GLOBAL CCS INSTITUTE

THE GLOBAL STATUS OF CCS

Qianguo Lin, Senior Advisor - China, Global CCS Institute

Latest IPCC report: A call to action

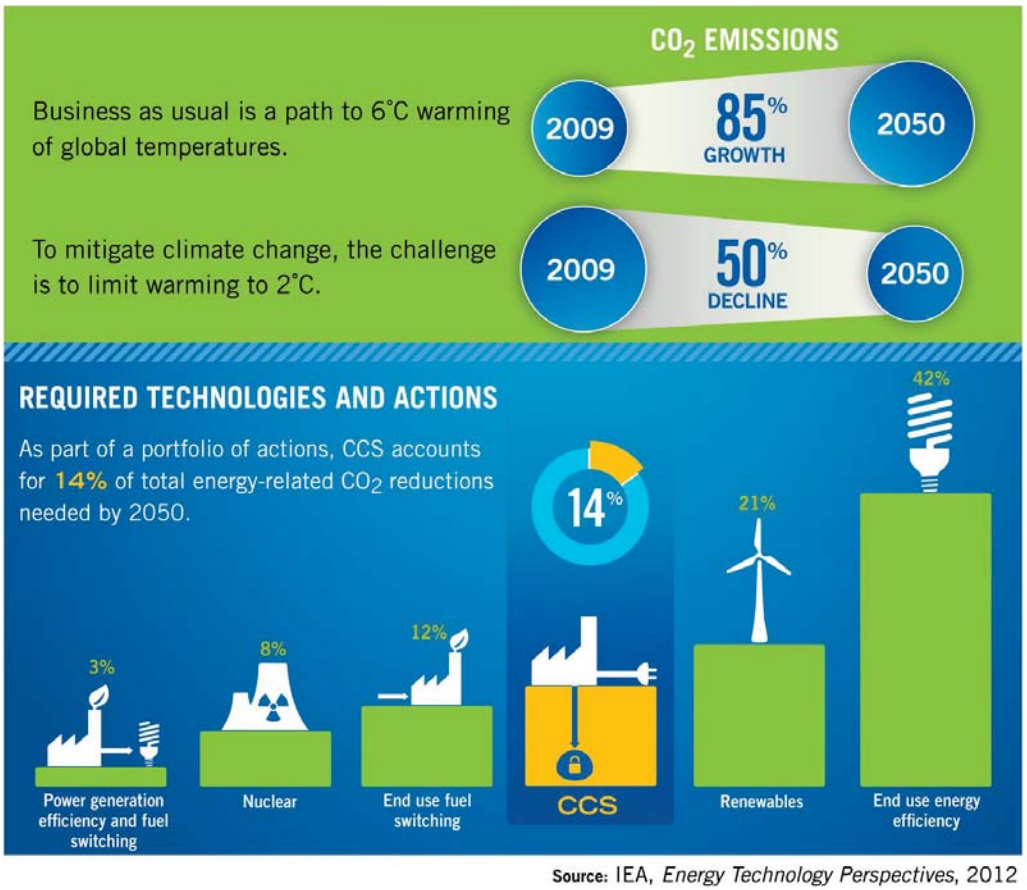
"Climate change is the greatest challenge of our time, in short, it threatens our planet, our only home."

Thomas F. Stocker, co-chairman IPCC

"The kinds of harm already being experienced from climate change will continue to worsen unless and until comprehensive and vigorous action to reduce emissions is undertaken worldwide"

John P. Holdren, President Obama's science adviser

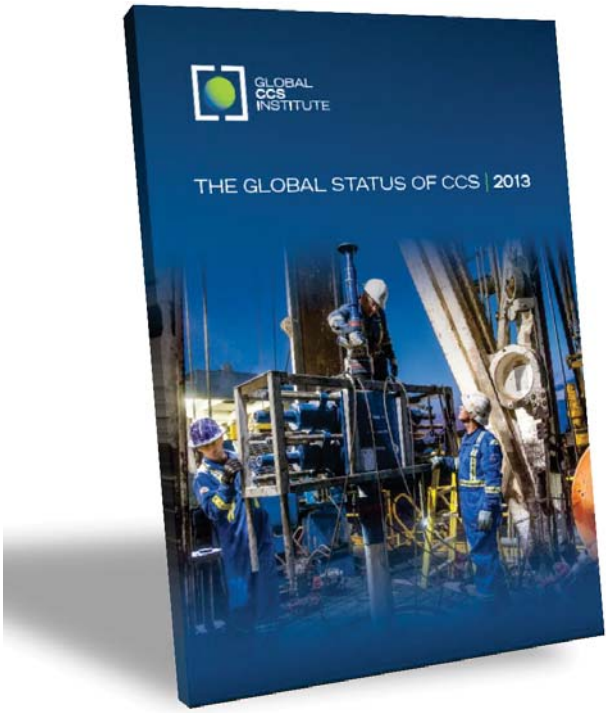
CCS: A vital part of our low-carbon energy future



Source: IEA, *Energy Technology Perspectives*, 2012

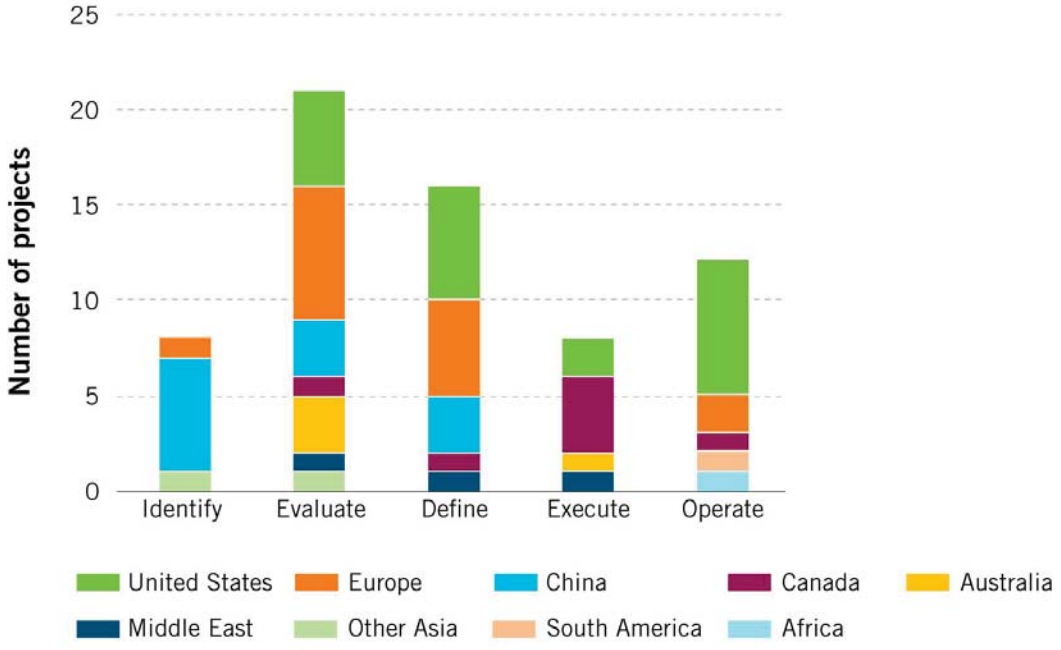
Achieving a low carbon future: A call to action for CCS

The Global Status of CCS: 2013 – The key Institute publication



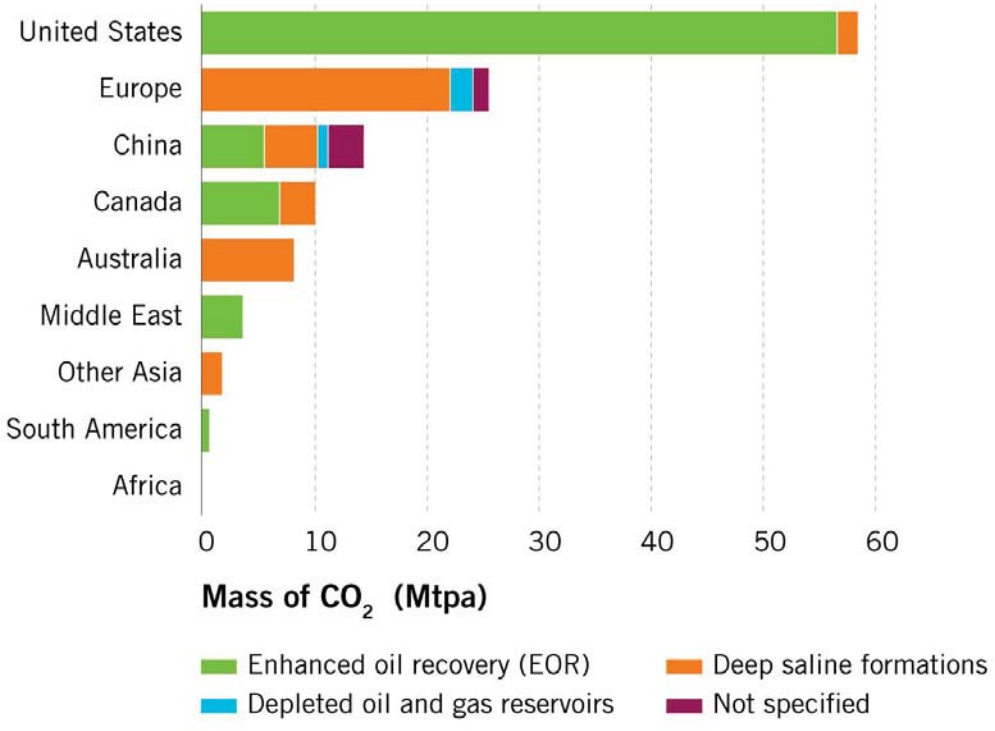
- 2013 edition: released 10 October
- Comprehensive coverage on the state of CCS projects and technologies
- Recommendations for moving forward based on experience
- Project progress outlined since 2010

CCS well understood and a reality



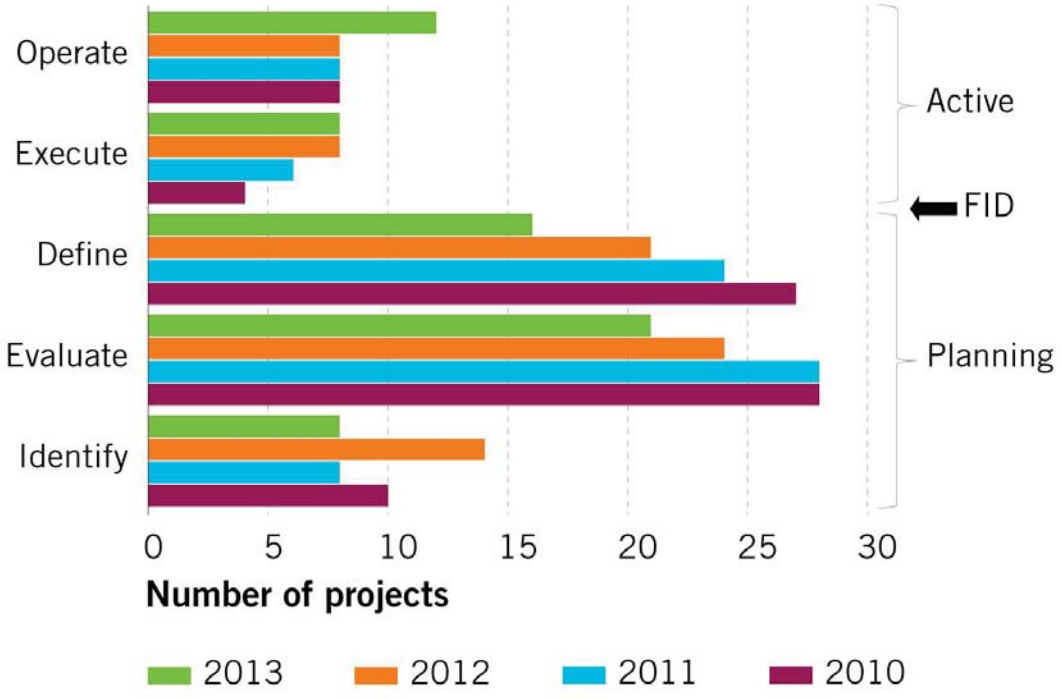
Large–scale integrated projects by project lifecycle and region/country

EOR continues to drive development



Mass of CO_2 potentially stored by primary storage type and region

Important gains but project pipeline reduced



Large–scale integrated projects by project lifecycle and year

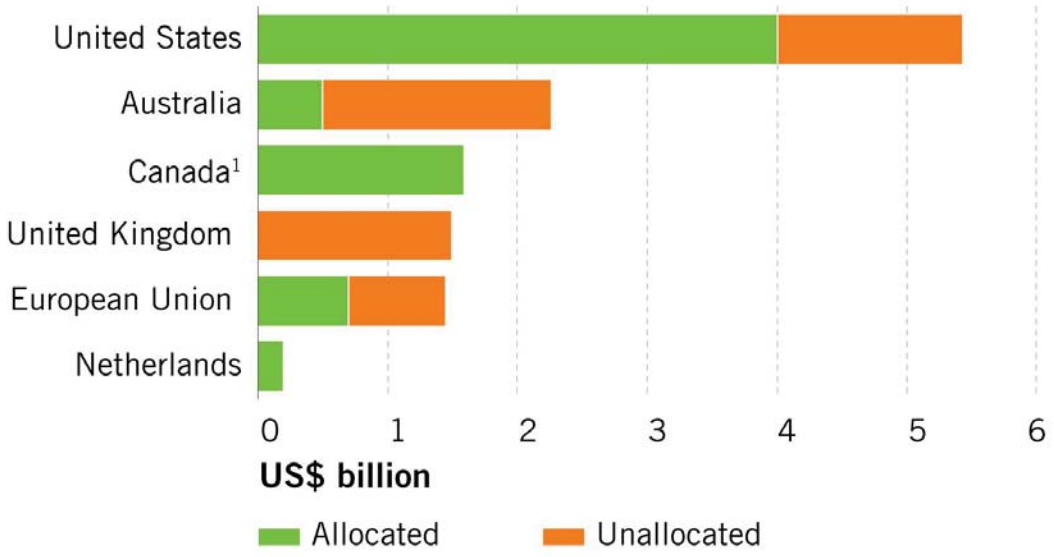
Need long term commitment on actions to mitigate climate change

- CCS progress is currently below the pace required to make a significant contribution to climate change mitigation
- In the Institute's project survey 70 per cent of projects agreed that policy uncertainty was a major risk to their project
- Pipeline of projects could then shrink further, placing climate change targets at risk

RECOMMENDATION 1

Implement sustained policy support that includes long-term commitments to climate change mitigation and strong market–based mechanisms that ensure CCS is not disadvantaged

Strengthen incentive mechanisms to support immediate demonstration



[1] Includes programs from the Government of Alberta and the Canadian Government

Public funding support for large–scale integrated projects under construction or in planning

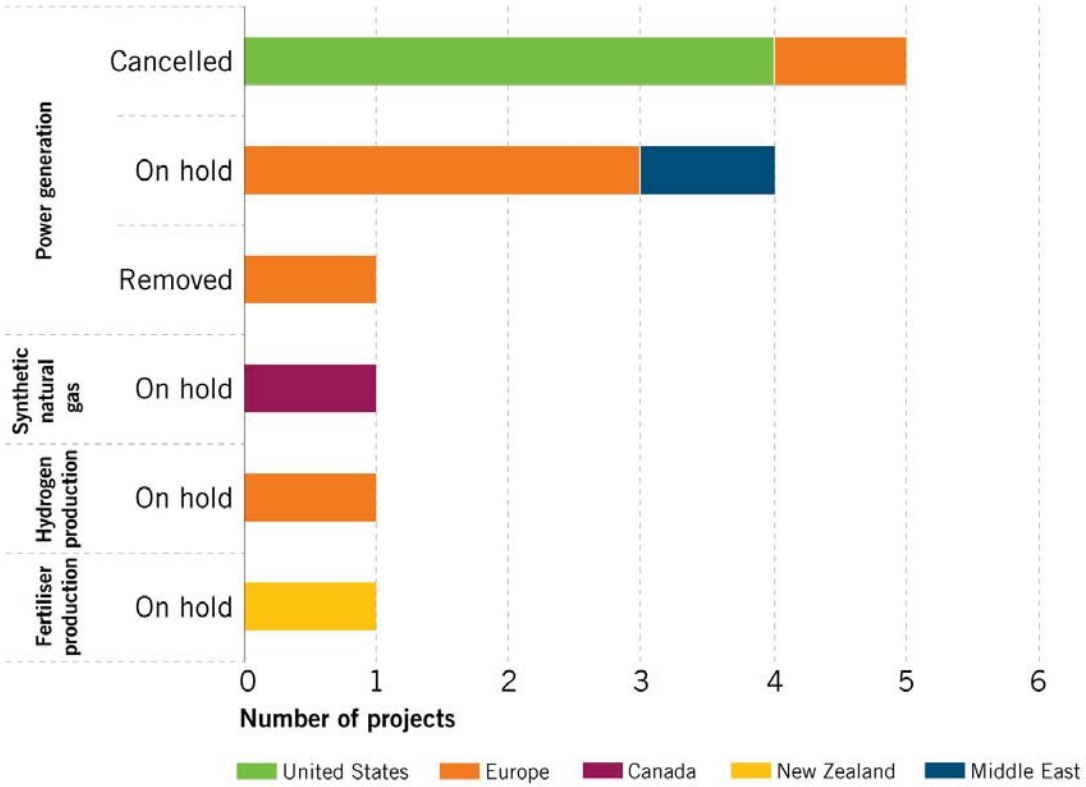
Support needed for first mover projects

- Need robust projects to move through the development pipeline and commence construction
- The value of CCS must be continually affirmed
- CCS must not be disadvantaged in relation to other low-carbon technologies

RECOMMENDATION 2

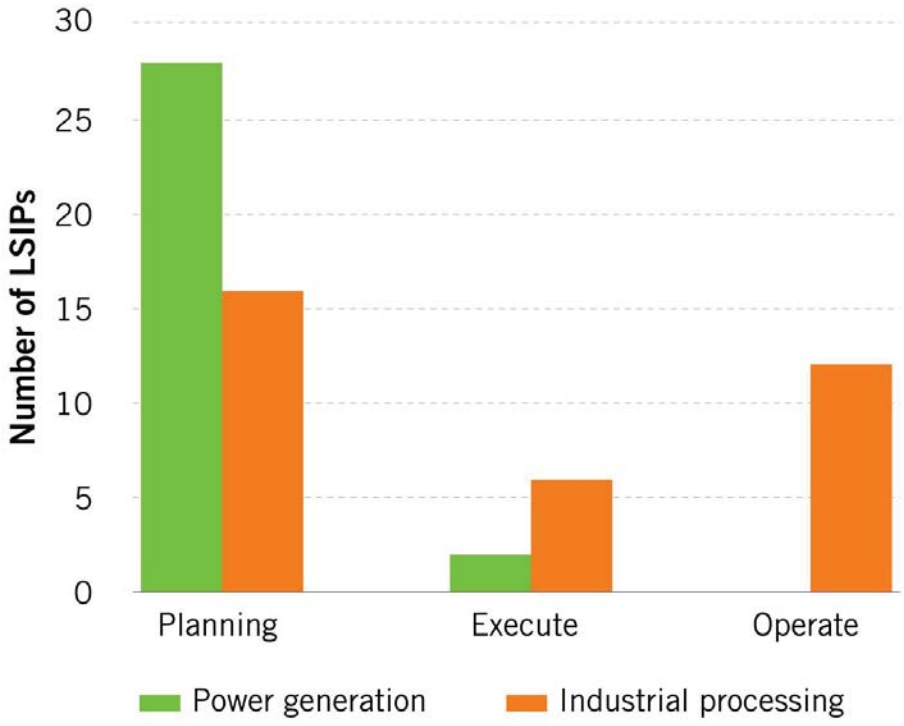
Boost short-term support for the implementation of demonstration projects. This will require targeted financial support measures that enable first mover projects to progress faster through development planning into construction and provide necessary support during operations

Projects are ceased for many reasons but almost all are in power



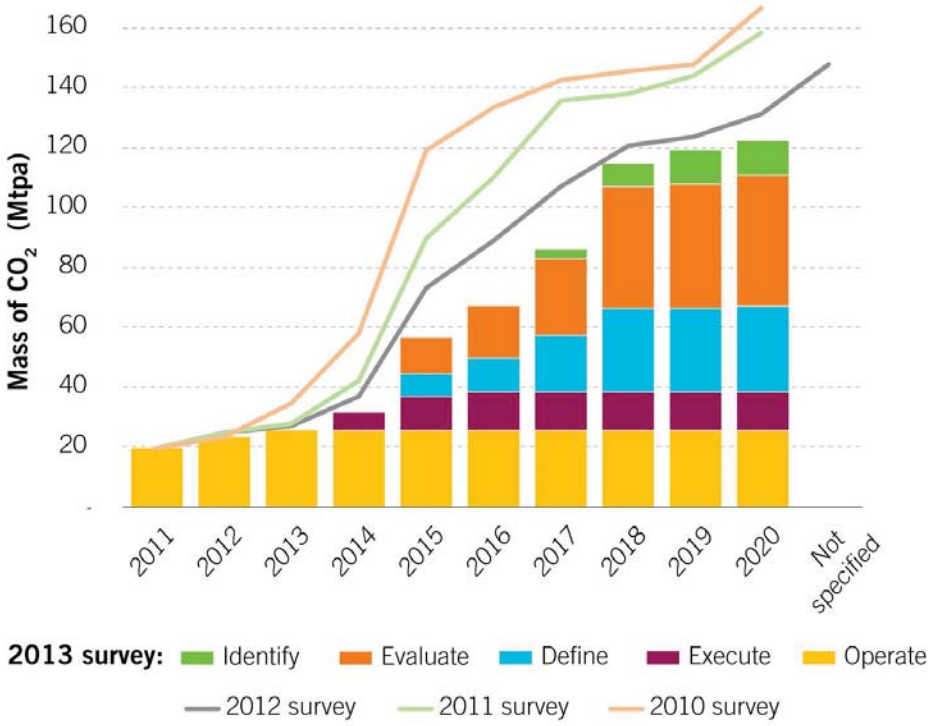
Large–scale integrated projects removed from the 2013 project listing

Some power generation projects are in the pipeline



Breakdown of large–scale integrated projects by sector

Goals remain challenging



Mass of CO_2 potentially stored by large–scale integrated projects

Dealing with regulatory uncertainties

- Some important legal and regulatory progress
- Despite this several issues persist
- Includes post-closure stewardship and cross-border movement of CO_2

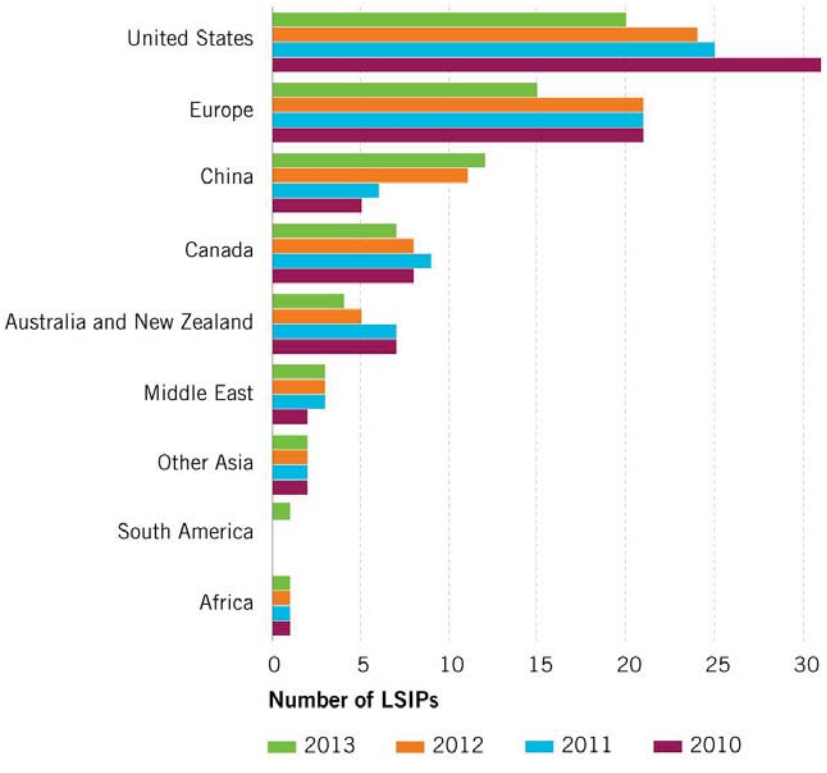
RECOMMENDATION 3

Implement measures to deal with the remaining critical regulatory uncertainties, such as long-term liabilities. This will involve learning from the efforts of jurisdictions within Australia, Canada, Europe and the US, where significant legal and regulatory issues have been, and continue to be, resolved

Meeting the energy needs of developing nations

- With a pressing need to build large amounts of generating capacity, emissions could increase dramatically without CCS
- Overall CCS is at the very early stages in many developing countries
- Encouragement is needed to consider CCS and if so help with implementation
- Significant progress is being made in some countries to advance CO_2 storage programs and CCS regulation

Growing importance of China



Large–scale integrated projects by region and year

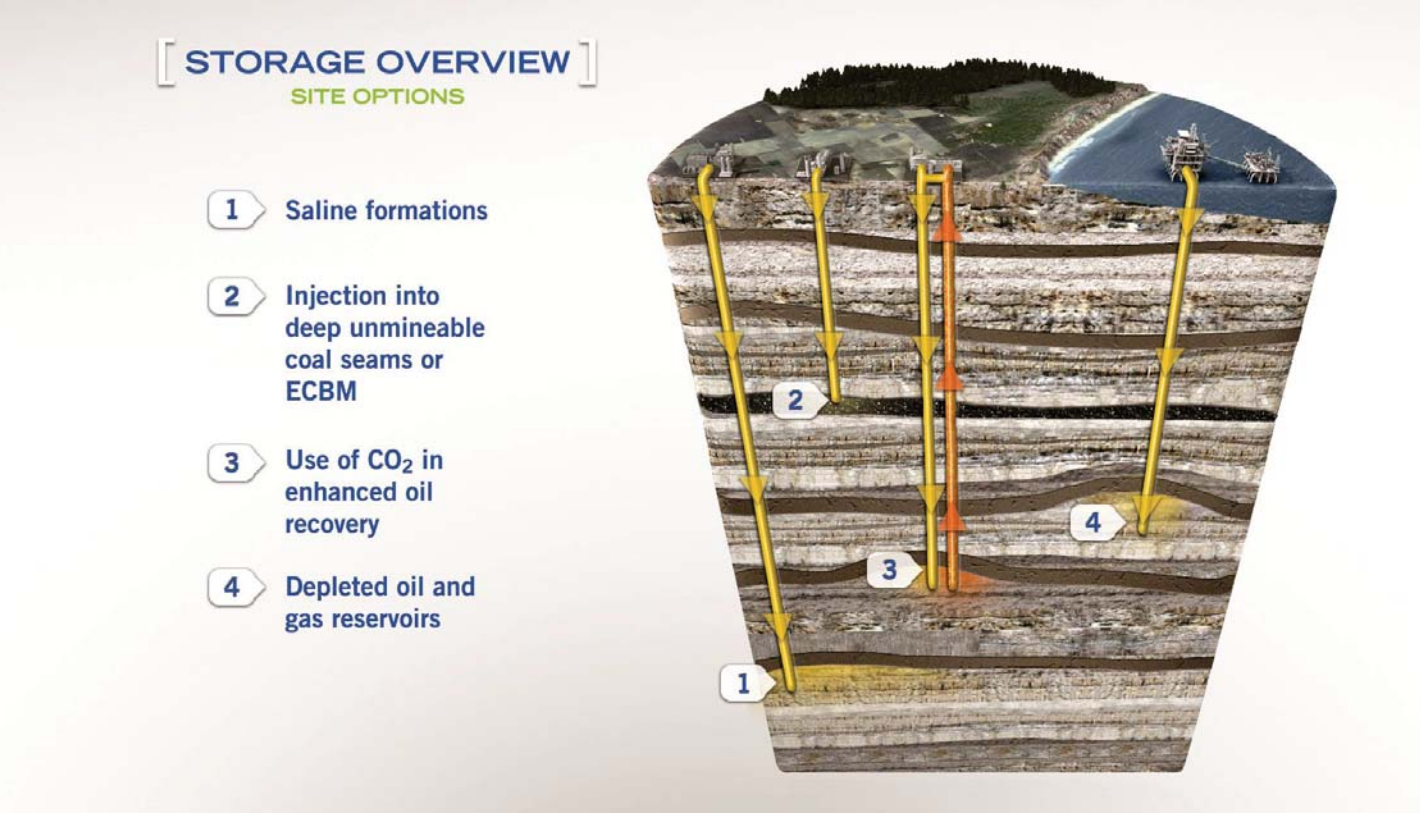
Support R&D and collaboration

- Much can be learnt from large pilot projects, especially in industries where no large-scale projects exist
- These projects are crucial for reducing costs and strengthening investor and stakeholder confidence
- Need to address gaps in iron and steel and cement
- Globally collaborative R&D more cost effective

RECOMMENDATION 4

Continue strong funding support for CCS research and development activities and encourage collaborative approaches to knowledge sharing across the CCS community

Storage pilots and demonstration projects have an important role



Planning for storage site selection

- Storage screening is important but there is also a need to focus on maturing demonstration project storage sites
- Storage site selection can take 5–10 years or more
- Currently limited incentives for industry to undertake costly exploration programs

RECOMMENDATION 5

Create a positive pathway for CCS demonstration by advancing plans for storage site selection

Encourage shared infrastructure

- Scale of infrastructure required for CCS to help meet climate change mitigation targets is great
- ‘Trunk lines’ that connect capture projects with storage formations could allow for:
  - lower entry barriers
  - optimal development of infrastructure

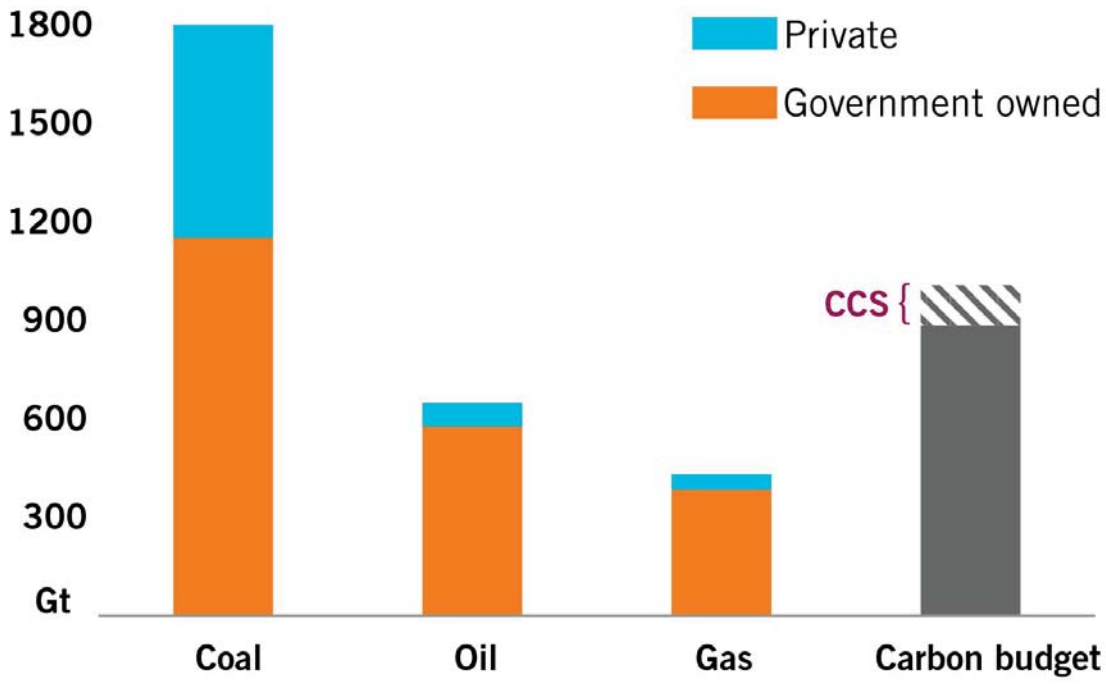
RECOMMENDATION 6

encourage the efficient design and development of transportation infrastructure through shared hub opportunities to become ‘trunk lines’ for several carbon dioxide capture projects

Action needed

- Encouraging progress with 12 projects in operation
- But we must deal with the decline in the project pipeline
- Short term injection of support required to help demonstration projects proceed and to build confidence
- Need to ensure that CCS can play its full part in climate change mitigation and in providing energy security
- Above all action on long-term climate change mitigation commitments is key to the deployment of CCS
- Time to act is now

We must act now if we want CCS benefits



Source: IEA, 2012

How the Institute is committed to the challenge

OUR MISSION

To accelerate the development, demonstration and deployment of CCS globally

1 Authoritative knowledge sharing

- 1.1 Drive knowledge transfer
- 1.2 Build on our world–leading CCS knowledge base
- 1.3 Optimise global collaboration and dissemination of high quality information

2 Fact–based influential advice and advocacy

- 2.1 Improve public awareness and understanding of CCS
- 2.2 Position CCS as a key low–carbon technology
- 2.3 Equip Members to make better informed decisions

3 Create favourable conditions to implement CCS

- 3.1 Help develop supportive policies, standards and frameworks
- 3.2 Encourage collaboration on business cases
- 3.3 Develop enabling capabilities