

A satellite night view of Europe, showing the continent's outline and numerous city lights glowing against the dark background of the night sky. The lights are concentrated in major urban centers and along coastlines.

# ELECTRICITY PRICES IN THE UNITED KINGDOM: FUNDAMENTAL DRIVERS AND PROBABLE TRENDS

REF

RENEWABLE ENERGY FOUNDATION

22 May 2008

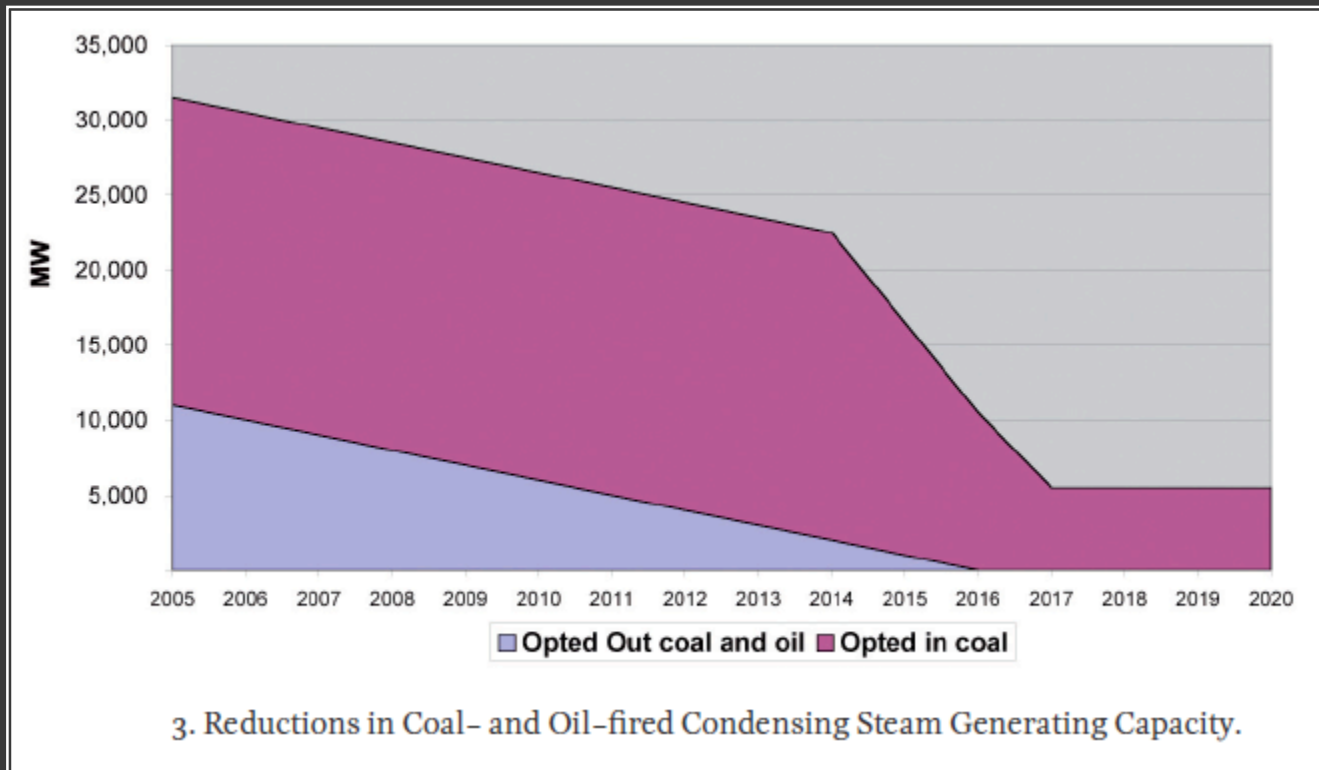
## About the Authors

- Renewable Energy Foundation is an independent charity
- Supported by private donation
- No corporate members or political affiliation
- [www.ref.org.uk](http://www.ref.org.uk)
- Incoteco is an energy consulting company
- Principal: Hugh Sharman
  - Prize-winning energy analyst
  - Institution of Civil Engineers, Telford Gold Medal (2006)
- [www.incoteco.com](http://www.incoteco.com)

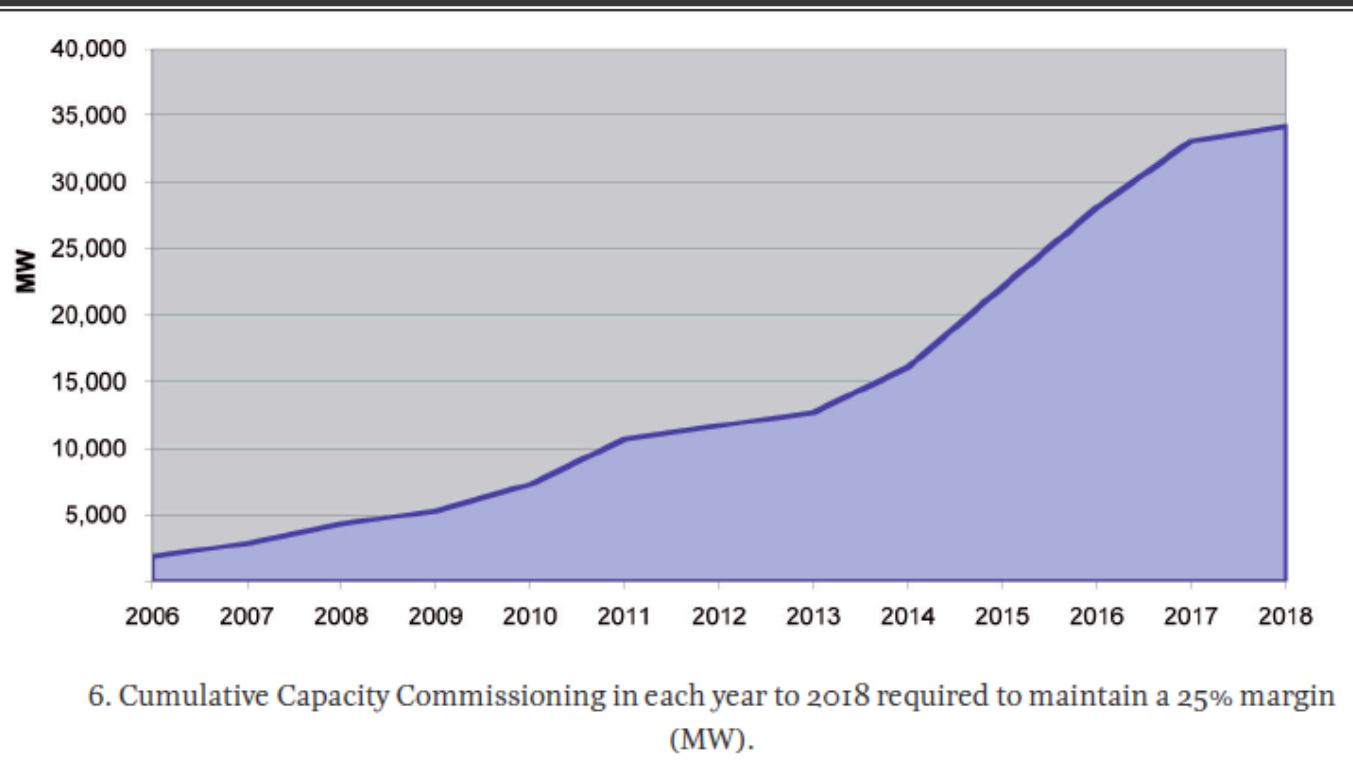
## Summary

- UK has underestimated generation capacity decline
  - Impact of Large Combustion Plant Directive ( $\text{SO}_2$ ,  $\text{NO}_x$ )
- UK has overestimated the contribution of renewables
  - Firm capacity (MWs), and energy (MWhs)
- Policy intervention has distorted the market, creating accidental gas dependency
- UK has been optimistic regarding competition for gas

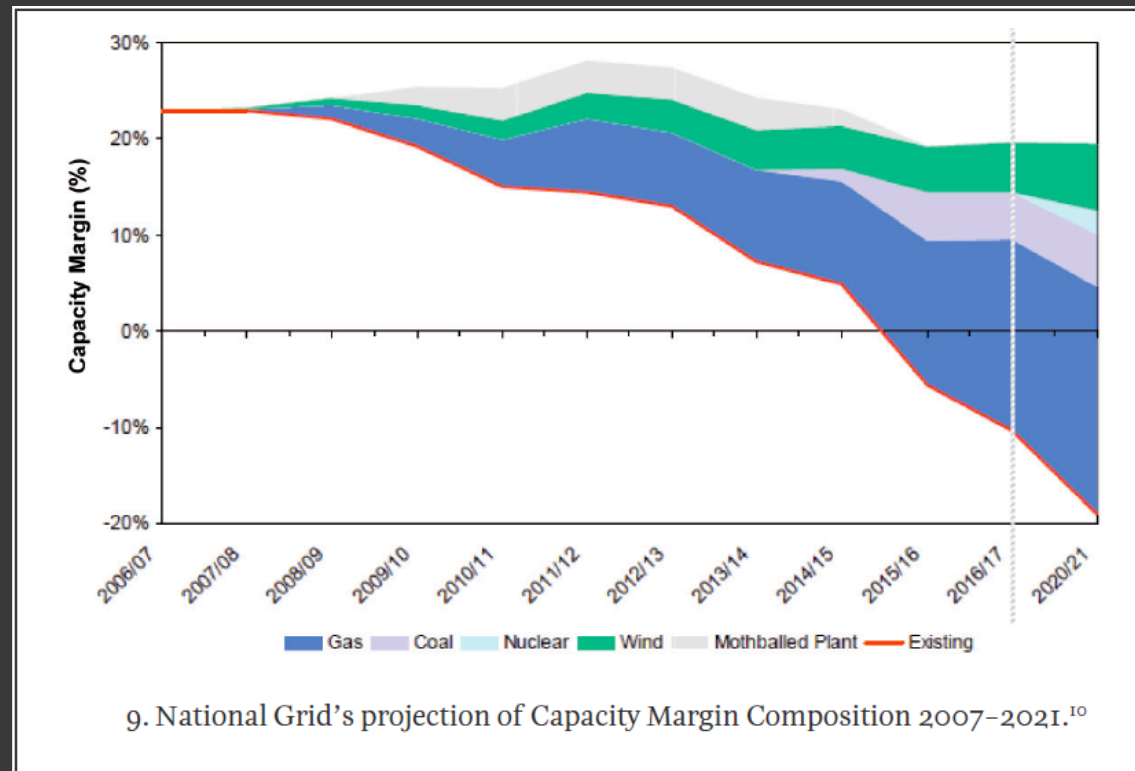
# Rate of Generation Capacity Decline



# Required Capacity Build Rate

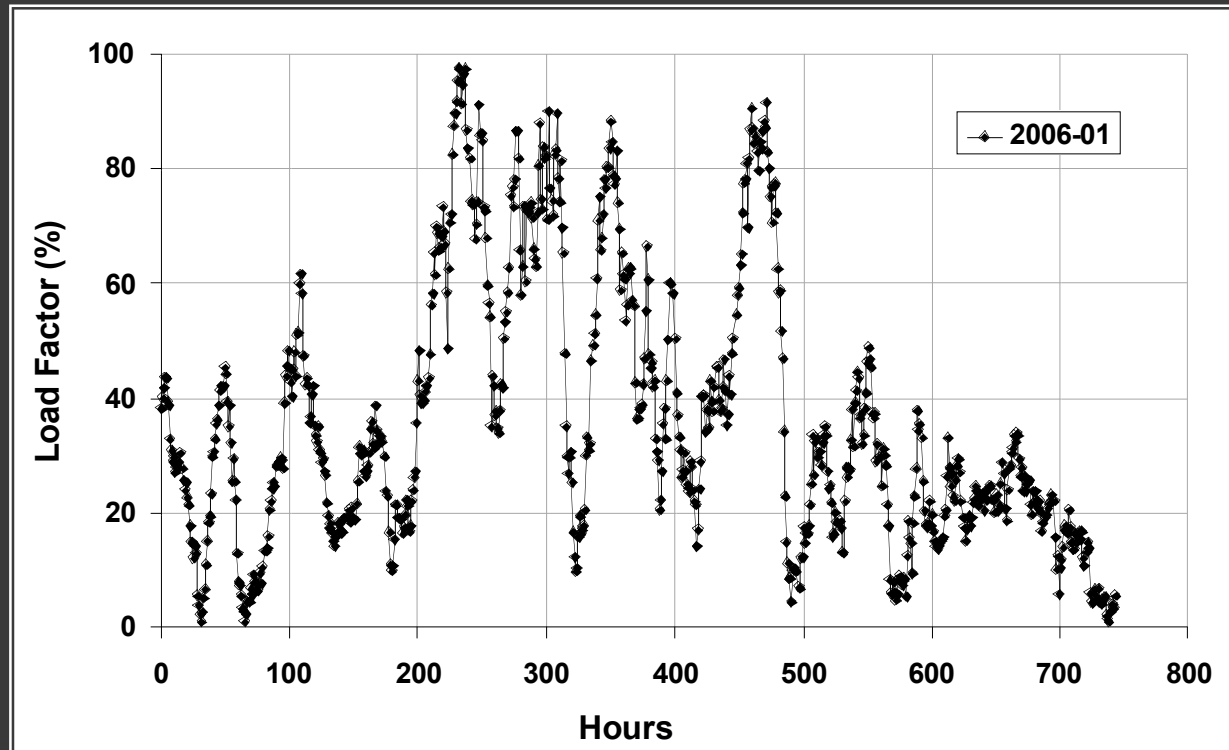


# Capacity Margin Decay



Source: National Grid (Simon Cocks), "The Connection Challenge", presentation to Institute of Economic Affairs conference, October 2007

# Capacity Contribution of Renewables



Modelled power flow from 25 GW of wind spread over the UK

Source Jim Oswald, Mike Raine, H. Ashraf-Ball, "Will British Weather Provide Reliable Electricity", *Energy Policy* (Forthcoming, 2008)

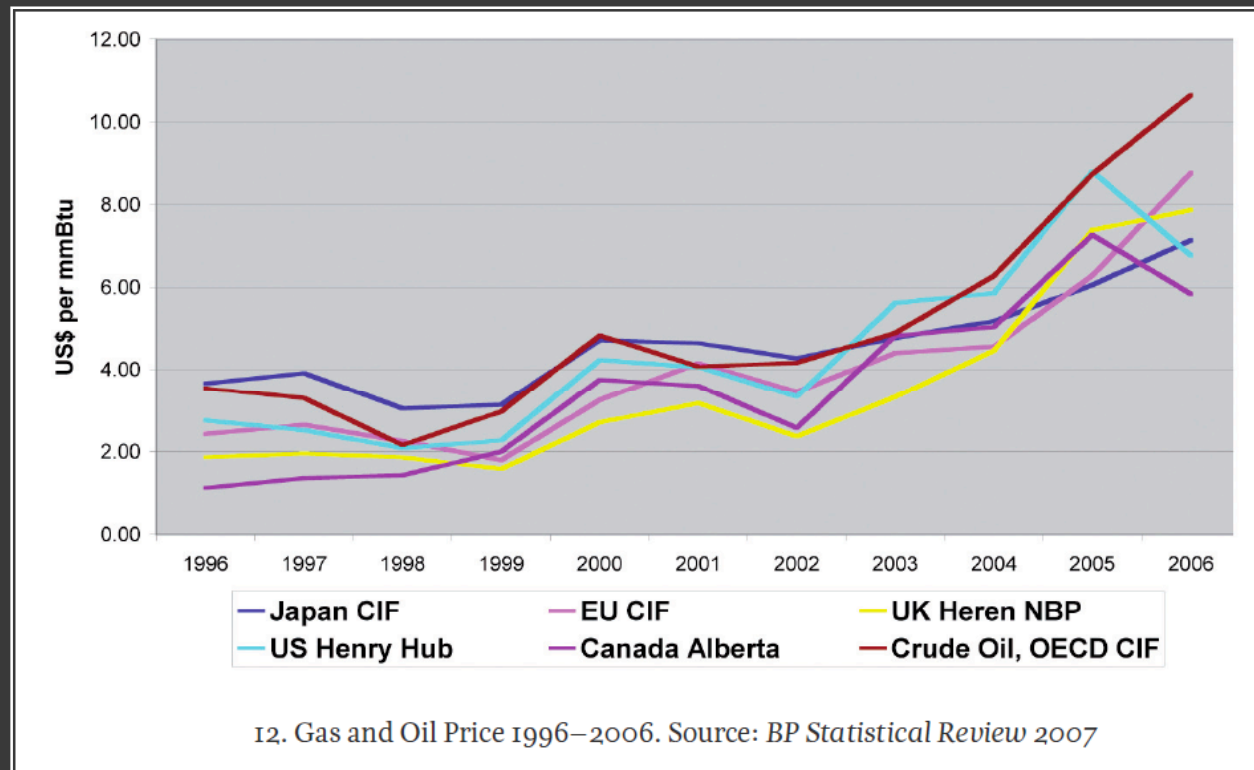


## Tight Capacity in 2010-2020

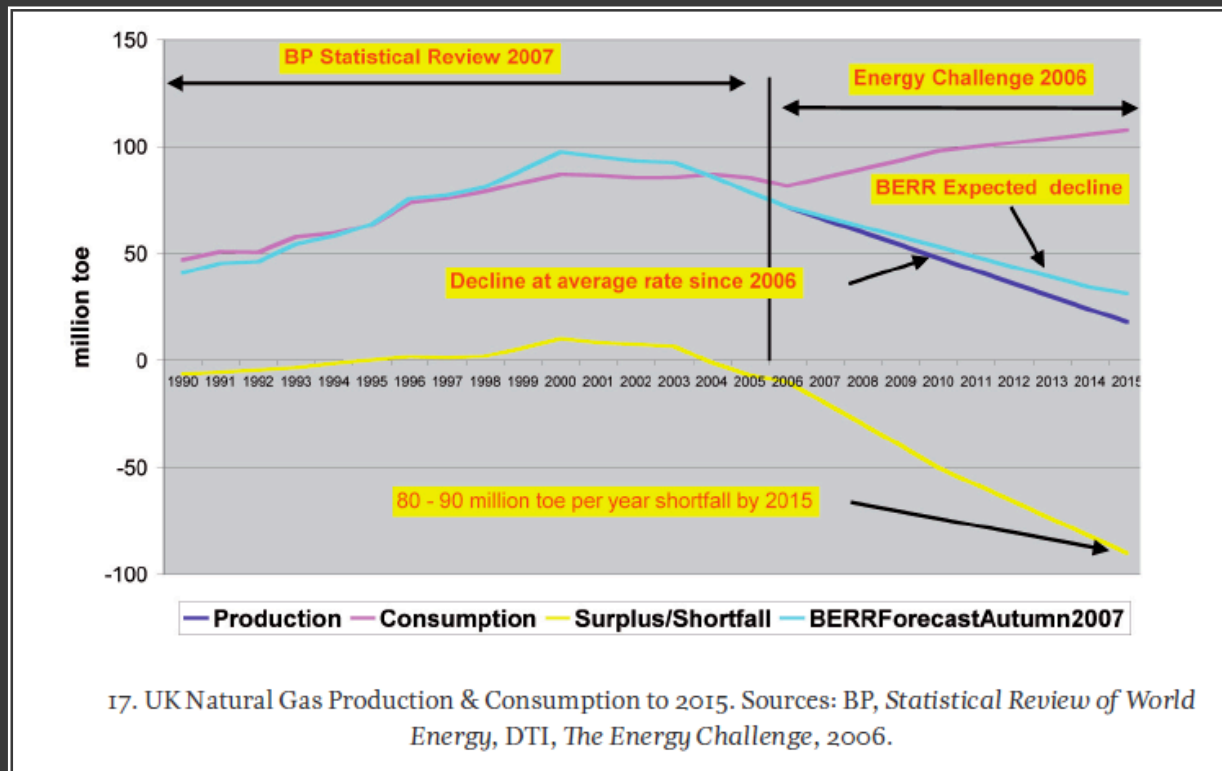
- Circa 30 GW under pressure to retire
  - EDF estimates 32 GW by 2015
  - E.ON UK estimates 26 GW by 2015
- Gas is the only likely new plant
  - Low capital cost, rapid flexibility
- Circa 20 GW of gas now in planning and pre-planning
- Is this level of gas dependency wise?



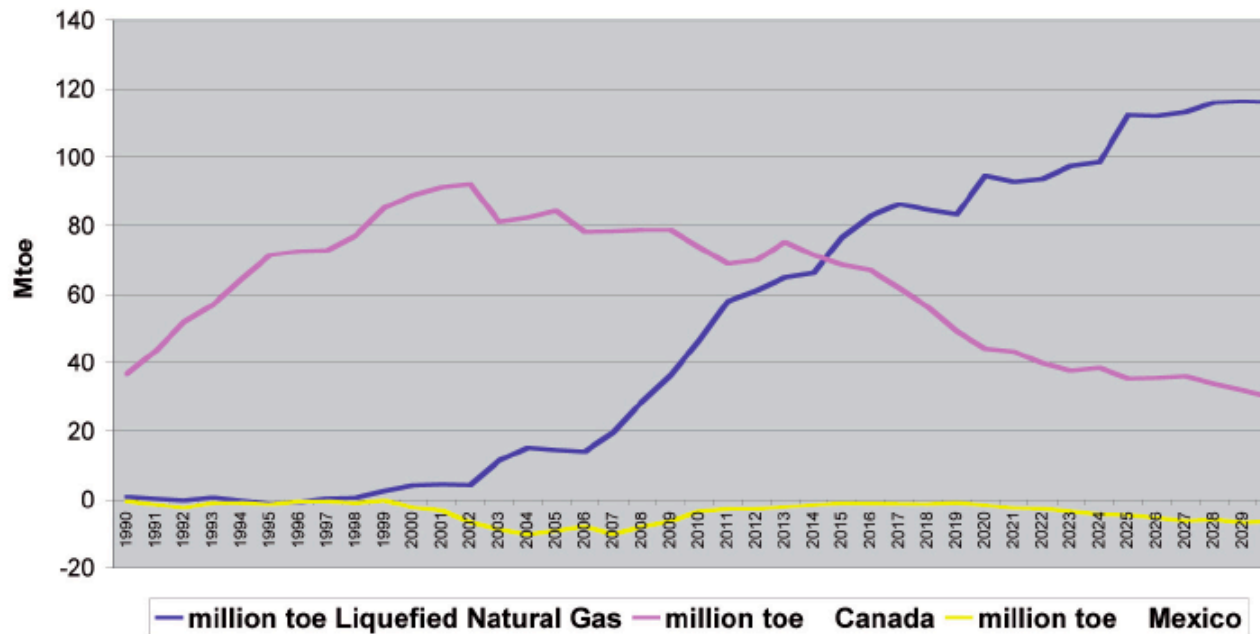
# Convergence of Oil and Gas Prices



# UK Natural Gas Production



# US Demand for LNG



18. US Natural Gas Imports, Mtoe. Source: EIA.

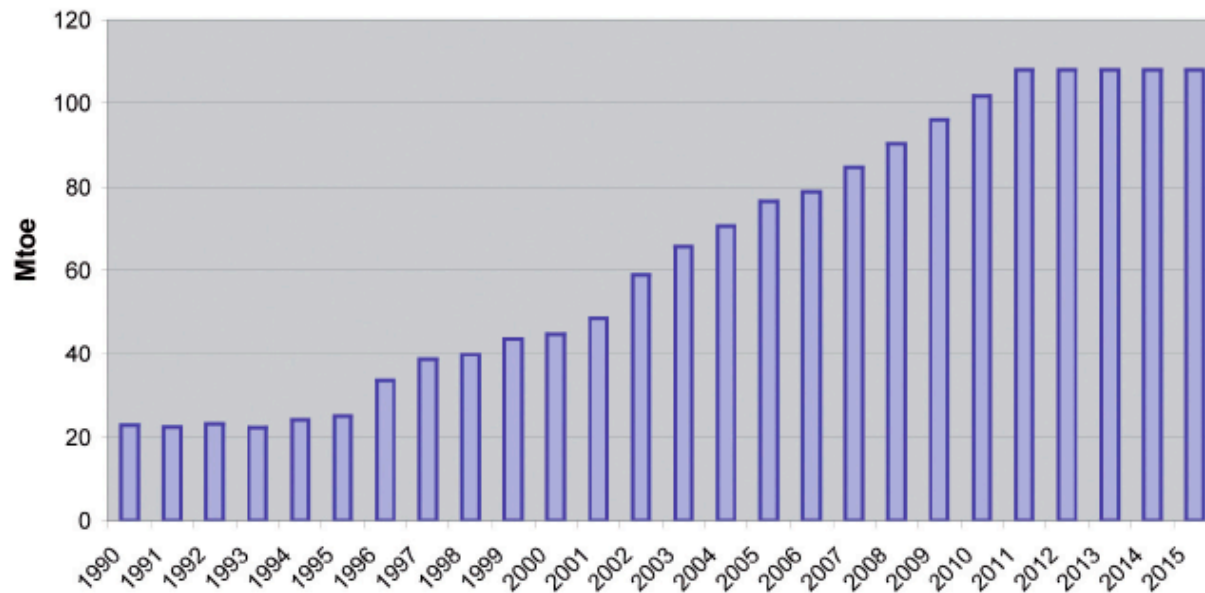
# International Competition for LNG

“I don’t see [the US] winning the battle with China and Japan on LNG”

Michael Morris, CEO, American Electric Power, April 2008

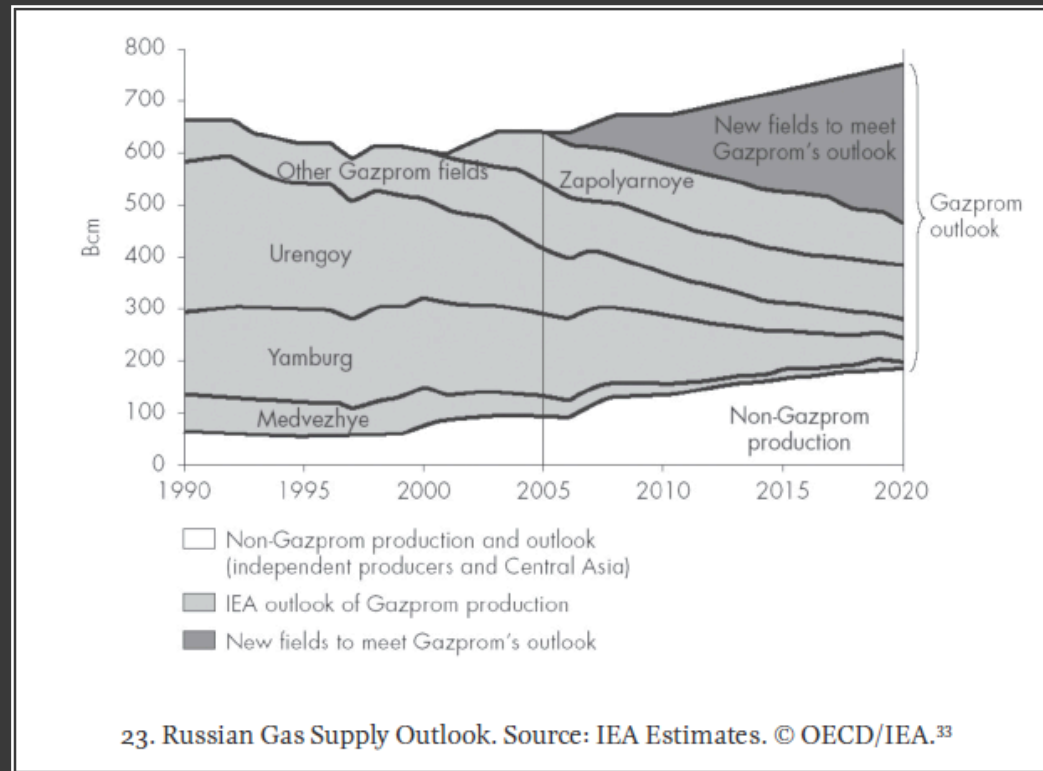
‘AEP’s Morris Warns of Possible Power Shortages’, *Power Engineering International* (1 May 2008).

# Norwegian Gas



19. Norwegian Gas Production, Mtoe. Sources: *BP Statistical Review (2007)*, and Norwegian Petroleum Directive, *Fakta 2007*.

# Russian Gas Production



## Russian Gas Consumption

“Energy must not be a barrier to our comfort. Our emerging middle class demands lots of energy and it is our job to ensure comfortable supply [...] We don’t plan to limit the use of fuel for our industries. We don’t think this would be right.”

- Vsevolod Gavrilov (Deputy Director, Ministry of Economic Development and Trade of Russia) April 2008.



## Conclusion

- Significant risk of price shock and interruption of supply
- *Force majeure* use of illegal coal plant probable ca. 2015
- Neither government nor any single market participant can grasp or address the problem
- Only the undistorted and collective action of the market is likely to produce an optimal response to the onset of crisis
- Even assuming excellent information and flawless market reasoning, a significant degree of risk will remain, therefore
- Government should prioritise social policy to mitigate hardship and maintain order