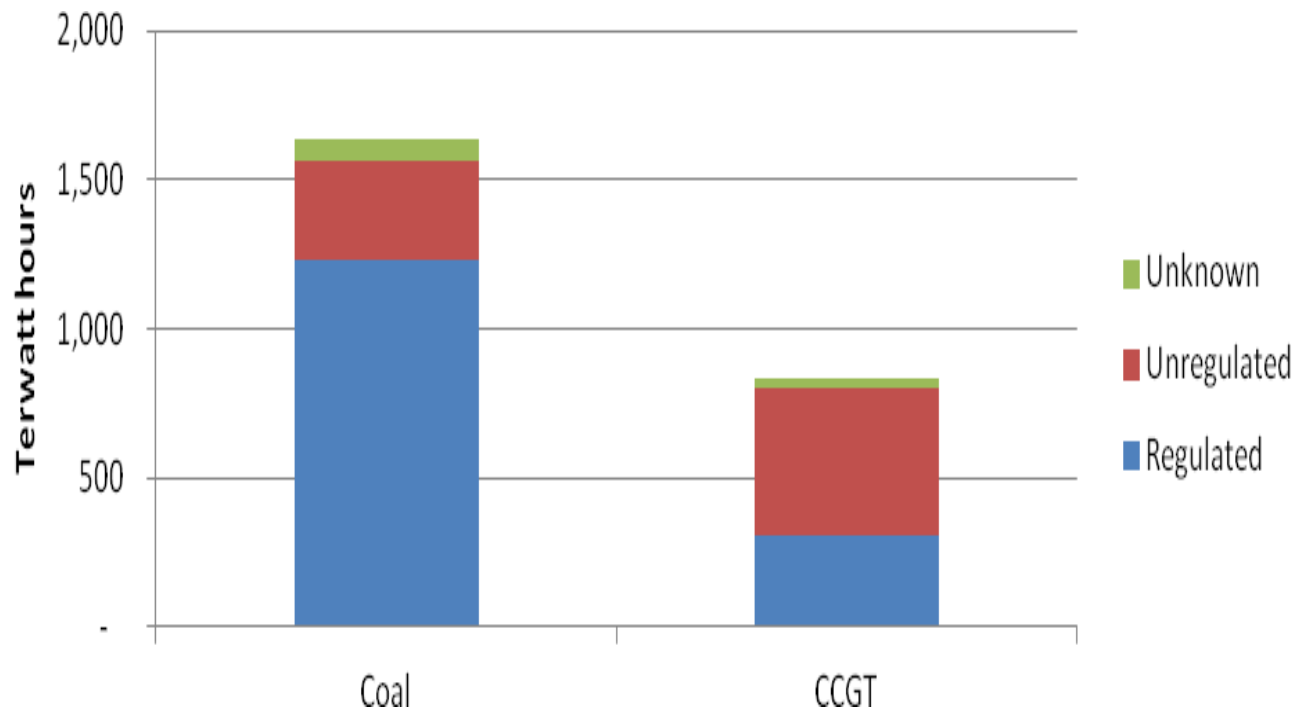


Location of gas and coal capacity

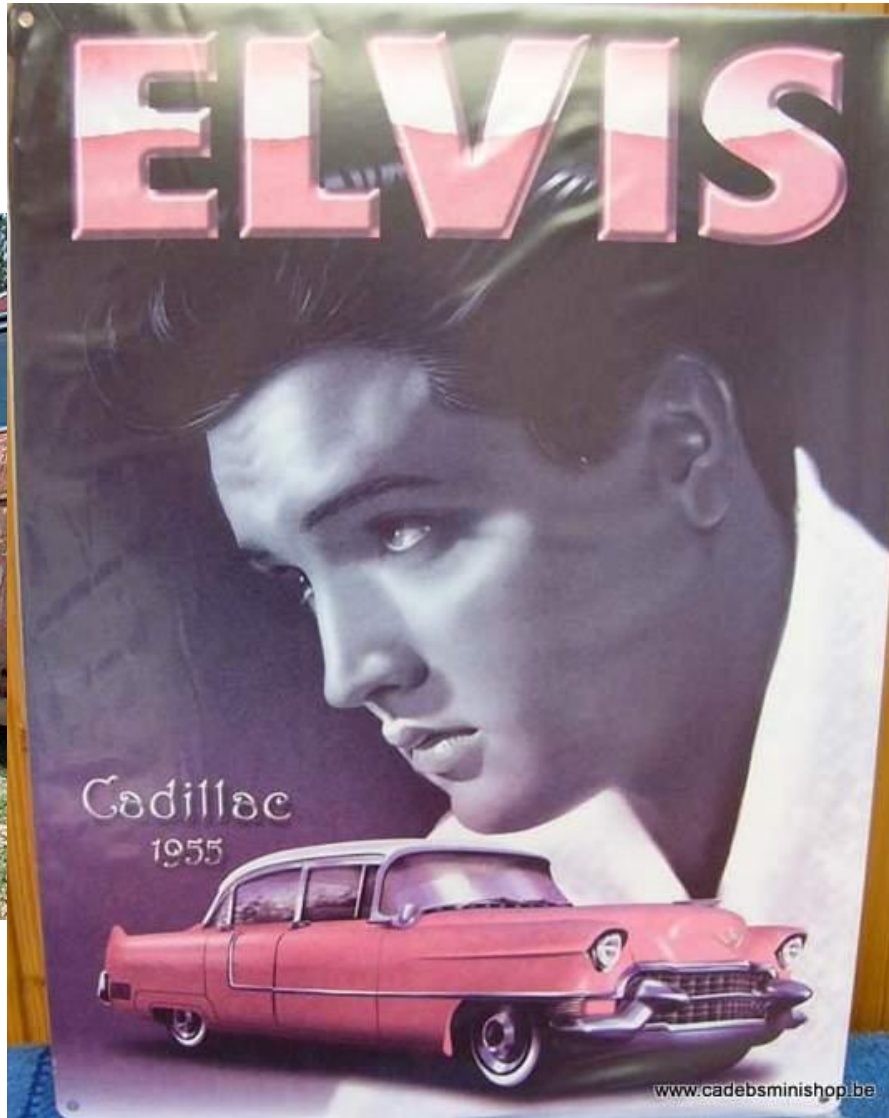


- Blue: CCGT capacity dominates
- Black: coal dominates (mostly due to availability of cheap coal)
- Red: balanced (dark red: very similar coal and gas capacity)
- Gas was not always built where there is coal to compete with
- Southern states more likely to displace coal

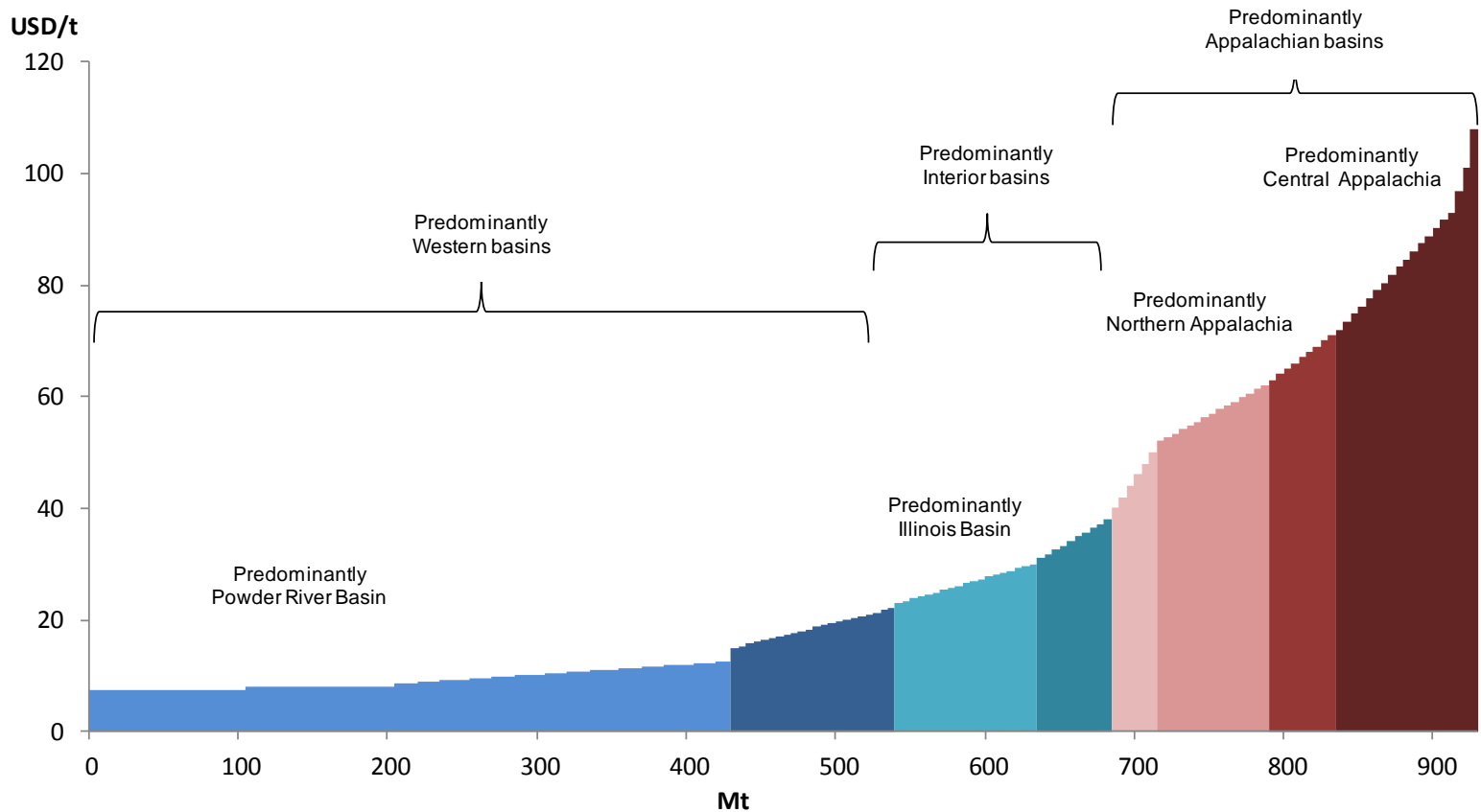
Effect of regulatory structure



But capacity is now showing its age Coal was the KING of the US power system



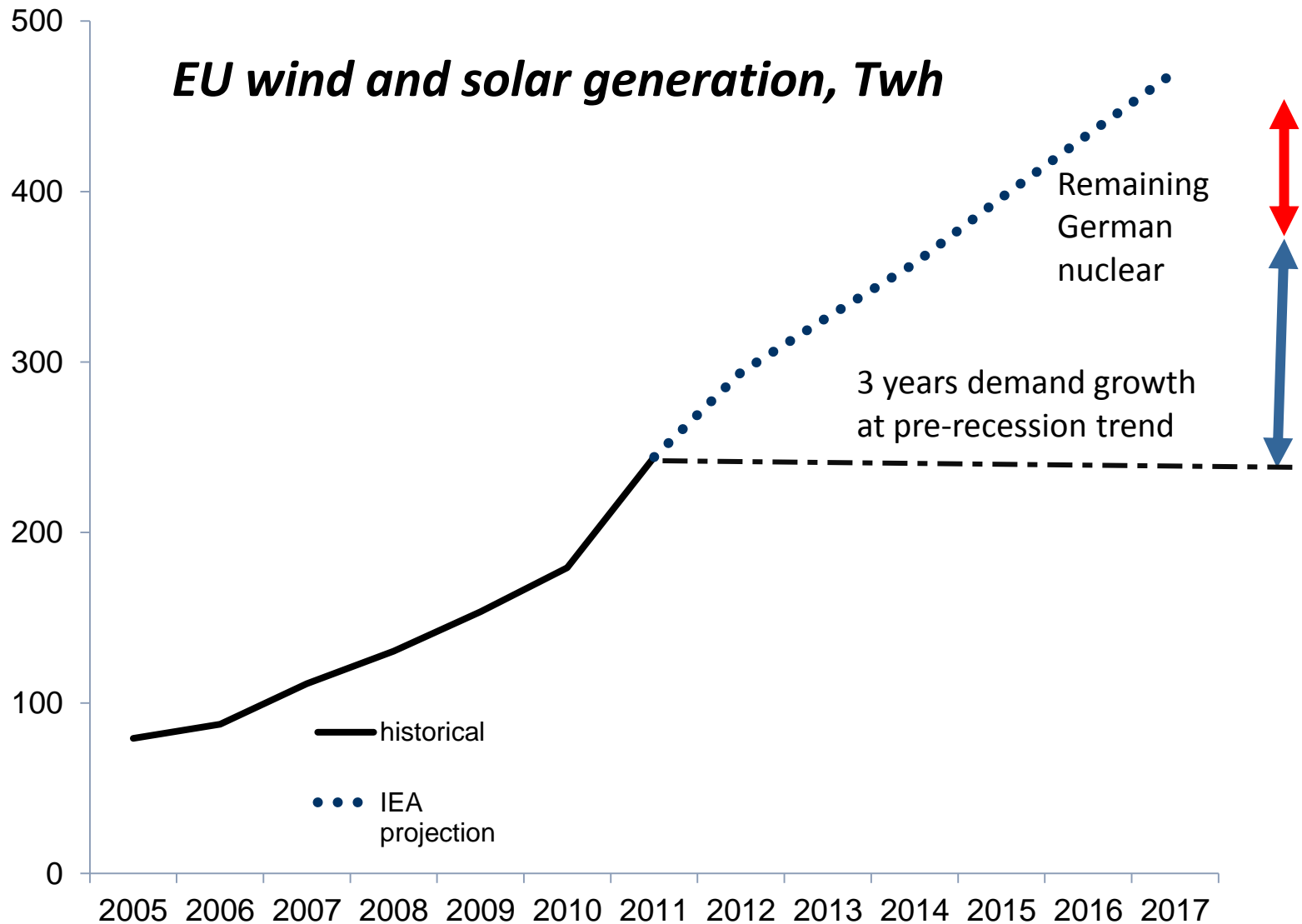
But: around 2/3 of US coal is the cheapest energy on planet Earth



Coal in Europe – an old star back on stage?



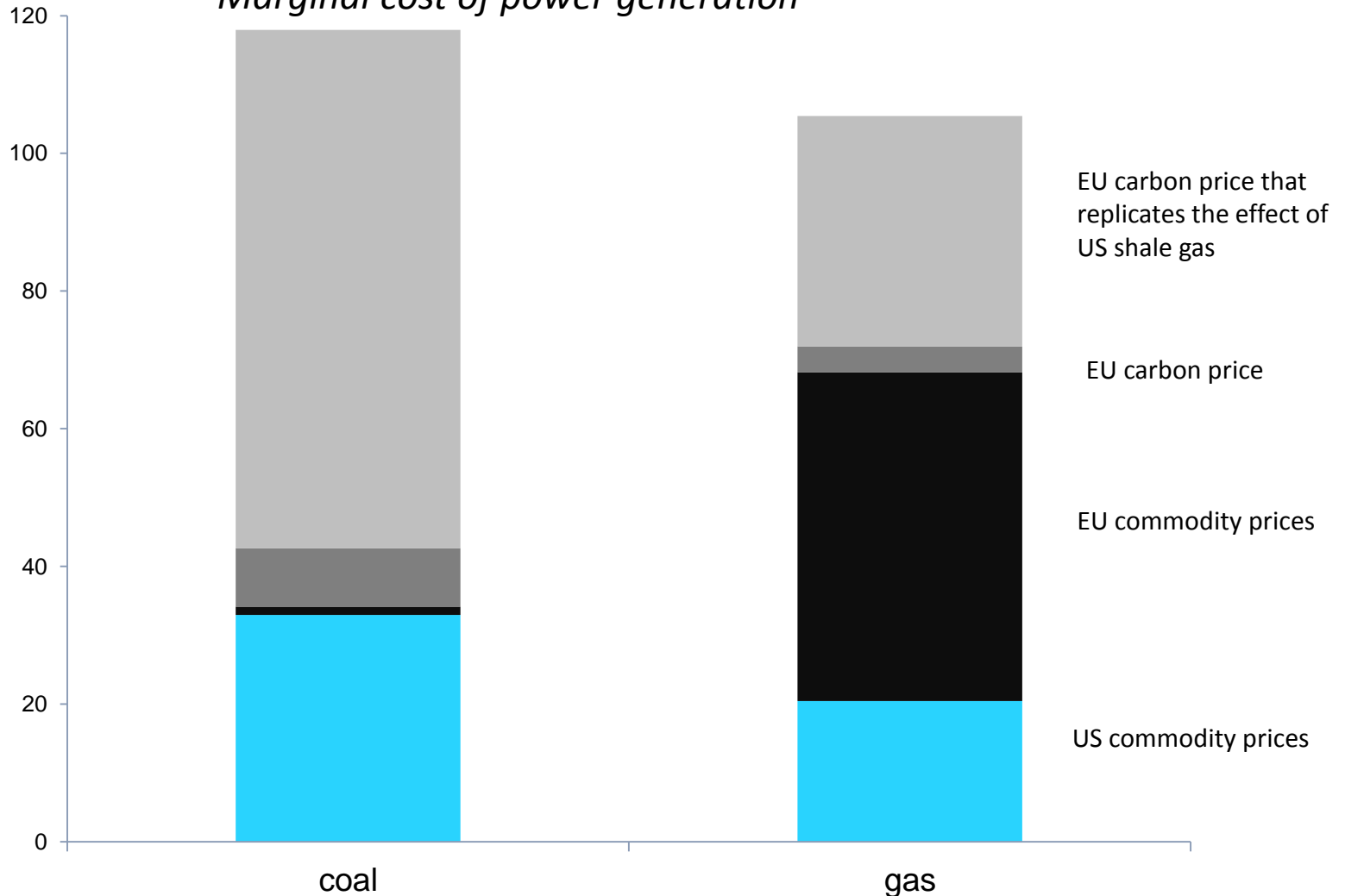
Wind, solar and weak demand reduce the call on conventional generation



No emission trading reform can restore the competitiveness of oil indexed gas

USD/MWh

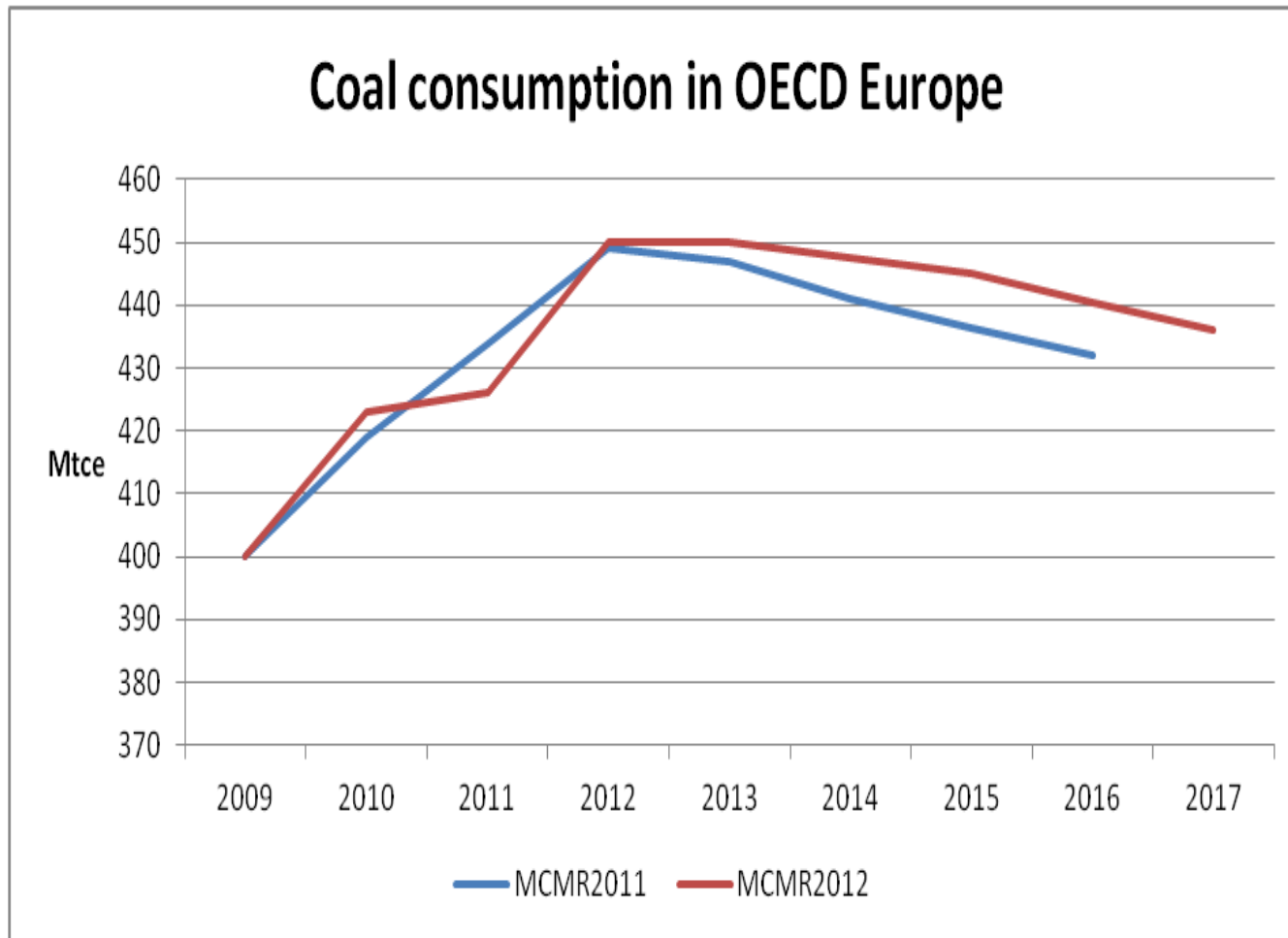
Marginal cost of power generation



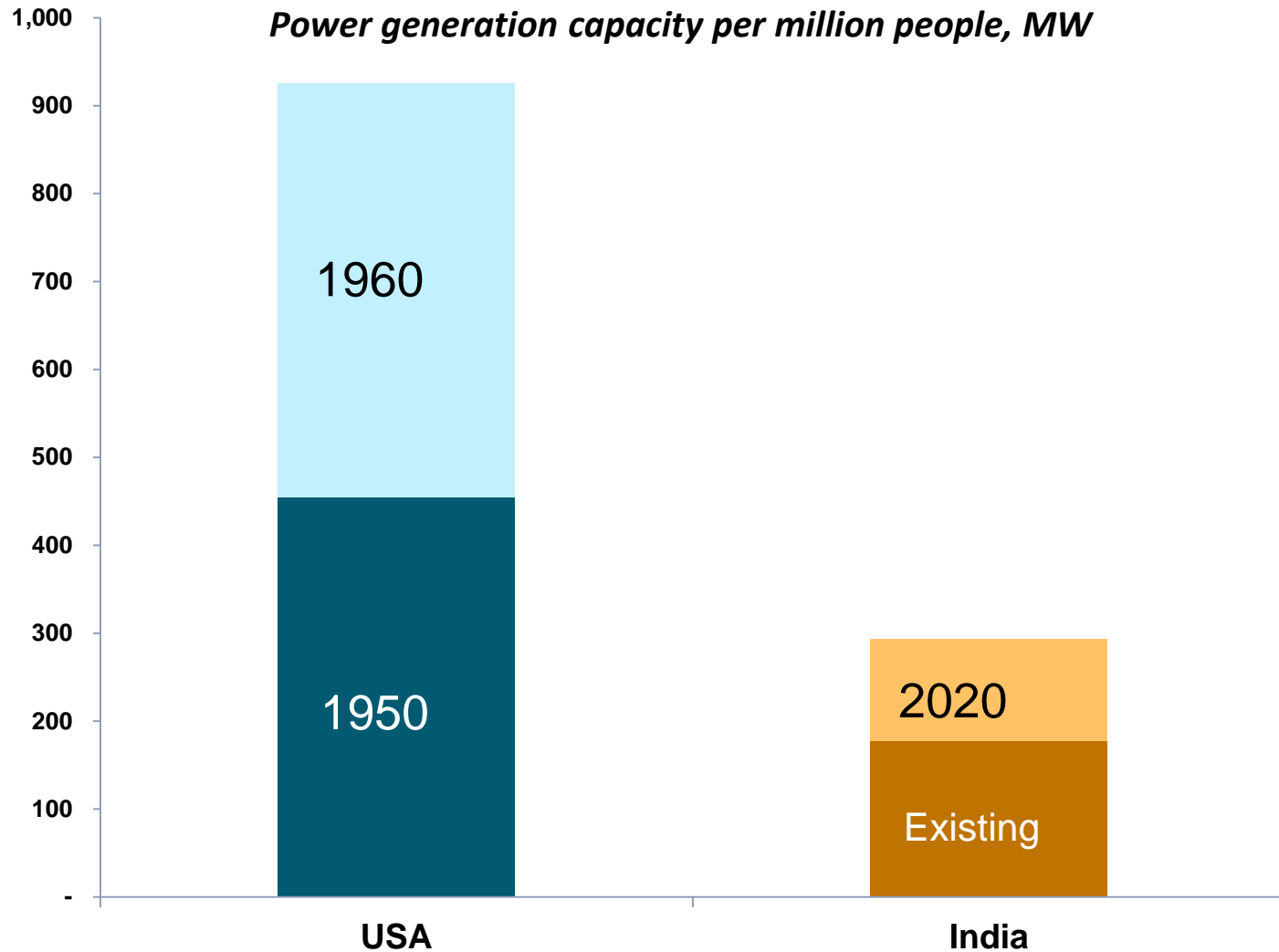
The peak year of investment into coal capacities in post war German history is...



Decommissioning will make the coal renaissance temporary



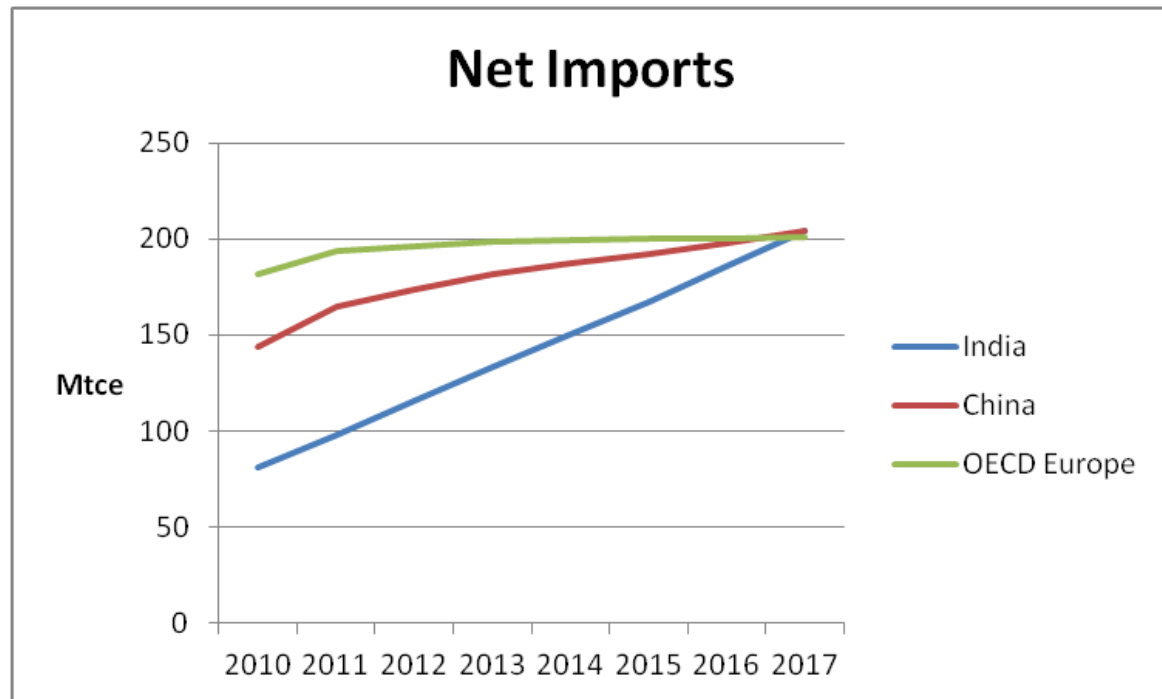
India: the 1000 billion dollars question



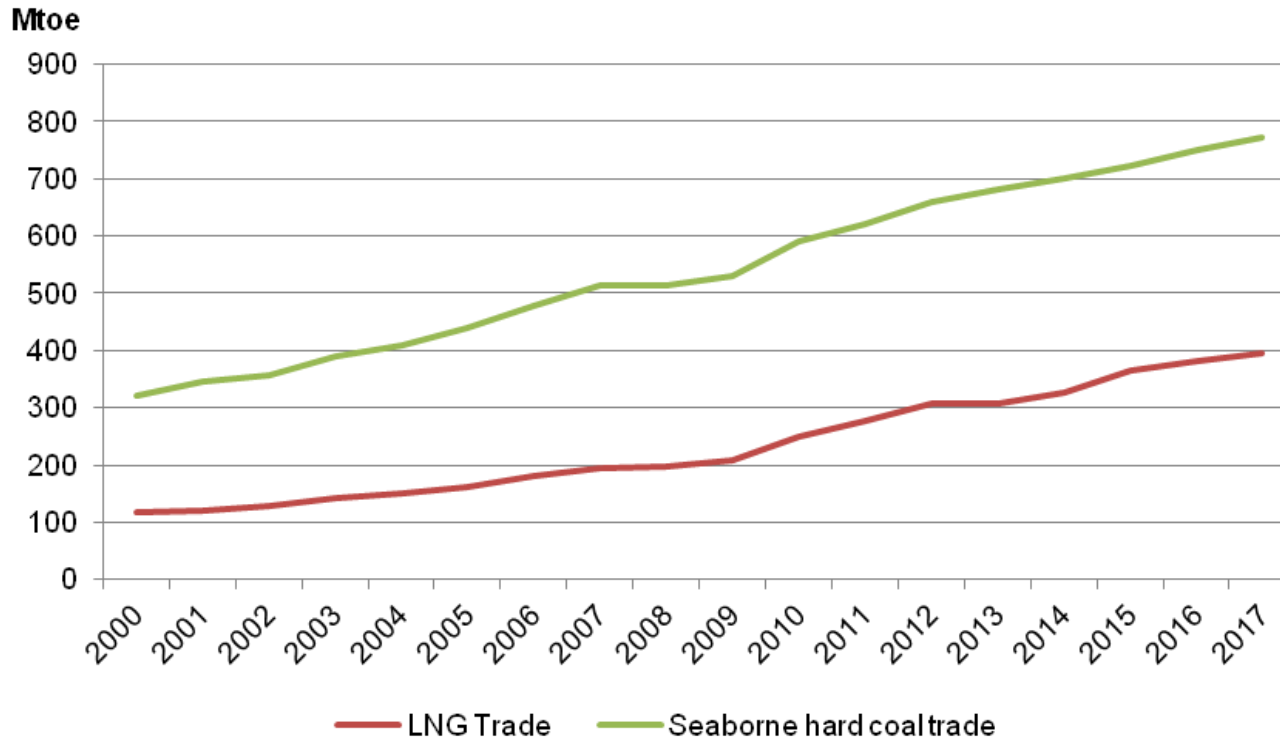
Indian domestic supply: imagine this in Rhode Island



India: on track to be the 2nd coal user and 1st importer

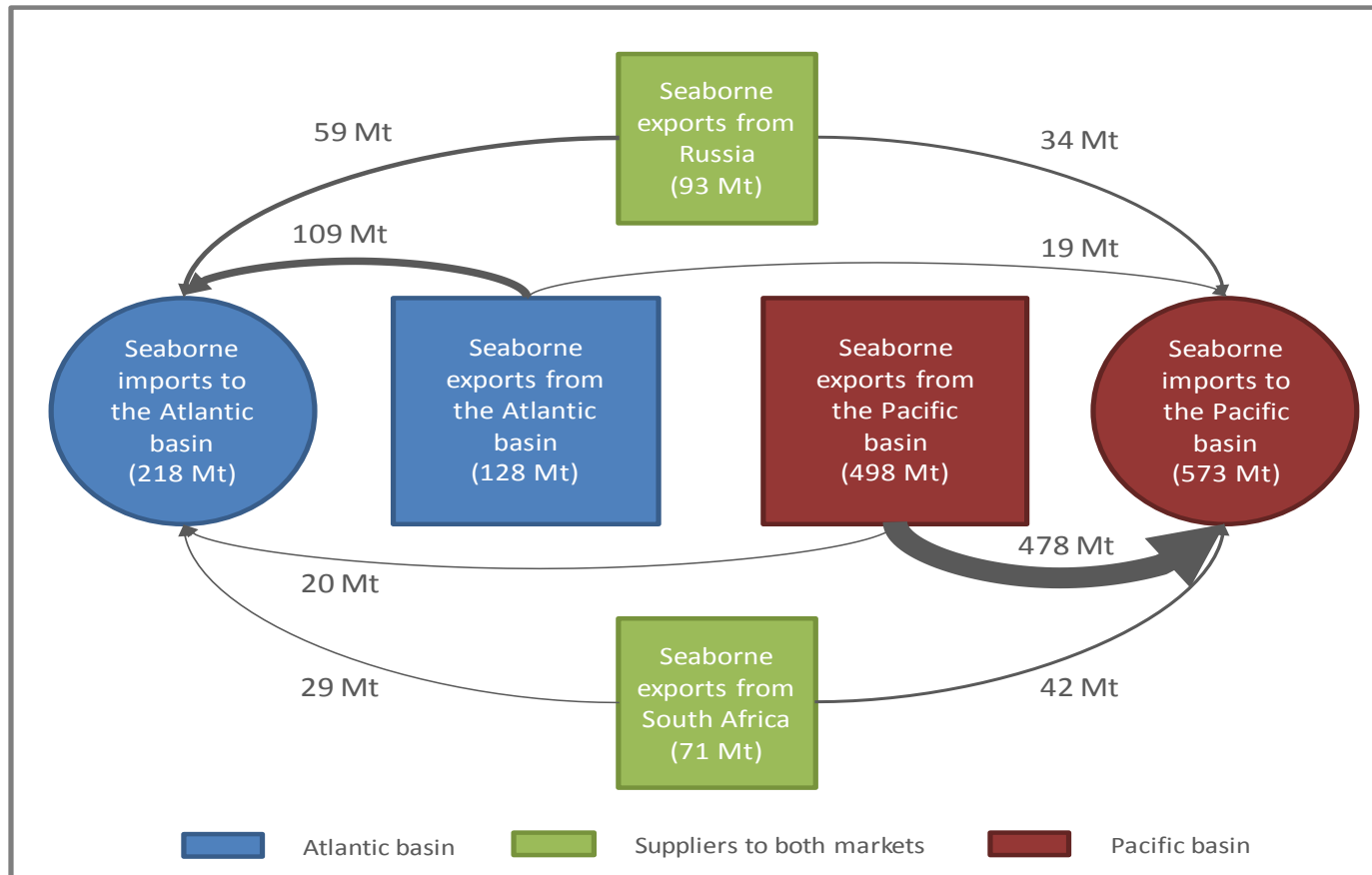


Coal is, and will remain more globalized than gas



- The growth in import needs of India is the main driver of trade
- The economics of shipping Wyoming coal to Asia is marginal

Moving East



- South Africa is increasingly an Asian rather than a swing supplier
- Segmentation leads to price differentials favouring Europe

Thank you for your attention