

Global carbon markets and mechanisms

Emerging lessons and implications

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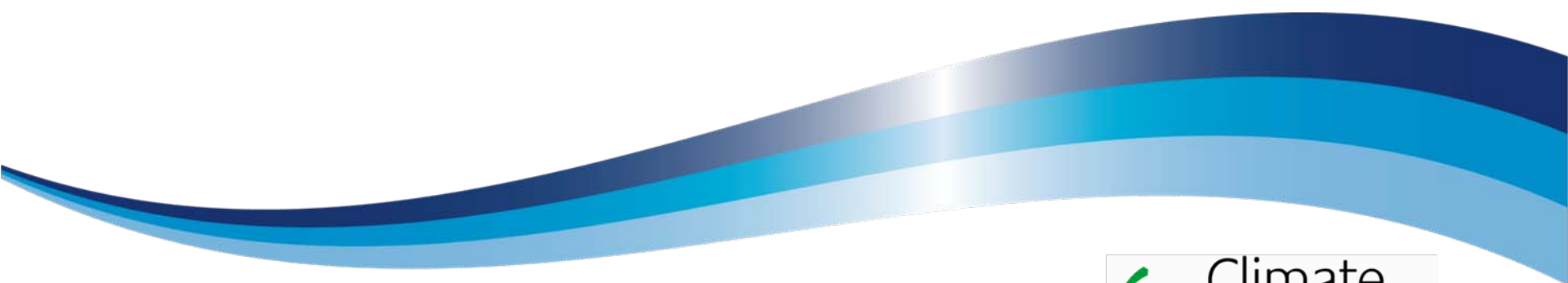
Overview



- Growth and types of Mechanism
- Delivery: initial findings
- How good (or bad) are the Mechanisms?
- Supply and demand – to 2012 and beyond
- Some future challenges

Growth and types of Mechanisms

- Roles and relationships



Kyoto Protocol was designed to reflect economic theory as constrained by political realities into three separate instruments

Relative progress in the international mechanisms has been almost opposite of what economists expected, dominated by 'CDM gold rush ...'

Clean Development Mech

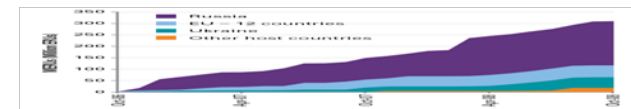
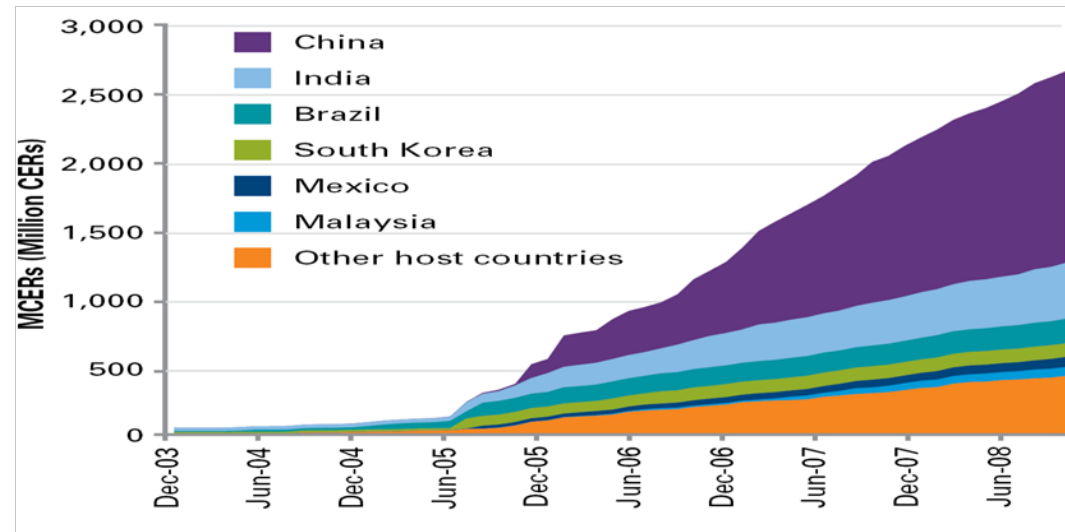
Credits for projects in developing countries that reduce GHGs and contribute towards Sus. Dev.

Joint Implementation

Project-investment crediting amongst Industrialised parties

Emissions trading

Allows countries to trade parts of their allowed emissions



First intergovernmental trade occurred under a 'Green Investment Scheme', from Hungary to Belgium and Spain, for programme on energy efficiency, Sept 2008

.. Reminder that the Mechanisms are governed by politics, and 'legitimacy' is key

In effect, industrialised world has four mechanisms, developing countries one + central funds

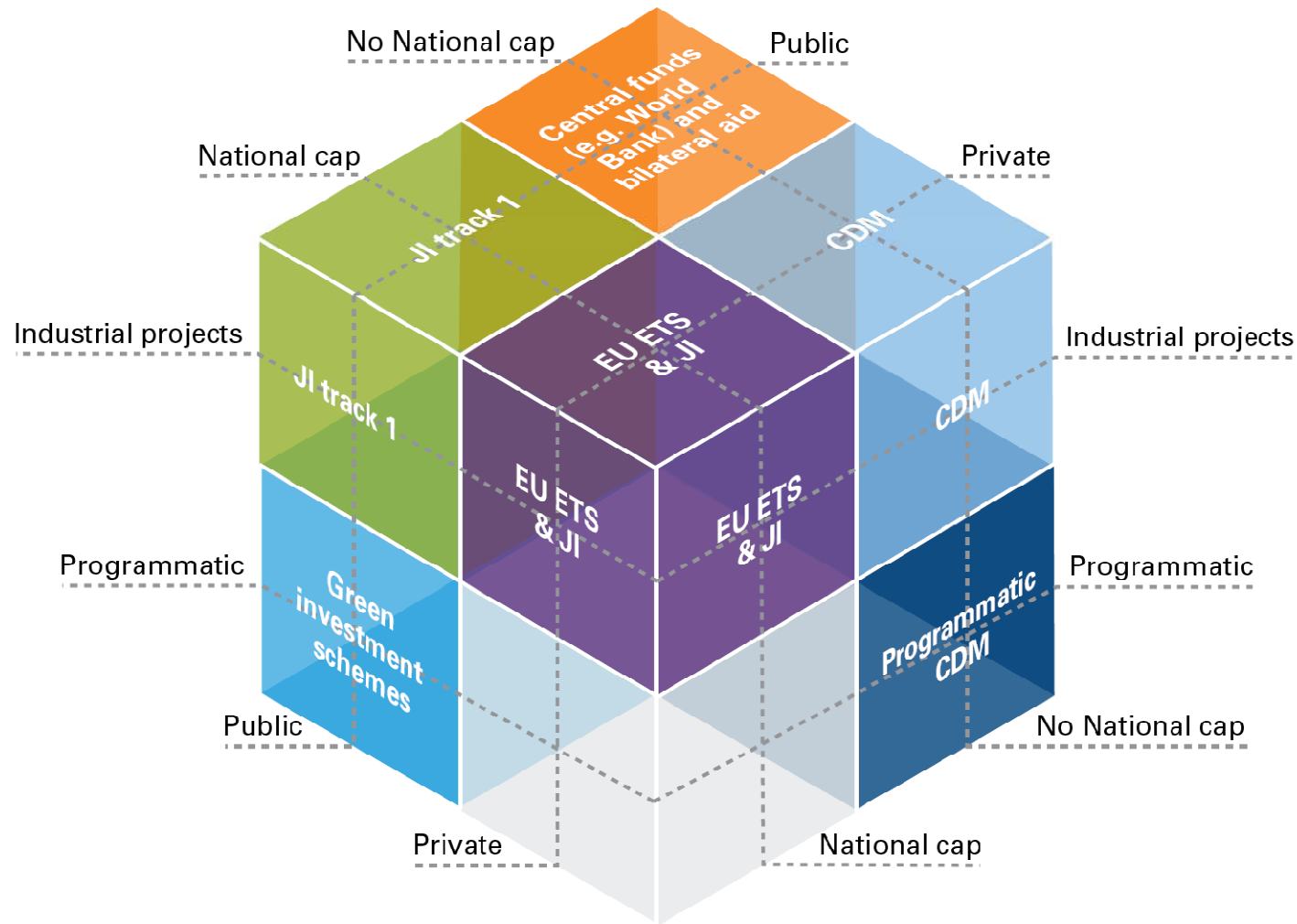
Eligible host parties	Developing countries	Industrialised countries (UNFCCC Annex I)			
Supervision	Multilateral supervision		Bilateral supervision subject to national compliance with full-scope Kyoto Protocol reporting & review		
Mechanism	Clean Development Mechanism (CDM)	Joint Implementation (JI) 'Track 2'	Joint Implementation (JI) 'Track 1'	Green Investment Schemes (GIS)	Industry-cap and-trade (EU ETS)

Overlaps in Industrialised country mechanisms have been:

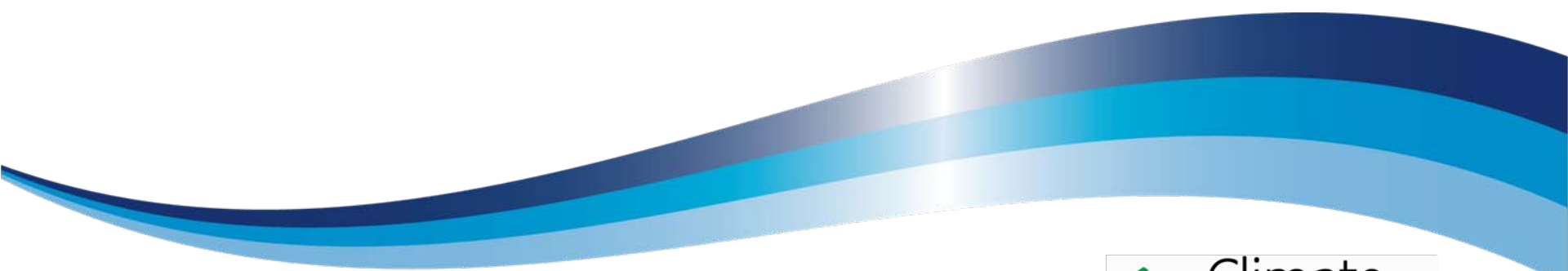
- EU ETS coming in over top of emergent JI in Accession countries
- Some duplication of JI track 1 with GIS in Ukraine

But overall, each is finding a valuable niche

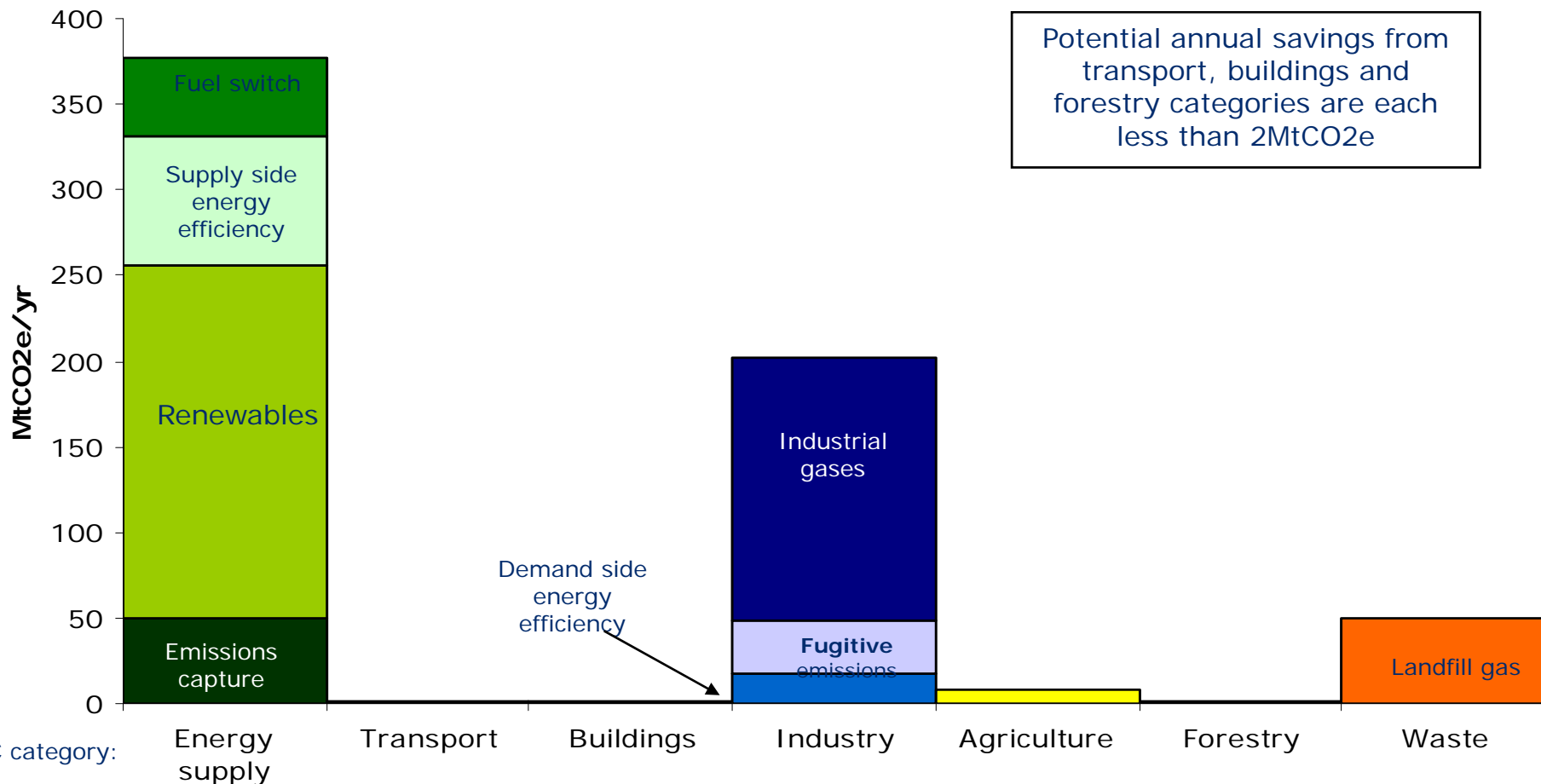
The Global Carbon Mechanisms – and their focal areas



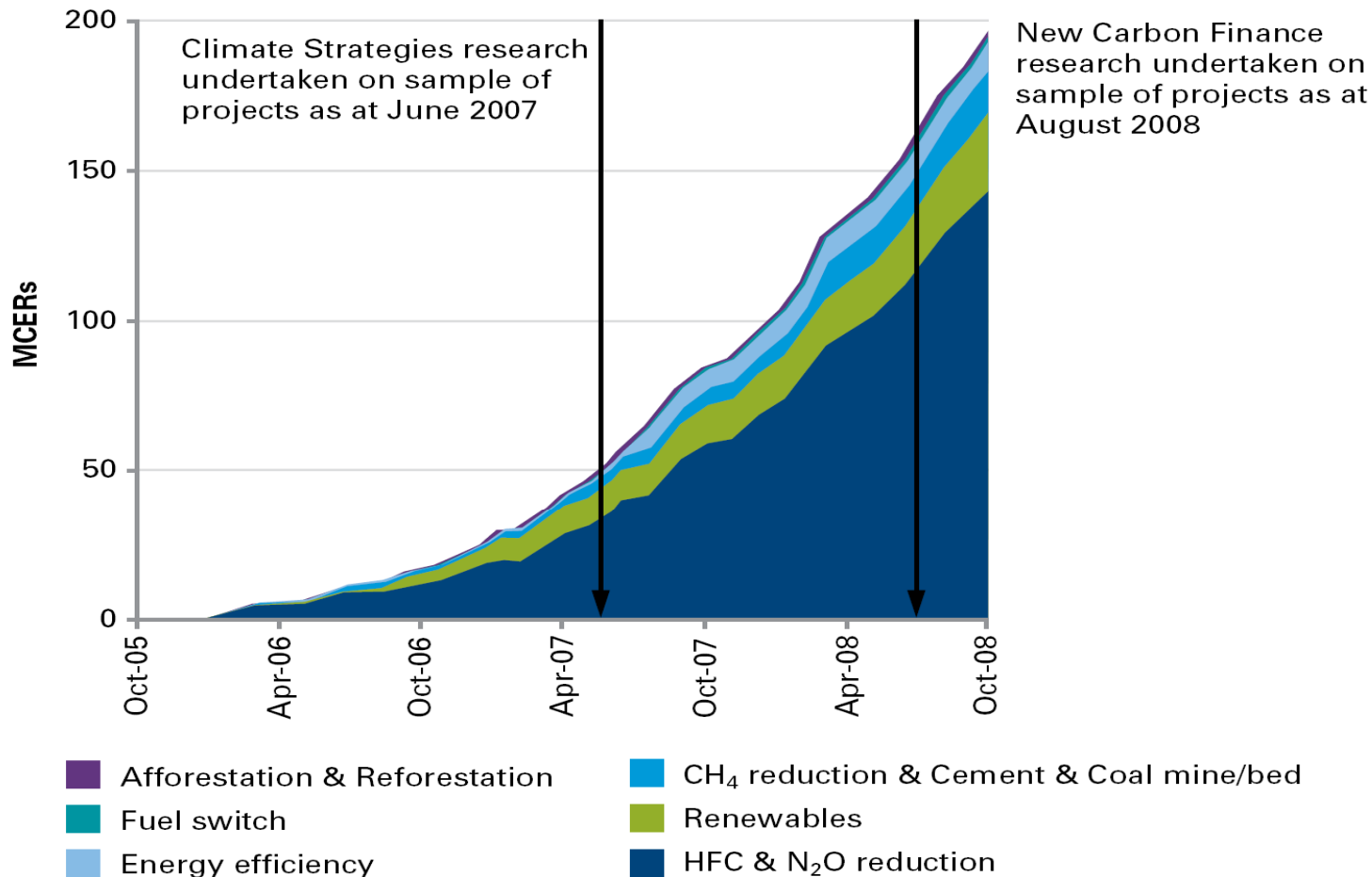
Delivery: initial findings



The most fundamental issue is sectoral coverage of current 4000+ CDM projects ..



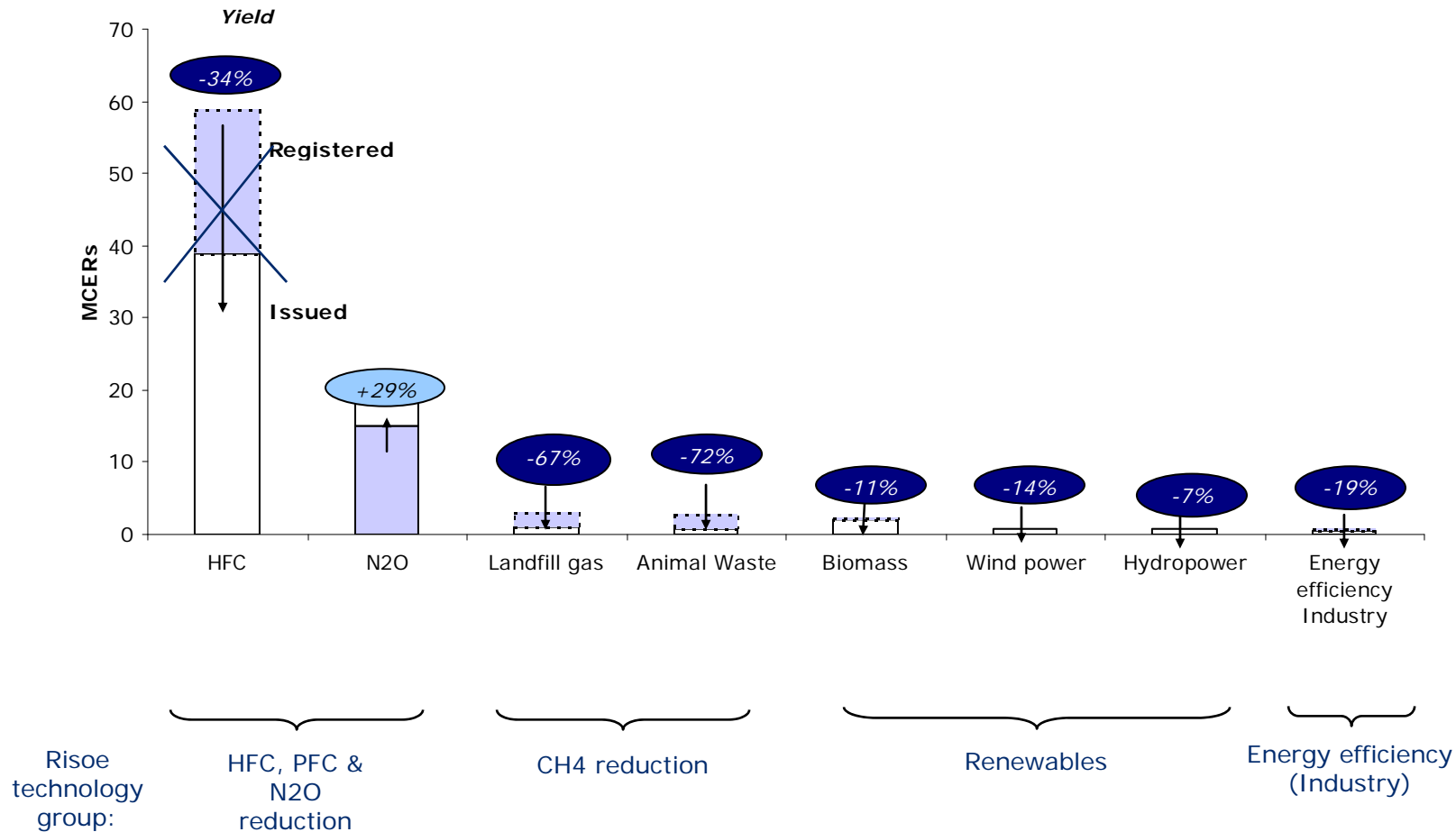
Data on project pipeline extensive, but only two main public studies had compared submitted design documents to delivered performance



Source: UNEP Risoe database November 2008

Note: The chart shows the cumulative number of million CERs issued by the date shown on the x-axis, stacking the different project categories to indicate the total.

'Submission to issuance' ratio varies mainly according to project type – other variables too weak for meaningful attribution



Note: Original analysis data July 2007, updated data see Annex I

HCF dominated by a few large projects, improved over time, most other categories relatively stable
 .. Other mechanisms, too soon to evaluate *delivered performance*

How good (or bad) are the Mechanisms?

- Performance, reforms and prospects

(i) Strengths

Clean Development Mech

Credits for projects in developing countries that reduce GHGs and contribute towards Sus. Dev.

- Substantial resource transfers to developing countries
- Strongly positive political engagement, global buy-in to idea of market mechanisms
- Rapidly identified and delivered cheapest abatement options

Joint Implementation

Project-investment crediting amongst Industrialised parties

- Identified least-cost opportunities and highlighted inefficiencies
- Direct positive engagement with business
- More modest political success

Emissions trading with Green Investment Schemes

.. Revenue directed towards internationally agreed purposes

- Flexible - huge diversity of programmes
- Up-front financing
- Substantial co-benefits
- Long time horizons

.. And collectively deliver key role of facilitating compliance with legally binding quantitative caps

Environmental performance - additionality critiques

Clean Development Mechanism

- Project cases can be debated in each main step of assessment
- Confirms additionality is a judgement not a science
- E+ / E- rules avoid perverse policy incentives, but increase uncertainty around project additionality
- Demonstrating additionality ***more not less difficult as time goes by:***
 - Easy and clear industrial projects become minority
 - Private sector getting better at 'presenting strong case'
 - Accumulation of CDM projects changing the reference case (eg. bagasse)
 - Elapsed time since E+/E- rules make baseline more removed from observables
 - Time also compounds changes technologies and systems

Joint Implementation

- Gas distribution projects put spotlight on extent to which Mechanisms should support opportunities caused by regulatory failures
- Similar (but more complex) issues around building-related opportunities

Emissions trading with Green Investment Schemes

- Most GIS focus more upon multiple environmental and social benefits – and longer timescales – than additional savings in CP1
- Ongoing debate around

=> Additionality in tension with both consistency and minimising transaction costs
=> It is problematic as main criteria post-2012: tradeoffs must be recognised

Efficiency and alternatives?

- 'Stanford critique' focused heavily on inefficiency re big industrial projects and transaction costs, and proposed central funding mechanism
 - Any fixed-price system will generate resource rents, particularly in the early stages – easy to identify *ex-post* but most such opportunities now taken anyway
 - Central funding mechanisms worked for Montreal Protocol, but climate is an entirely different kind of problem: GEF experience is mixed
 - No reason why central funding would be better in terms of additionality and every reason to think it would be more bureaucratic and politicized
- Lack of credible alternatives proposed: most other critiques focus upon greater or lesser degrees of reform that still involve transfer of credits
- ... or of AAUs as driving incentives

Conclusions on most oft-cited problems

- Many concerns reflect fundamental features of market mechanisms ..

Baseline measurement:
perverse incentive



E+/- rules and L+ /L-
(sectoral) rules

Large profits, cheap projects



Centralised funding?
A debateable solution

Ensuring additionality



Judgement not a
science: case for a
higher level goal of
'additional investment'

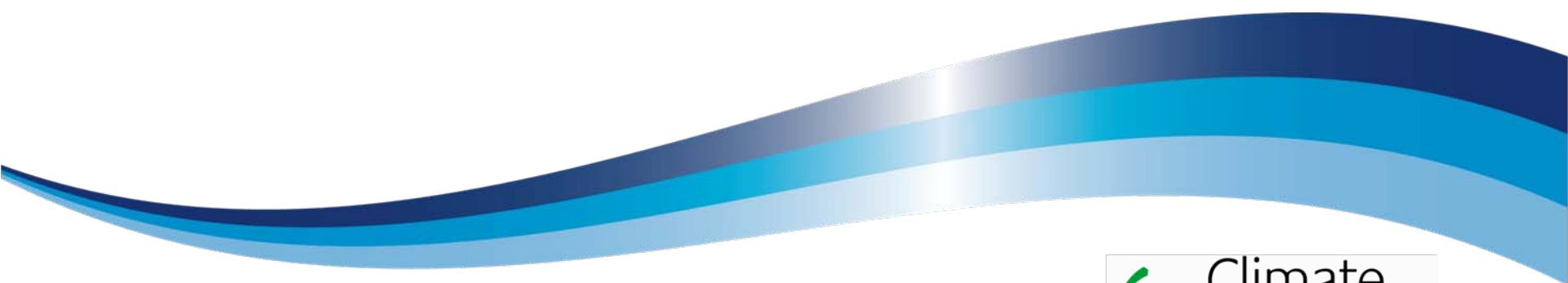
Procedural inefficiencies



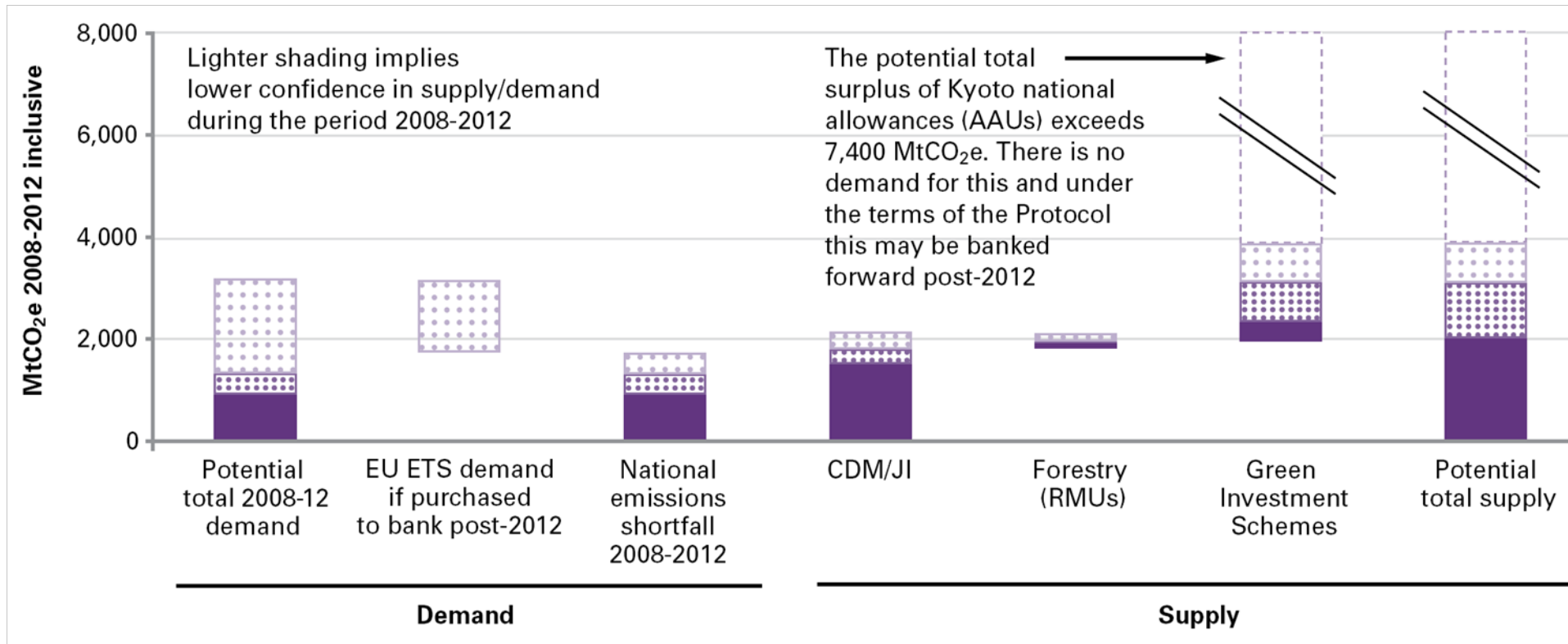
Reform of scope and
structures

*Experience in Central and Eastern Europe can inform future
CDM+ development*

Supply and demand – to 2012 and beyond



Supply, demand and market outlook – an intrinsic governmental surplus, likely private market surplus balanced only through large EU ETS ‘buy to bank’



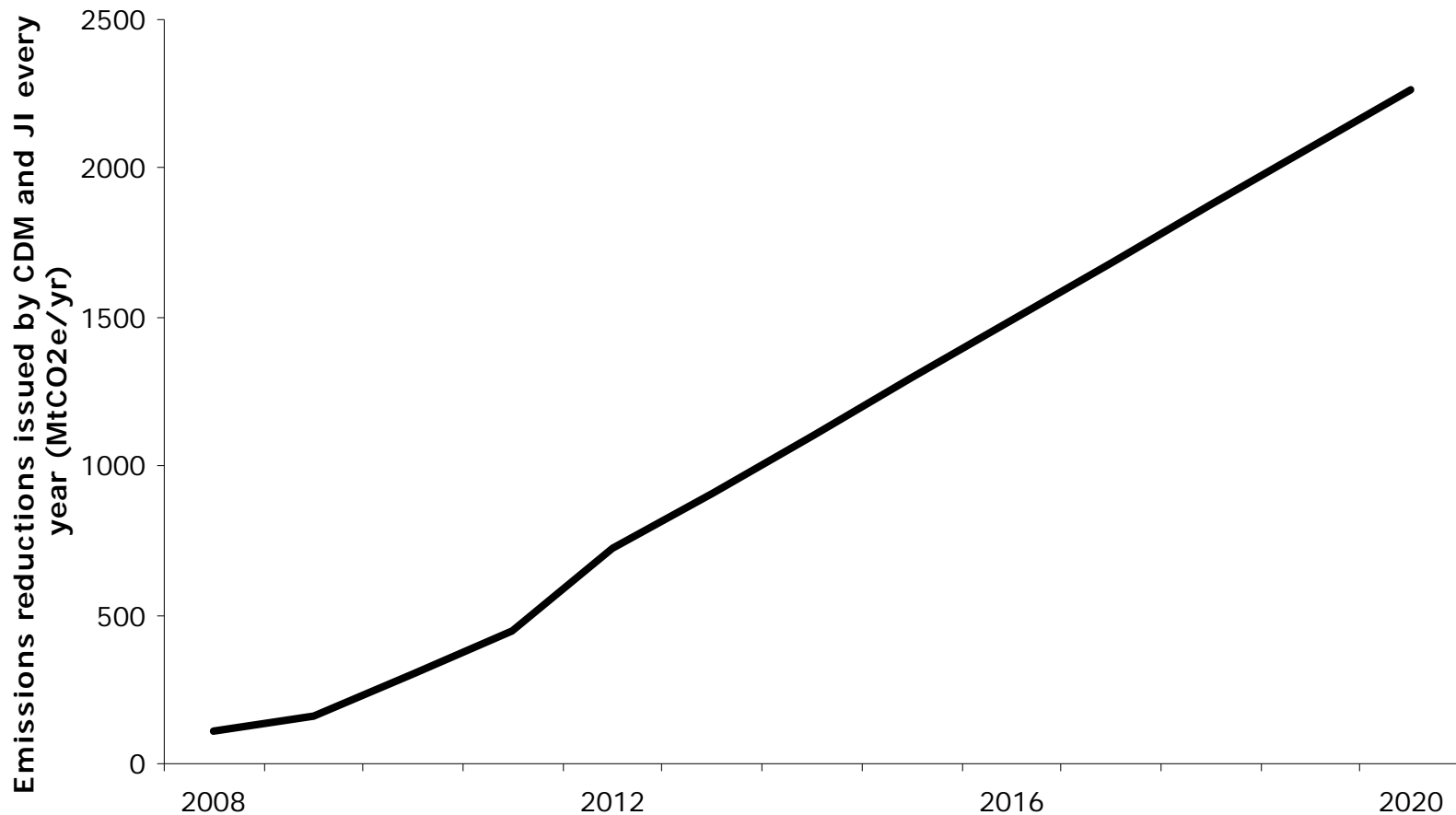
Underlying parallels with EU ETS Phase 1, but we predicted a major shakeout rather than a total price collapse ...

- Specific market distributions & perceptions that may sustain compliance & precautionary buying over a short period;
 - The ability to bank forward to post 2012;
 - Sharp decline in CDM investment in light of low prices and recession
 - Possibility of additional purchase:
 - Canada
 - Voluntary demand market at the margin particularly as prices fall;
 - The political desire of some (buying) governments to maintain prices;
 - Chinese 'floor price' on CDM.
-
- "... However a plausible estimate is prices averaging below €10/tCO₂ – depending on Chinese floor price or other govt actions - with all eyes turning towards post-2012 deal "
 - Would implying severe market angst and high volatility

In practice, international credit prices have been close to €10/tCO₂ but EU ETS prices have 'bounced back' - broadly tracking coal/gas differential ?

- Major decline in CDM investment
- Recession data from late 2008 suggest impacts on emissions 'not as big' as some expected
- High hopes on US – including Waxman-Markey – reinforces sense of post 2012 deal and emergent 'OECD carbon market'
- Strong constraints on imports to EU ETS post 2013 driving wedge between EU ETS and international mechanisms prices?
- *An interesting divergence of views between 'aggregate balance' assessment and 'hedging/liquidity' concerns*
- Don't believe volatility has gone away!

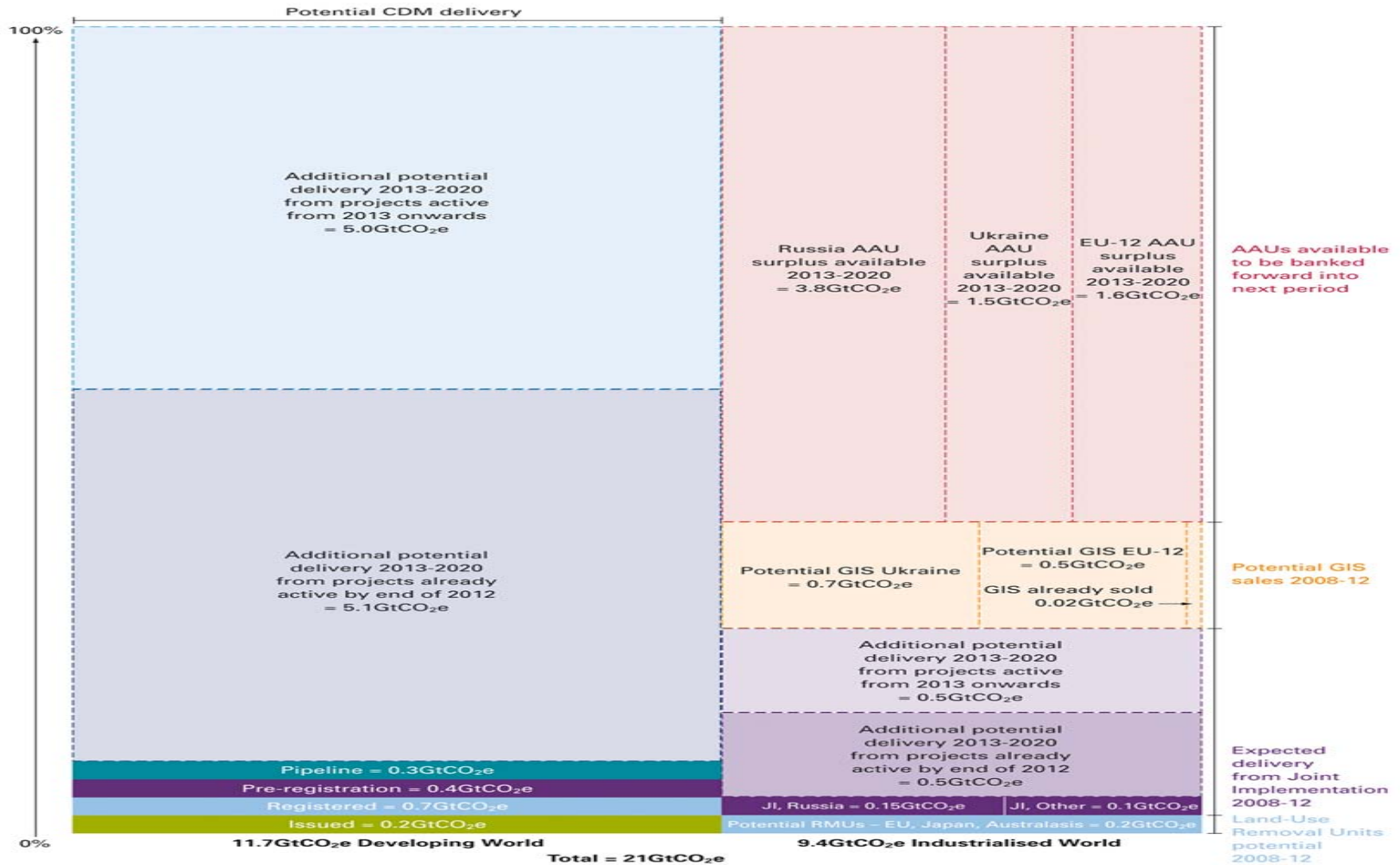
Post-2012 emission savings from project mechanisms, if extrapolated, exceed 2GtCO₂/yr by 2020 ..



Imply

Source: team analysis using data from UNEP Risoe as at 1st November 2008

Post-2012 cutbacks to 2020 will have to absorb supply from future CDM, JI, & Kyoto surplus if banking is honoured:
total 15-20GtCO₂e (c. 10% total ind. country emissions 2013-2020)



Source: For CDM and JI Unep Risoe data as at Oct 2008, for GIS Climate Strategies estimates based on analysis of Kyoto surplus and relevant states announced intentions Source: Carbon Trust, *Global carbon mechanisms: emerging evidence and implications*

Policy interventions to restore market ... ?

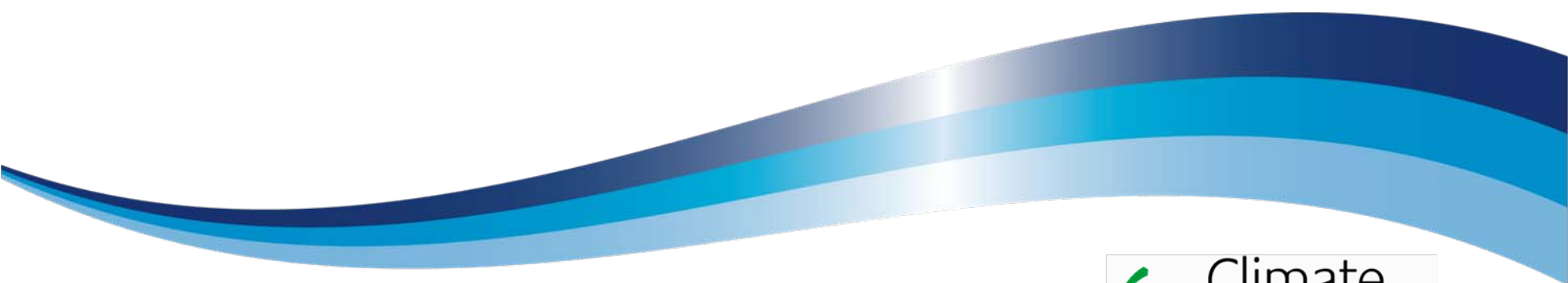
➤ Economic & political fundamentals:

- Clarity about objectives: quantity, investment and efficiency
- Distinguishing features: governments establish market and quantities, and this offers tools not otherwise available

Practical (demand-side) options to support price:

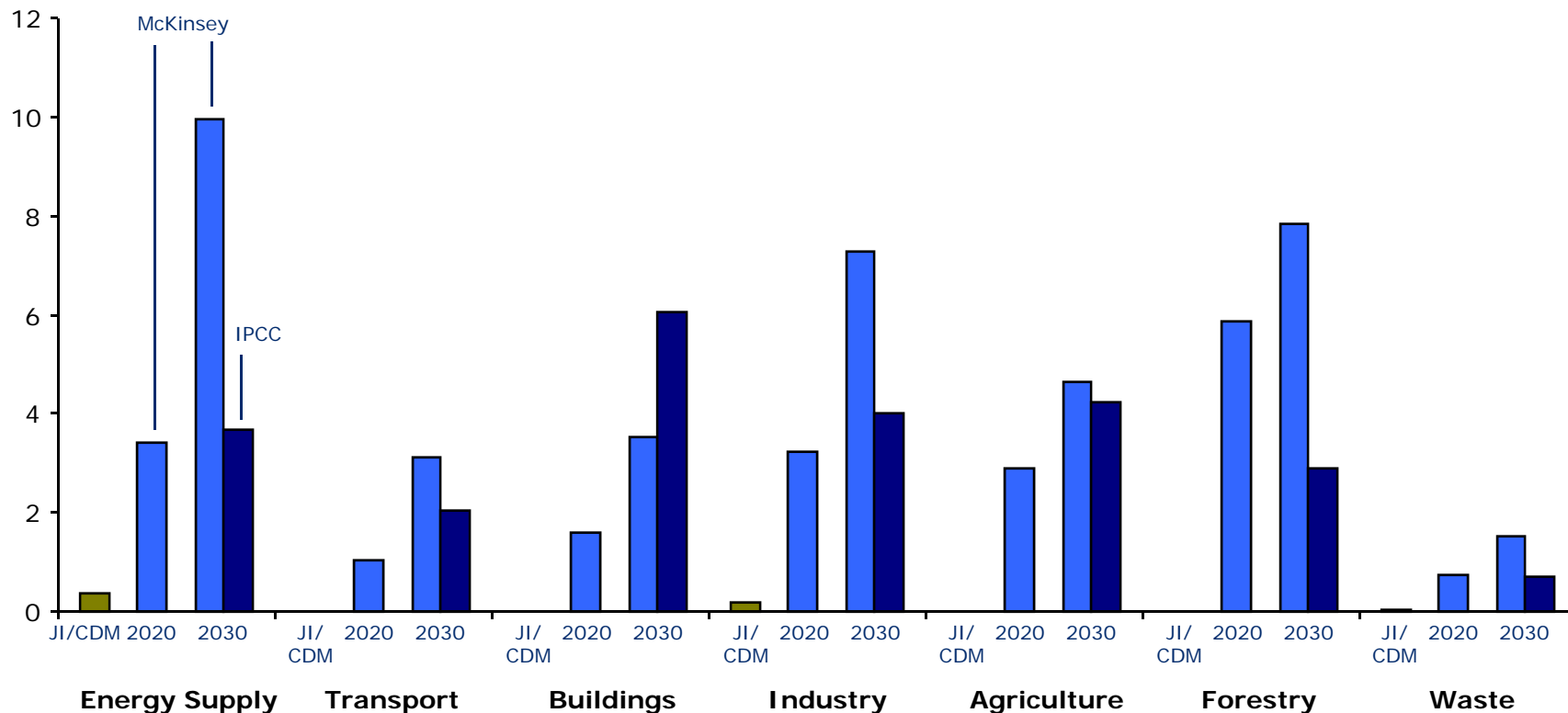
- Entry of Canadian purchases
- Retiring units
- Commitment to banking
- **Reserve price** on EU ETS auctions (esp. UK and German)
- Early declaration on post-2012 targets

Some future challenges



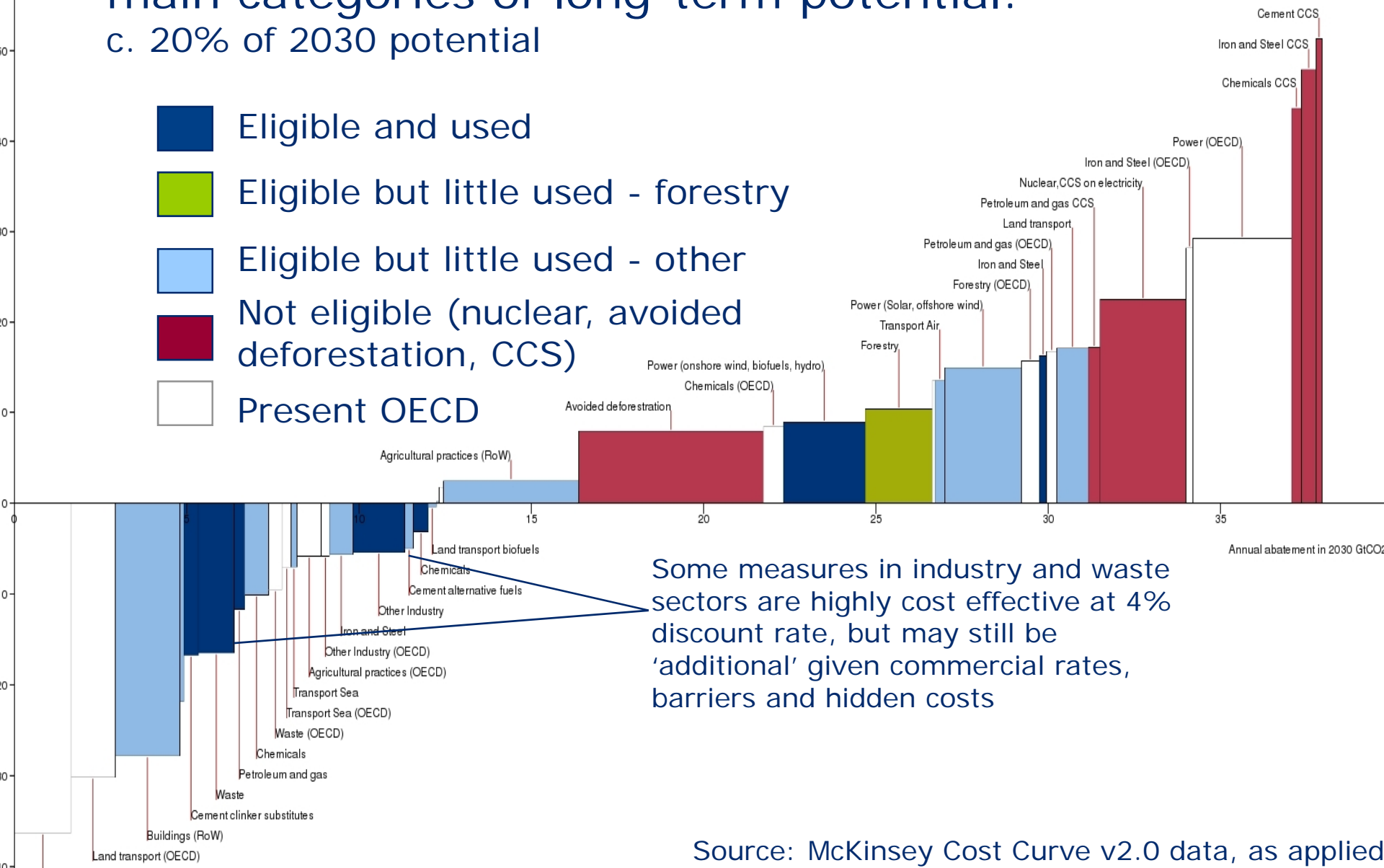
The system cannot cope with the huge expansion implied if the full 2020 and 2030 potentials are to be realised along the current lines

Abatement GtCO2e



Kyoto Project Mechanisms to date (4000+ projects) *in practice* are supporting investment in only a few main categories of long-term potential: c. 20% of 2030 potential

- Eligible and used
- Eligible but little used - forestry
- Eligible but little used - other
- Not eligible (nuclear, avoided deforestation, CCS)
- Present OECD

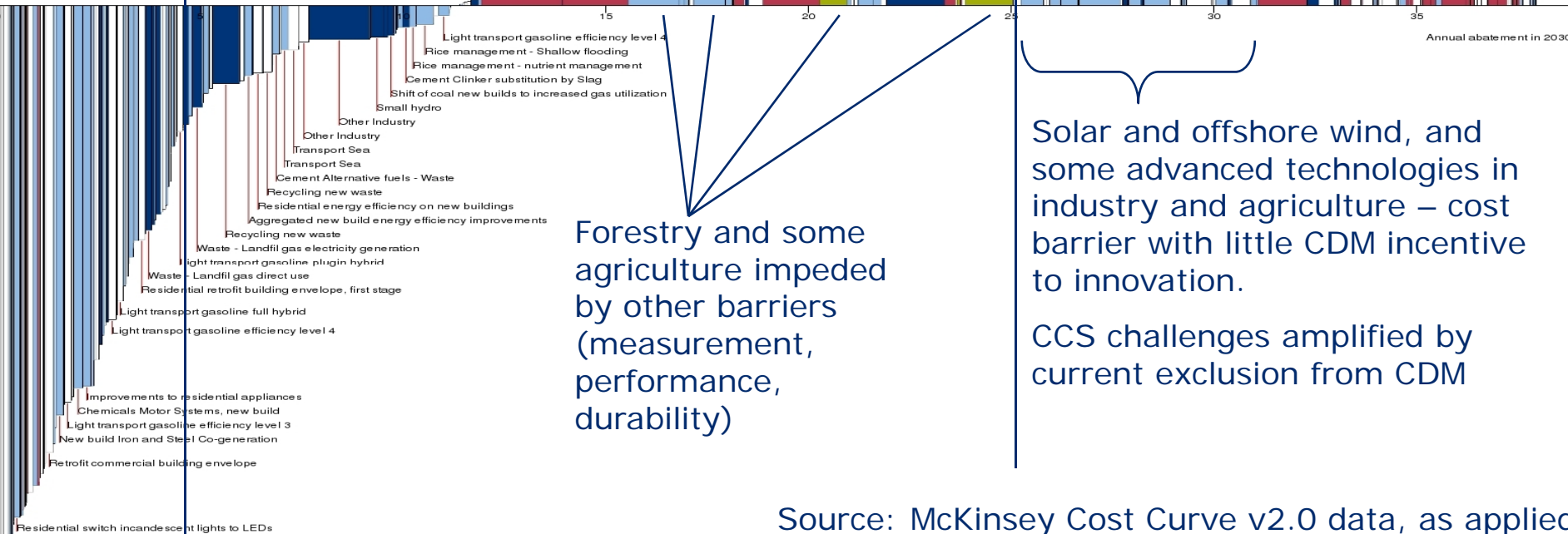
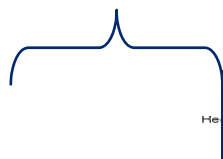


Some measures in industry and waste sectors are highly cost effective at 4% discount rate, but may still be 'additional' given commercial rates, barriers and hidden costs

Source: McKinsey Cost Curve v2.0 data, as applied

Disaggregation underlines challenges at both ends of cost curve (and some in the middle)

Energy efficiency - transaction cost and additionality problems inhibit mechanisms



Forestry and some agriculture impeded by other barriers (measurement, performance, durability)

Solar and offshore wind, and some advanced technologies in industry and agriculture – cost barrier with little CDM incentive to innovation.

CCS challenges amplified by current exclusion from CDM

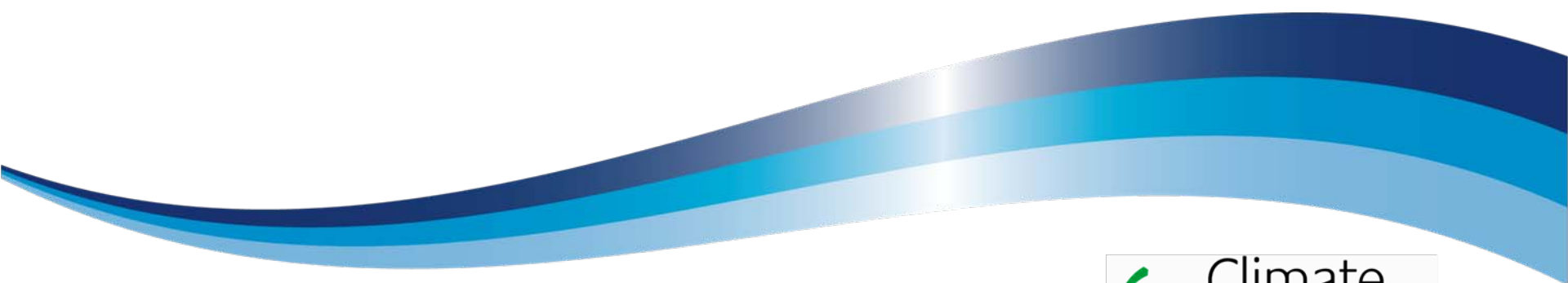
Source: McKinsey Cost Curve v2.0 data, as applied

Carbon Trust (2009) 'Global carbon mechanisms: evidence and emerging implications'

Categorisation of reform options

- Governance and procedural reform
 - Maintain project and programmatic structure
 - Professionalise bodies, separate EB functions better, introduce more checks and balances, etc.
 - Streamlining eg. programmatic
 - Cannot address the more fundamental dilemmas
- Maintain project focus whilst amending additionality rule
 - ‘Penetration-based’ metrics
 - Multiple and discounted CERs
 - *Also affect and can give a throttle on supply-demand balance*
- Expanding the horizons
 - ‘Sector-based’ instruments
 - ‘Policy-based’ instruments
 - Should look to GIS for evidence-base
- Fundamental need to keep supply-demand balance in focus on context of post-2012 negotiations, lack of an integrating mechanism .. ‘the single most important weakness in the global negotiating process’

Broad conclusions



The Mechanisms have been broadly successful but experience indicates they will need both reform, and *more differentiation with new tools/variants added*

- Some “problems” have simply been that CDM has delivered what it was designed to deliver!
- Future developments need to reflect divergence in
 - Geography and politics
 - Intrinsic transaction costs of different types
 - Project classes where additionality is broadly demonstrable compared to those where almost impossible (eg. REDD)
- Maintain a credible supply-demand balance going forward, which has to be part of the ‘package design’
- Acknowledge dominant value of incentivising policy reform
- Evaluate these in context of
 - global abatement supply curves
 - .. and the IPCC Fourth Assessment finding that ‘the global baseline matters more than the mitigation potential’...

By 2020, CDM and JI could be crediting 2GtCO₂e/yr – but this is not in itself sufficient to bring about radical global transformation (hence study of reform options)

Conclusions: Global Carbon Mechanisms can, should and will form part of post-2012 landscape but face serious problems and intrinsic limitations

- The unprecedented growth of the Global Carbon Mechanisms has overcome initial resistance, but reforms will be needed
- Scepticism particularly in North America, which will be fuelled by ..
- Looming surplus of credit supply over demand will create very low prices in the absence of action. Governments could consider various options to support prices during 2009.
- Mechanisms are only effective if means exists to deliver supply-demand balance out of negotiations and underpin prices
- Evolution of developing country instruments could learn from the industrialised country experience
- Carbon credit mechanisms can only address part of the whole picture of abatement opportunities. Developing countries need a variety of instruments in addition to those that already exist, and the world overall requires additional measures to tackle inefficiencies and accelerate technology innovation.
- ... NB *bottom-up linking of emerging ETS and sectoral mechanisms is unlikely to provide an adequate solution .. (forthcoming ..)*

	Climate Strategies www.climatestrategies.org Academic Synthesis Reports*	Carbon Trust www.carbontrust.co.uk Insights publications
EU ETS design and incentives	<i>National allocation plans in the EU ETS (2006)**</i> Grubb, Neuhoff et al.: <i>Submission to EU ETS review (2007)</i> Neuhoff et al. <i>Auctioning (2008)</i>	<i>EU ETS Phase II allocation: implications and lessons (2007).</i> <i>Cutting Carbon in Europe: The 2020 plans and the future of the EU ETS (2008)</i>
Competitiveness and carbon leakage	Grubb et al.: <i>Emissions trading and competitiveness (2006)**</i> Hourcade et al, <i>Differentiation and dynamics of EU ETS industrial competitiveness (2007)</i> Droege et al., 'Tackling carbon leakage' (2009)	<i>The European emissions trading scheme: implications for industrial competitiveness (2004)</i> <i>Allocation and competitiveness in the EU emissions trading system: options for Phase II and beyond (2007).</i> <i>EU ETS impacts on profitability and trade: a sector by sector analysis (2008).</i> <i>Tackling carbon leakage (Sept 2009)</i>
Global Carbon Mechanisms & international linking	P. Castro and A. Michaelowa, <i>Empirical analysis of the performance of CDM projects (June 2008)</i> ; A. Korppoo and O. Gassan-Zade, <i>Joint Implementation: looking back and forward (October 2008)</i> ; D. Urge-Vorsatz et al., <i>Green Investment Schemes: maximising their benefits for climate and society (November 2008)</i> . Michaelowa and Mueller, <i>Future of CDM report (in review 2009)</i> Tuerk et al., <i>Linking emission trading schemes (2009)**</i>	<i>The Global Carbon Mechanisms: evidence and Implications (Feb 2009)</i> <i>Linking emissions trading schemes (July 2009)</i>

* Academic Synthesis reports are accompanied by a variety of working papers from the contributing authors on the project; see website
 ** Projects from which main papers have been published as a Special Issue of the *Climate Policy* journal, www.climatepolicy.com.