

# IEA CCS Roadmap and China

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**NZEC- Beijing  
28 October 2009**

## Technology Roadmap

Carbon capture and storage

Image: Bellona



# International Energy Agency

**Created in 1973**

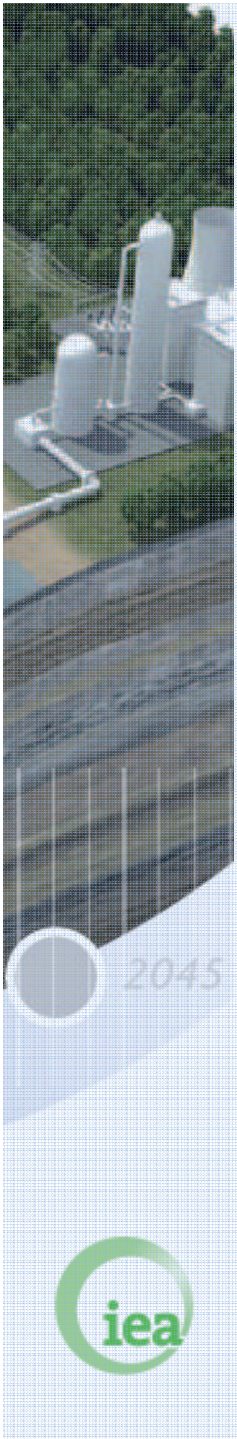
**Currently 28 Member Countries**

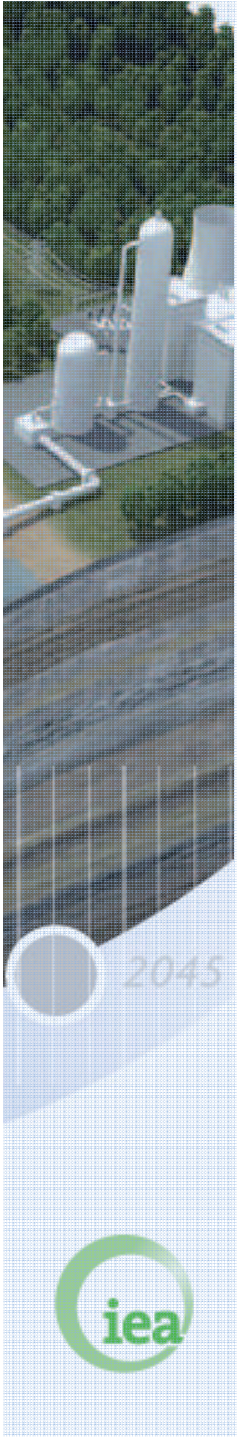
**Goals:**

- energy security
- environmental protection
- economic growth

**Activities:**

- co-ordinates efforts to ensure energy security
- compiles energy statistics
- conducts policy analysis
- reviews energy policies & programs
- convenes, mobilizes science & technology experts



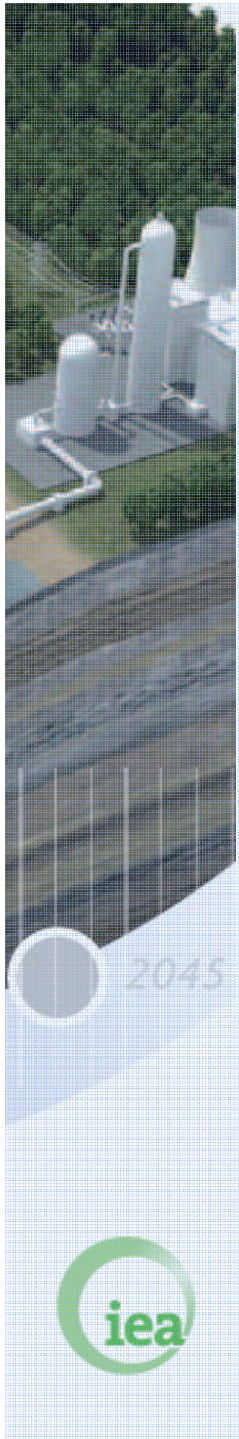
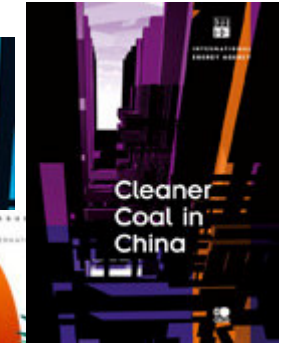


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# IEA and China

# Many past and ongoing projects

- Sectoral studies
  - Natural gas
  - Electricity
  - Coal
- Scenarios
  - World Energy Outlook
  - Energy Technology Perspectives
- Technologies
  - Roadmaps
  - Implementing Agreements
- Statistics



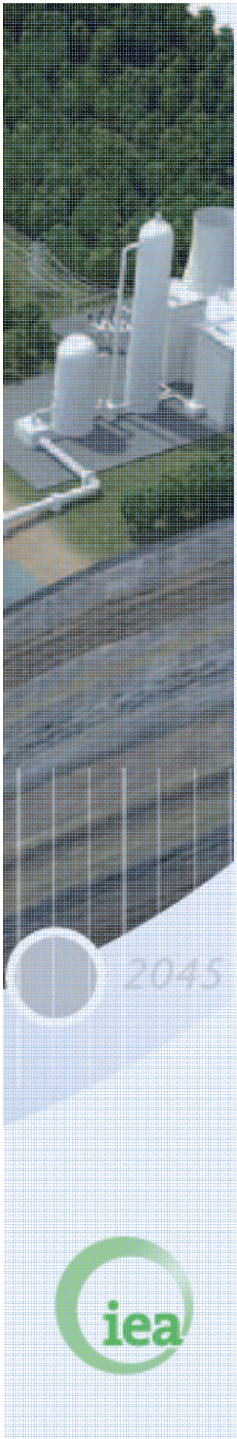
# Bilateral agreement has cleaner coal, including CCS, as priority

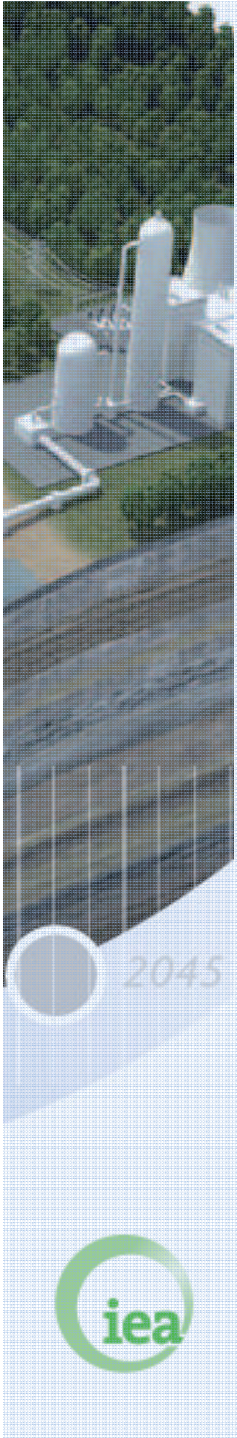
- NEA and IEA Joint Statement at IEA Ministerial, 14-15 Oct 2009

- Energy Security
- Energy Efficiency
- Renewable Energy
- Market Reform
- **Cleaner Coal**
- Energy Statistics
- Technology Collaboration
- Personnel Exchanges
- Translation of Publications



*Mr WU Yin, Deputy Administrator, National Energy Administration, China, during the Meeting of the IEA Governing Board at Ministerial Level in Paris on 14 October 2009.*



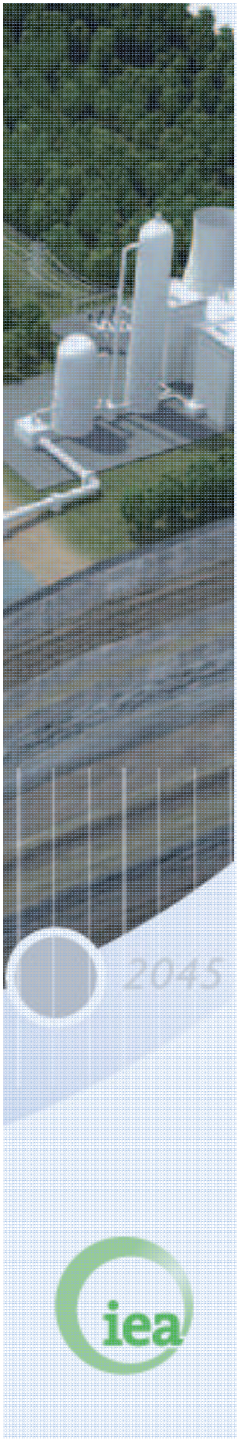


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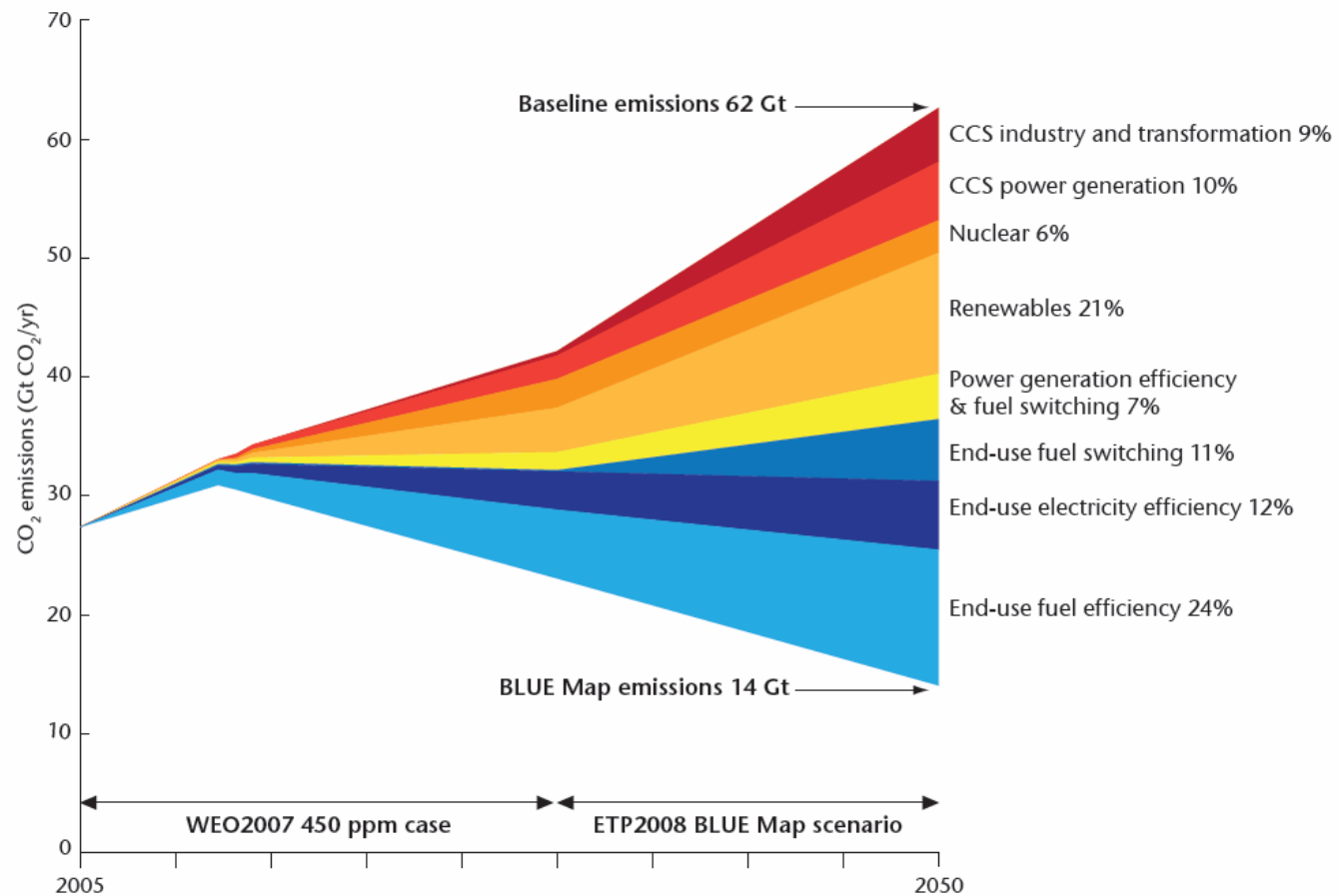
# IEA CCS Roadmap

# IEA Roadmap Process

- Establish the current technology baseline
- Assume a 50% reduction in energy-related CO<sub>2</sub> by 2050
  - Identify growth pathway
- Create technical, policy, legal, financial, and public acceptance milestones to achieve that pathway
- Identify priority near-term actions
- Create a process for enhanced collaboration
- Implement actions and track progress
- 19 Roadmaps in total

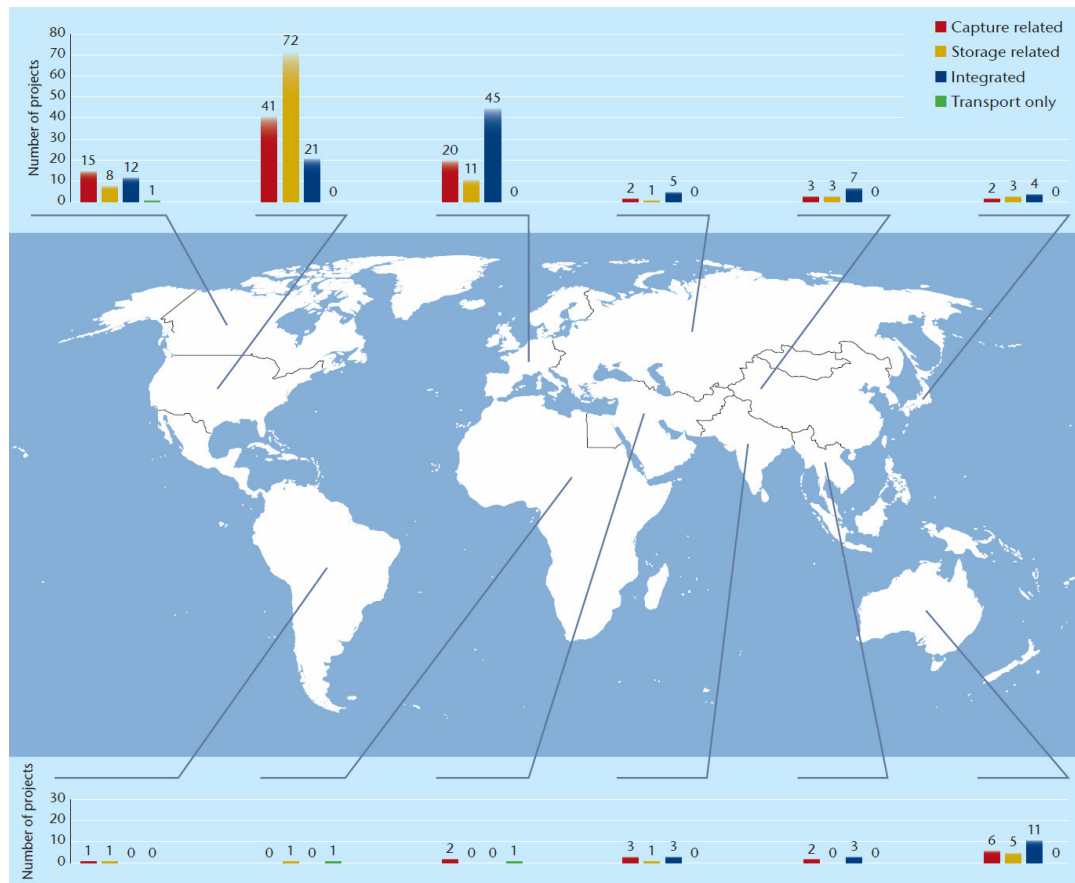


# The ETP Blue Map Scenario



**CCS to contribute 19% of emissions reductions in 2050**

# Current status



Source:GCCSI

**5 large-scale commercial projects operating**

**Over 100 large-scale integrated projects planned - 7 in China**

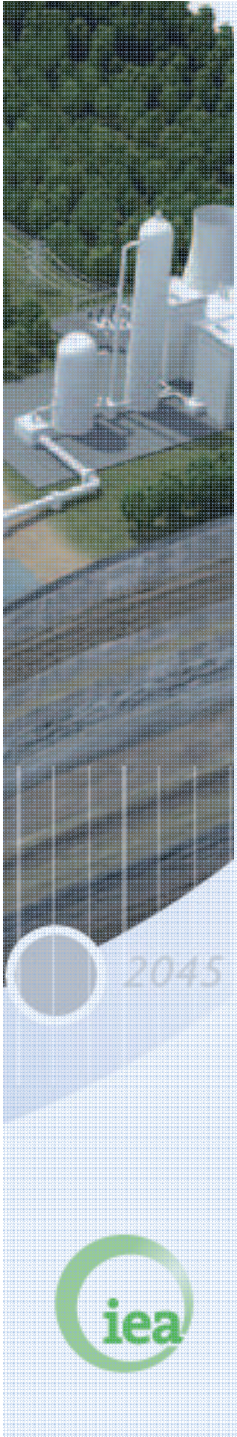


2045

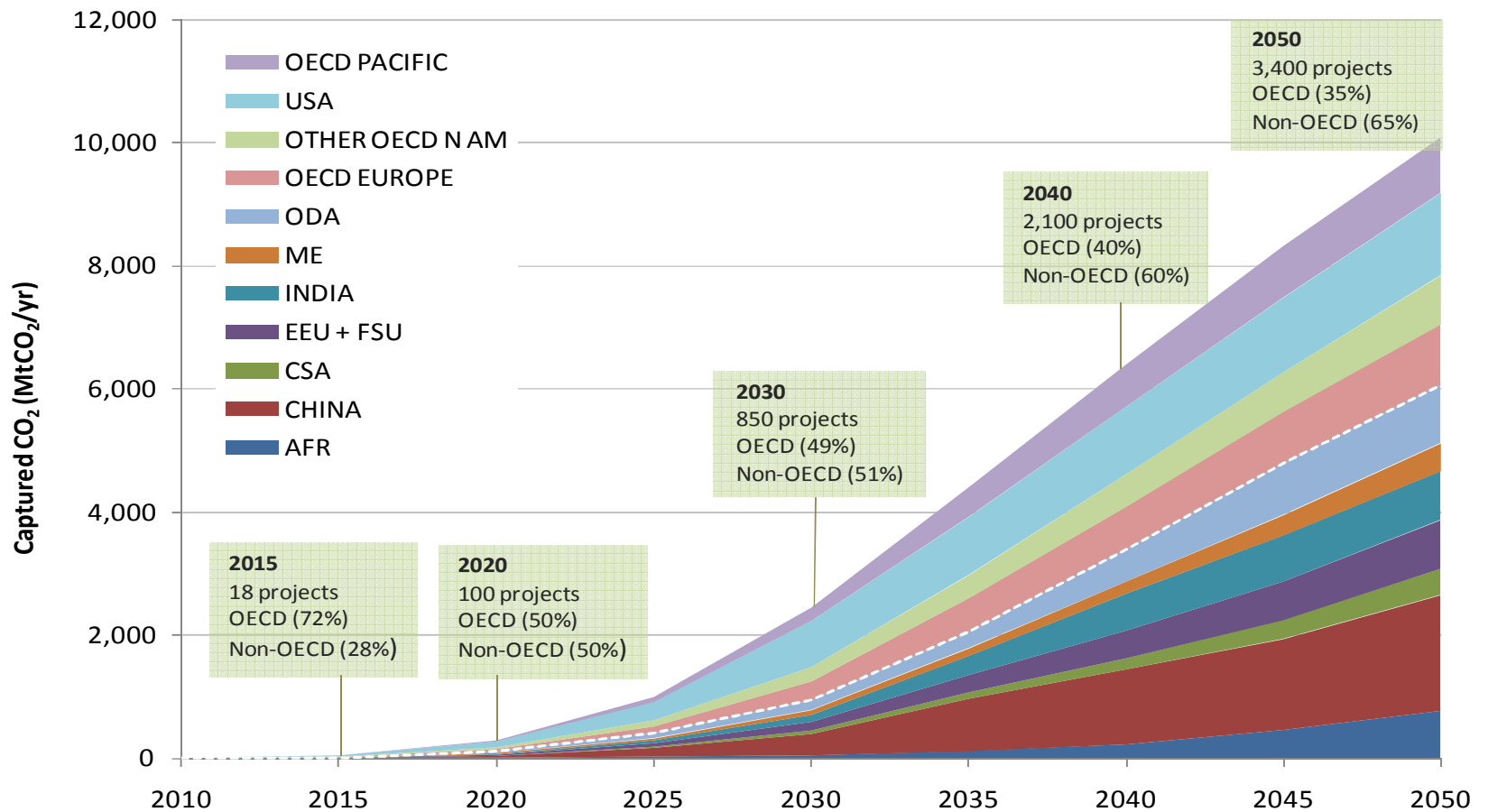
# Current challenges

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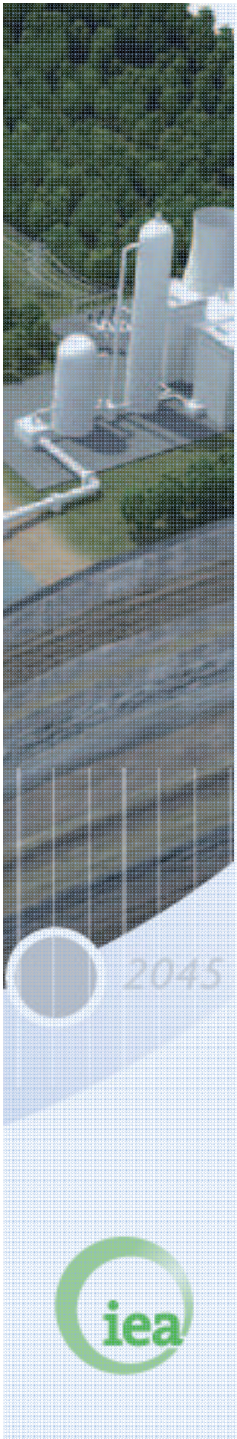
- Accelerating R&D for capture technologies
- Exploring and documenting suitable CO<sub>2</sub> storage sites
- Identifying funding mechanisms for demonstration and deployment
- Developing appropriate legal & regulatory frameworks
- Ensuring public engagement
- Expanding international collaboration



# An ambitious growth pathway

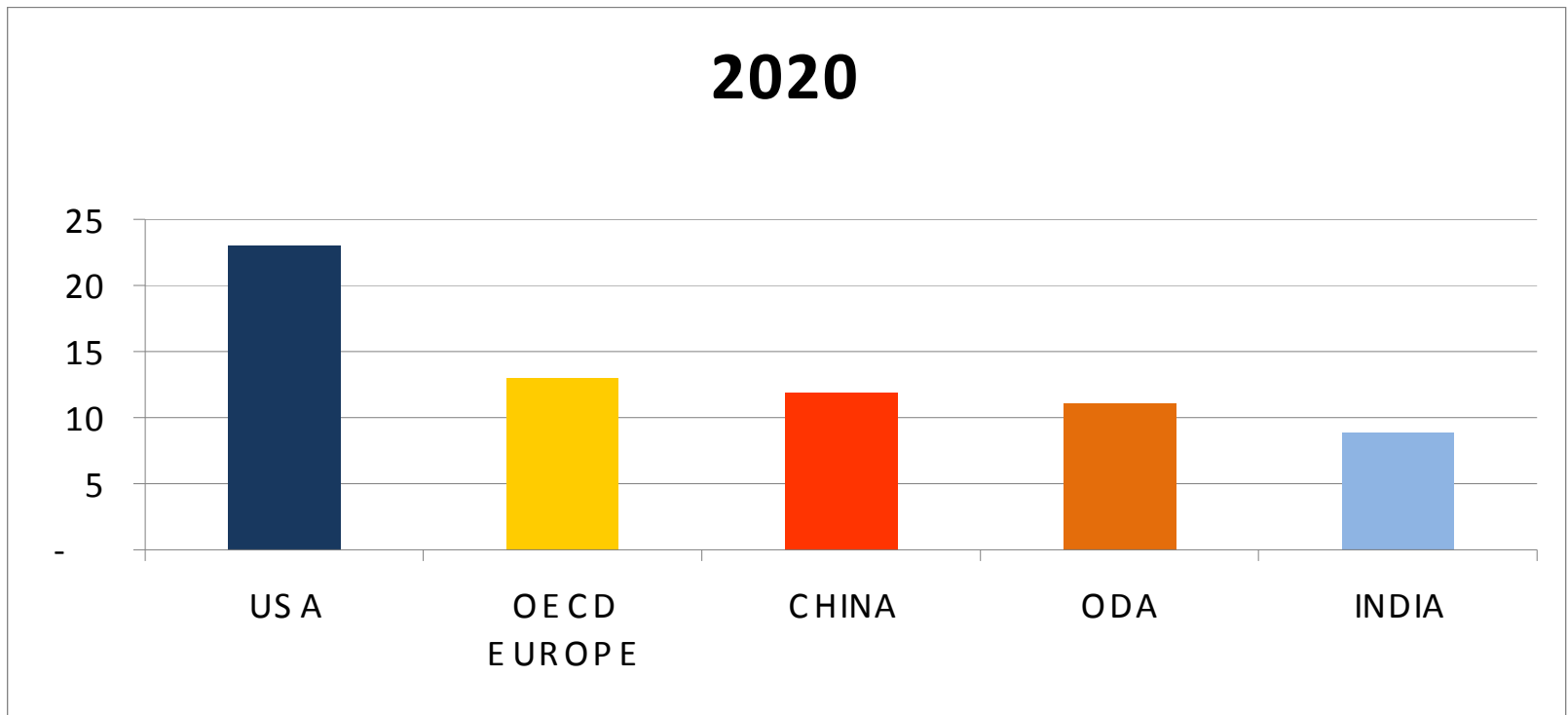


*CCS will require additional investment of \$2.5-3 trn by 2050*



# A Global Challenge

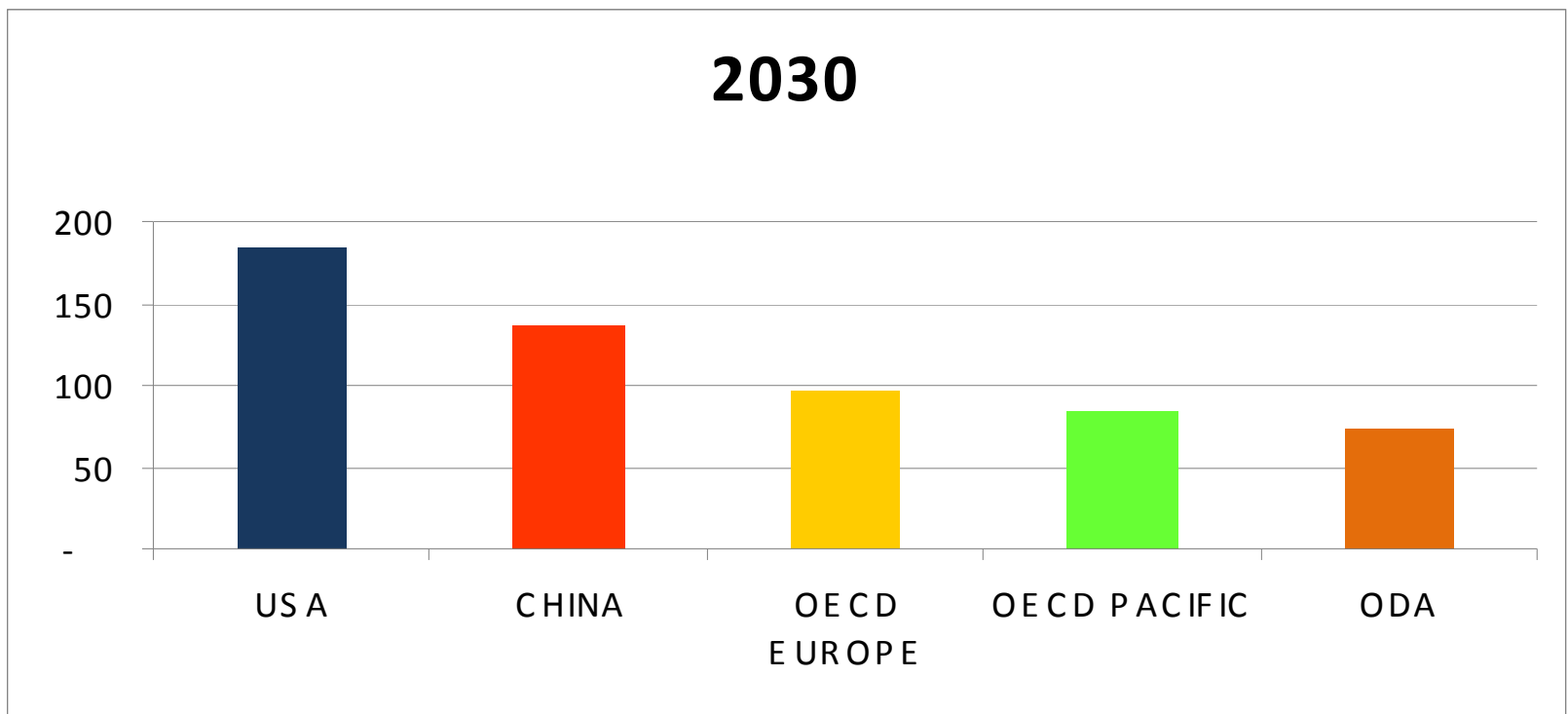
## *Contributing regions – Top 5*



*100 projects by 2020 – (10-12 in China)*

# A Global Challenge

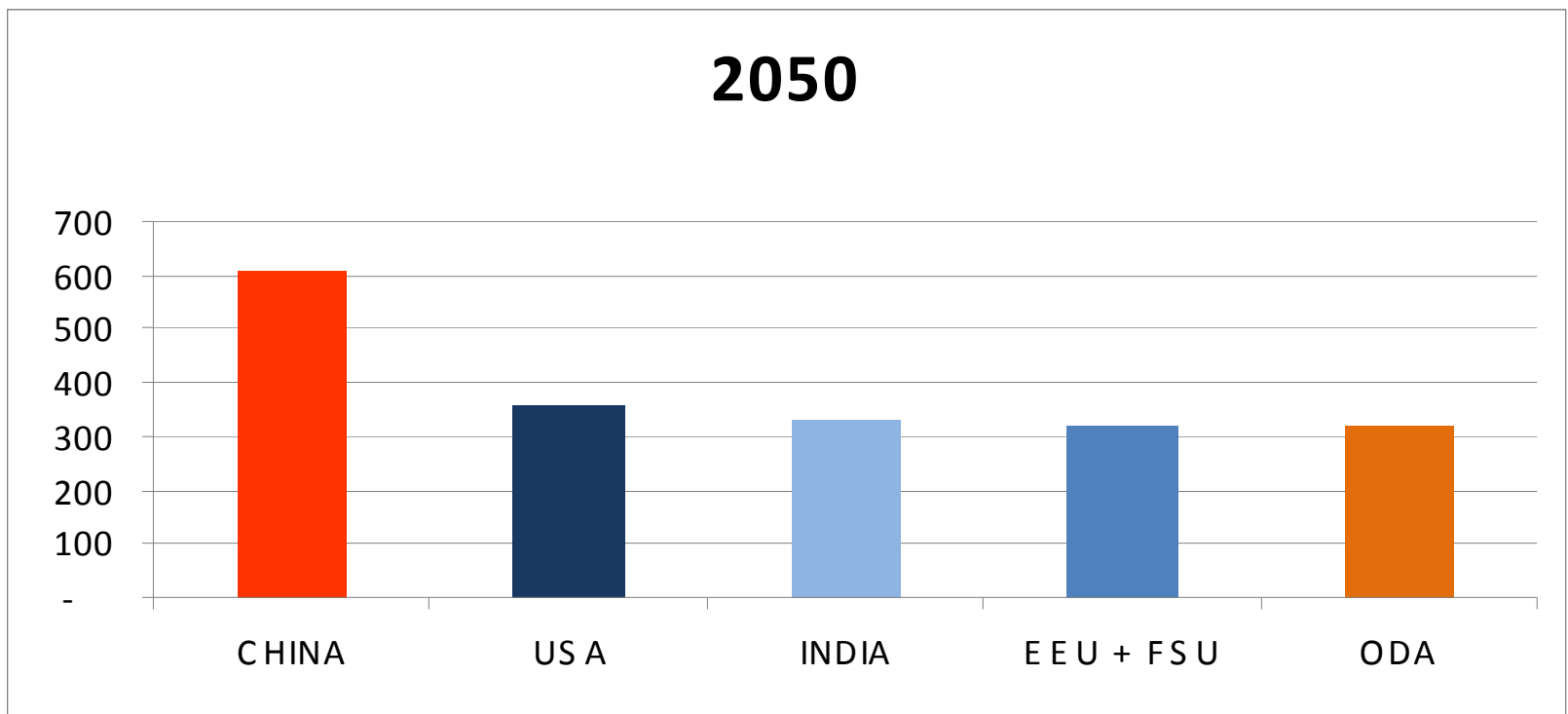
## Contributing regions – Top 5



**850 projects by 2030 – (130-140 in China)**

# A Global Challenge

## Contributing regions – Top 5

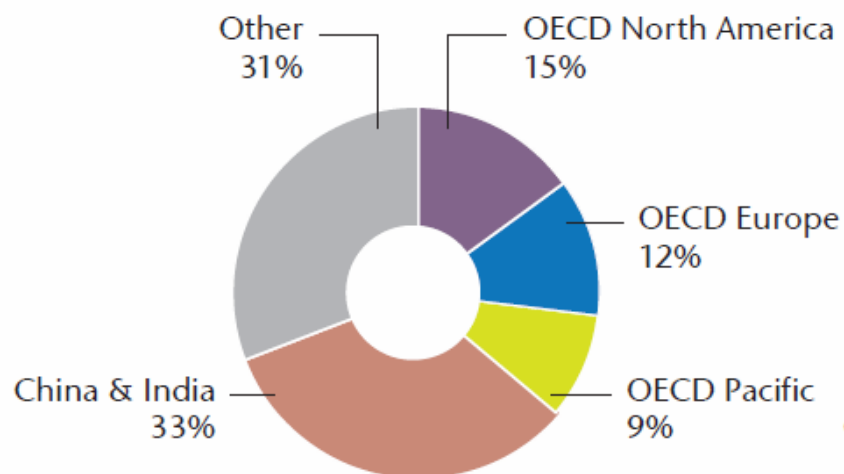


**3400 projects by 2050 – (600 in China)**

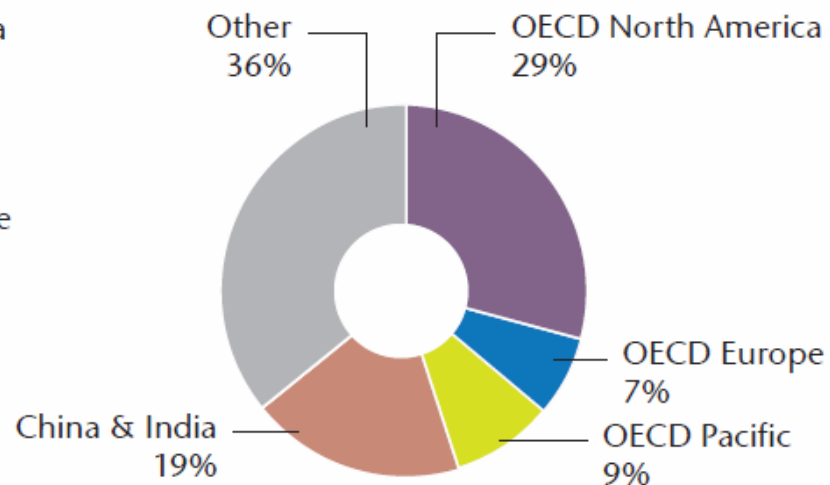
# A Global Challenge

## Regional contributions in 2050 (MtCO<sub>2</sub>)

Power generation on 5.5 Gt CO<sub>2</sub> captured 2050



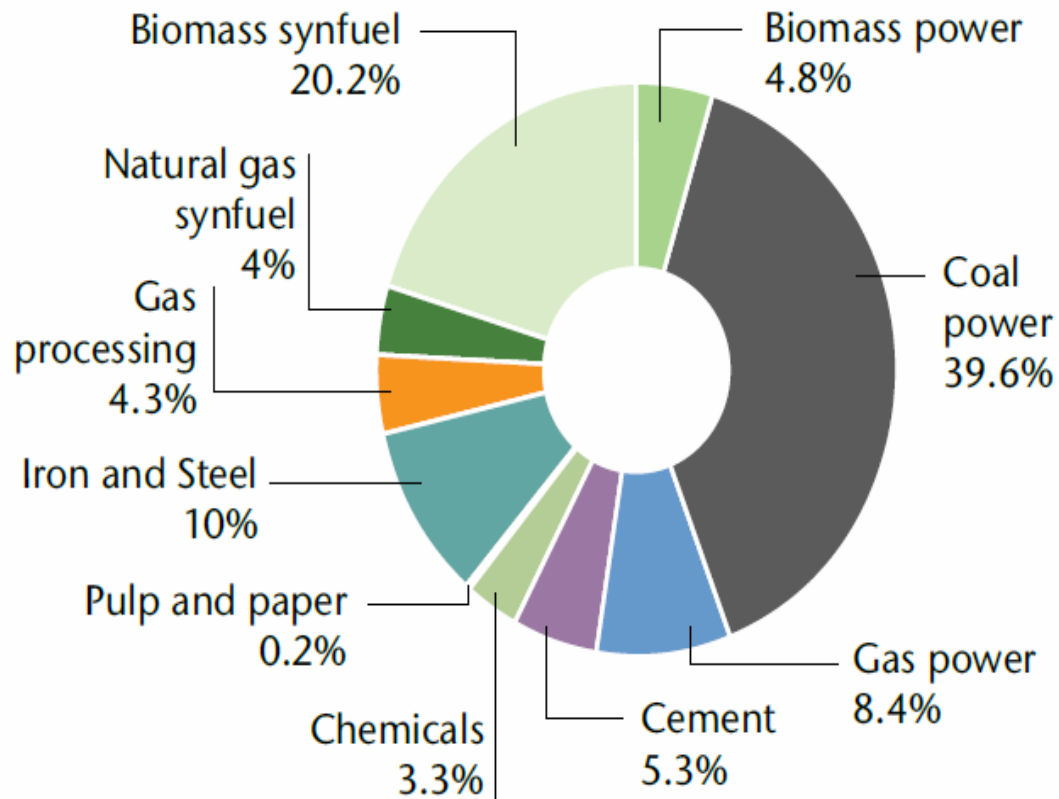
Industry & Upstream 4.5 Gt CO<sub>2</sub> captured 2050



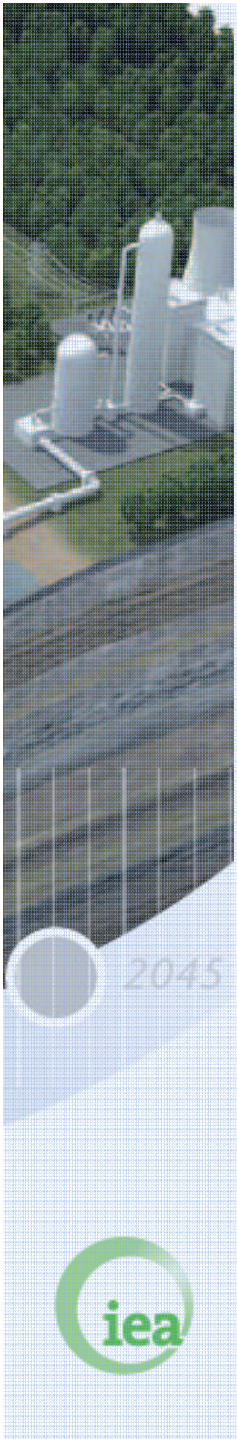
***China to contribute 18% of stored emissions in 2050***

# CCS is not just a “clean coal”

## Sector contributions in 2050 (MtCO<sub>2</sub>)

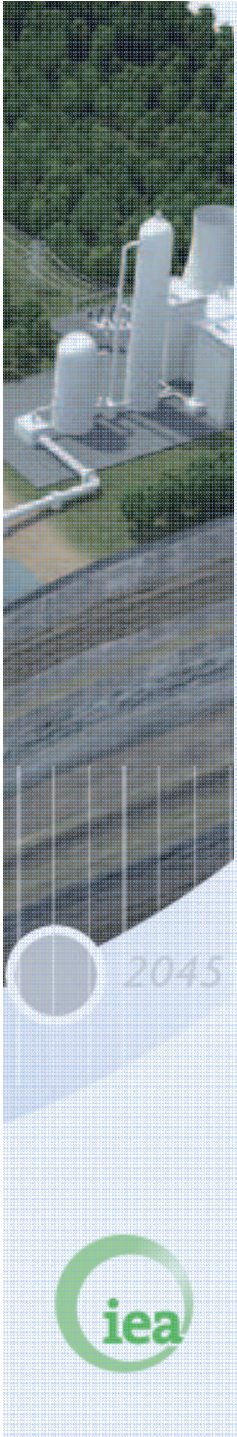


**Coal power to contribute 40% of stored emissions in 2050**



# The next 10 years: a critical period for CCS

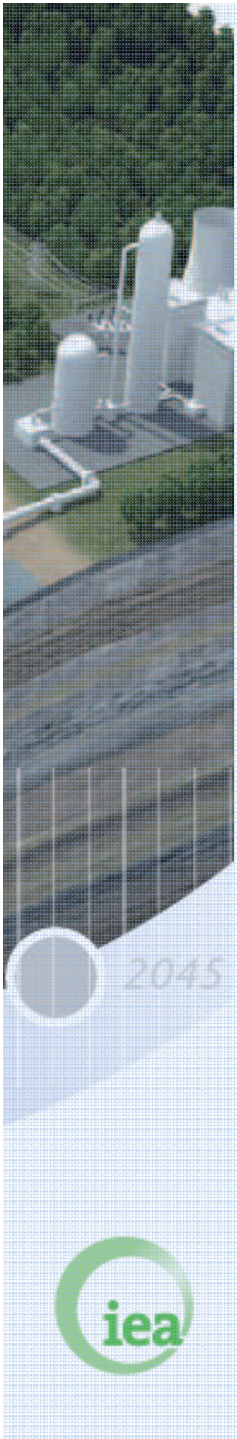
- **Technological milestones**
  - Reduce cost of CO<sub>2</sub> capture
  - Reduce energy penalty of CO<sub>2</sub> capture
  - Improve storage capacity estimates
- **Demonstration milestones**
  - Meet G8 goal of 20 project announcements by 2010
  - Demonstrate CCS in industrial sectors
  - Demonstrate CCS retrofit
  - Achieve commercialisation with 100 projects by 2020



# The next 10 years: a critical period for CCS

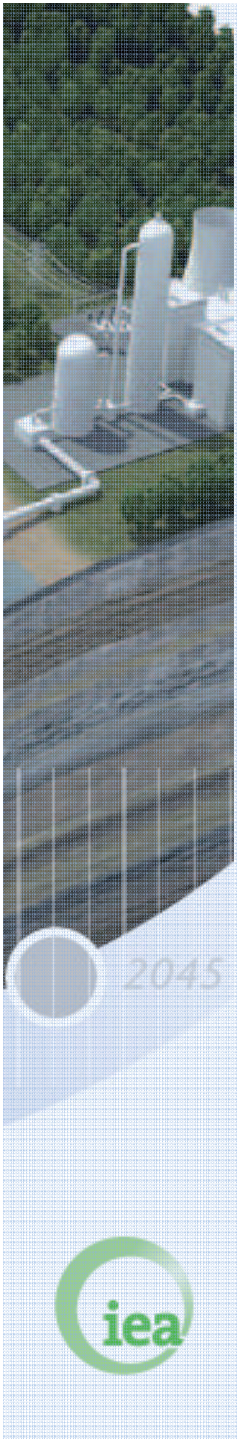
- **Financial milestones**

- Provide USD 3.5-4 bn annually from 2010-2020 for CCS in developed countries
- Provide USD 1.5-2.5 bn annually from 2010-2020 in developing countries
- Provide funding for long-term R&D
- Finance and plan CO<sub>2</sub> transport infrastructure
- Incentivise CCS via bonus allowances in cap-and-trade schemes, emissions performance standards or carbon taxes



# The next 10 years: a critical period for CCS

- **Legal/regulatory milestones**
  - Amend existing frameworks to regulate demonstration projects
  - By 2015, all countries with CCS potential should have comprehensive frameworks
- **Public engagement milestones**
  - Increase government expenditures in 2010-2012
  - Provide greater (and earlier) information on planned projects
- **International Collaboration**
  - Grow collaborative R&D, demonstration, and information sharing efforts. Eg. NZEC, IEA GHG, GCCSI





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***”Without CCS, cost of stabilisation rises  
by 70%” - IEA ETP 2008***

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**[www.iea.org/roadmaps/ccs\\_power.asp](http://www.iea.org/roadmaps/ccs_power.asp)**