



Global Status of CCS

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Backdrop



- ***Full scale demonstration of CCS is needed to establish confidence in the technology***
- ***The G8 have set the goal of 20 demonstration projects by 2020***
- ***The IEA CCS Road Map has set out the case for 100 demonstration projects by 2020 and 3000 by 2050.***

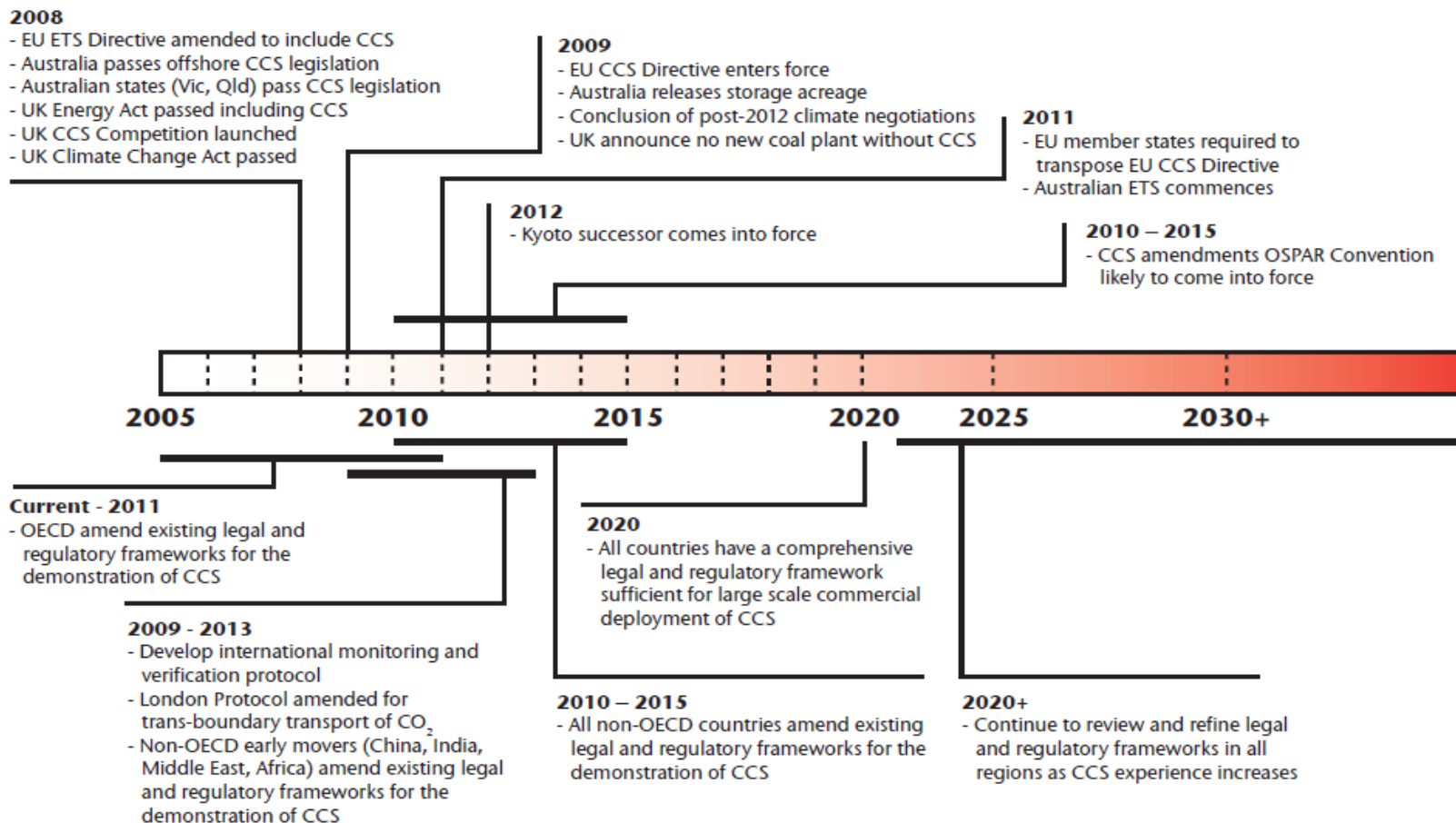
Regulatory Frameworks



- ***Existing legal and regulatory frameworks should be reviewed and adapted for CCS demonstration by 2011 in OECD countries and by 2015 in all countries***
- ***All countries should have a legal and regulatory framework suitable for large-scale CCS deployment by 2020***
- ***International legal issues need to be resolved by 2012***

Source: IEA CCS Technology Roadmap 2009

Milestones



Source: IEA CCS Technology Roadmap 2009

Finances



Government finance needed to support demonstration projects

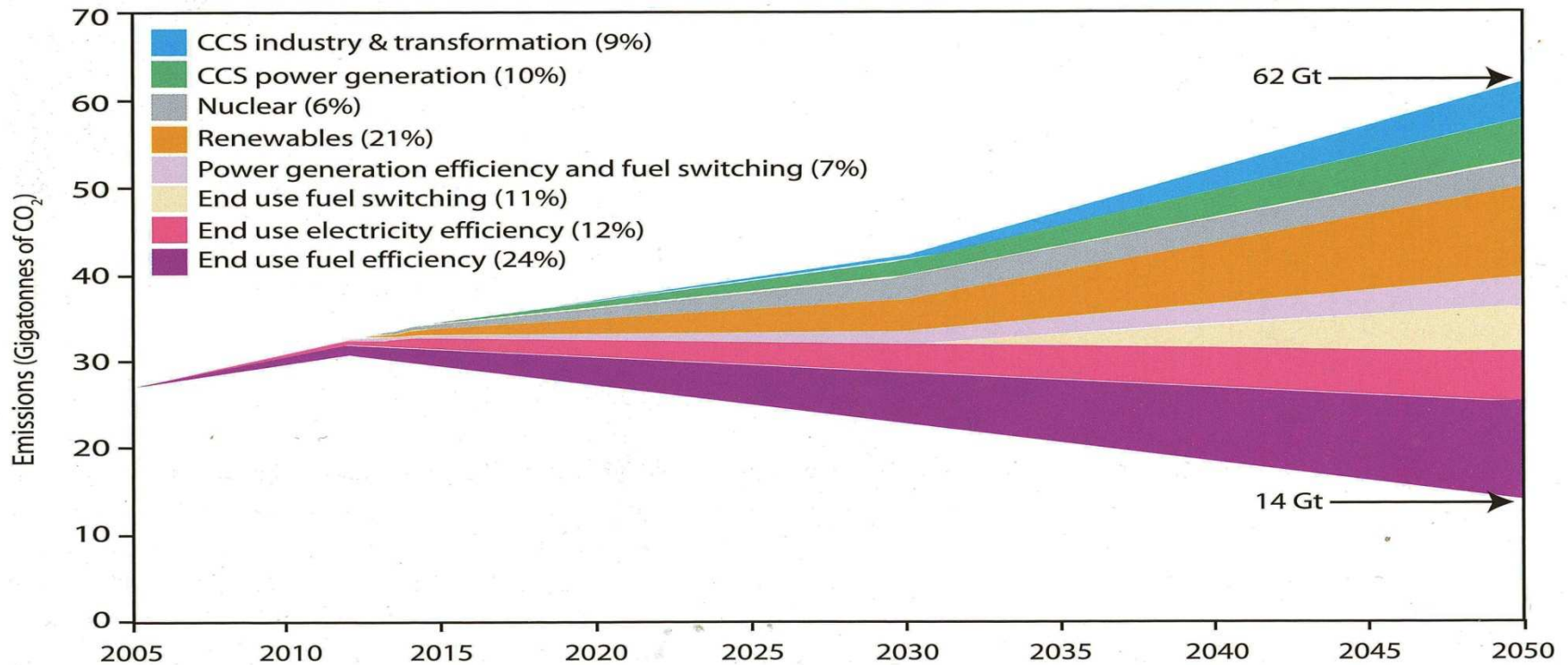
- Australia, Clean Energy Initiatives Programme
 - CCS Flagship Program
 - A\$2.0 billion to fund 2 – 4 industrial-scale CCS projects
- Canada, C\$1 billion clean energy fund
 - Alberta has earmarked C\$2 billion for CCS projects
- USA
 - \$1bn for CCS projects, \$1bn for FutureGen and \$1bn for industrial CCS projects
- European Energy Recovery Programme
 - €1 billion to six CCS projects

Implementation



- ***Global Capture and Storage Institute established to assist implementation of CCS demonstrations***
- ***European CCS Demonstration Monitoring Programme established***
- ***IEAGHG “lessons learnt” from existing CCS projects programme***

We need to deploy CCS in power and industrial sectors



An analysis by the International Energy Agency shows the measures needed to cut emissions in half by 2050. Most of the needed emissions reduction can be achieved by CCS in the power generation and industrial sectors, energy efficiency and renewable energy sources.

Image Source: Based on International Energy Agency, *Energy Technology Perspectives, 2008: Scenarios and Strategies to 2050*, OECD/IEA, Paris, June 2008.

Technical Status in Power Sector



- ***Post combustion capture demonstrated at 1Mt scale on natural gas***
 - Pilot plants on flue gas need to be scaled up
- ***Pre combustion capture (IGCCS) not yet demonstrated in integrated mode at scale***
- ***Oxy fuel***
 - Pilot plants need to demonstrate technology then scale up needed

Other Industrial Sectors



- ***Recently looked at cement industry***
- ***Technically feasible to introduce CCS technology into cement plants***
- ***Costs are high***
 - €107/t CO₂ avoided for a typical EU plant
 - €60/t CO₂ avoided for a typical Asian plant
 - Integration could halve costs
- ***May be commercial implications for CCS deployment***
- ***50% of current cement production in China***
 - No driver to implement CCS.
- ***Steel industry study underway***

Transport



ICON₂

Pipeline network to capture and supply 1.2Mt/y CO₂ by 2010



CO₂ flooding in the Permian Basin demonstrating CO₂ sources (yellow), flooded oil fields (green) and associated transmission lines.

Permian Basin, 3000km pipeline network operating since mid 80's



Snohvit
160km Sub sea pipeline



Weyburn 300km transboundary pipeline

Long distance transport of CO₂ by pipeline is established technology

CO₂ Storage



Snohvit capturing and injecting 0.7Mt/y CO₂ since 1996



Sleipner capturing and injecting 1Mt/y CO₂ since 1996



Weyburn capturing and injecting 1Mt/y CO₂ since 2000

Rangeley injecting 3 Mt/y CO₂ since 1996



In-Salah capturing and injecting 1Mt/y CO₂ since 2004

Challenges



- ***Long term monitoring needs?***
- ***Storage capacity – is there enough?***
- ***Pressurisation impacts?***
- ***Brine displacement/water contamination?***

- ***Costs?***
- ***Water usage?***

Public Engagement



- ***Need to learn from both positive and adverse experiences***
 - US study from Regional Partnerships Programme
 - Barendrecht
- ***Communications research network established by GCCSI and IEAGHG***
 - Aims to share experiences and establish best practise guidelines



Thank You

New web site: www.ieaghg.org

GHGT-10: www.ghgt.info

