

Diversifying global energy markets.

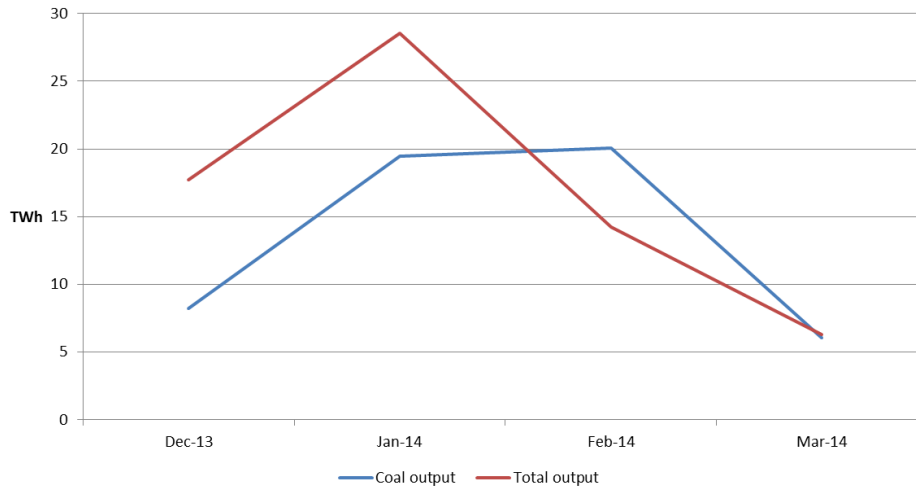


Carlos Fernández Alvarez. Senior Coal Analyst.

Manila, 8 September 2014

A tale of two crises

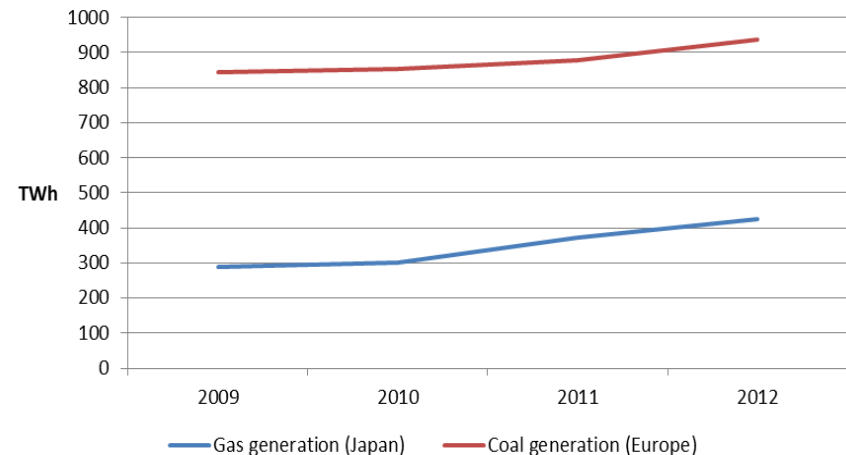
Increase (y-o-y) of electricity during the polar vortex in US



Most of additional power demand in US during the polar vortex was produced from coal

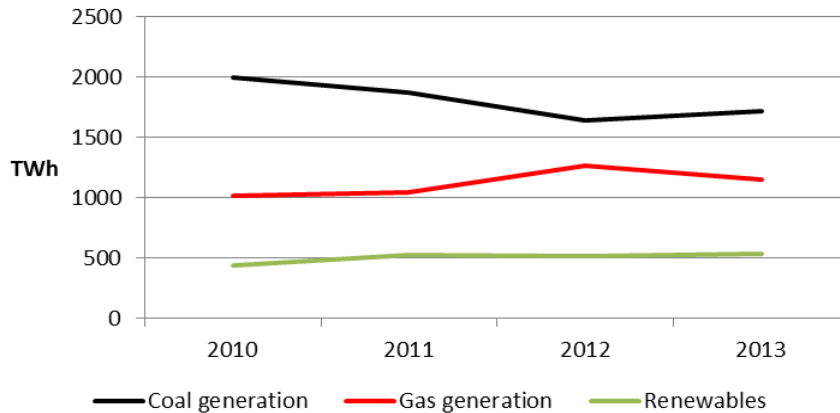
Post-Fukushima coal generation increase in Europe was similar to gas generation increase in Japan

Post-Fukushima coal and gas generation



Gas-to-coal switching potential protects consumers

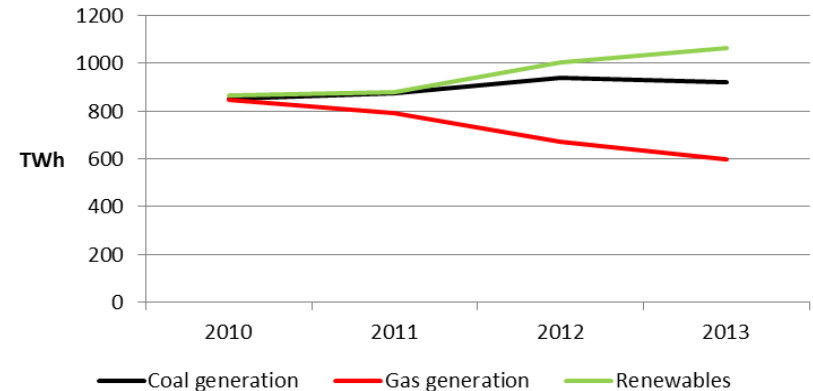
Coal and gas generation in US



In United States, increase / decrease of gas largely means decrease / increase of coal

In Europe, coal to gas competition occurs with big renewables increase

Coal and gas generation in Europe



Coal and gas prices are key to determine electricity prices and generation mix

Gas to coal competition is at regional level

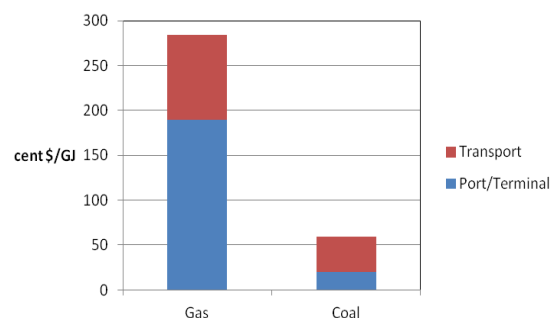
US gas prices are low

Asia is paying the highest

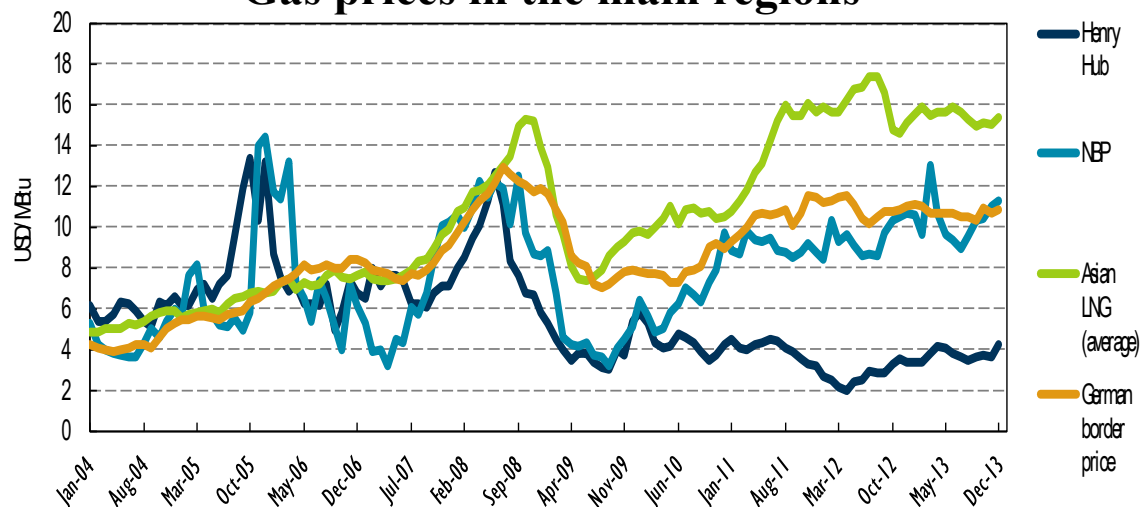
European prices are in between oil-linked contracts and market driven prices

International coal markets are much better integrated.

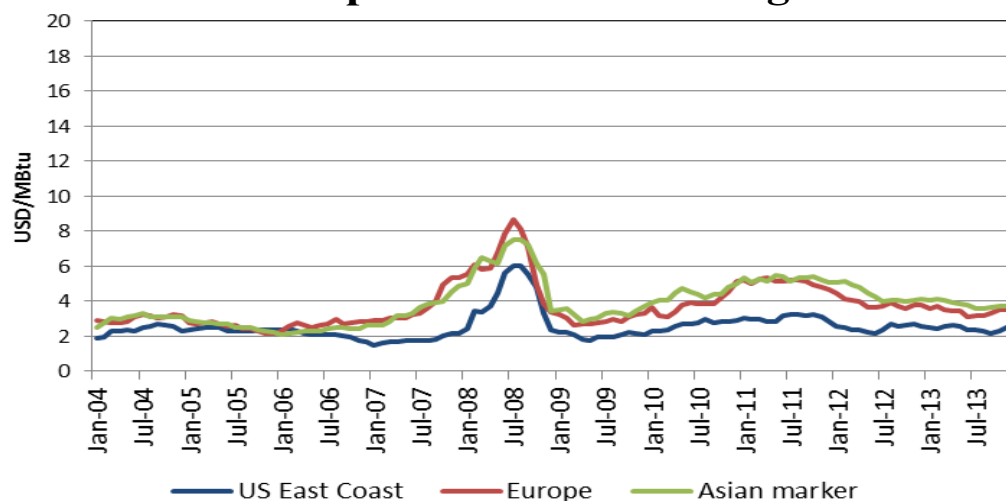
Typical cost breakdown for 5000 km transport



Gas prices in the main regions

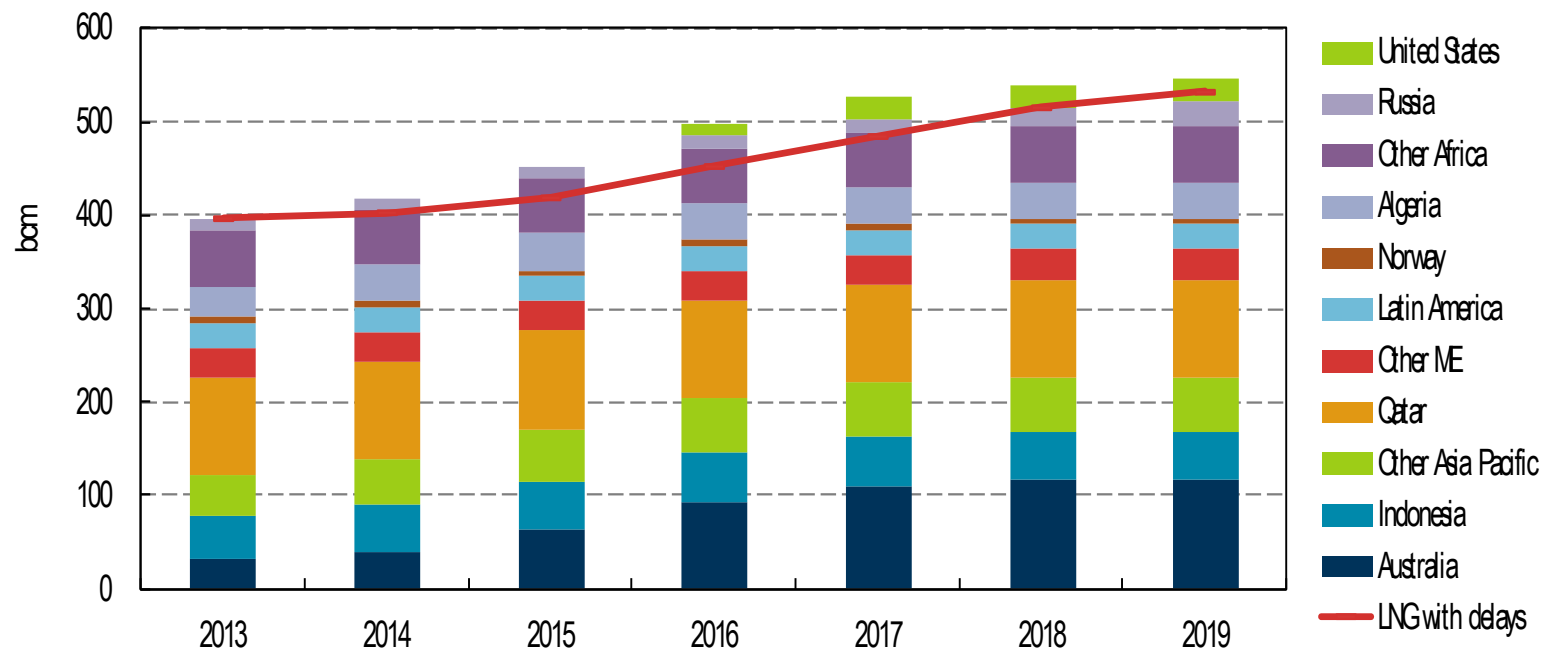


Coal prices in the main regions



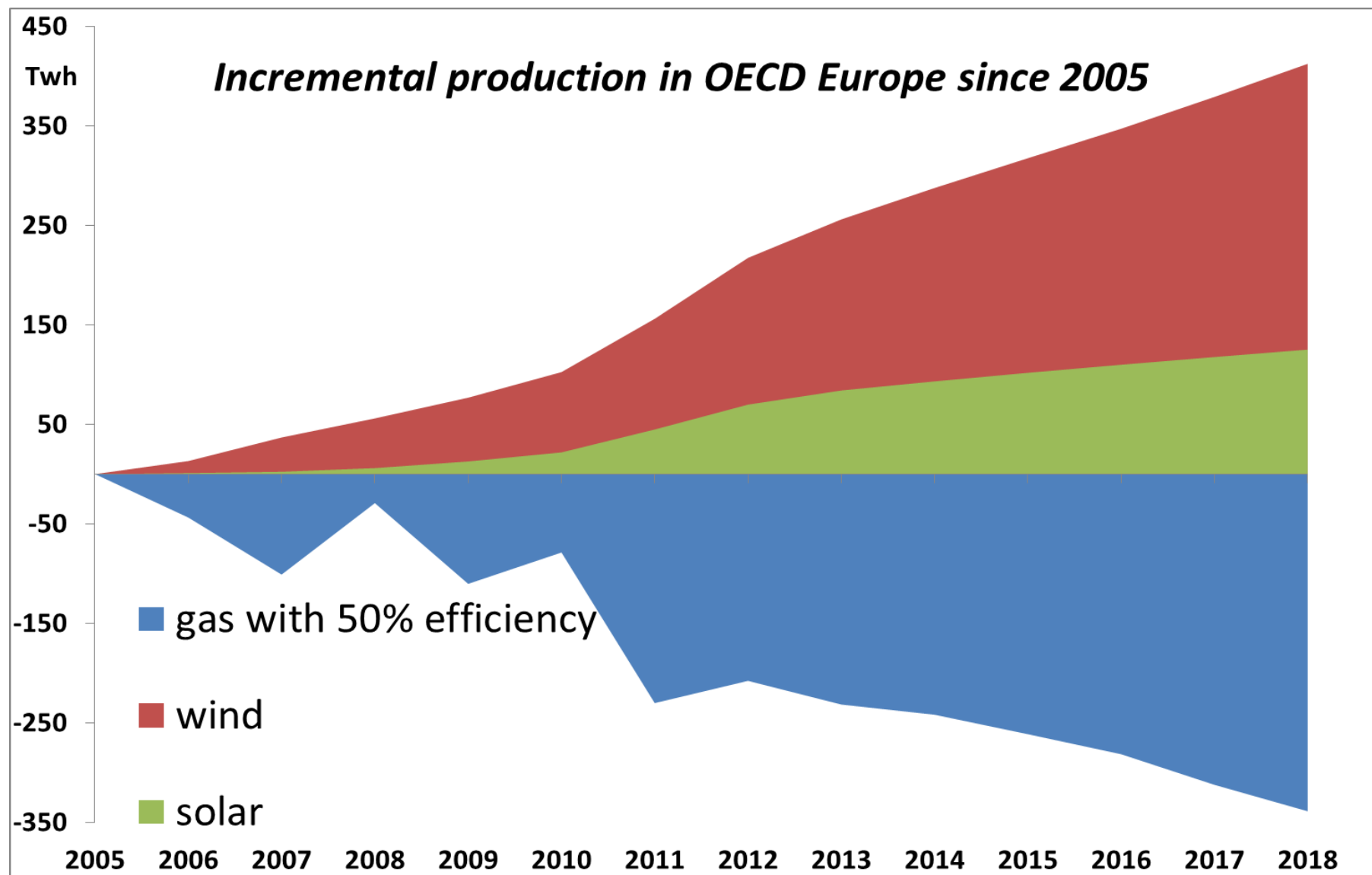
New LNG coming on line

LNG export capacity, 2013-19



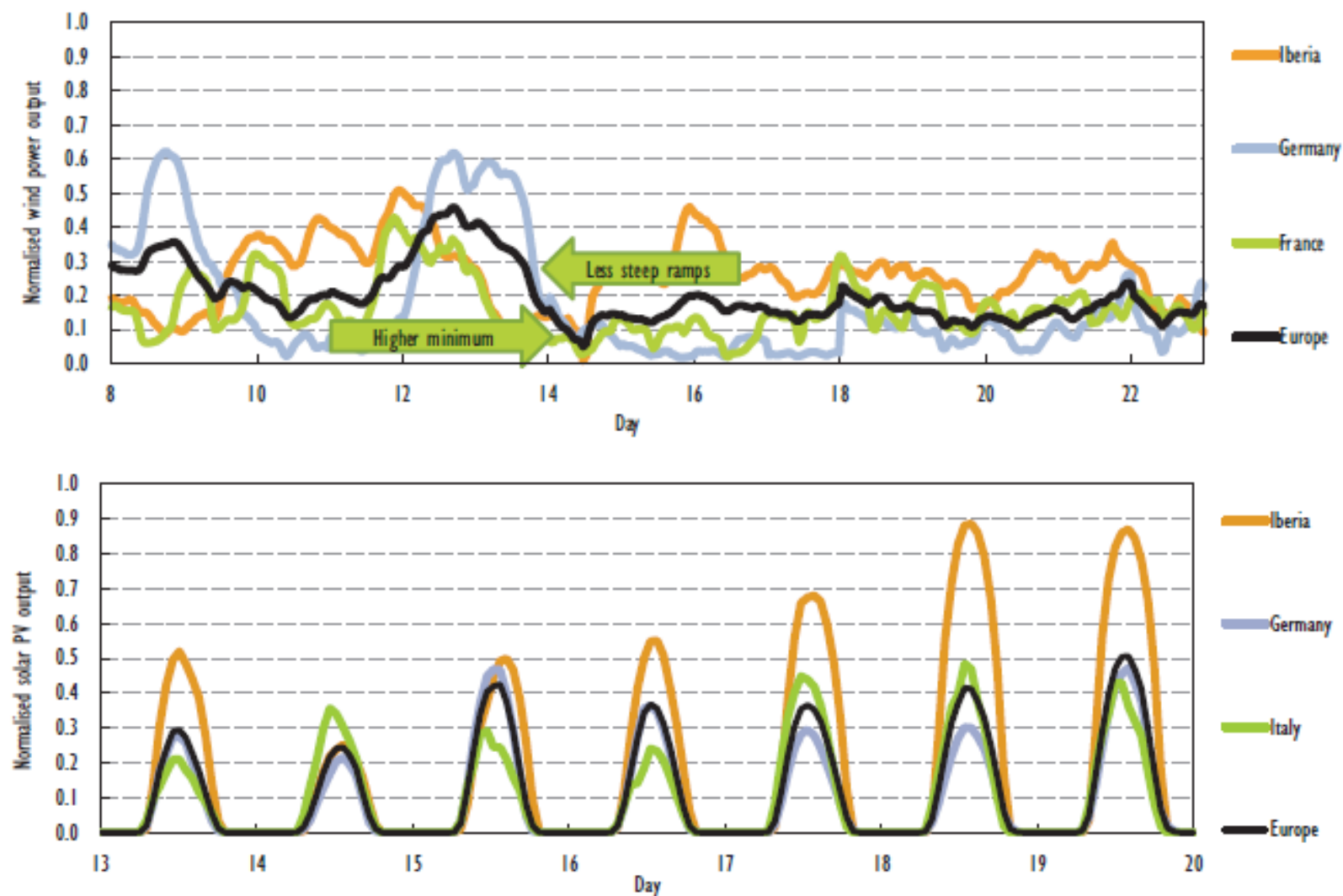
Source: MTGMR 2014

Large scale lock in into wind and solar



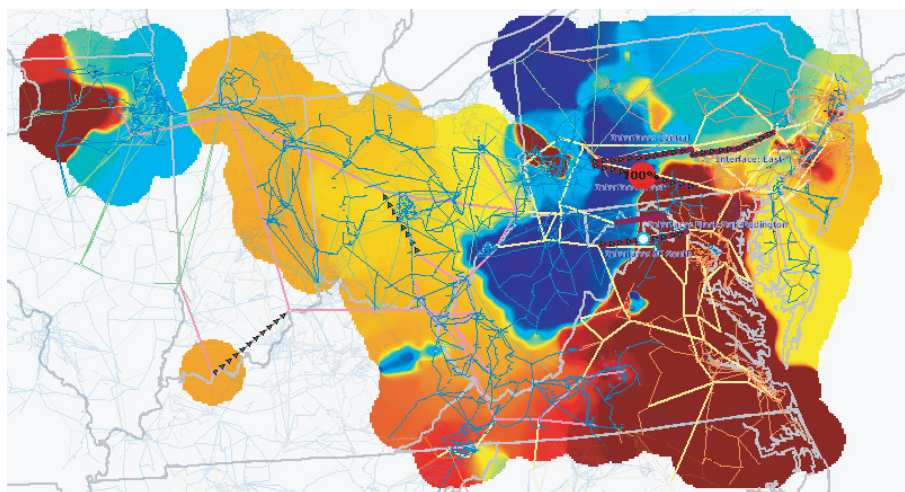
Patterns of renewable production: variability and predictability

Reasonable smoothing for wind, almost none for solar

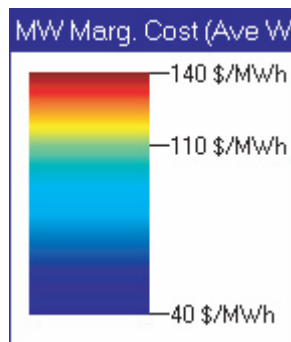
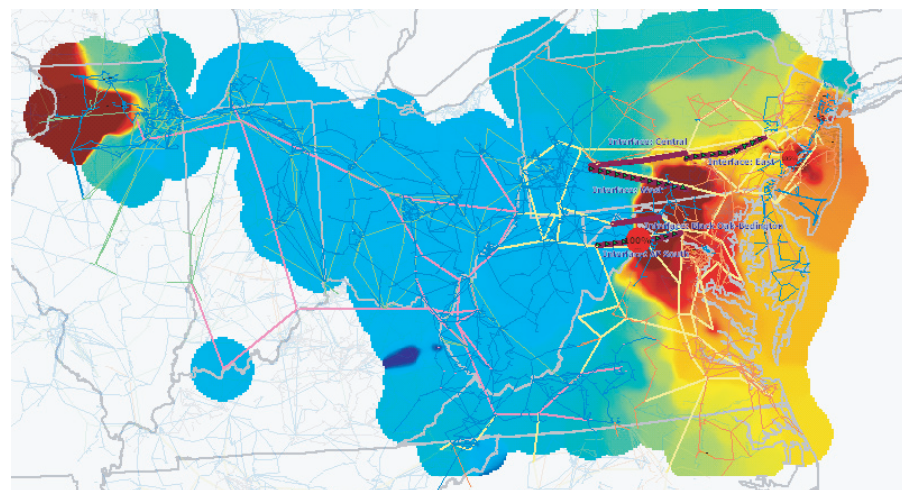


Markets integration leads to lower prices

Pre-integration price pattern (PJM)

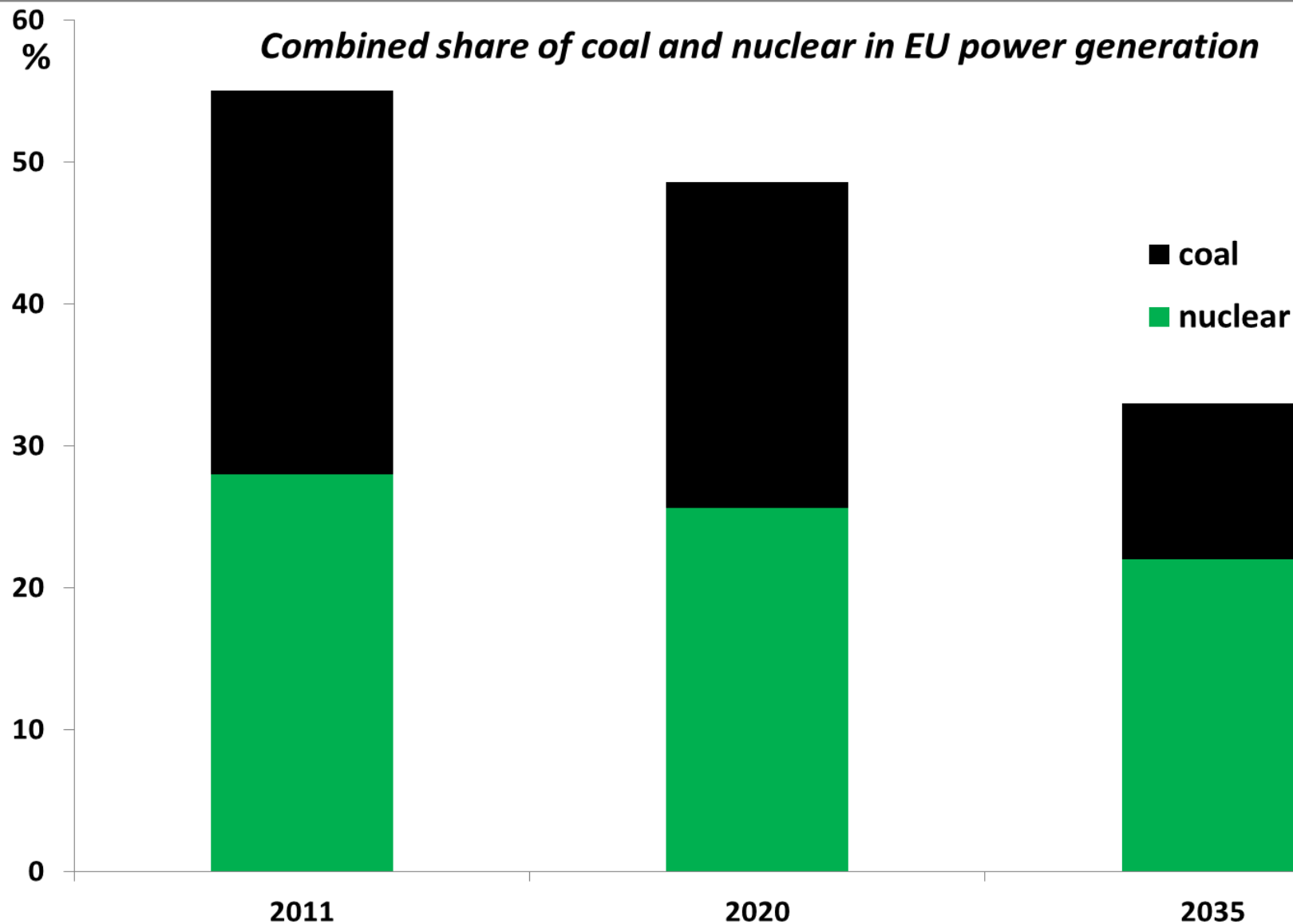


Post-integration price pattern (PJM)



Loss of baseload generation

Combined share of coal and nuclear in EU power generation



- An efficient power market with diversified generation capacity is cornerstone of supply security
- LNG and shale gas lead to more secure and efficient gas markets, but challenges persist
- Renewables have a major impact on fossil fuel dependency but generate new security challenges
- Coal and nuclear play a major role, but faces challenges in both EU and US

Thanks for your attention

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