

**In Search of ‘Good’ Energy Policy:
why multi-disciplinary approaches to
to Energy and Climate problems are so important**

Michael Pollitt

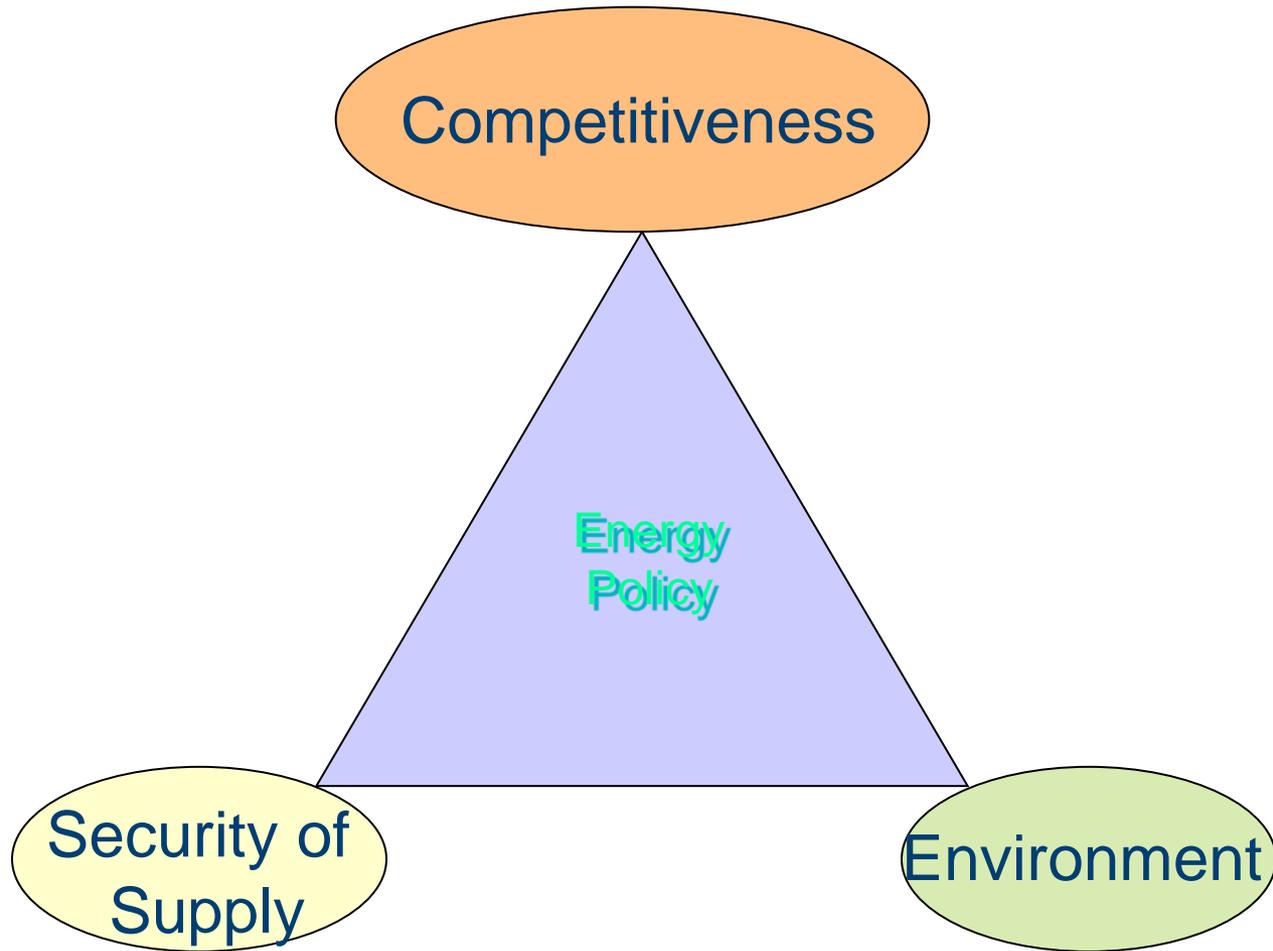
*Professor of Business Economics
Judge Business School,
University of Cambridge*

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Plan

- With thanks to the In Search of ‘Good’ Energy Policy initiative at Cambridge which brings together 20 scholars from 12 faculties:
<http://www.energy.cam.ac.uk/good-energy-policy/good-energy-policy-video-media>
- Why is ‘Good’ Energy Policy so difficult?
- Technology, Technologists and Energy
- A Multi-disciplinary approach
- Themes for ‘Good’ Energy Policy
- An example

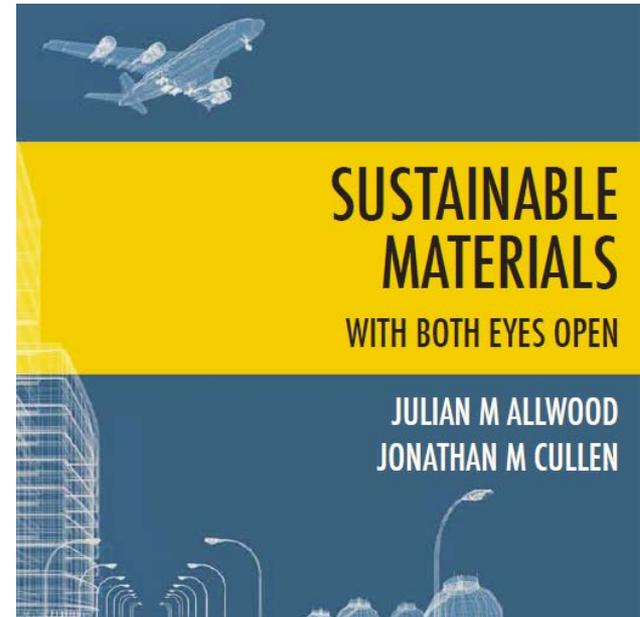
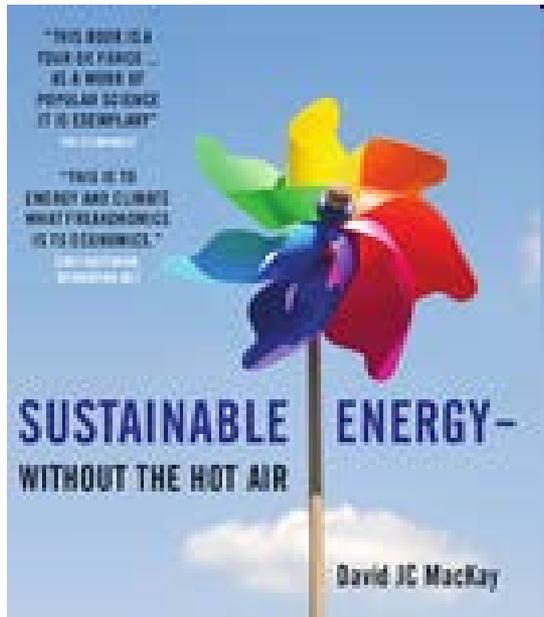
The Energy Policy 'Trilemma'



In Search of 'Good' Energy Policy

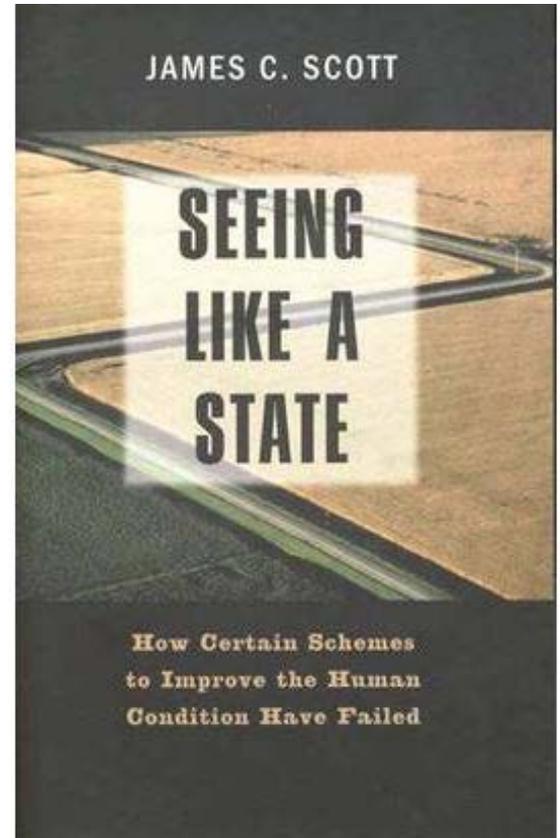
- Affordable, clean, efficient and secure provision of electricity, heating and transport fuel difficult to reconcile.
- Many developing countries have clearly disastrous policies with expensive, dirty, inefficient and insecure energy.
- Many developed countries just have 'mess' of policies (f.Rhodes, 1988).
- Difficult to move from current reality to the clearly better, especially given trade-offs with non-energy policies.

The technological view: The 'right' technology can 'save' us

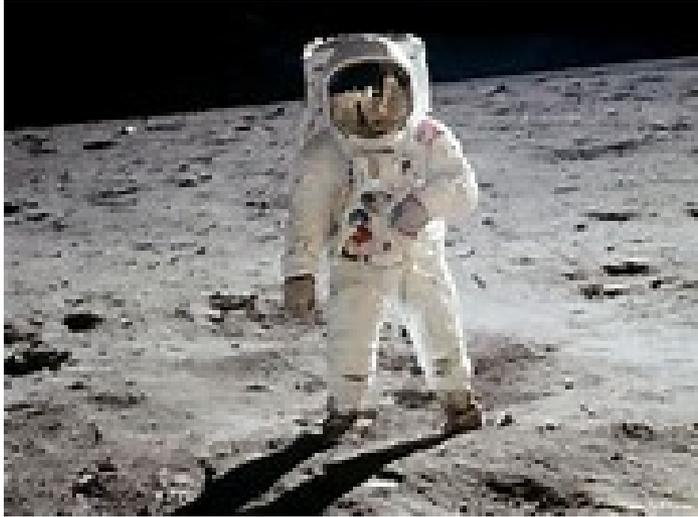


What technologists often forget...

1. Opportunity costs of energy in terms of education, healthcare...
2. Initial distributions of wealth, income, tax revenues, jobs etc. matter...
3. Not everyone is as keen to engage with energy technology as they are...
4. The history of optimism bias and hubris in delivery...
5. Policy development is a process, which has been extensively studied by other disciplines, and they are one lobby group within that process! (As are economists!)

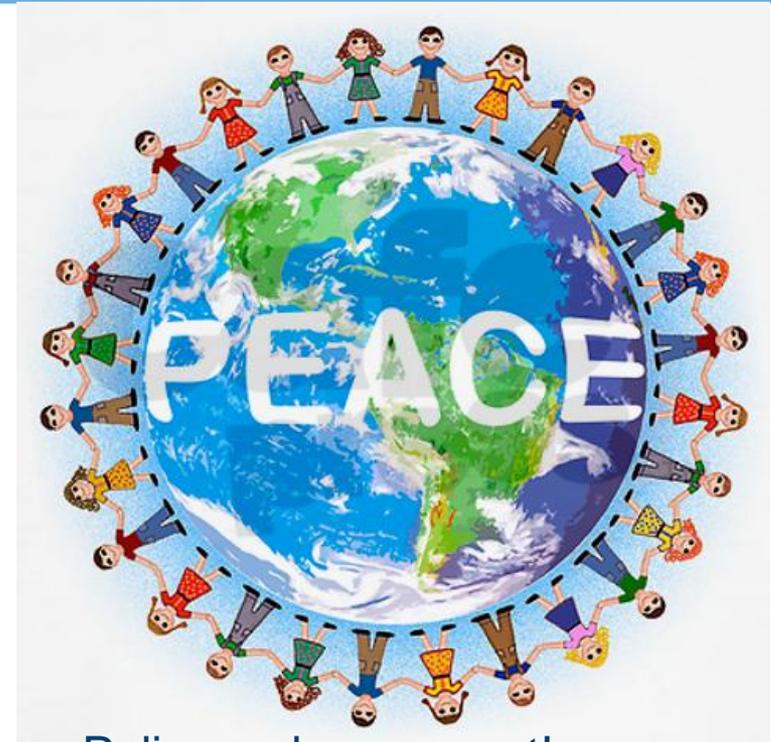


...not just about technology...



Scientists and Engineers can do anything!

[Cost of Apollo Programme from 1961-72 = \$170bn (2005), to put 12 men on the moon]



Policy makers cannot!

Excess Defence expenditure in UK,
c.1% of GDP p.a.

Example of Multi-disciplinary approach: UK Clean Air Act 1956

See Chaplin et al. (2016)



Illustration of community action before Clean Air Act titled, 'We Want Clean Air protest banner at Paddington: 1956,' courtesy of the Museum of London/Grant

Enacted the world's first national policy to clean up coal use in cities.

A multi-disciplinary perspective on policy:

- *Politics* and windows of opportunity for action
- *Economics* and the proper valuation of the pollution externality
- *Philosophy* and energy justice, emotions and the non-neutrality of expert advice
- *Public Theology* and the need for resource stewardship and sustainable living
- *History* and the importance of 'the long view' of energy transitions

Starting points matter: What is 'good' and 'just'?



'The Good Life' in the UK in the 1970s



Oil spill in Niger Delta

Starting points matter: Legacy investments

Anti-Fracking protests



Support for miners strike



SIEMENS

ABB



British Gas
Looking after your world

e.on

npower



SCOTTISHPOWER
The Energy People

Starting points matter: Failure of Prediction (Experts get it wrong!)

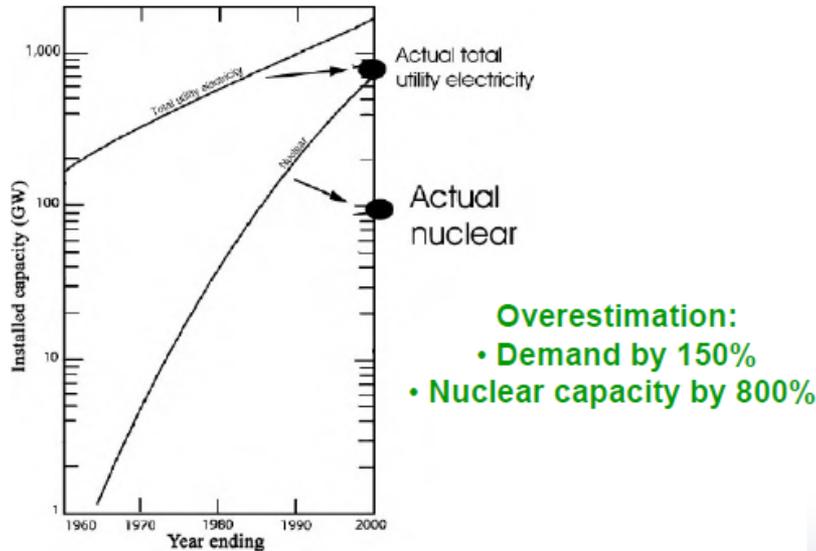
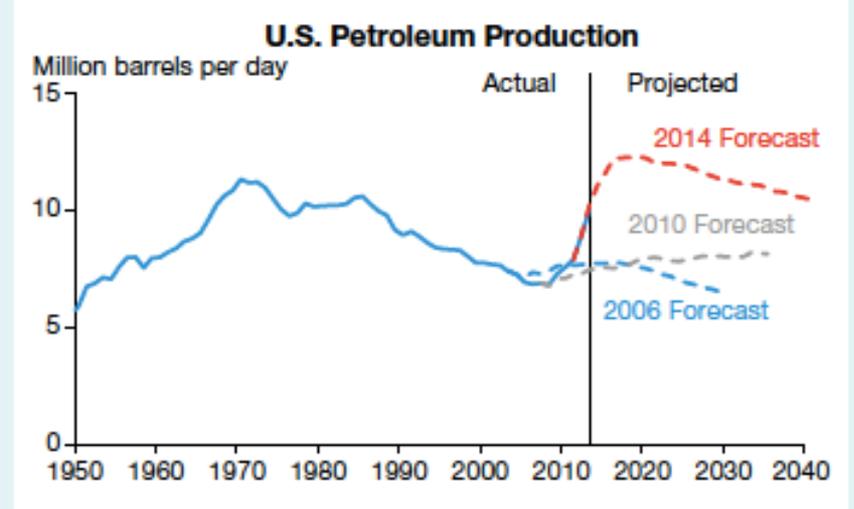


Figure 3 An Atomic Energy Commission forecast from 1962, designed to show demand for nuclear power plants. The curve of interest here shows electricity demand. The authors judgmentally assumed a growing nuclear market share. Actual electricity and nuclear electricity in 2000 is indicated (10).

Source: P.P. Craig, A. Gadgil, and J.G. Koomey, "What Can History Teach Us? A Retrospective Examination of Long-Term Energy Forecasts for the United States," *Annual Review of Energy and the Environment*, 27: 83-118



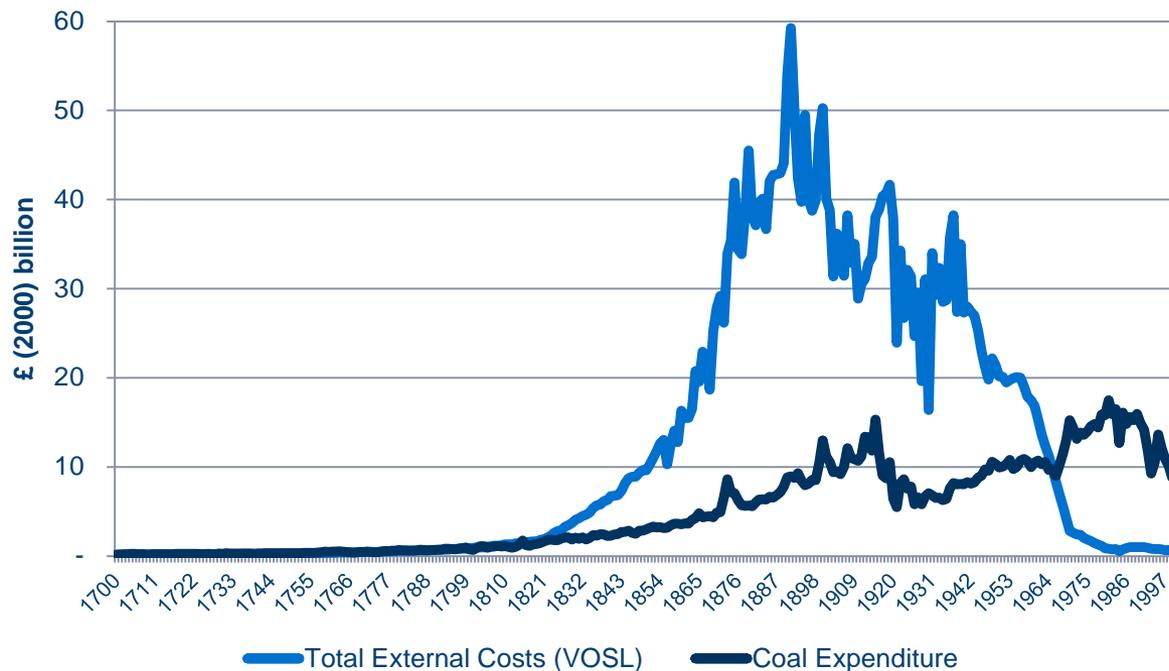
Source: EOP (2014)



Floating nuclear power plant

Source: International Risk Governance Council (2015), *CONCEPT NOTE ASSESSMENT OF FUTURE ENERGY DEMAND*
 A methodological review providing guidance to developers and users of energy models and scenarios, Lausanne: IRGC, p.15.

Starting points matter: Persistence of 'bad' policies



VOSL = Value of Statistical Life

(Peak (VOLY): 17.3% of GDP in 1891; VOLY = Value of Life Year)

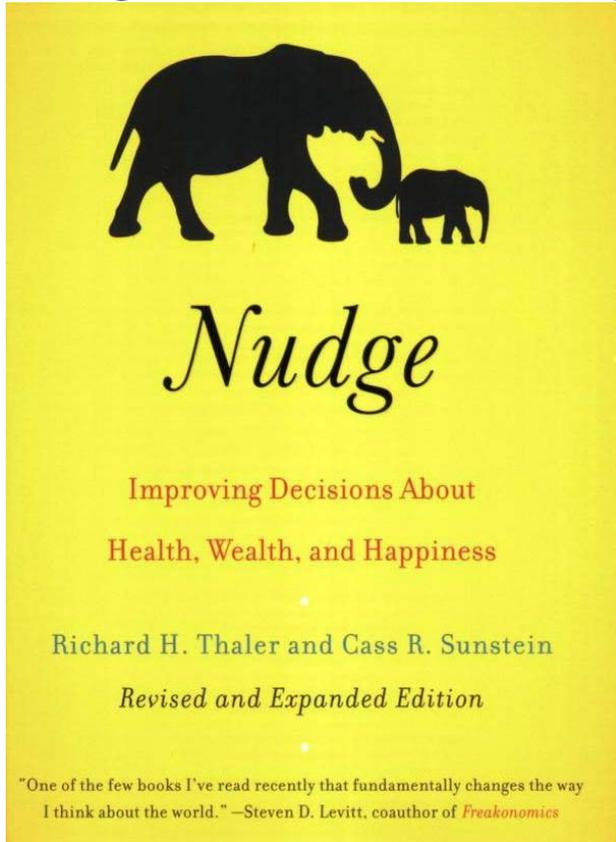
Source: Fouquet, 2011, *Ecological Economics*, p.2385. <http://dx.doi.org/10.1016/j.ecolecon.2011.07.020>

Starting points matter: Public consultation *is* messy



What we need to think about: Perception

- Theory of planned behaviour, nudge and mindset change

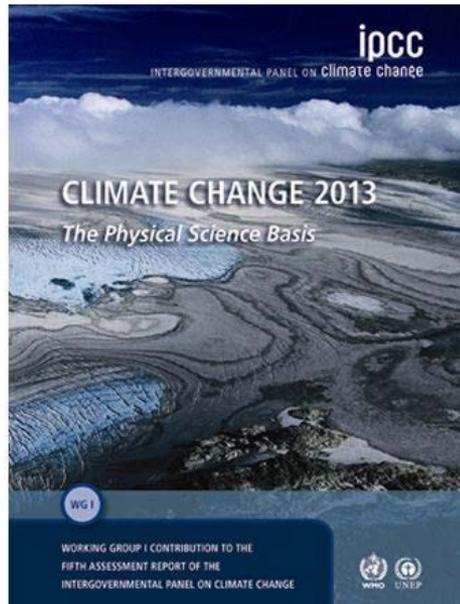


- Perception of the problem and object



What we need to think about: Quantification and use of scientific argument...

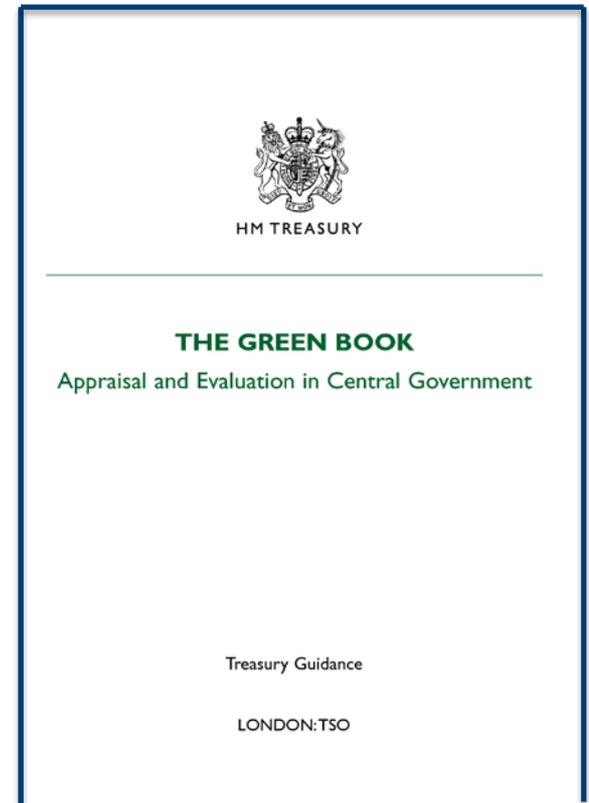
- Demand for quantitative evidence and prediction
- Allocation of burden of proof to whom?
- Role of scientists and 'scientific' argument
- Why can't public just be more sensible / better educated about science?



Sir David King: "*Climate change is not....the biggest challenge of our time, it's the biggest challenge of all time*" 29 April 2014

What we need to think about: Well-being

- Quality of life and energy
- Rational choice, risk and fairness and the future of energy policy
- Is there a quantitative basis for assessing well being? (e.g. government assessment tools)



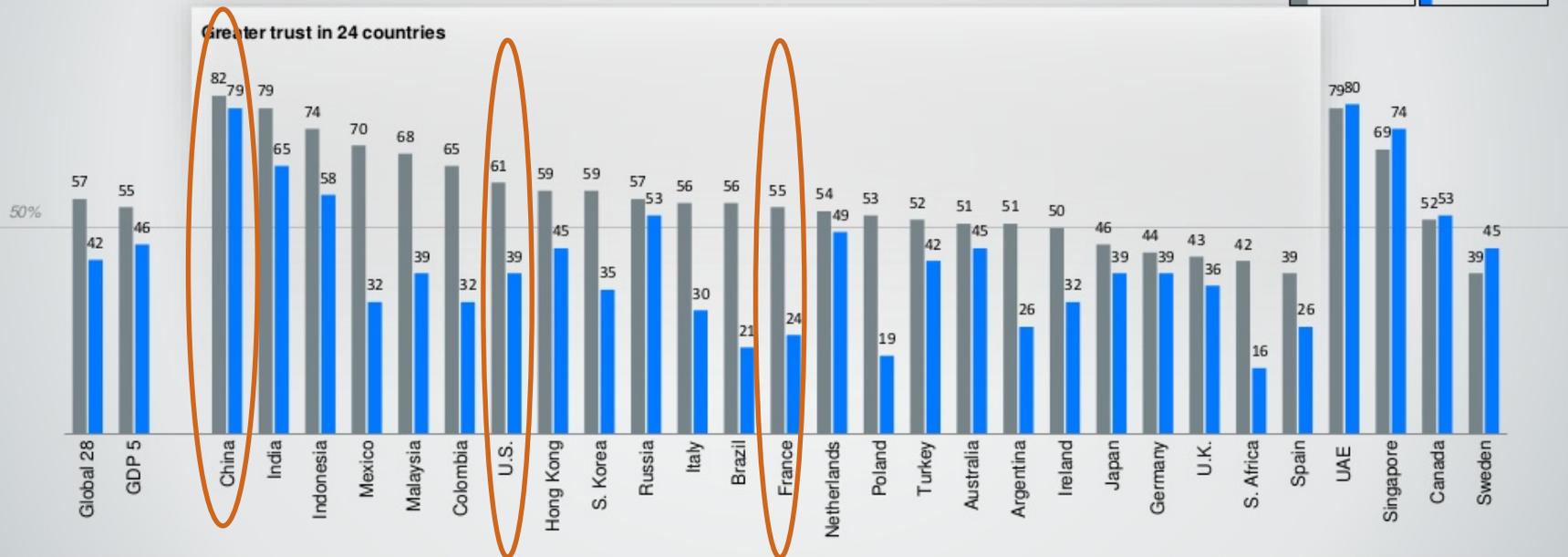
What we need to think about: Public Trust in Energy Stakeholders

Energy More Trusted Than Government

Percent trust in energy vs. trust in government, 2016, ranked by trust in energy

▲ General Population

Energy Government



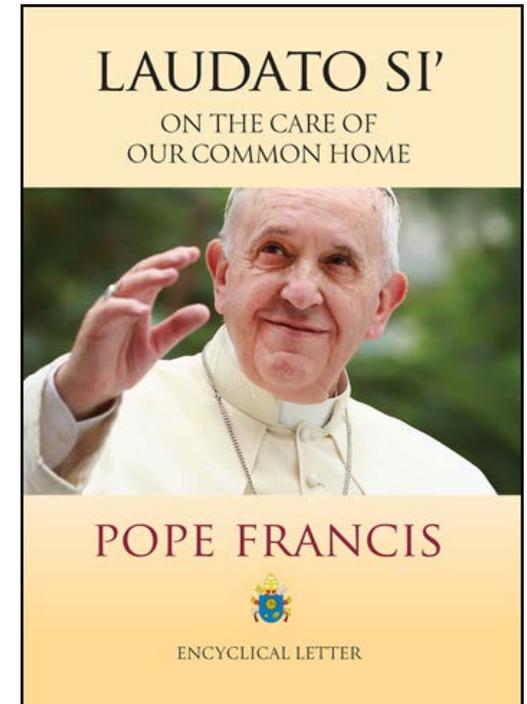
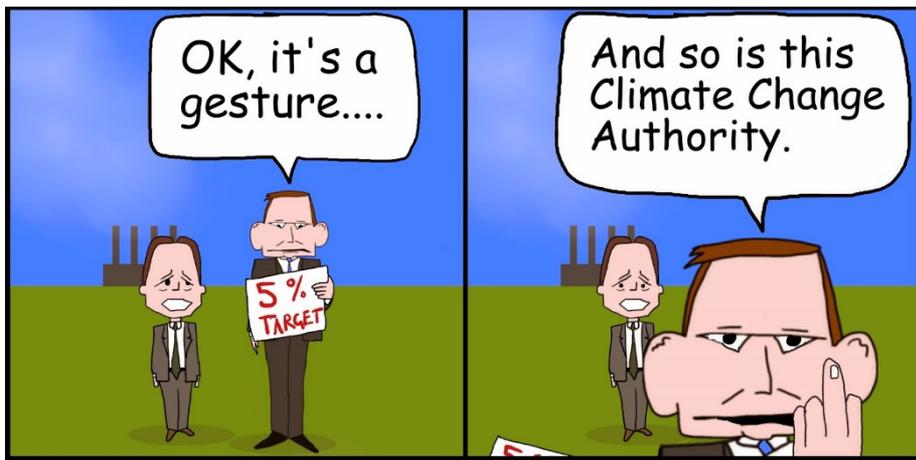
Source: 2016 Edelman Trust Barometer Q11-14. [GOVERNMENT IN GENERAL] Below is a list of institutions. For each one, please indicate how much you trust that institution to do what is right using a nine-point scale where one means that you "do not trust them at all" and nine means that you "trust them a great deal." (Top 4 Box, Trust) Q45-429. Please indicate how much you trust businesses in each of the following industries to do what is right. Again, please use the same 9-point scale where one means that you "do not trust them at all" and nine means that you "trust them a great deal". (Top 4 Box, Trust) General Population, 28-country global total.

GDP 5 = U.S., China, Japan, Germany, U.K.

Source: <http://www.edelman.com/insights/intellectual-property/2016-edelman-trust-barometer/turbulent-times-call-for-new-strategies-in-building-trust/>, p.29

What we need to think about: The Role of the State

- Personal responsibility vs centralised policy
- Stewardship and public theology and role of beliefs and culture
- Appropriate level of governance and process
- Necessary policy incoherence and a restrained role?



What we need to think about: Competence and hubris in delivery

- Long term commitment to building / exploiting competence is important
- Competence in delivery required for success
- Desire to work on big, exciting projects and over-promise

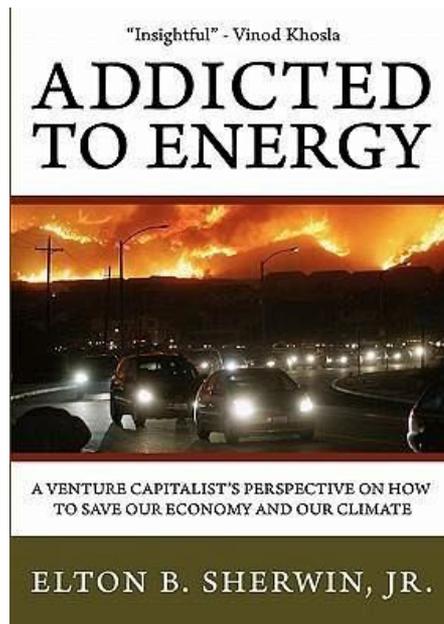


Flamanville 3 – France
Est. 6 years late; Cost E10.5bn vs E3.3bn

Okiluoto 3 – Finland
Est. 8 years late; Cost E8.5bn+ vs E3bn

What we need to think about: Parallels to other 'messy' policy areas

- Parallel between energy and sugar/fat consumption
- Similarly messy policy area
- Good policies can be found, e.g. right to second opinion in Netherlands



Policy application: Clean Air in China



Air pollution in Beijing

Themes:

- Perception
- Quantification
- Well-being
- Public Trust
- Role of the State
- Competence
- Parallels with other policies

Concluding thoughts on good policy

- *Examples of good policy in UK:*
 - Successive raising of pension age
 - Improvement in primary school performance
 - Drink driving campaign and Smoking bans
 - Inheritance taxes in C19th
 - Etc...
- *Common characteristics of good policy:*
 - Good use of quantitative evidence
 - High engagement and positive public support
 - Fairness and distributional issues addressed
 - Takes time...
 - Etc...

Key readings

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