Two possible climate futures: Low carbon race and Mexican stand-off.

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Demarcations and a caveat

- Climate policy has several inputs
  - Climate science, which frames but can never specify policy
  - Technical policy tools (estimates of social costs of climate change)
  - Ethical and normative reasoning, which bound policy options

- Reasonable minds may disagree in all these spheres, and legitimate and defensible reframings within these areas change the way the problem looks

Transformational change

- This is what ~100 years of economic development can look like

- The series of biases, heuristics and other bits of fallibility that afflict climate prediction also distort predictions of social systems and technology

Pluralism

- Range of lenses through which people view climate change (e.g. Hulme)
  - Technological problem
  - “Mother of all public goods problems”
  - Problem of international justice
  - Problem of consumerism
- Pushing exclusively on any one of these framings will speak to a limited constituency
- As John Thwaites said this morning – we need greater levels of bipartisanship to get sustainable climate policies

- A “deficit model” here is of limited value

What's special about climate change?

- The evidence (eg IPCC 2007, Stern review, IAMs) suggests it isn't an existential threat such as asteroid strike or total war
- It isn't an urgent threat like a bomb on a bus or the Cuban missile crisis
- It's a long, slow, relentless burn

- The real problem is that it's difficult to see how anyone has the incentives to reduce emissions
- The strategic dimensions of climate change are the really distinctive parts of the problem

Strategy and climate change with three agent models: The low carbon race and the Mexican stand-off

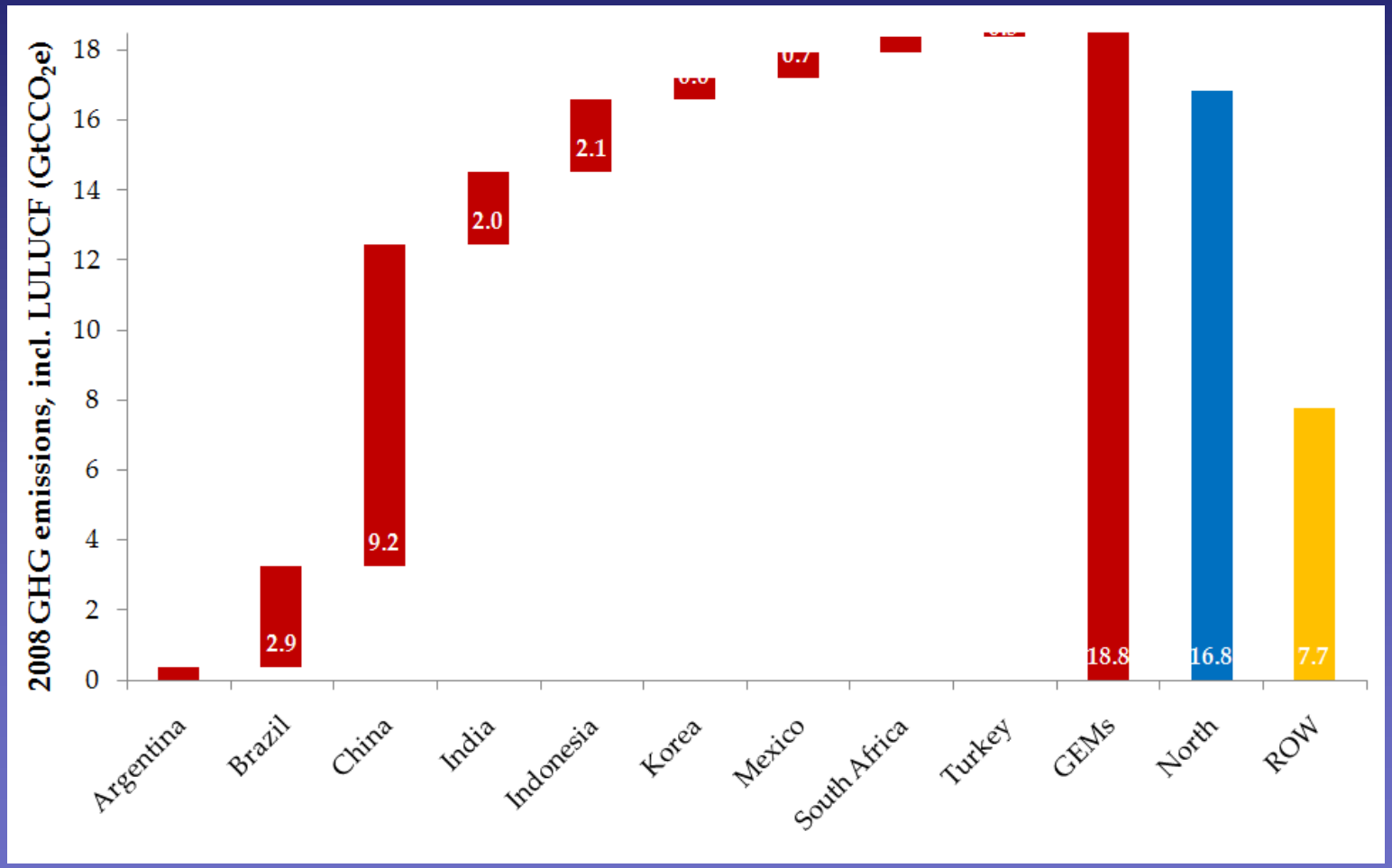
- Two agent models (rich vs poor, Annex vs non-Annex, North vs South) have predominated in highly aggregated models of climate change
- We explore three agent models and show how they can bring out important dimensions that are masked in two agent models
- Which could carry a range of implications for climate policy

Based on D. Frame and C. Hepburn "Equity and climate change: the Mexican stand-off and the low-carbon race" prepared for Symposium in Honor of Thomas Schelling, Sustainable Consumption Institute, University of Manchester, October 2010

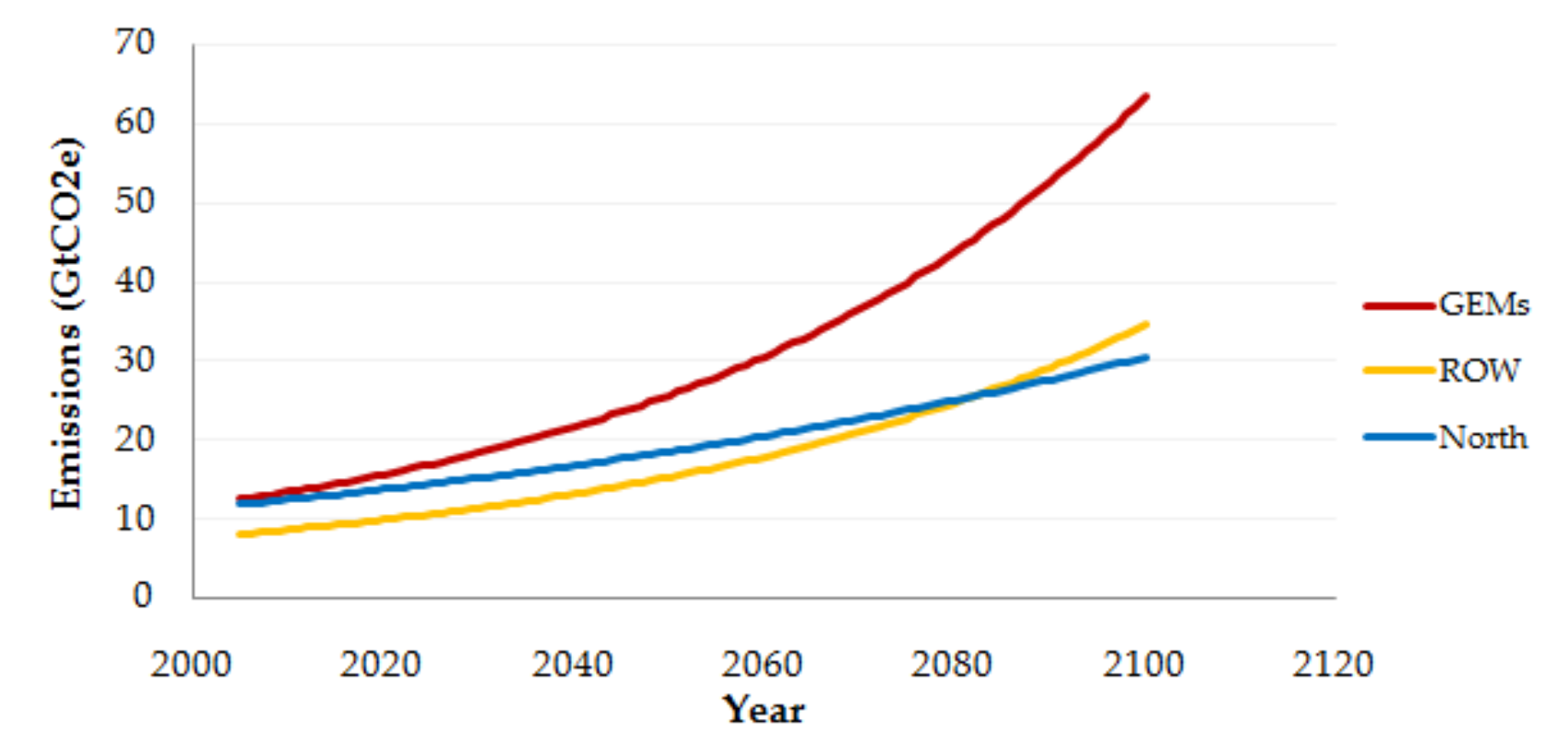
Ethical analysis requires care with aggregation

- Ethical and/or optimal responses to climate can depend on aggregation
  - e.g. Utilitarianism is clearly "too demanding" at the individual level, more plausible at the level of the hypothetical global planner
  - e.g, Agent-relative ethics clearly suitable at the individual level, highly dubious for use by judges or heads of state in their official capacity where impartiality is called for
- The "representative agent" model is clearly an extreme level of aggregation which can be more misleading than helpful
- The "two agent" model of Annex I and non-Annex I still pervades the academic literature and the international negotiations
- While also flawed, a "three agent" model may be more suitable for some aspects of climate change:
  1. North
  2. GEMs (G20 Emerging Markets)
  3. ROW

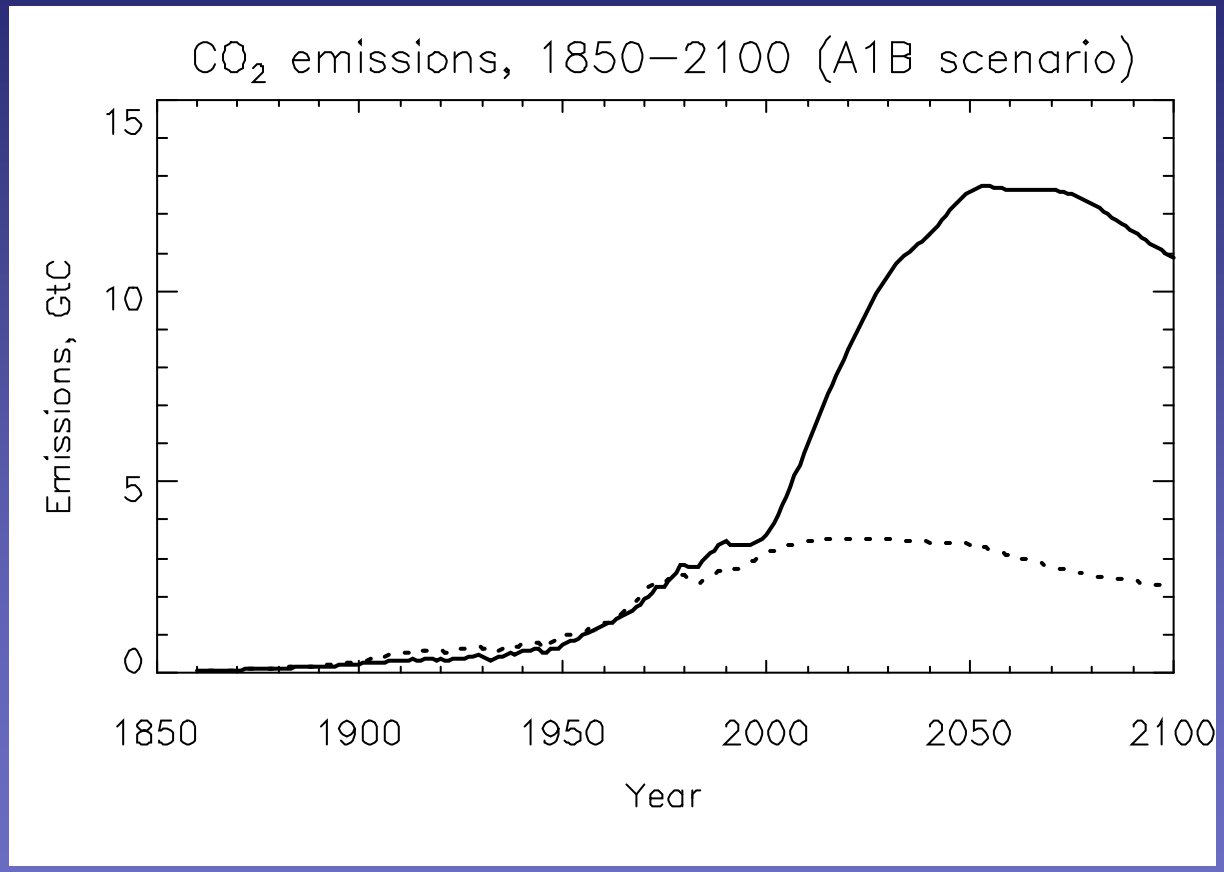
GEMs already emit more GHGs than the North, and China emits more than the USA



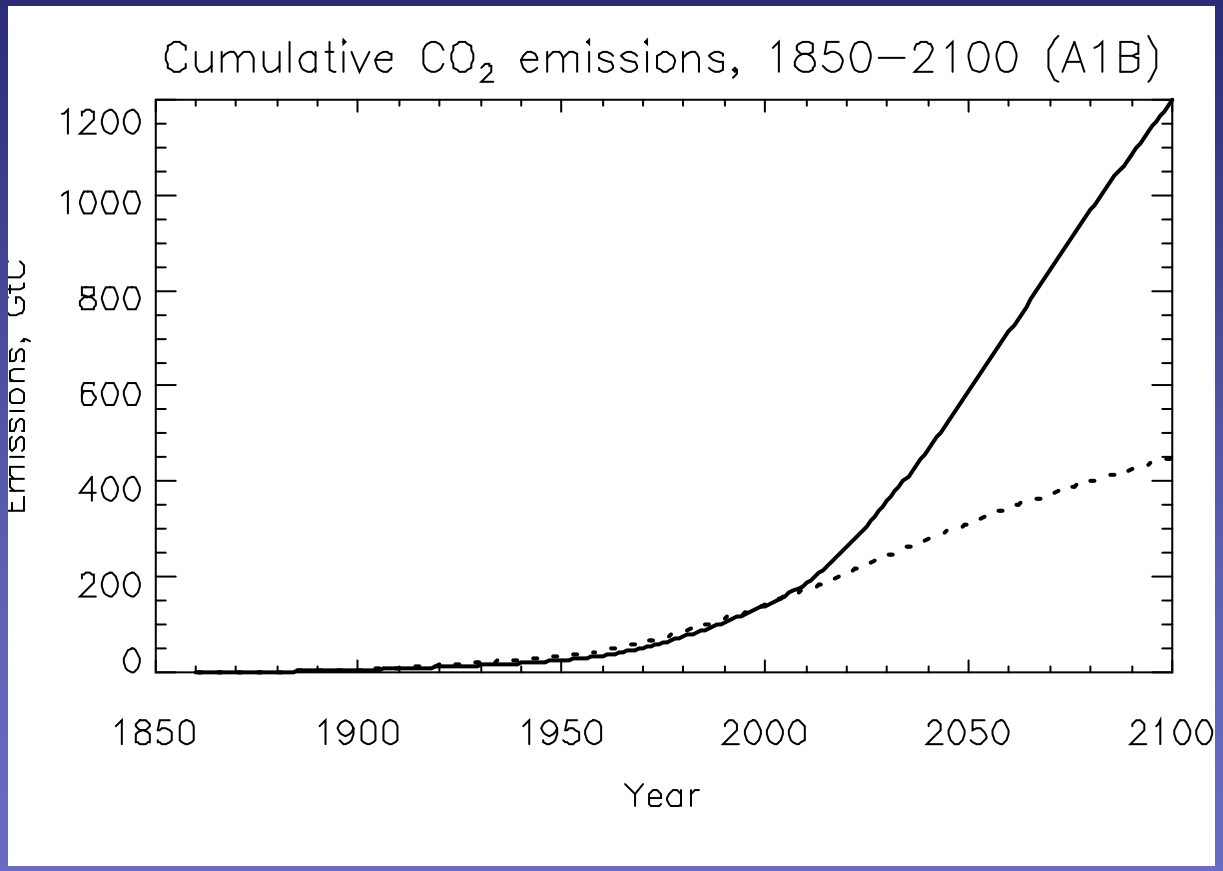
And GEM emissions are projected to increase their emissions six-fold to 2100



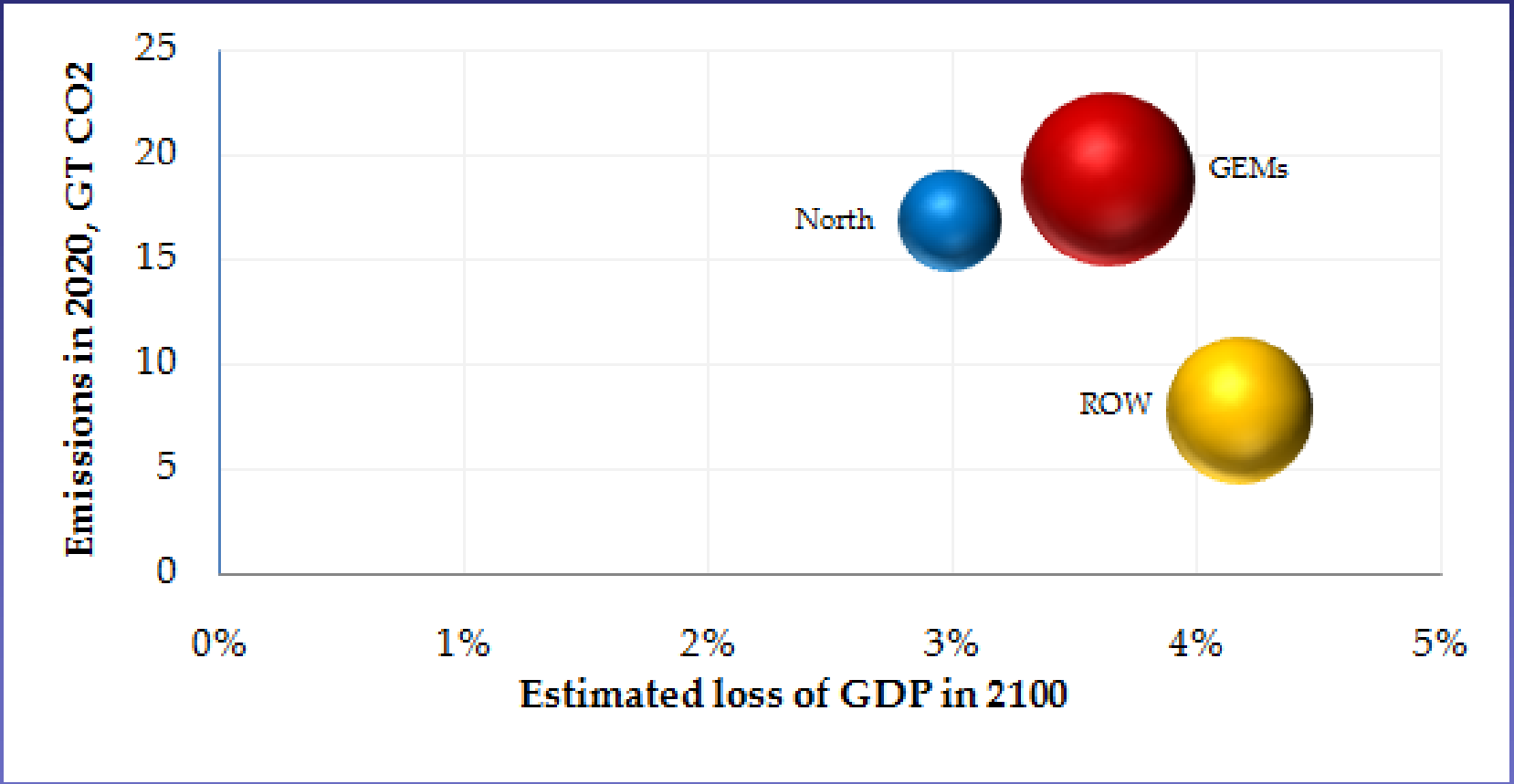
Emissions partitioned into OECD/non-OECD



Cumulative emissions partitioned



GEMs have more to lose, and greater control over the global emissions pathway, than the North



Note: Bubble size proportional to 2008 population

Three illustrative scenarios

- **No deal:** business-as-usual, fossil driven growth roughly following an A1FI scenario
- **North leads:** North takes action to cut emissions by 80% by 2050
- **North and GEM joint action:** In addition to North action, GEMs stabilise emissions at 2005 levels by 2050, and slow the rate of deforestation by 50%

Stabilising emissions in the GEMs does considerably more than an 80% reduction by the North

Variable	*No deal*	*North leads*	*North and GEMs joint action*
Average global temperature increase in 2100 (on 1990 levels), °C	4.6	3.9	2.7
Atmospheric concentrations of CO_2, parts per million	905	730	550
Sea level rise in 2100, cm above 1990 levels	48	41	32
Economic damages in 2100, % of GDP in GEMs:	3.0	2.3	1.5

Using MAGICC model, best guess parameters, analysis done at LSE

We should also disaggregate “the poor”, and three groups have significantly different interests

- Industrialised-world poor (IWP)
- Aspirational/urbanising poor (AUP)
- Traditional/rural poor (TRP)

		Now	Later
No Deal	IWP	~	-
	AUP	+	-
	TRP	~	--
North Leads	IWP	--	-
	AUP	++	-
	TRP	~	--
North and GEM action	IWP	-	~
	AUP	-	~
	TRP	-	+

This is climate's Mexican stand-off

No one has the capacity to solve the problem unilaterally

They each may want to avoid different outcomes

But there are also things they want from each other

We need to find ways to move from a vicious circle to a virtuous one

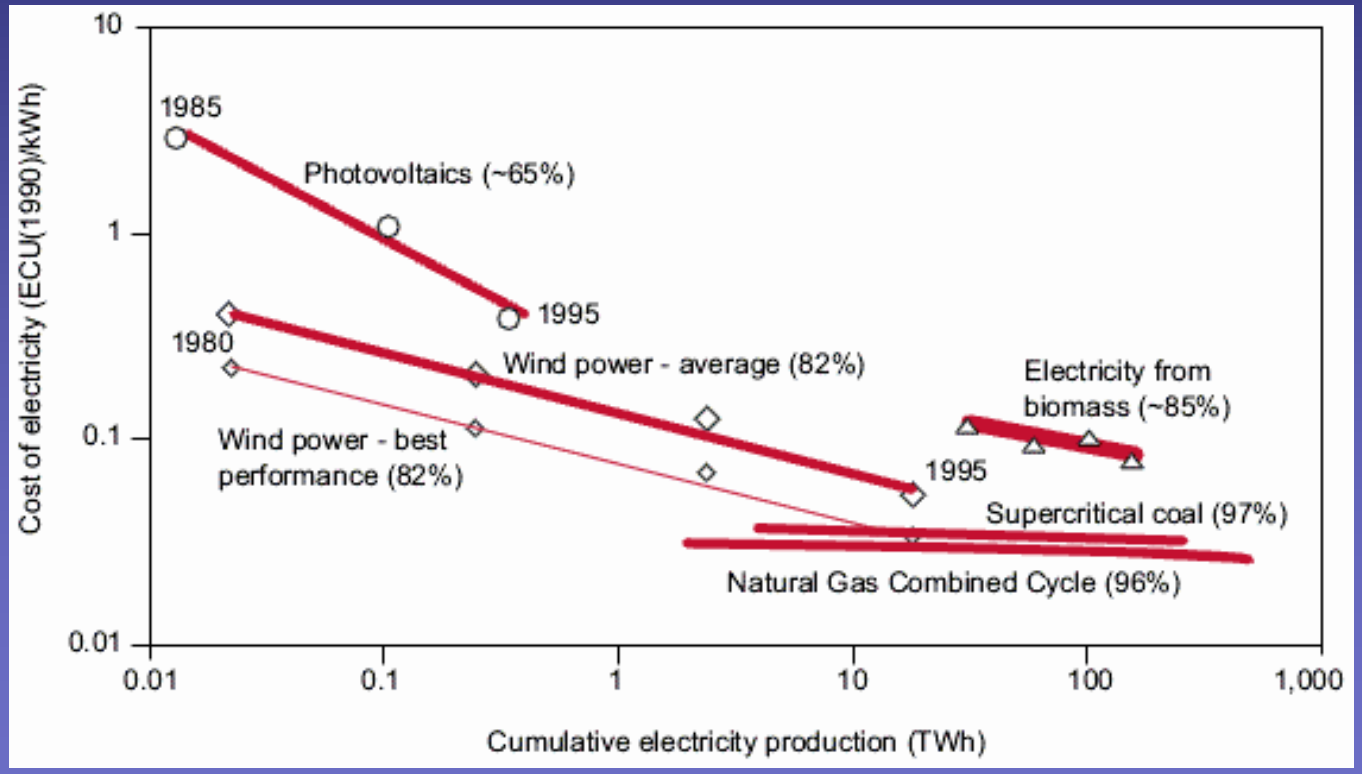
Low carbon race

- Lots of chat from heavy hitters
  - President Obama: "the nation that leads the clean energy economy will be the nation that leads the global economy. And America must be that nation."
  - BHP Billiton CEO: "Australia will need to have acted ahead of [global carbon pricing] to maintain its competitiveness"
  - In the EU, a coalition of CEOs wrote to the FT on 20 July to support EU 30% emissions reductions by 2020

- Is there anything much behind this?

Learning curves suggest more rapid energy cost reductions may be available in renewable technologies

– Energy costs fall ⇨ energy consumption rises ⇨ economic activity rises



China is investing US $750 billion to grow their low-carbon sectors in the next ten years

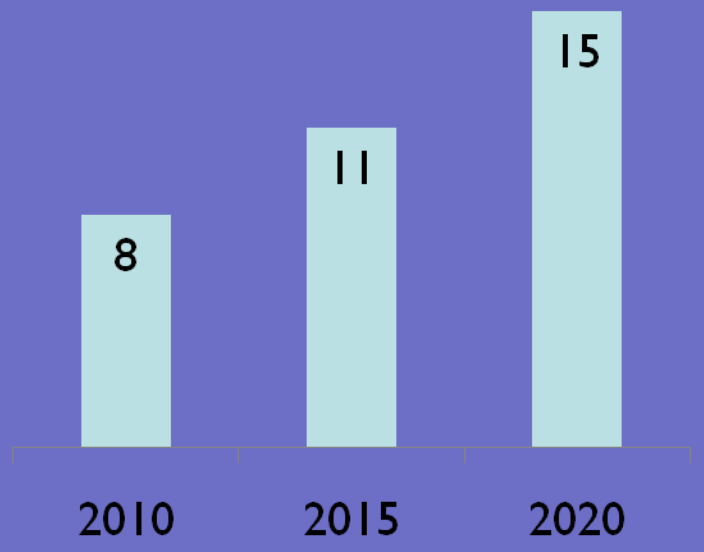
China is planning to invest ~$750B in alternative energy over the next 10 years in:

- Developing renewables technology
- Improving transmission grid infrastructure
- Deploying additional nuclear capacity
- New energy cars
- Natural gas

In Q2 2010, investment in Chinese clean technology companies and projects total $11.6 B, more than Europe and the US combined

Renewable energy targets for China

% of non-fossil based fuels



Companies with a strong position in the Chinese renewables market stand to benefit significantly from the scale up in activity

Source: Climate Bridge (2010), using Chinese government announcements and NEF analysis

China likely to beat the USA to implementing a carbon trading scheme

China is beginning a pilot carbon trading program in 8 cities and 5 provinces

Pilot cities

Pilot provinces

Pilot provinces : Guangdong, Hubei, Liaoning, Shaanxi, and Yunnan

Cities include: Tianjin, Chongqing, Hangzhou, Xiamen, Shenzhen, Guiyang, Nanchang, and Baoding

These pilots will help feed into a national domestic scheme

- China is expected to commit broadly to carbon trading during the ratification of its 2011-2015 Five Year Plan (March 2011), though details will likely be determined later (informed by pilots)
- Each area will be required to develop its own plan and market mechanism to reduce emissions in the near term
- Beijing and Shanghai are also independently working on trading schemes
- Domestic participation aids China's credibility in international discussions

Source: Climate Bridge (2010), using Chinese government announcements

There is potential for both conflict and cooperation; strategic substitutes and complements

- Climate change is complex enough that in some domains there are incentives to compete, and in others there are reasons to cooperate
- Competition – "low-carbon race"
  - Countries have incentives to ensure their citizens and firms secure and protect low-carbon IP, perhaps in areas like electric vehicles, smart grids/networks etc.
- Cooperation – "burden sharing"
  - Countries have an incentive to help other countries reduce their emissions
  - Rich countries have a moral sense of duty to support the poorest to adapt to climate change (via polluter pays)
- Need to determine which parts will resolve themselves with a small prod (because of competitive pressure) and which require coordination
- Is the question:
  - Why has so little been achieved?
  - Why has anything been achieved?

Conclusions

- Framing of information plays a crucial role in climate change
- There is no consensus framing of the integrated dimensions of climate change
- New reframings can yield new insights
- Even if this is sometimes uncomfortable knowledge
- If we are to be effective communicators and honest brokers of information to a wide range of stakeholders, we should be familiar with and open to multiple framings