Policies and Instruments to Leverage Private & Multilateral Flows for Climate Finance

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Some Key Facts

- Finance for low carbon development is big business both in developing and developed countries
- There are major information inconsistencies so we don’t really know the full picture
- The private sector is playing the major role in mitigation
- But its role in adaptation is still very small

The Broad Picture

- The Copenhagen 2009 meeting set a target of $100 billion a year by 2020 for climate change finance in developing countries.
- This has to come from private and public sources and has to fund mitigation and adaption activities.
- Developed country cost estimates vary but are around $600 bn p.a. from 2016-2035 for mitigation alone.
- One estimate shows that developing country climate finance flows are already around $100 billion. (Climate Policy Initiative)
- Another estimate shows low carbon finance in 2010 to developing countries to be nearly double that and to developed countries to be about $350 billion.

The Current Picture for Developing Countries: CPI

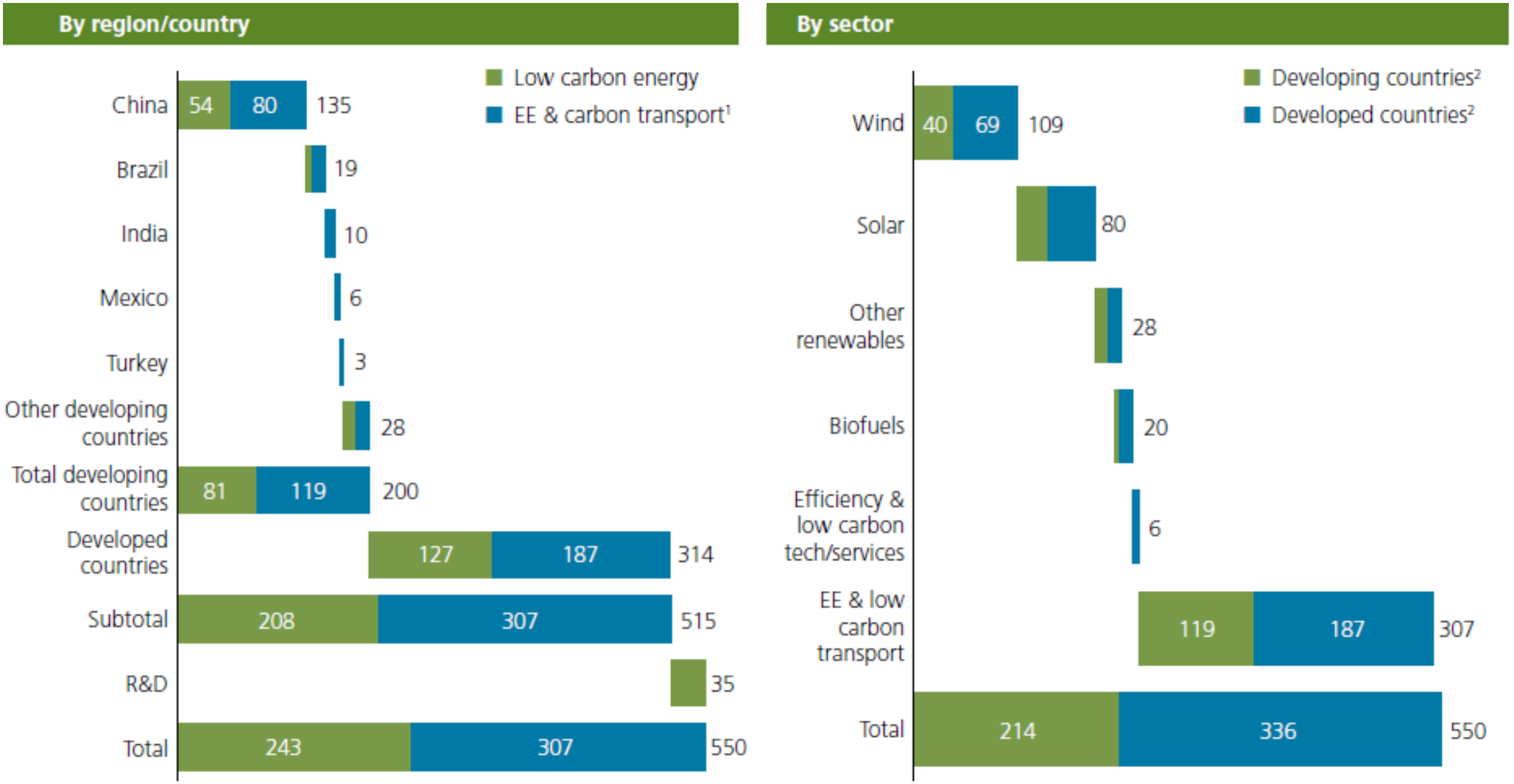
Table 1. Estimated volume of mitigation and adaptation finance (USD million and in percent)

Source	Total^ (USD m)	Adaptation (%)	Mitigation (%)	Adaptation (USD m)	Mitigation (USD m)
Bilateral	22,767	16%	84%	3,641	19,127
Multilateral	14,361	3%	97%	475	13,886
Funds	2,492	3%	97%	65	2,428
Offsets*	2,250	0%	100%	0	2,250
Philanthropy**	450	47%	53%	210	240
Private finance	54,600	0%	100%	0	54,600
Total	**96,920**	**5%**	**95%**	**4,390**	**92,531**

Source: Climate Policy Initiative (CPI)

- Private finance is even now around 60% of total climate finance
- But it covers only mitigation. Adaptation is not funded from this source.

The Picture in 2010 from HSBC/PEW



1 EE and low carbon transport allocated proportionally (Total EE & low carbon transport in 2010: USD180 billion)
2 Pro-rated split between developing and developed countries
SOURCE: PEW, HSBC, team analysis

So Are We OK With Current Flows?

- Well, no, because:
  - Not all the $97-200 billion is addition to what was being provided prior to the Copenhagen Accord.
  - The WEO and McKinsey state that developing countries need around $360-370 bn. a year between 2016 and 2035 for low carbon energy alone!
  - So it looks as if we don't really know what the amount is!
  - Some commentators have argued that the $100 bn. For developing countries was intended to come from public sources, with the private sector providing even more.
  - Some argue that the $100 bn. covers incremental costs rather than total costs of investment.
  - The CPI figures include some funds from developing countries and the Copenhagen Accord was intended for transfers from developed to developing.

This Presentation

- Focuses on private flows and multilateral flows that leverage private finance.
- My view is that public funds will prove difficult to mobilize for this purpose on the scale needed.
- Discussion is significantly on developing countries although a lot also applies to developed countries.
- We look at mitigation first, then at adaptation and last at some innovative structures that reduce public burdens and transfer them to the private sector.

FINANCE FOR MITIGATION

Private Sector Investment in Low Carbon Energy

- Renewable energy
  - Hydro, wind, solar, geothermal, modern biomass, biofuels. Make up ≈ 18% of global electricity supply.
  - Private Sector needs access to debt finance for investment in these areas.
  - It also needs a clear policy regime that sets targets or puts other policy incentives in place (RPS; FITs).
  - Developing countries account for more than half global renewable capacity and make up more than half countries with policy targets or renewable energy policies

Energy Efficiency

- Consists of power energy efficiency (PEE) and industrial energy efficiency (IEE).
- Can operate on both the demand and supply side. Although demand side measures are more difficult to implement they can offer cheaper options.
- Many IEE projects involve small companies and are usually funded via financial intermediaries (Energy Service Cos. or ESCOs)

Agriculture and Forestry

- Potential for reducing emissions from these sectors is large but role of private sector has been very limited.
- The feasible options relate to REDD and forestry. In future the scope for involving the private sector via purchase of credits could be significant if obstacles can be removed.

REDD + Market

- **R**educing **E**missions from **D**eforestation and forest **D**egradation is an international framework (set of policies, measures, incentives) to halt GHG emissions from deforestation and fight poverty while conserving biodiversity and sustaining vital ecosystem services.
- **Simple idea**: to financially reward (forest land owners in) developing countries for reducing GHG emissions by protecting their forests (avoiding deforestation and forest degradation).

REDD + Market

- The importance of REDD programs relies on the relevance of tropical **deforestation** as an important source of GHG emissions, accounting for **11.3% of global CO2eq emissions** (WRI, 2005).

- **Deforestation is expected to remain a major emission source in the future.** Around 13M ha of forest are annually lost (FAO, 2006).

- Emissions reductions from REDD are among the **least expensive mitigation options available** compared to other options (e.g. afforestation and options in the energy market). However, this claim seems to be based on **opportunity costs only**, MRV costs can be substantial.

REDD + Market

- The main problems are institutional: contracting, measuring, monitoring, financing.
  - Ensuring additionality and permanence;
  - Definition of forest (failing to distinguish between natural forests and plantation forests);
  - Leakage (agreement to stop deforestation in A means more deforestation in B);
  - Ownership and tenure issues
  - Setting a baseline scenario (need an adequate cadaster of existing forest areas and projections of future loss).
- These problems are being addressed through pilot projects but progress is slow….

Technology Development

- Much of the EE and RE technologies are being developed and refined in part by the private sector and in part by public-private collaborations.
- The bulk of the private sector activity here is in developed countries, via venture capital financing.
- We can identify a number of barriers to PS investment in low carbon. Each can be addressed from a range of policies and measures.

Barriers to Finance for Low Carbon

	Barrier	Description
FINANCIAL	Revenues (where unsubsidized)	■ Many fossil fuels still subsidized ($300 bn globally) and carbon externality not yet consistently priced
	Higher capital intensity	■ Many low carbon technologies face large overall capital needs and higher financing cost than high carbon alternatives
	O&M costs	■ For some low carbon technologies O&M cost is high (e.g., offshore wind) but typically lower than for low carbon alternatives
	Risk	■ Higher technology and financing risks ■ Lower market risk exposure
STRUCTURAL	Network effects	■ Many technologies rely on networks to happen (e.g., solar and wind require flexible and sufficient grid capacity)
	Fragmentation and transactional costs	■ Many low carbon investments are small scale which makes them difficult to deliver and typically leads to higher transaction costs
	Agency problems	■ In energy efficiency, the person paying for the investment is often not the one reaping the benefits
	Status quo bias	■ Like with most changes, there is a bias in society for the status quo
TECHNICAL	Immaturity	■ Markets are only evolving—capacity needs to be built across the value chain including in the financial community
	Awareness and education	■ Lack of awareness of opportunity and understanding of the technical solutions available as well as their financial benefits
	Inability to price risk	■ Inability to price risk due to limited historic data ■ Cross-industry linkages make risk assessment more challenging
	Technical solution	■ Products are inferior or perceived to be inferior on some usage dimensions (e.g., the case for energy efficient light bulbs)

Barriers and How to Address Them

Project Type	Key Barriers	Measures to Address Them
Renewable Energy	• Fossil fuel subsidies • Large up-front capital cost • Technology risk • Network effects	• Price externality • Feed-in tariffs • Predictable regulation • Network upgrades • Develop project risk data
Industrial Energy Efficiency	• Energy pricing distortions • Lack of standards • Lack of ESCOs • Transactions costs • Inability to price risk	• Develop & enforce standards • Local banking capacity • Risk reduction measures • Demonstration projects • Develop industry risk data
Building Energy Efficiency	• Agency problems	• Reduce builder-user asymmetry by establishing codes and performance standards
Clean Technology	• Weak local venture capital • Most technology innovations from developed countries	• Support local R&D • Supportive technology transfer regime • Support local venture funds

Policy Makers have a “tool kit” of alternatives with which to address the imbalance…

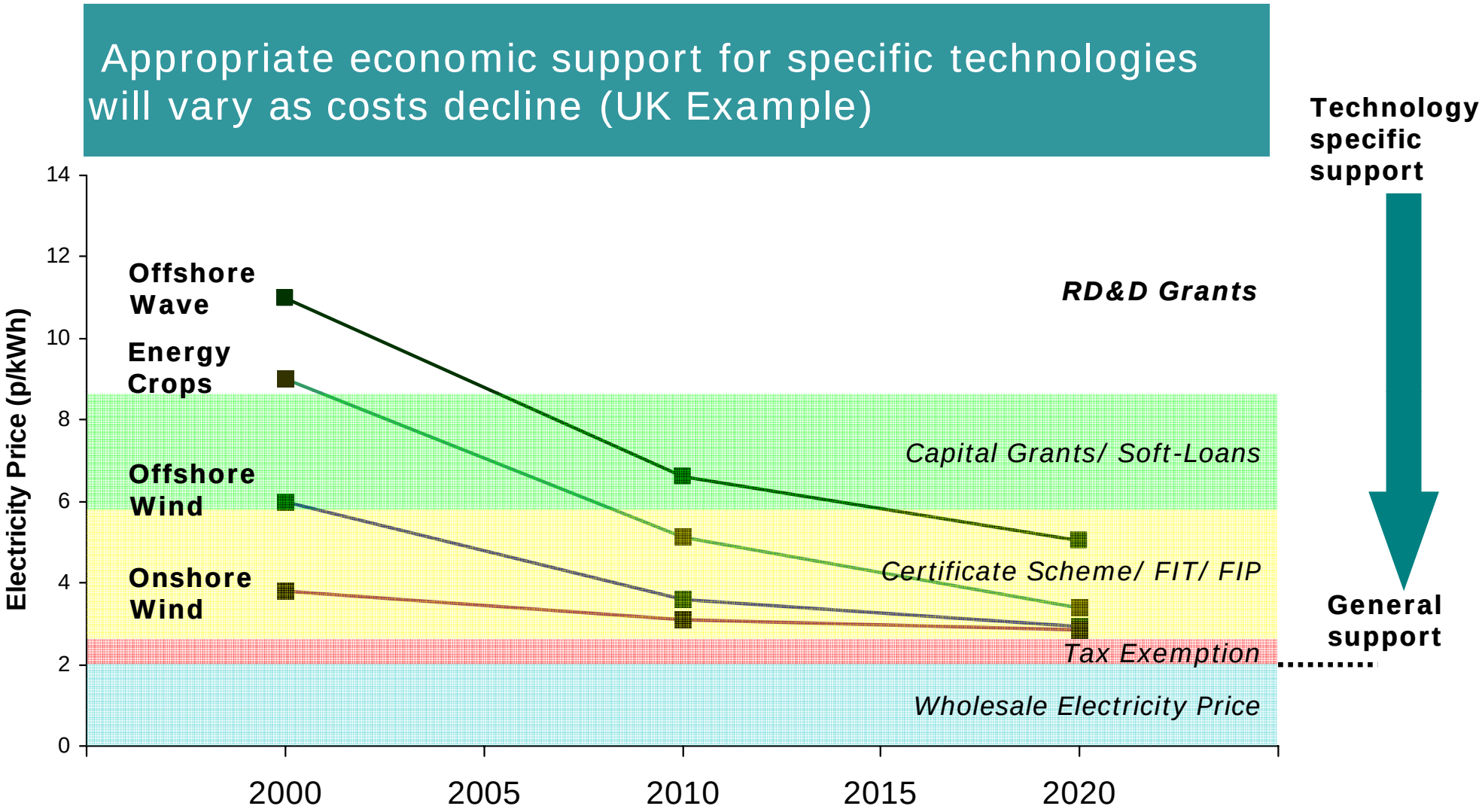
Tools to “price-in” externalities…

- Direct Financial Assistance
  - Grant
    - University Funding/ R&D Institute
  - Soft Loans/ Guarantees
    - Greater access to cheaper debt funding
- Fiscal Measures (Indirect Financial Assistance)
  - Pollution/ Emission/ Carbon Tax
    - Carbon tax used in Costa Rica in mid 1990s
  - Production or Investment Tax Credit
    - Main financial support for renewables in USA
- Standards/ Target Based
  - Direct Regulation :
    - Minimum pollutant thresholds from point sources (Clean Air Act)
    - Biofuels minimum blend requirements (EU)
  - Renewable Portfolio Standard (RPS)
    - Used in 49 States/ Countries
    - Main current policy tool in USA
- Traded Certificate Schemes
  - White/ Green/ REC/ ROC/ EUETS/ Offsets
- Feed-in Tariffs
  - Premia or special rates paid to producers for electricity of renewable origin
    - Used in 63 Countries *(Source: REN21 09)*

Instruments and Mechanisms for Low Carbon Investment

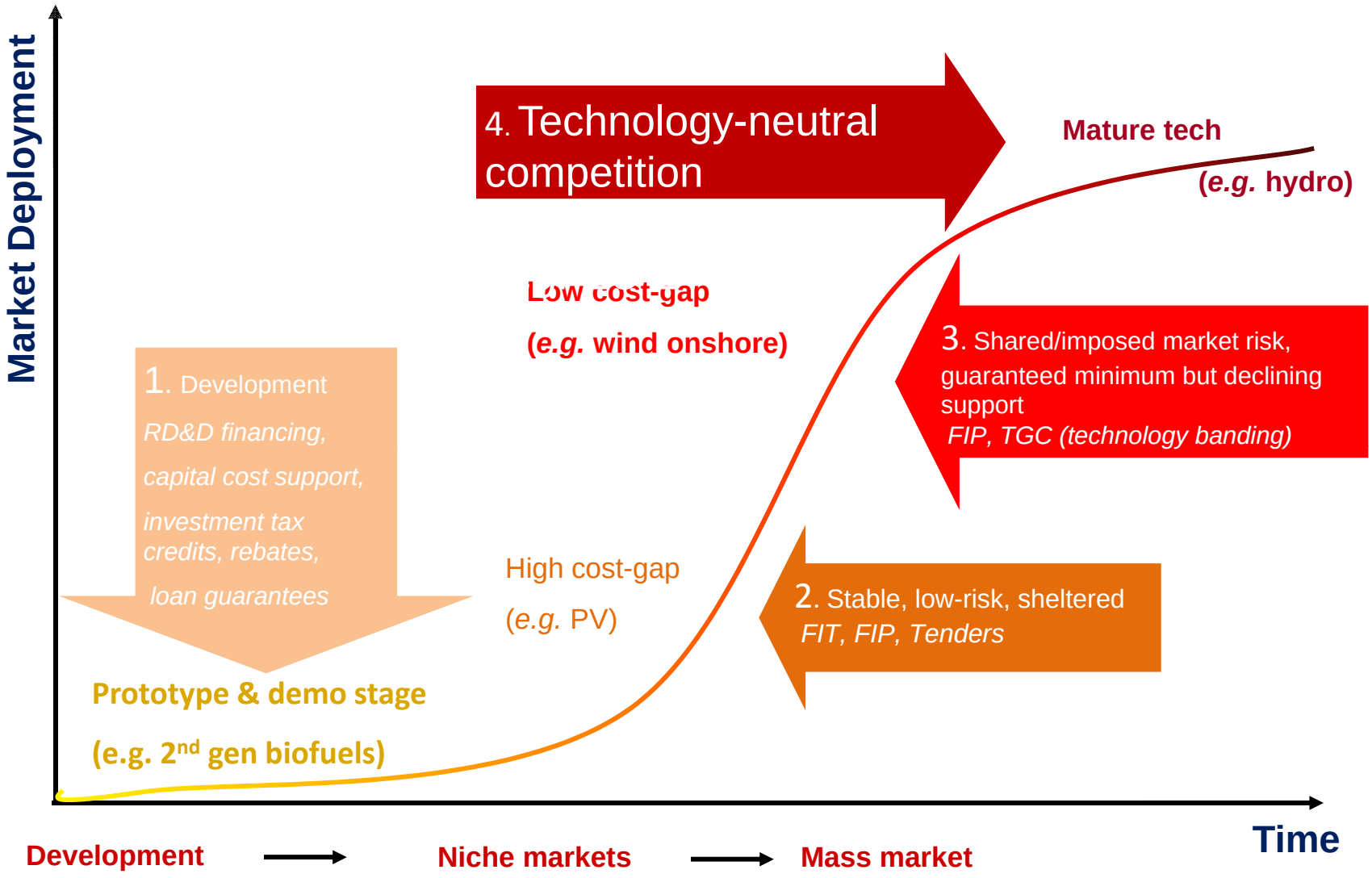
- For Energy Efficiency:
  - Technical standards for buildings, transport
  - Access to credit lines
  - Risk mitigation guarantees
  - Technical Assistance and capacity building
- For Renewable Energy
  - Carbon pricing and/or carbon credits
  - Risk mitigation guarantees
  - Feed-in tariffs
  - Technical Assistance and capacity building

...Different Tools have optimum application at different maturities of new low carbon technologies...



Note: Capital grant based on maximum of 40% of typical capital costs
Source: PIU Working Papers (OXERA II Base case cost decline)

…the maturity process is dynamic and non-linear, often moving faster than Policy-makers can react



Instruments and Mechanisms for Low Carbon Investment

- Commercially Unproven Technologies
  - R&D to drive costs of key technologies down
  - Subsidized applications to drive costs down
  - Risk mitigation
  - CAPEX subsidies
  - Feed-in tariffs

Appropriate Mechanisms Differ By Country

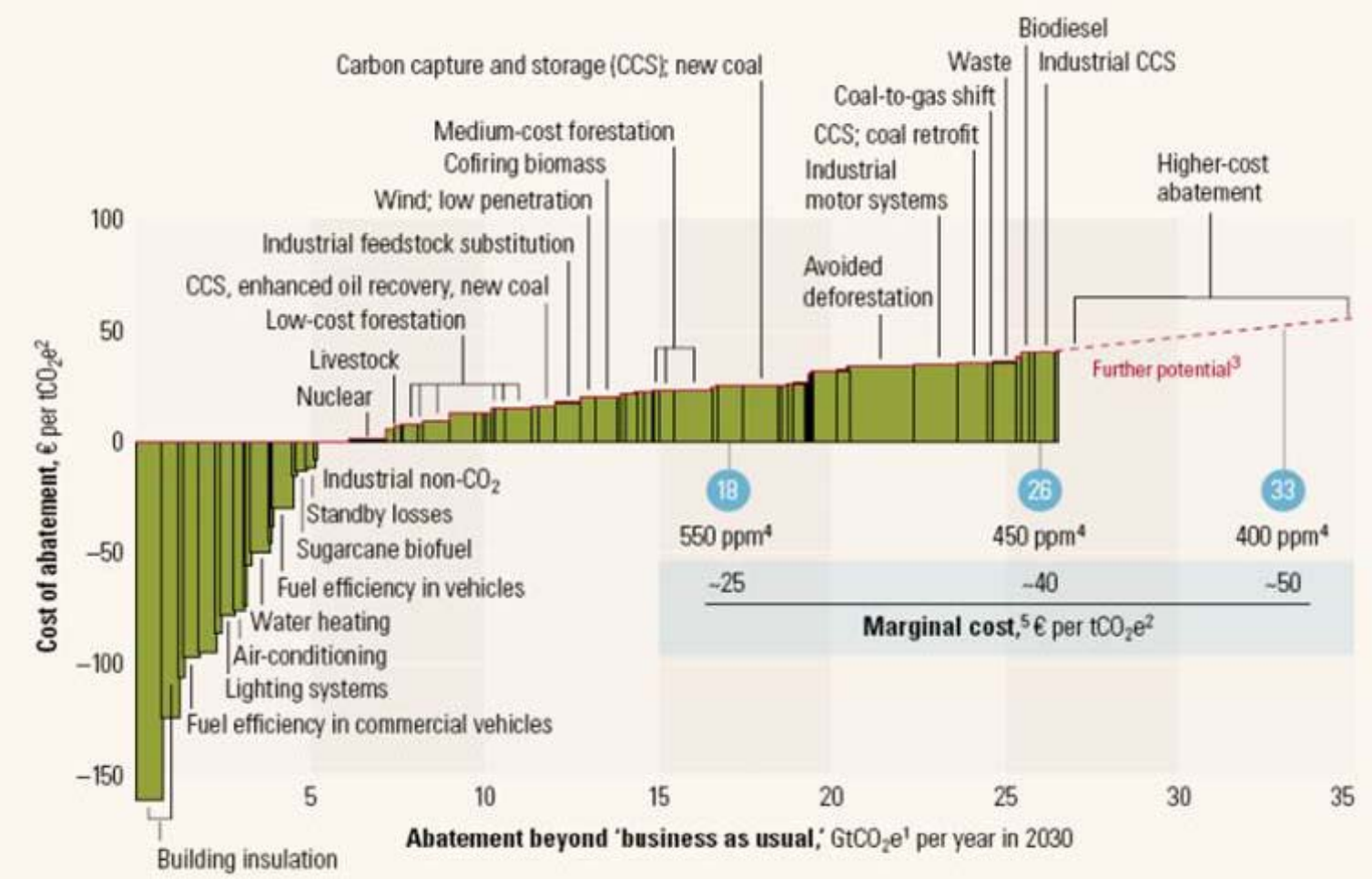
Instrument	Market development level[1] (High — Low)	Rationale
Feed-in-tariffs		▪ Requires well functioning electricity markets with credible counterparties ▪ Decreasing effectiveness of FITs to trigger private investment when capital markets not well developed
First-loss		▪ First loss effective mechanism to foster investment in higher risk geographies
Guarantees		▪ Good administrative systems required ▪ Significantly higher absolute risk level in countries without capital markets
Concessional financing		▪ In more developed capital markets, market mechanisms are effective to supply financing ▪ In less developed markets, project-based structures more appropriate
MDB debt		▪ MDB debt not required in developed capital markets ▪ Total financing volume likely to be lower in LDCs
Carbon credits/tax		▪ Potentially applicable in all developing countries ▪ Focused on project-based in LDCs, moving towards ETS in more developed countries

1 Can be approximated by IFC "Doing Business" ranking
SOURCE: PEW, HSBC, team analysis

High importance  Low importance

Costs of CO2 Reduction Vary By Sector: We Can Exploit these Differences

Marginal Abatement Cost of CO2e abatement shows what can be done given a price for carbon



Policy & Financial Support to Catalyze PS

- Policy Support
  - Investment friendly policies for low carbon include renewable energy portfolio standards, FITs, EE standards and appliance standards.
  - Reduced subsidies to fossil energy can help a lot.
- Sources of finance include:
  - Green Bonds (MDBs raise money on capital markets and ring fence it for climate projects). Already more than $12 billion has been raised.
  - International Finance facility (IFF) issuing long term bonds underwritten by donor countries to finance expenditures now (already applied to Immunization).
  - Export credit agencies finance some flow of funds for energy investments from OECD to developing countries.

Policy and Financial Support to PS

- Bilateral support. Climate change mitigation aid represents about 7.4% of DAC members bilateral aid but share going to PS is not known. (Ca. $22 billion annually was for Climate Change in 2011)
- Multilateral Development Banks. MDBs provided around $19 billion for mitigation in 2010 of which around 25% was for the Private Sector.
- National Development Banks. Raised around $6 billion in 2010 for clean energy. Share of PS is not known.

Role of MDBs in Mobilizing PS Finance

- While they cannot generally provide direct concessional finance to the PS, they can reduce the cost of borrowing by channeling concessional sources to which they have access.
- They also provide support in the form of TA that helps the PS to mobilize finance from other sources
- Most important, they make it possible for the PS to have access to additional funds through leveraging.

Leveraging of MDBs

- Leverage: the amount of private financing that can be mobilized per dollar of public or quasi-public support (Nb. Other definitions exist!)
- Estimates indicate that the leverage ratio is between 3-6 for “commercial” MDB lending and between 1-1.5 for concessional MDB lending.
- For the IFC it was highest for power sector EE projects and lowest for industrial EE and renewable EE

Concessional Finance

- A number of ways in which this can be provided to facilitate investment.
  - Debt products where an MDB or NDB offers concessional finance to an ESCO to lower the cost of on-lending to companies. TA is also included.
  - Subordinated Debt where the MDB offers a loan to a project with lower priority of repayment in event of default (often combined with lower interest payments). A first-loss system is similar.

Concessional Finance

- Guarantee/Risk Sharing. The MDB provides a partial guarantee to investors in a project in case of default and the investing institution pays a below market fee for that guarantee.
- Technical Assistance. Not directly finance but TA can be critical to identifying opportunities and preparing the case for a successful investment

Experience with PS Climate Finance

- Central problem for low carbon energy investment is the need for large amounts of up-front capital, and
- Need for investors to be confident in long term promises to buy power or repay loans.
- Potential of MDBs and NDBs to extend tenor of loans is therefore important (e.g. from 5 to 15 years)
- There is also a strong demonstration effect to resolve uncertainties about technical and financial feasibility. This can increase investor willingness to invest in an entire class of assets.

FINANCE FOR ADAPTATION

Current Situation

- Current finance for adaptation is mainly bilateral and multilateral and role of PS is not clear.
- Yet PS will have to spend a lot on adaptation, simply because a significant part of the need to “climate proof” future capital will relate to investments made by the private sector or by private and public sector partnerships.

Estimates of Adaptation Needs

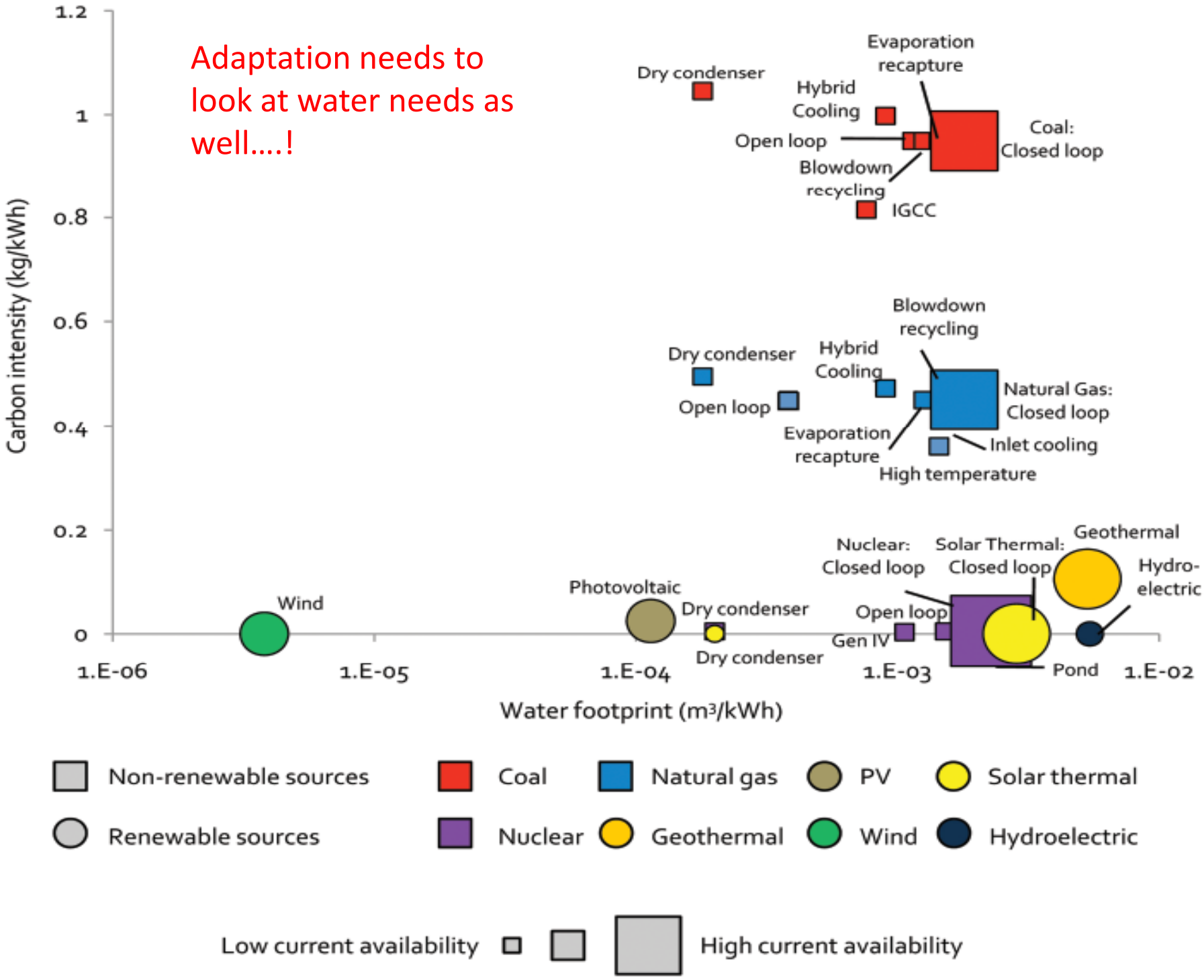
TABLE ES-2

INFRASTRUCTURE, COASTAL ZONES, AND WATER CAPTURE THE BULK OF ADAPTATION COSTS

(Global costs of adaptation by sector, X-Sum)

Sector	Wet	Dry
Infrastructure	27.5	13.0
Coastal zones	28.5	27.6
Water supply and flood protection	14.4	19.7
Agriculture, forestry, fisheries	2.5	3.0
Human health	2.0	1.5
Extreme weather events	6.7	6.4
Total	81.5	71.2

- The figures are billions of US dollars per annum
- The estimates are from the WB 2010 study with two scenarios
- Much of this will have to be undertaken by the PS (esp. infrastructure, coastal zones)


Adaptation needs to look at water needs as well….!
Carbon intensity (kg/kWh)
1.2
1
0.8
0.6
0.4
0.2
0
Dry condenser
Evaporation recapture
Hybrid Cooling
Open loop
Coal: Closed loop
Blowdown recycling
IGCC
Blowdown recycling
Dry condenser
Hybrid Cooling
Natural Gas: Closed loop
Open loop
Evaporation recapture
Inlet cooling
High temperature
Geothermal
Nuclear: Closed loop
Solar Thermal: Closed loop
Hydro-electric
Photovoltaic
Wind
Dry condenser
Open loop
Gen IV
Dry condenser
Pond
1.E-06
1.E-05
1.E-04
1.E-03
1.E-02
Water footprint (m³/kWh)
Non-renewable sources
Coal
Natural gas
PV
Solar thermal
Renewable sources
Nuclear
Geothermal
Wind
Hydroelectric
Low current availability
High current availability

Key Issues for Adaptation

- Adaptation action is a combination of autonomous (mostly private) and public actions.
- The autonomous actions are not enough by themselves, yet they are critical to a successful adaptation policy.
- It is important to ensure that the right incentives are in place for private adaptation where appropriate.

Risks of Mal-adaptation

- If the public sector gives the wrong signals the private sector will “mal-adapt” –i.e. take actions that make things worse with respect to climate change.
- An example is when the state provides full cover for damage from extreme events and permits construction in flood plains. The result is an increase in construction in a risky area and increased potential damage in the future.

Incentives for Good Adaptation

- (i) Insurance schemes (all sectors; extreme events)
- (ii) Price signals / markets (water; ecosystems)
- (iii) Financing schemes via PPPs or private finance (flood defence, coastal protection, water);
- (iv) Regulatory measures and incentives (building standards; land use zone planning);
- (v) Research and development incentives (agriculture, health).

Insurance and Other Risk Sharing Schemes

- Risk transfer and risk sharing are economic instruments that shift disaster risk from one party to another.
- Such mechanisms could lead to improved climate change adaptation as they generate post-disaster finance for relief, recovery, and reconstruction; help with reducing vulnerability; promote knowledge and provide incentives for reducing and managing extreme event risk.
- In many situations the risk sharing instruments are not able to function because of lack of data and information on risks and lack of capital. Public support for insurance is needed in form of information and some co-insurance to make the system work (e.g. farmers insurance)

Delivering Adaptive Actions

- Structural actions include all actions requiring sector-wide changes. These could be physical regulations as well as economic or fiscal incentives.
- An important example of the latter are tools to hedge costs of protecting energy infrastructure in a disaster does strike.
- Some energy firms are already a major user of weather derivatives for high probability events and insurance against catastrophic events. E.g. weather derivatives can hedge exposure to colder than expected winter, reducing impacts on consumer bills. Used to stabilize revenues, control costs and manage cash reserves.
- Use is mainly in developed world, especially North America and Australia but now also in India.

Price Signals and Markets

- Schemes of payments of environmental services (e.g. for water conservation) can generate finance for the protection of threatened ecosystems (PES) but they need a good institutional structure to function.
- In the design of such schemes we need to be aware of the rebound effect: e.g. an increase in water use when drip irrigation is introduced to save water but increases area that is irrigated. (Technical solutions are not enough!)

Loans, Public Private Finance Partnerships

- Public Private Partnerships (PPPs) involve contracts between public and private sector entities with aim of generating finance for the provision of public goods and increasing the effectiveness of project implementation.
- The rationale for governments is to reduce their financial cost by leveraging private funding, as well as to reduce the financial and operational risks involved in carrying out projects. Key instruments comprise public contracts, service concessions, and financial instruments including public guarantees for loans as well as concessional loans.
- An example is the Drought Tolerant Maize for Africa Project initiated (CGIAR) NGOs and private sector seed providers. Funded by donor money, research institutes have developed many drought resistant maize crop varieties and successfully used the seed providers and community based organizations to have the seeds distributed and used by Sub Saharan smallholders . Similar new varieties may be key for European agriculture in the future as well…

Regulatory Measures

- Markets for water and water pricing schemes create incentives for conservation and generate finance for further investment (issues of equity often arise, however).
- *Land use taxes* are one type of taxes which may effectively provide incentives for adaptation to slow (sea level rise) and sudden onset change (climate extremes) by pricing location choices in exposed areas.
- The IPCC (2011) finds exposure of people and assets to have been the major driver behind rising disaster losses so the potential is large. Yet, overall land use taxes for steering behavior in hazard-exposed areas, for many reasons including those related to political economy, have only been used sparingly so far

Some Conclusions

- The private sector has a major role in finance for climate change, especially in mitigation but also in adaptation.
- The data on how much is spent by the PS on mitigation is unclear and even less is known about adaptation.
- Yet we know that there are barriers to investment in low carbon by the private sector, in developing and developed countries.

Some Conclusions

- A number of measures can be taken to make more private finance flow into low carbon energy.
- Some of regulatory and some are institutional.
- On the regulatory side it is critical to provide a clear and strong signal that the state supports and will continue to support low carbon measures.
- On the institutional side developing countries need TA and access to finance that lowers risk in the market.

Some Conclusions

- On adaptation there is going to be a major need for the private sector to investment in reducing climate risk.
- In many cases it needs information of the risks and measures available to reduce them.
- But is also needs to work with the public sector in co-financing some activities.
- And the state and international community need to help develop the market and institutional mechanisms that promote more effective adaptation.

Thank You!