

CCS Legal, Regulatory and Financial Issues: A Roadmap for Future Development

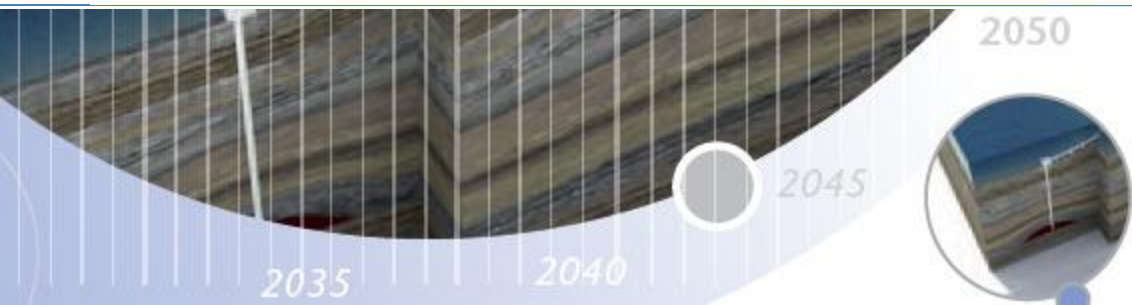
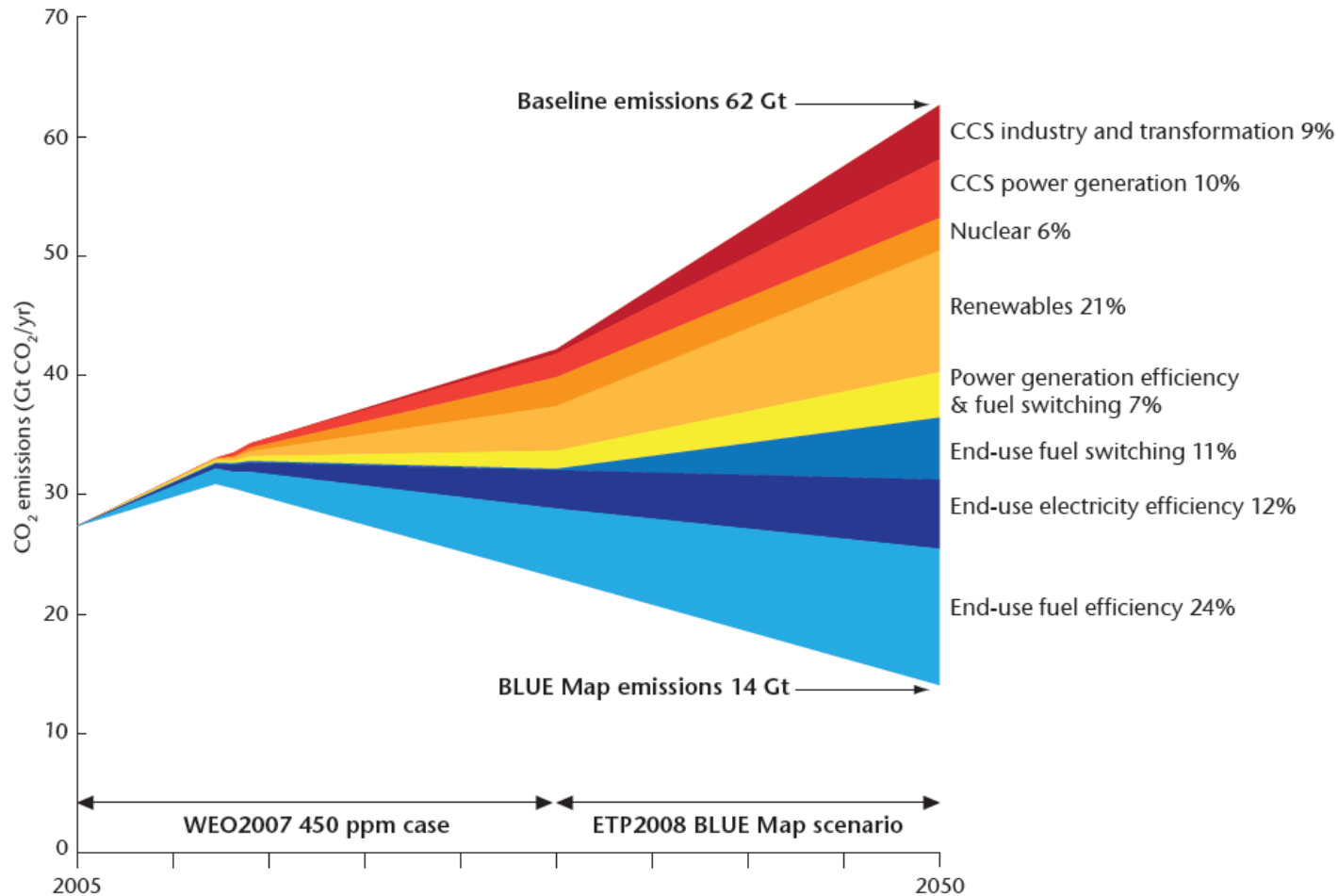
Tom Kerr

*IFP CCS Meeting
November 2009*

Technology Roadmap

Carbon capture and storage

An energy technology revolution is needed

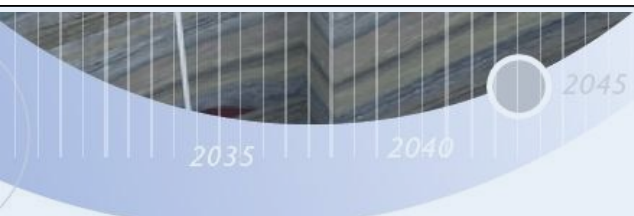
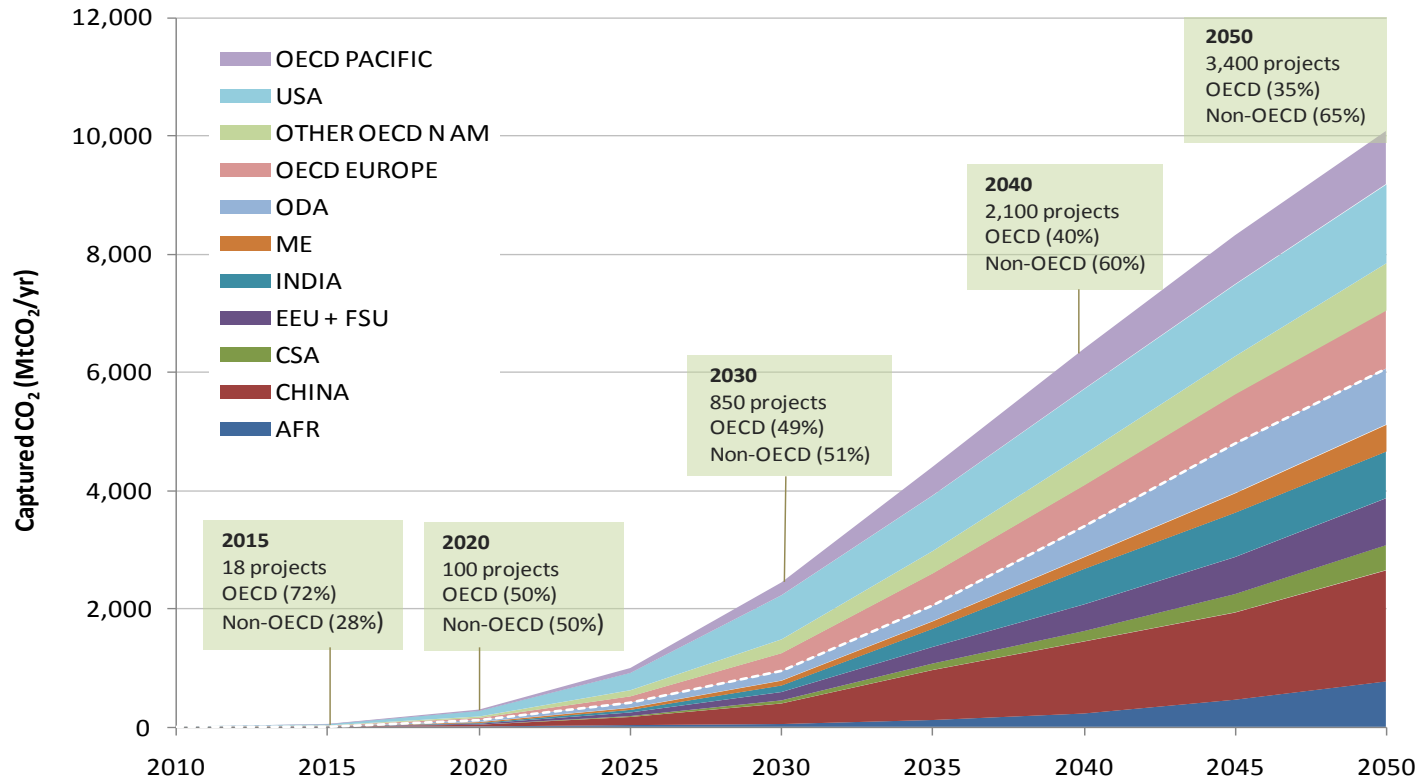


Technology Roadmap

Carbon capture and storage

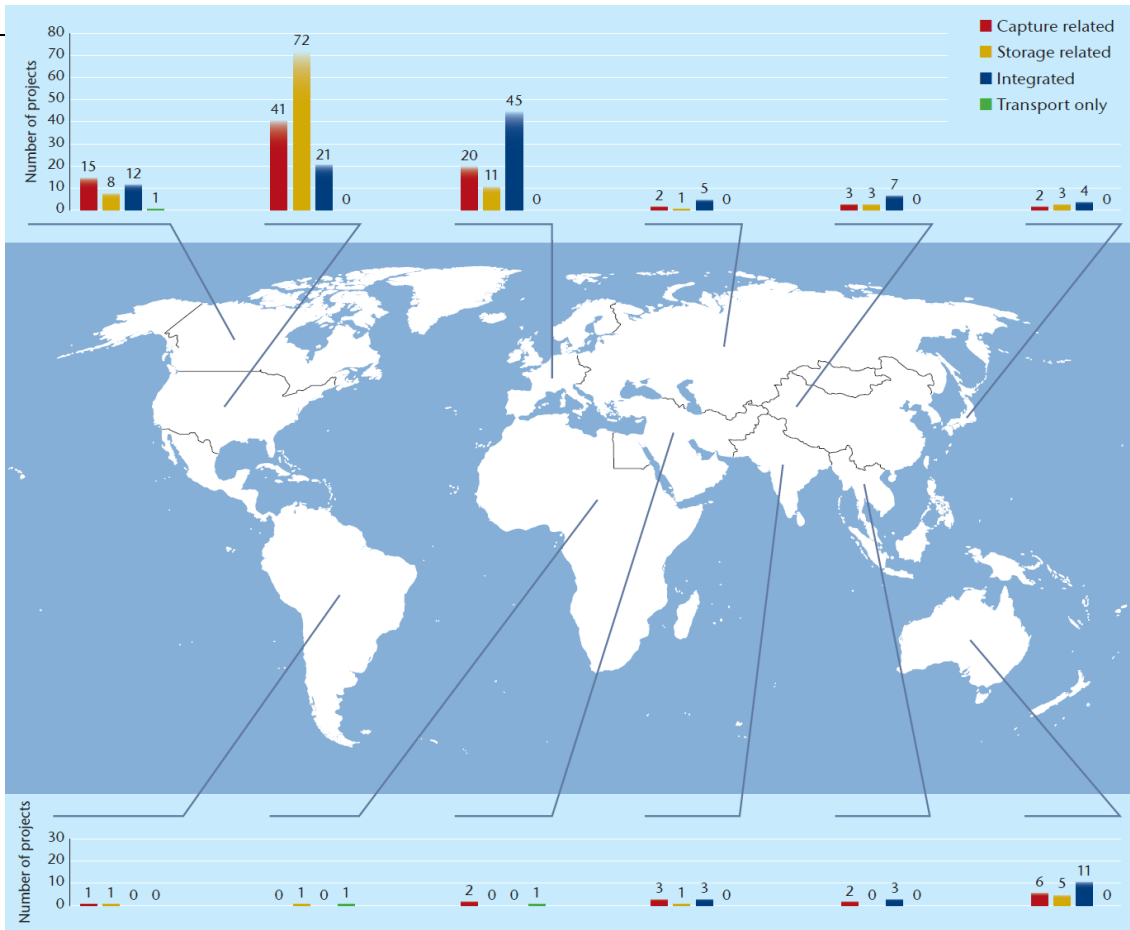


An ambitious growth pathway



Technology Roadmap Carbon capture and storage

CCS is ready...



Over 100 integrated projects planned

Source: GCCSI

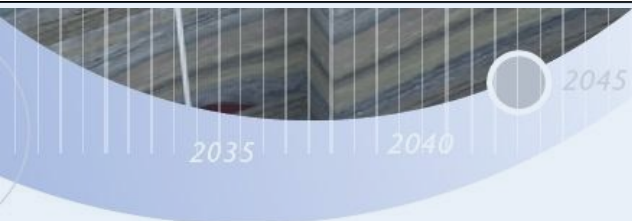


Technology Roadmap
Carbon capture and storage

...but faces challenges



- Accelerating R&D for capture technologies
- Exploring and documenting suitable CO₂ storage sites
- Developing appropriate legal & regulatory frameworks
- Ensuring public engagement
- Expanding international collaboration



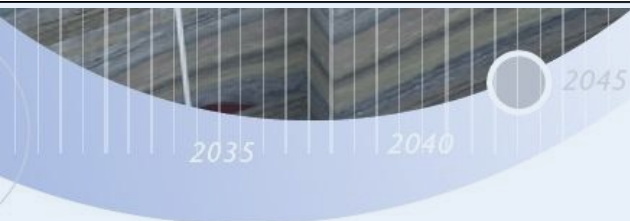
Technology Roadmap

Carbon capture and storage

The IEA CCS roadmap



- Establishes the current technology baseline
- Identifies a growth pathway for CCS, assuming a 50% reduction in energy-related CO₂ by 2050
- Creates technical, policy, legal, financial, and public acceptance milestones to achieve that pathway
- Identifies priority near-term actions
- Creates a process for enhanced collaboration
- Will implement actions and track progress



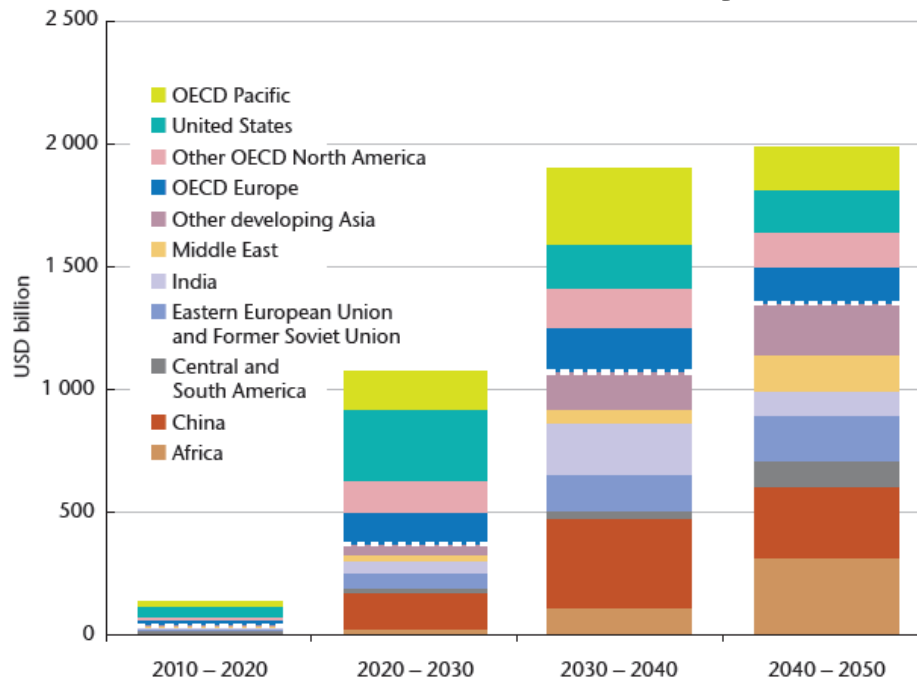
Technology Roadmap

Carbon capture and storage

CCS roadmap financing needs

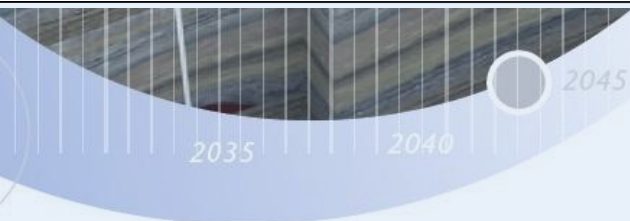


Total CCS investment by decade (USD)



Additional investment is \$42 bn in the next decade, \$2.5-3 trn by 2050

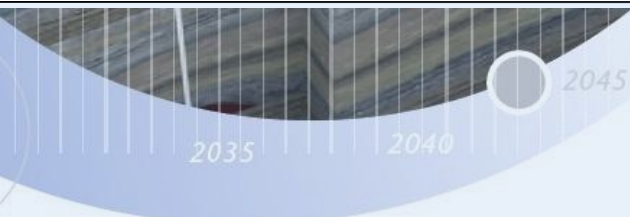
Notes: Does not include investment in transport and storage; the dashed line indicates separation of OECD/non-OECD groupings.



CCS financing milestones



- Increase funding for CCS demonstration to achieve an **average annual investment of \$3.5 - 4 bn from 2010 to 2020**
- **Establish incentives** to accelerate commercial-scale CCS deployment beyond the demonstration phase
- **Average annual investment of \$1.5 - 2.5 bn from 2010 to 2020 in non-OECD regions** via the establishment of new financing strategies (e.g., approval of CCS in the Clean Development Mechanism or similar mechanism)

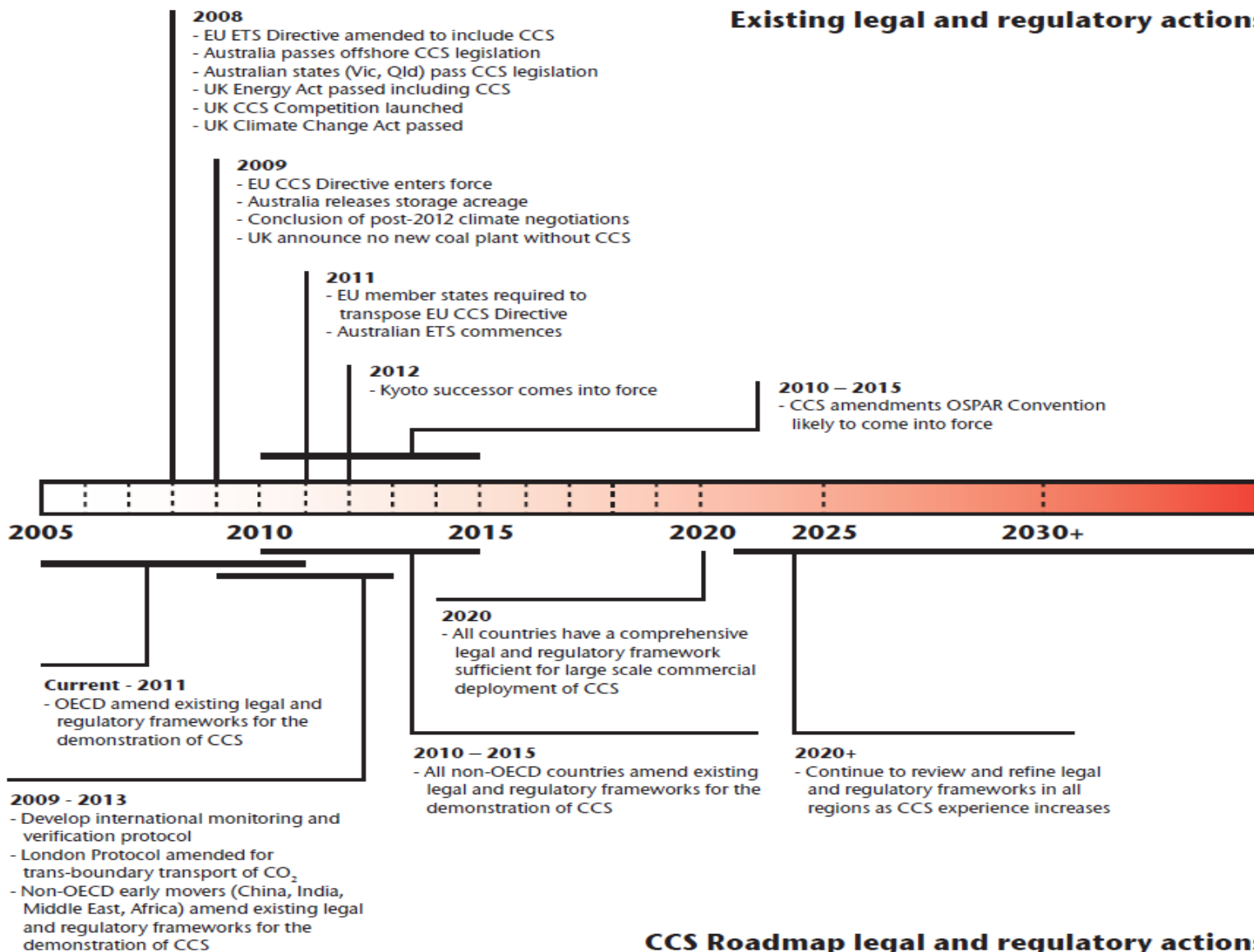


Technology Roadmap

Carbon capture and storage

CCS roadmap legal milestones

Existing legal and regulatory actions

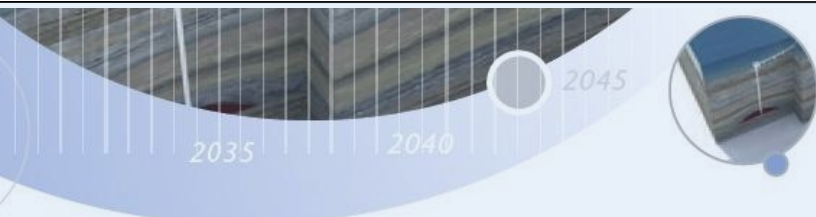


CCS Roadmap legal and regulatory actions

CCS regulatory issues



- **Framework legislation**
 - Australia, EU, UK, Norway, Japan, Canada (some provinces), US (some states)
- **Permitting of storage operations**
 - EU risk management approach
- **Monitoring & verification**
 - Australia, EU scheme for ETS
- **Long-term liability**
 - US state legislation transfers responsibility to state government (TX and others)
- **CO₂ transport**
 - EU directive –national property and planning laws
- **CCS enabling legislation**
 - Alberta Canada funding for CCS
- **Integration with GHG regulation/possible incentives**
 - CDM, EU ETS, US Congressional bills



Technology Roadmap

Carbon capture and storage

CCS roadmap

legal & regulatory actions



- **Review and adapt existing legal frameworks** to regulate CCS demonstration projects by 2011 in OECD countries, 2013 in early-mover non-OECD countries, and 2015 in all non-OECD countries with CCS potential
- All countries create a **comprehensive CCS regulatory framework**, if required, by 2020
- **Address international legal issues**, including development of an international monitoring and verification protocol for CO₂ storage and allowance of transboundary CO₂ transfer under the London Protocol by 2012
- **Expand government education and engagement efforts**; provide transparent information about planned CCS projects in a timely manner



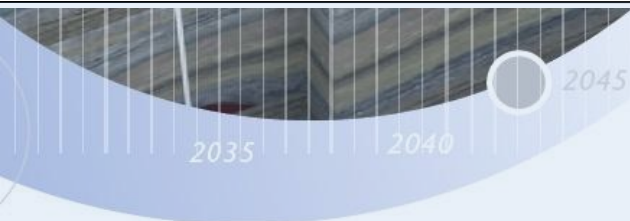
Technology Roadmap

Carbon capture and storage

CCS roadmap implementation



- Partnering with GCCSI, CSLF, other entities to track implementation, report on milestones
- G8 2010 meeting in Canada – status report
- Legal issues: IEA CCS Regulators' Network
 - regular webinars on specific topics, peer-exchange events
 - developing a model legal framework – June 2010



Technology Roadmap

Carbon capture and storage

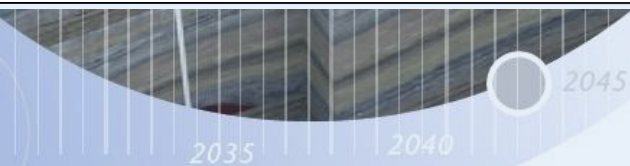
For further information



IEA roadmaps: www.iea.org/roadmaps

IEA CCS Regulators' Network:
www.iea.org/subjectqueries/ccs/ccs_legal.asp

Carbon Capture Legal Programme:
www.ucl.ac.uk/cclp/



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