



Towards a Global Deal on Climate Change

Nicholas Stern

FAPESP

3 November 2008



Part One

Risks and Targets

'Probabilities' (in %) of exceeding a temperature increase at equilibrium

Stabilisation level (in ppm CO₂e)

	2 C	3 C	4 C	5 C	6 C	7 C
450	78	18	3	1	0	0
500	96	44	11	3	1	0
550	99	69	24	7	2	1
650	100	94	58	24	9	4
750	100	99	82	47	22	9

Source: Hadley Centre: From Murphy et al. 2004

- Monte Carlo estimates from Hadley Centre (similar to IPCC AR4)
- Those who argue e.g. for stabilisation levels of 650ppm CO₂e and above are accepting very big risks of a transformation of the planet
- By 2080 extra 600 million affected by malnutrition, 400 million exposed to malaria and 1.8 billion without enough water (UN HDR)
- Some models have significant Amazon dieback by 3 C increase

Impacts in Brazil

- Poorest hit hardest and earliest
- Catastrophic redrawing of river flows possible
- Viability of food crop production projected to fall (impact on subsistence households and price effects on poorest)
- Impact on water supplies – especially in coastal and semi-arid regions. Large impact on poorest households
- Health impacts from shift/expansion of disease vectors (malaria in the Recife?)
- Knock on effect of urban migration multiplying existing challenges
- Impact of potential Amazon dieback
- More information needed – especially on the interaction with poverty – forthcoming ECCB report

Structure of argument on mitigation objectives (I)

- Risk of going above 5°C increase are very severe; e.g. would induce massive movements of population
- On basis of implied probabilities of temperature increase, dangerous to go beyond 500ppm CO₂e
- Stabilisation at or below 500ppm CO₂e 'buys' sharp reduction in probabilities of dangerous temperature increases relative to BAU
- Cuts of at least 50% by 2050 required for target of stabilisation 500ppm CO₂e or below
- Cost of action to get in range looks acceptable relative to reduction of risks and damages avoided: 1 or 2% of GDP
- Some aggregate formal modelling useful to inform damage estimates but loses key detail, sensitive to assumptions and implausible for optimisation analysis

Structure of argument on mitigation objectives (II)

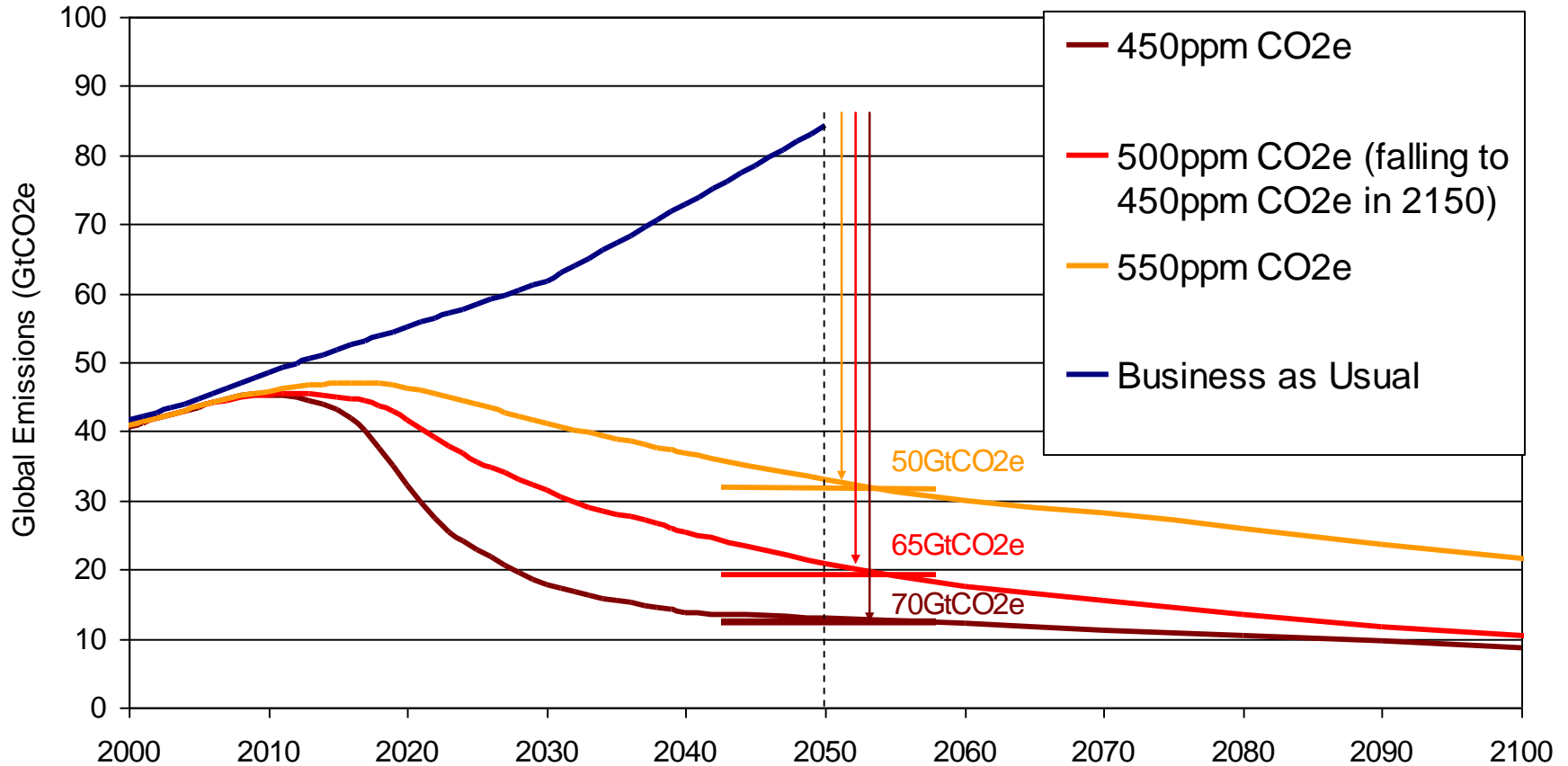
- Whilst considerations of risk steer quantity targets (i.e. cuts), efficiency requires use of market mechanism to keep down costs
- These cuts would need a carbon price of \$50 plus per tonne of CO₂e; thus we have a “take” on marginal abatement costs
- This is in range of marginal social cost (MSC), for paths associated with 500ppm CO₂e but MSC is very sensitive to ethical and structural assumptions
- Equity demands that rich countries take much bigger targets for cuts than poor. Trading can then provide flow of finance to developing countries



Part Two

Flows, Costs and Stern
Review Two Years On

Delaying mitigation is dangerous and costly



Source: Stern Review

Cost estimates

- Stern Review examined results from bottom-up (Ch 9) & top-down (Ch 10) studies: concluded that world could stabilise below 550ppm CO₂e for around 1% of global GDP; stabilisation at 500ppm costs around 2%
- Subsequent analyses have indicated lower figures
- Starting planning now with clear targets and good policies allows measured action and keeps costs down. Delayed decisions/actions (or “slow ramp”), lack of clarity, bad policy will increase costs
- Associated co-benefits (energy security, reduced local pollution...) and opportunities (innovations, new markets...)
- Importance of good policy

Reflections on costs and damages in Stern Review analysis after two years

- Emphasis on risk avoidance rather than formal modelling well-founded
- Modelling without making risk central misses the point – both ethics and risk crucial : Stern Review damages averaged over space, time, outcomes : 5-20% GDP
- Probably under-estimated emission growth (growth of China and India)
- Probably under-estimated risks of high-temperatures (omitted features in climate science modelling) and damages from high temperatures (implausible 'overly linear' extrapolations)
- Thus magnitude of avoided damages under-estimated
- Discounting: nature of the problem (long-term, non-marginal and uncertainty) means discounting approach from standard CBA is inappropriate. Satisfied approach in the Review is appropriate (for more see Ely lecture)
- Cost of action about right, perhaps on high side. But good policy is important

Implications of the current economic crisis for climate change action (I)

- Current crisis gives lessons on managing risk
- Scale of unmanaged climate change much larger and irreversible for generations (if ever)
- Action on climate change cannot be postponed
- In the short term there will be restricted lending making capital intensive projects more difficult
- Implications for investment flows to MICs and local investment
- Policies to boost demand must deliver growth that is sustainable

Implications of the current economic crisis for climate change action (II)

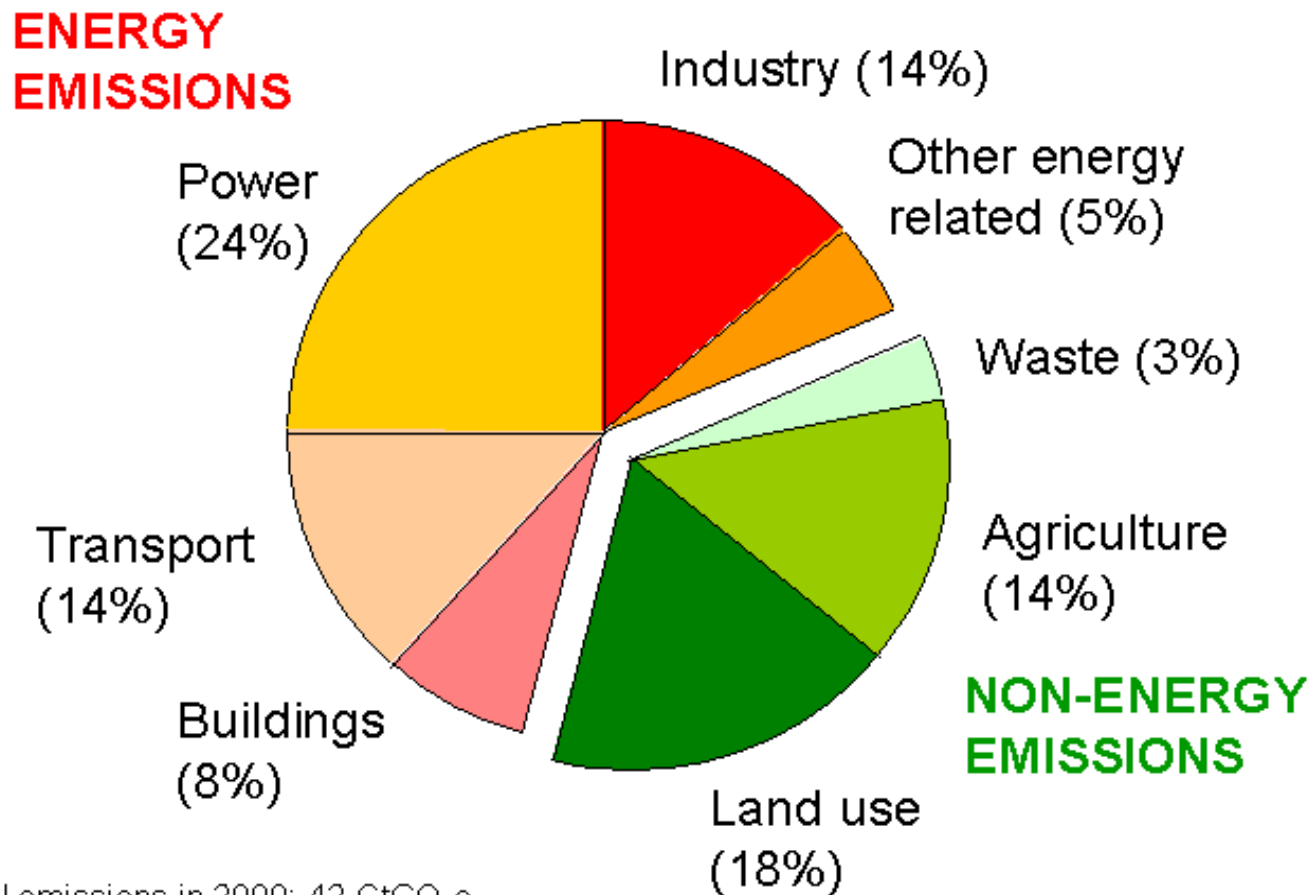
- Could be a good time for longer term investments such as infrastructure (lower input costs and interest rates)
- Should focus on the technologies and infrastructure needed for future growth e.g. energy
- Benefits of energy efficiency measures are even greater
- Potential job creation benefits of a shift to a low carbon economy as many actions are more labour intensive (especially energy efficiency)



Part Three

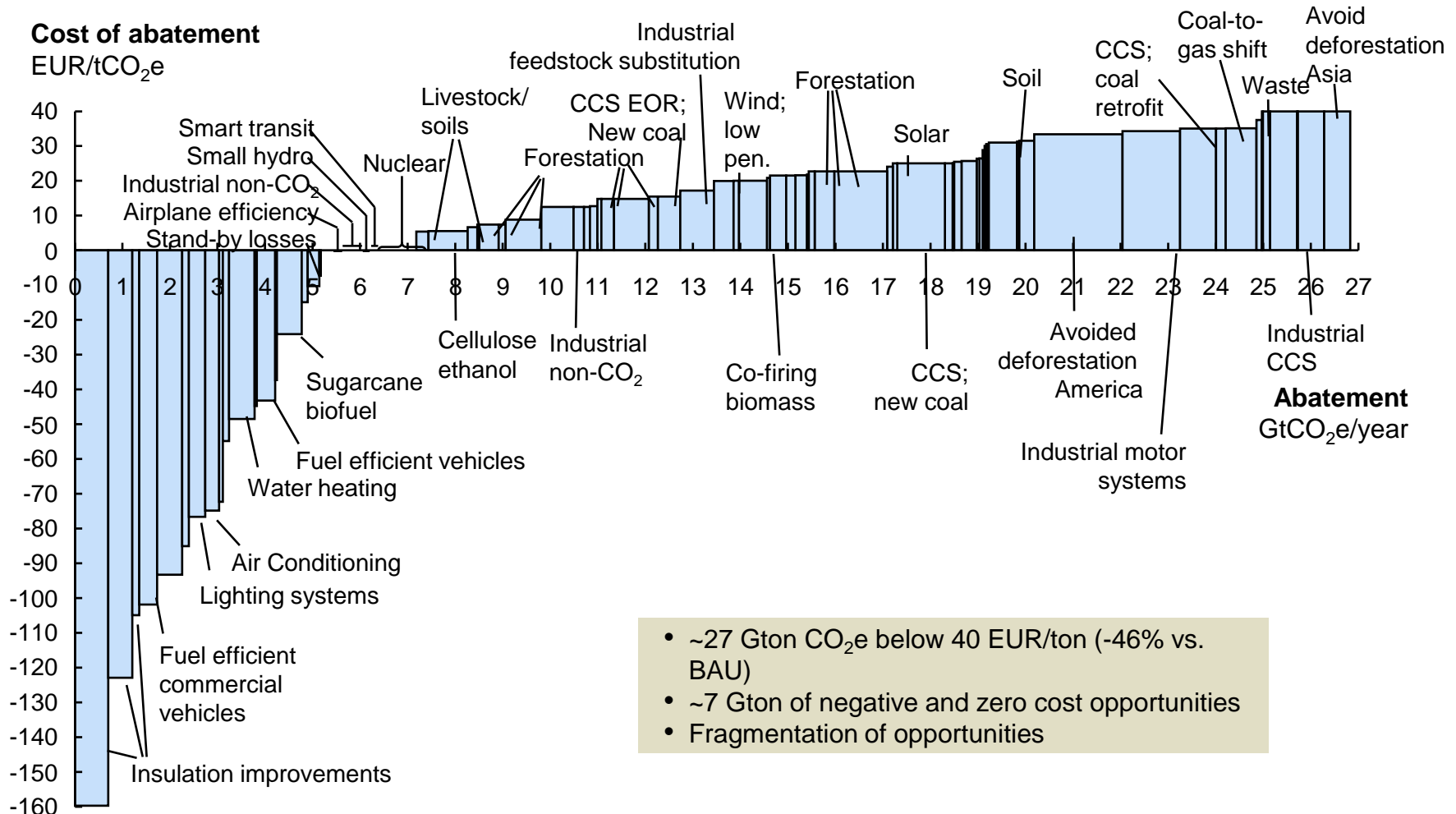
Policies for Sectors and Technologies

Reducing emissions requires action across many sectors



Many options: policy matters and prices crucial

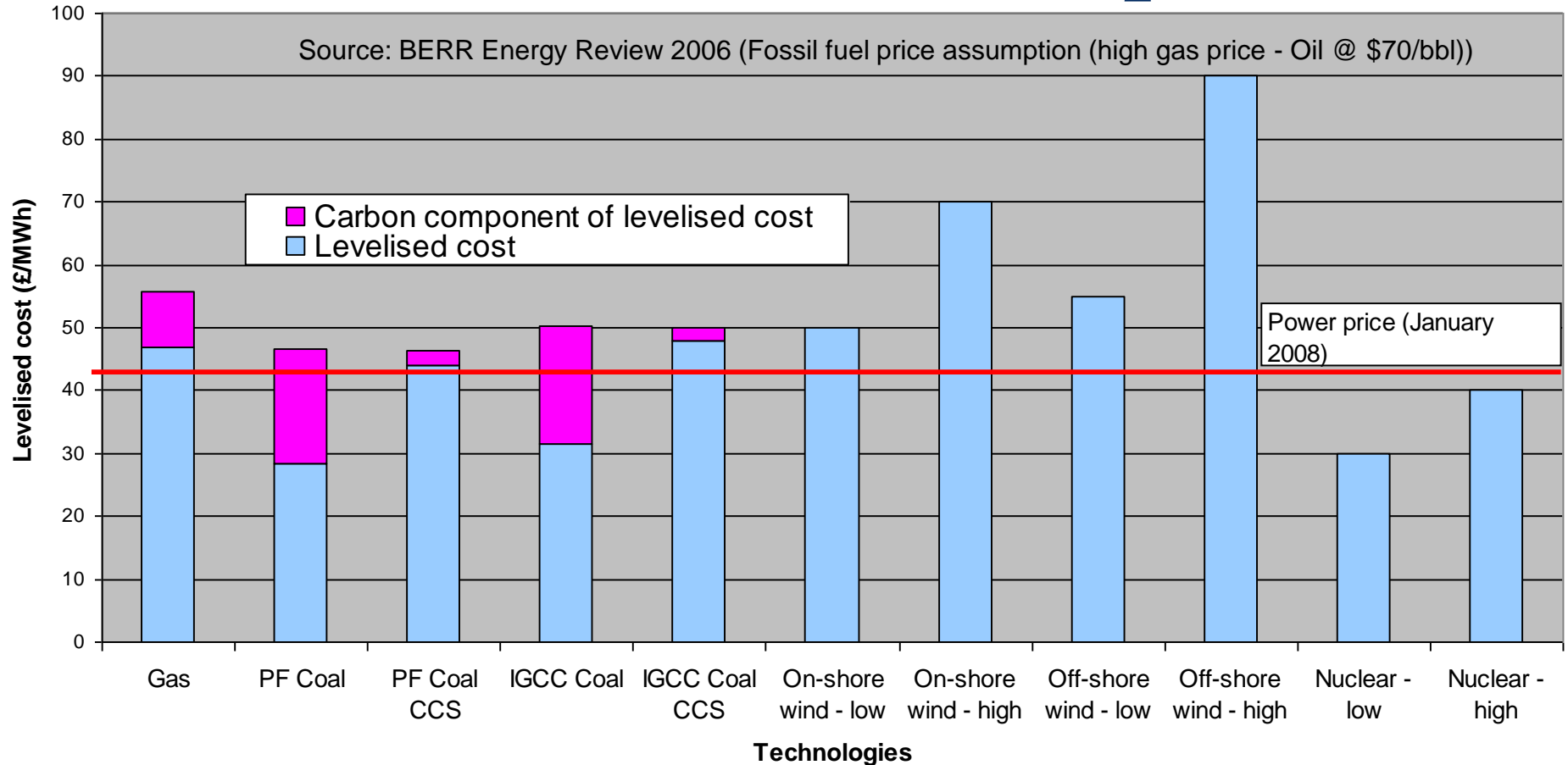
2030



Mitigation policy instruments

- Pricing the externality - carbon pricing via tax or trading, or implicitly through regulation
- Bringing forward lower carbon technology - research, development and deployment
- Overcoming information barriers and transaction costs – regulation, standards
- Promoting a shared understanding of responsible behaviour across all societies – beyond sticks and carrots

Levelised costs of different technologies (£/MWh) : carbon price €40 per tonne CO₂



Costs of new technologies fall over time with deployment

Avoiding deforestation

- Curbing deforestation could be highly cost-effective, and significant (UN: nearly 1/5 of global emissions)
- Forest management must be shaped and led by nation where the forest stands
- Estimated 1.6 billion people depend on forests for their livelihoods; they must be supported to develop sustainably
- A global deal should put in place a framework to mobilise international support for locally led action
- This should be integrated into development with strong support for soft and hard infrastructure using publically provided resources
- Large-scale pilot schemes could help explore alternative approaches to provide effective international support giving benefits for producers and local communities
- Possible sources of longer-term finance – carbon market?



Part Four

Development and Adaptation

Climate change and development

- Development and climate change are the central problems of the 21st Century
- If the world fails on either, it will fail on both
- Climate change undermines development
- No deal on climate change which stalls development will succeed

Threats

- Developing countries are particularly vulnerable to impacts of climate variability
- Climate change will threaten all aspects of the development agenda
 - Income poverty and hunger
 - Direct and indirect health effects
 - Dislocation, migration and conflict
 - Some effects already here

Opportunities

- For low carbon development
- To improve land use and reduce deforestation
- For adaptation
 - Forecasting climate and weather
 - Disaster response
 - More resilient crop varieties
 - Technologies for water conservation and irrigation
 - New methods to combat land degradation
 - Prevention and treatment of malaria and other water- and vector- borne diseases
- To shape international co-operation

Adaptation and development

- Development key to adaptation - it enhances resilience and increases capacity
- Adaptation to current climate variability reduces costs of natural disasters
- Adaptation is development in a hostile climate - it requires economy-wide planning and regional co-operation so adaptation and development must be integrated
- Leadership and co-ordination is essential: key role for Heads of Government, Finance and Economic Ministries
- Link between development and adaptation has implications for ODA scale and focus. This strengthens still further argument for rich countries to deliver on aid commitments
- Additional ODA flows will be a bigger source of funding for adaptation and development and must be part of post-2015 development goals and funding



Part Five

A Global Deal

Key elements of a global deal / framework

A global deal should deliver effectiveness, efficiency and equity

- Confirm Heiligendamm **50%** cuts in world emissions by 2050 with rich country cuts at least **80%** demonstrate low-carbon growth with 'carbon flows' to developing countries rising to \$50-\$100bn p.a. by 2030
- Developing countries to take on **targets by 2020** as part of a credible plans to reach 2 tonne/cap by 2050 - requires peaking before 2030
- Strong public funding initiatives on **deforestation** (a \$10-15 bn p.a. could halve global deforestation. Demonstration and sharing of **technologies** (e.g. CCS coal). Deliver of **ODA** commitments (additional cost for development in a hostile climate upwards of \$80bn p.a.)

Nature of deal / framework

- Such an agreement would help overcome the inequities of climate change and provide **incentives for developing countries to play strong role** in global deal, eventually **taking on their own targets**
- Within such a framework **each country can advance** with some understanding of global picture
- Individual country action **must not be delayed** (as e.g. WTO) until full deal is in place
- Main enforcement mechanism, country-by-country, is **domestic pressure**; but not in all – **leadership**
- If we argue that, “it is all too difficult” and the world lets stocks of GHGs rise to 650, 700 ppm or more. Must be **clear and transparent** about the great magnitude of these risks