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Energy and commodity price benchmarking and market insights

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Market Reporting

Consulting

Events

illuminating the markets

Gas and coal competition in the power markets from a long-term sustainability perspective

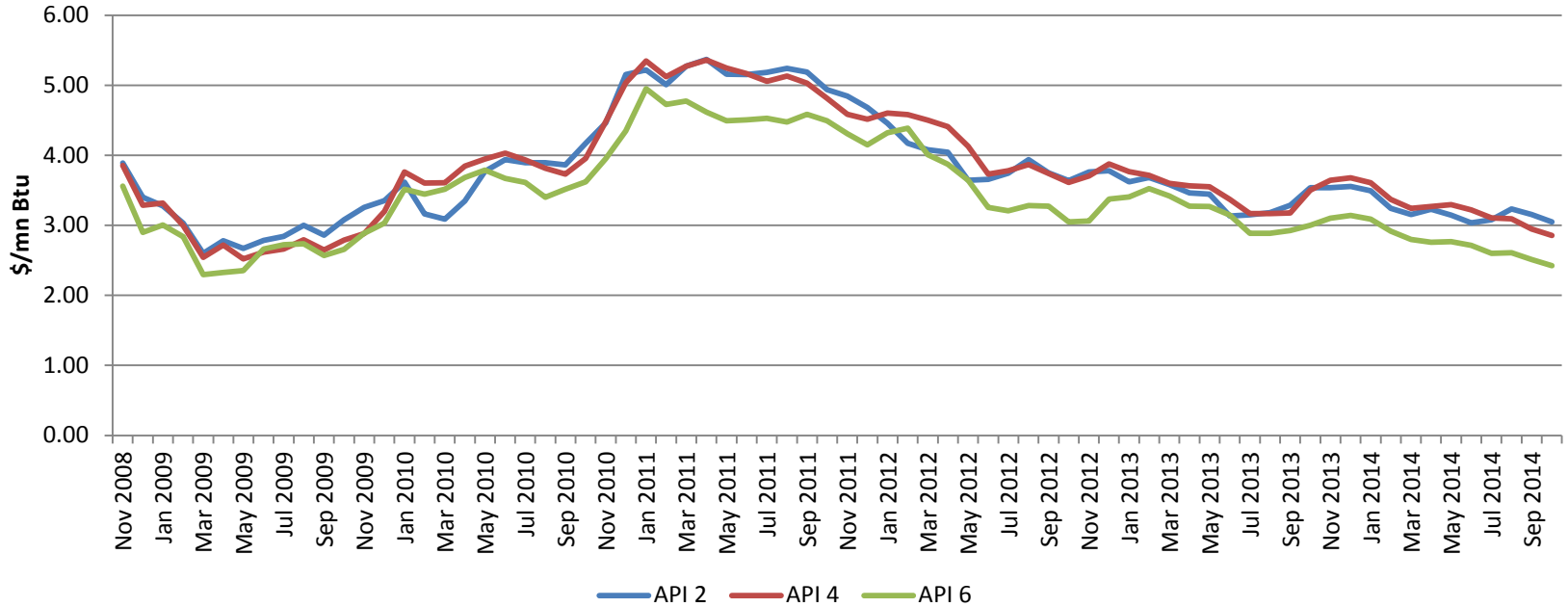
Overview of trends and policies

Paris, 30th October 2014

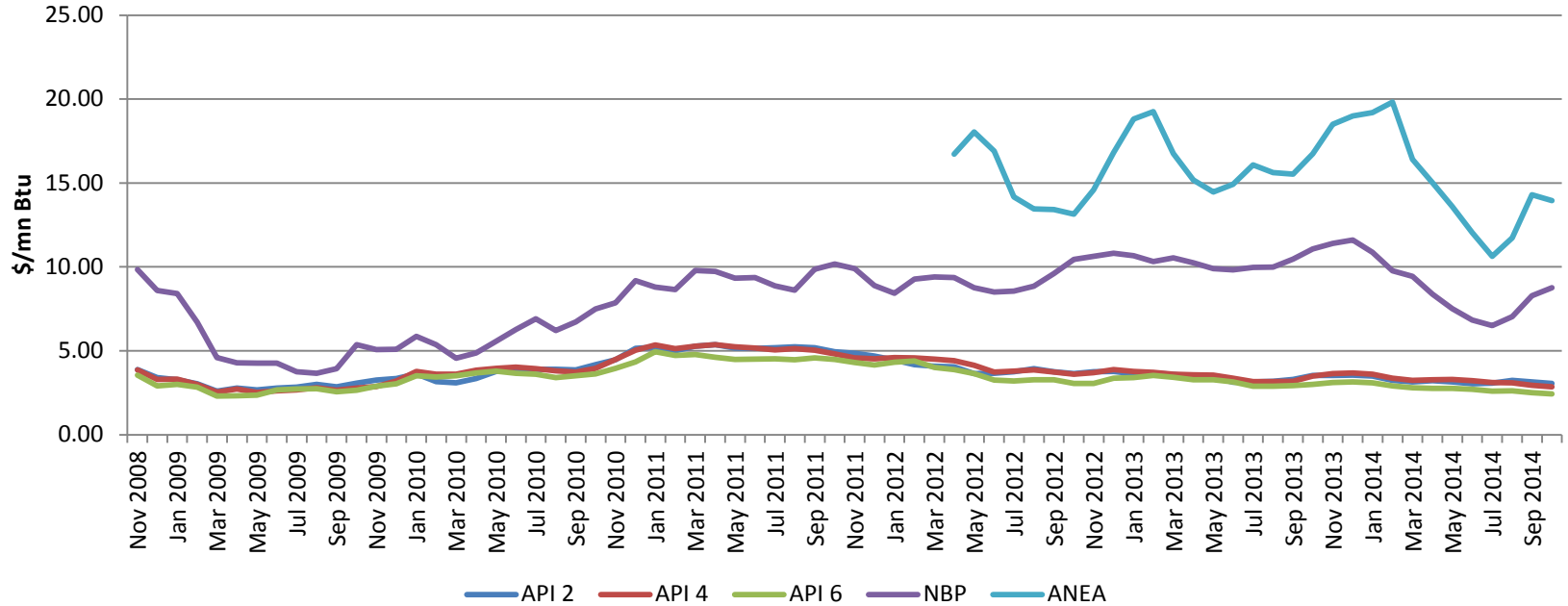
General wisdom

- Coal is dirty but cheap
- Gas is clean(er) but expensive

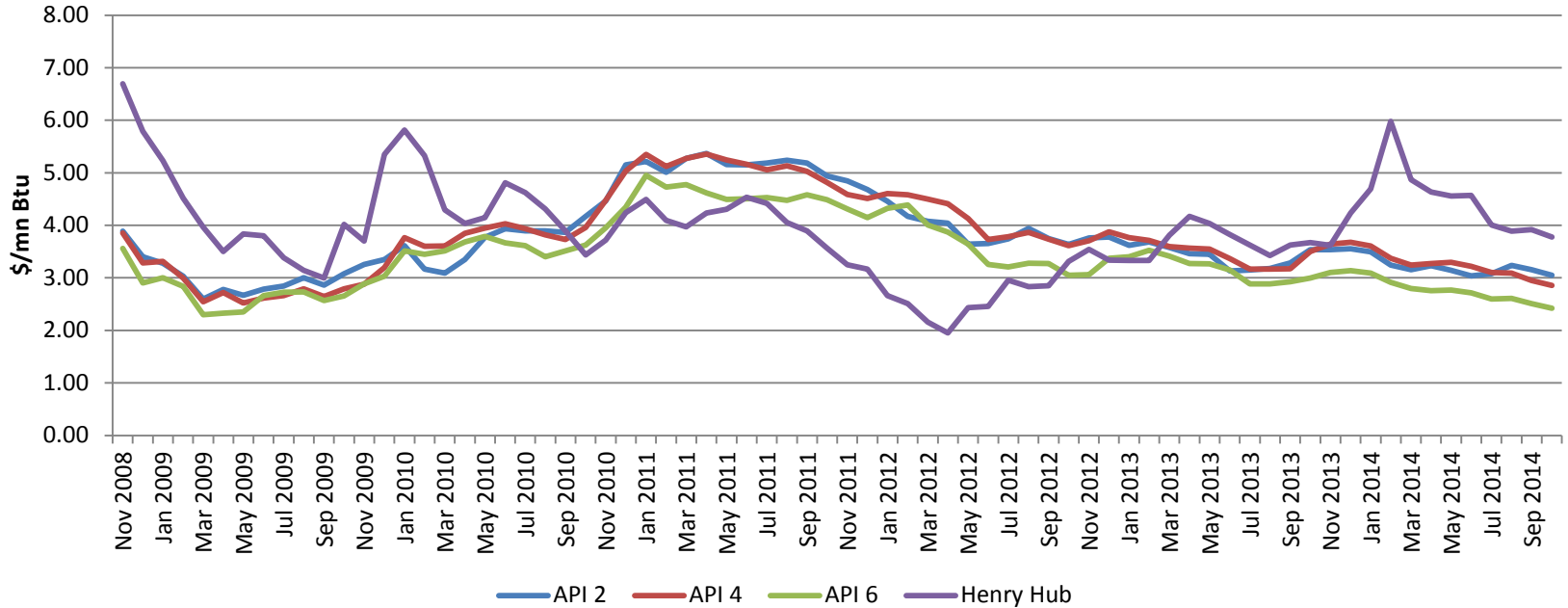
Coal is inexpensive...



...relative to European and Asian gas...



...but not so clear-cut compared to US gas



| US

The US is an exception globally

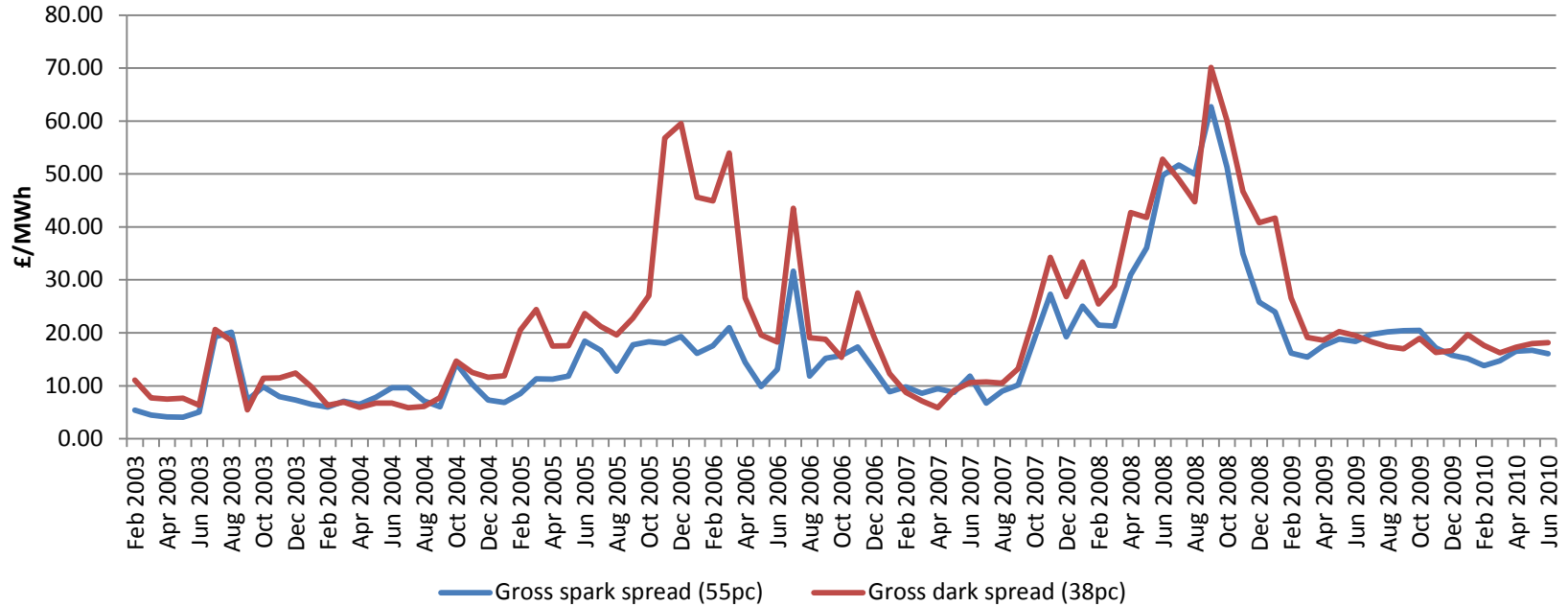
- Gas has competed successfully with coal in recent years largely without a CO2 reduction incentive system – although other Nox and SO2 legislation is helpful to gas
- The US shale gas revolution may not be replicable anywhere in the world ... but it might (the energy industry is a notoriously bad predictor of the future)
- It would make logical sense for the US, with its cheap domestic gas, to push aggressively for a binding global CO2 deal

| Europe

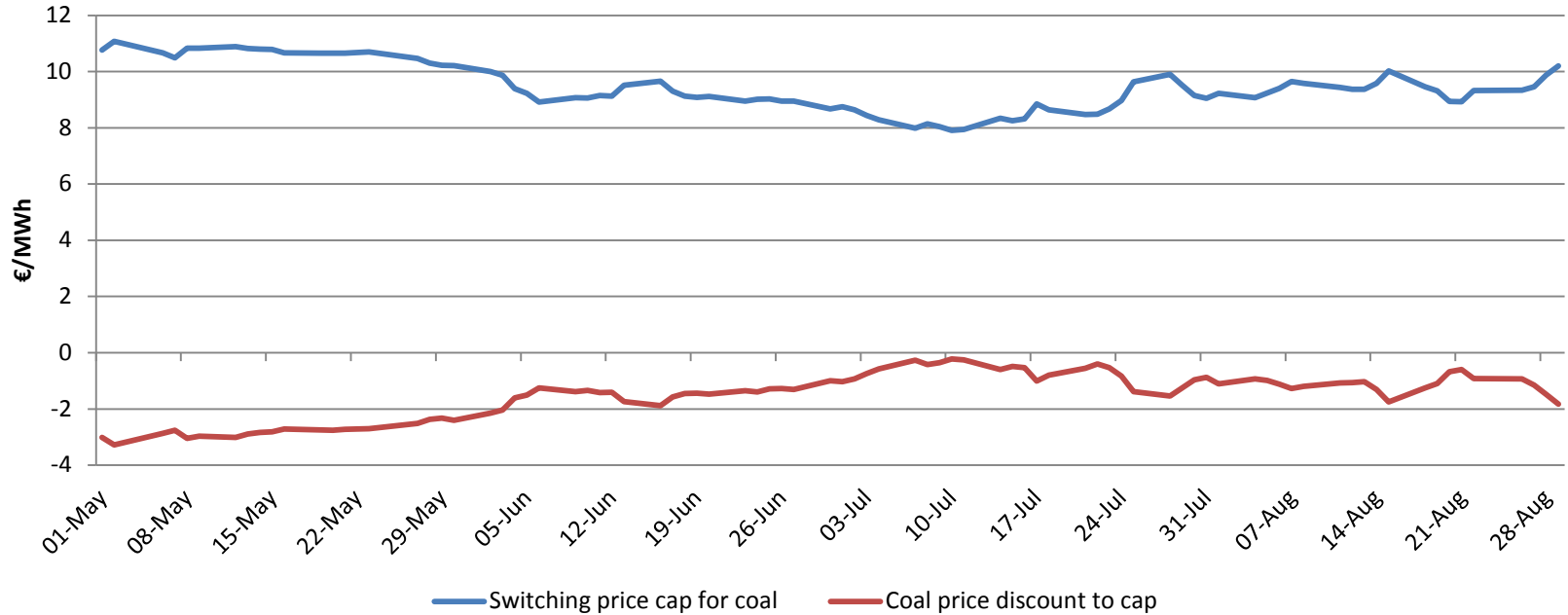
Where we are in Europe politically?

- UK
 - Technology neutral capacity market from 2018-19; first auctions this year
 - But CfDs favour renewables and nuclear (at very high cost)
 - Carbon levy promotes gas over coal
- Germany
 - Government producing a green paper on a capacity market
 - Want any capacity market to be supra-national
 - Nuclear banned; enthusiasm for supporting renewables has waned
 - No discrimination between gas and coal
- France
 - Capacity market launching imminently; likely to be in operation 2016-17
 - Long-term planning favours renewables and nuclear
- Netherlands
 - Has a coal tax which favours gas over (old) coal

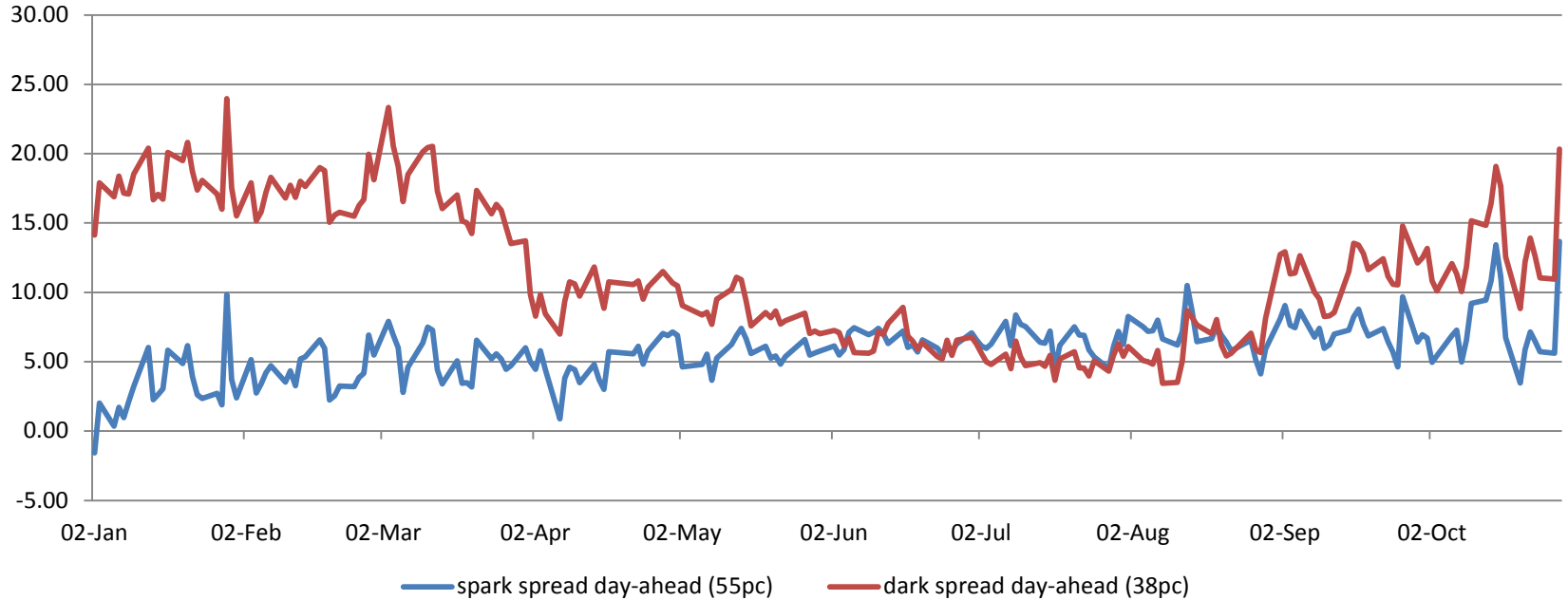
A reminder from the UK past...



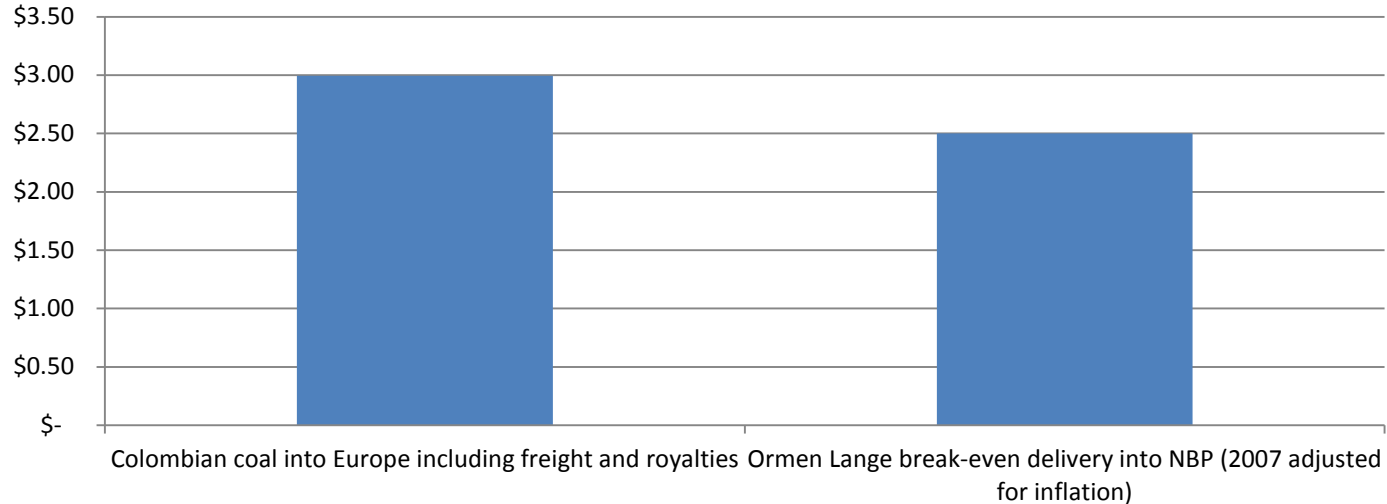
...an interesting summer in Germany...



...and in the UK



Is imported coal cheaper than European gas?



Erik Johnsen, Norwegian Ministry of Petroleum and Energy — “Ormen Lange is very profitable; the southern Norwegian North Sea fields are very, very profitable”

Russian gas costs are uncertain

- Production cost estimates vary from \$0.50/mn Btu up to around \$3/mn Btu for new, remote fields
- Additional costs including taxes and transit provide even greater divergent estimates
 - Anywhere from \$5/mn Btu up to \$11.50/mn Btu!
 - Reducing these costs is to a large extent in the hands of authorities and pipeline operators

Asia

Summary

- Asia is almost entirely devoid of competitive electricity markets, meaning that the generation economics at play in US/European markets is much less of a factor
- Asia is seen as a hugely promising growth market by both the coal and gas industries
- Policy drivers – price, but also environmental factors (e.g. China) and supply security/diversity – tend to play the major role in determining the fuel mix

Supply diversity

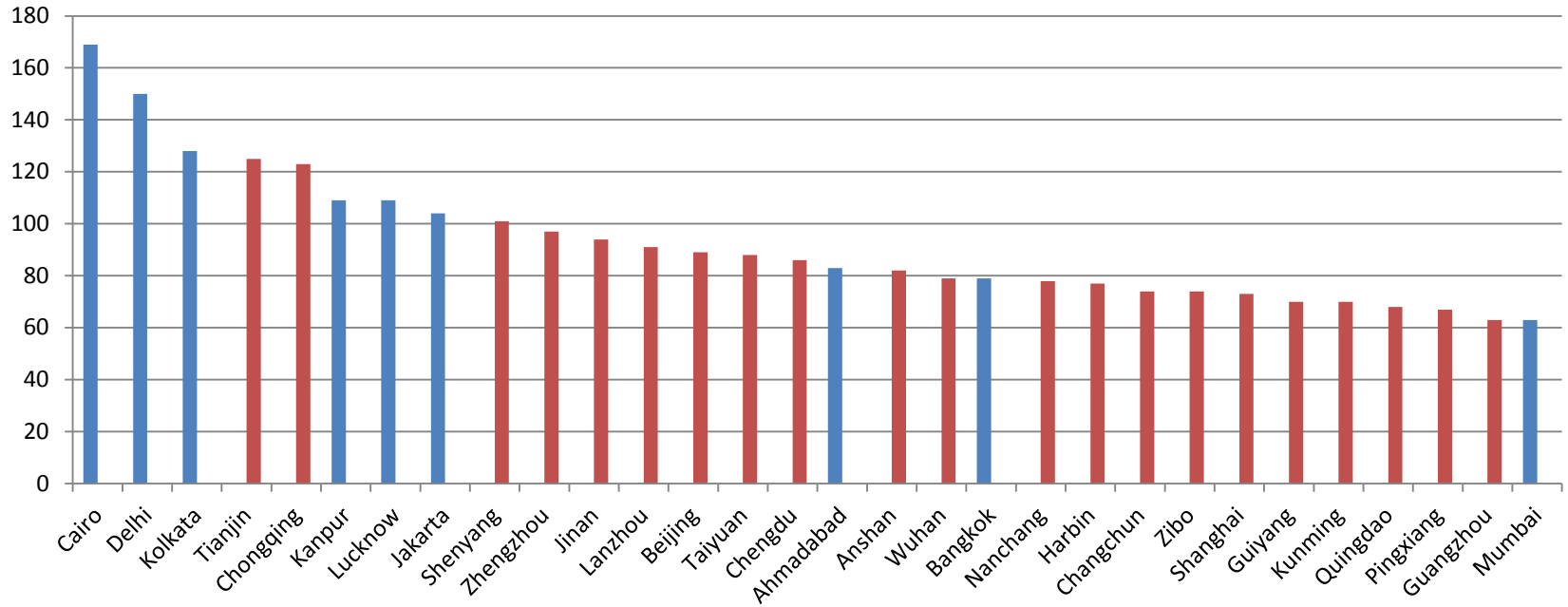
- Coal

- China
- Indonesia
- Australia
- South Africa
- Russia
- India
- Colombia
- US

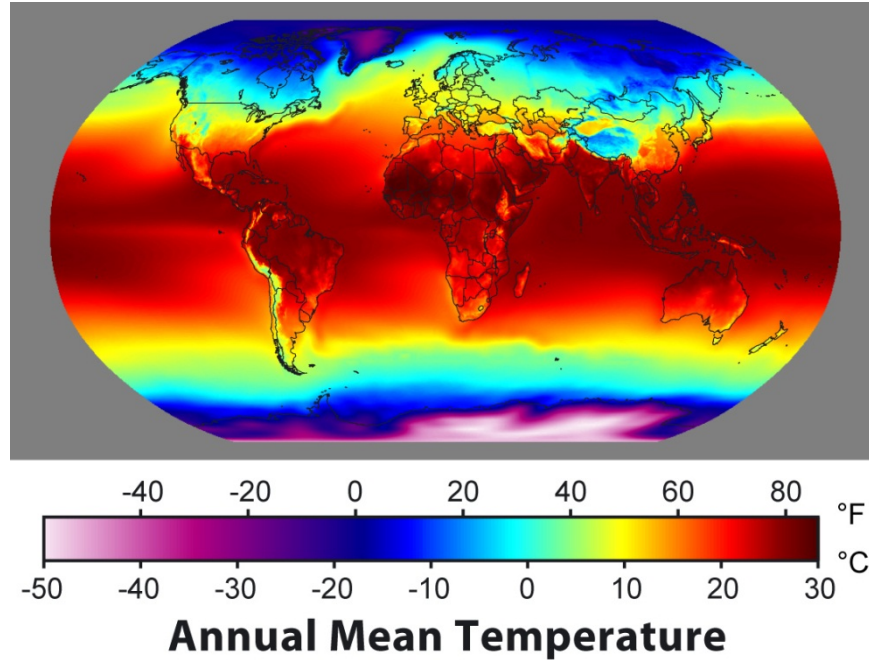
- LNG

- Australia
- Qatar
- Indonesia/Malaysia/Brunei (for now)
- Other Mid-East Gulf
- Russia
- West Africa
- Norway
- European reloads
- US?
- Canada?
- East Africa?

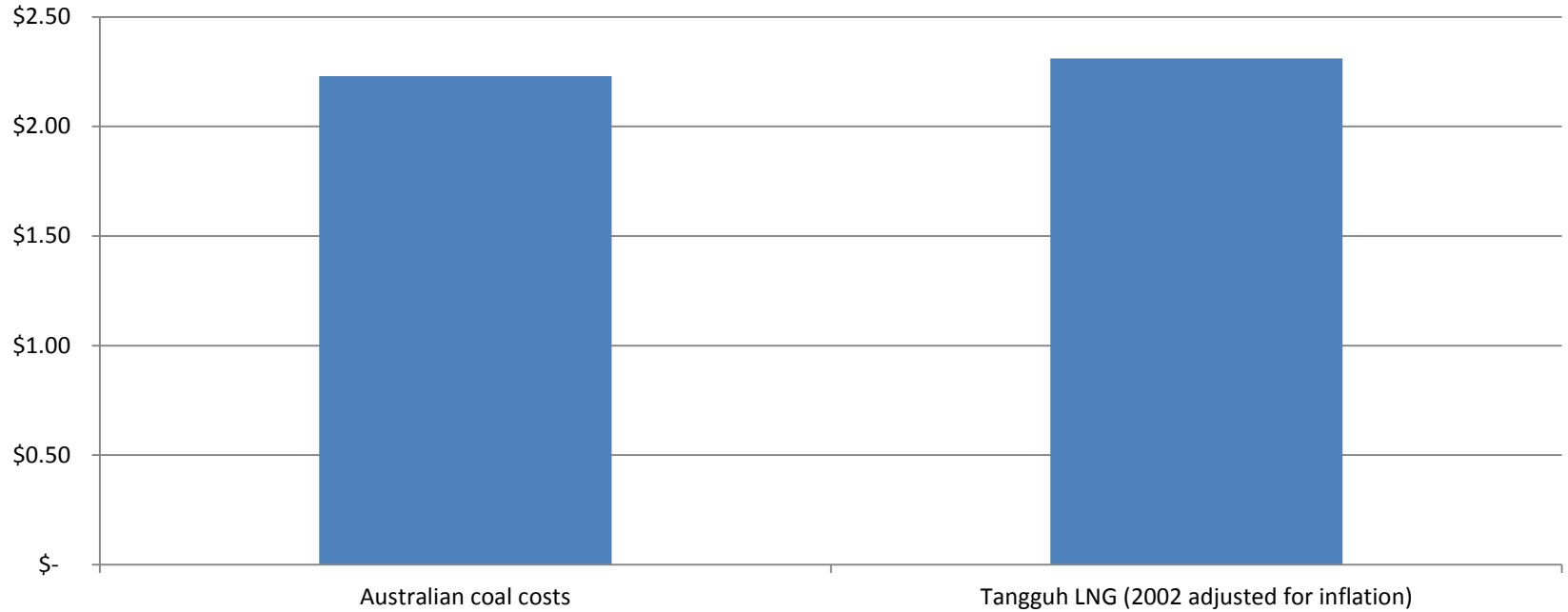
Environment



Environment



Price



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