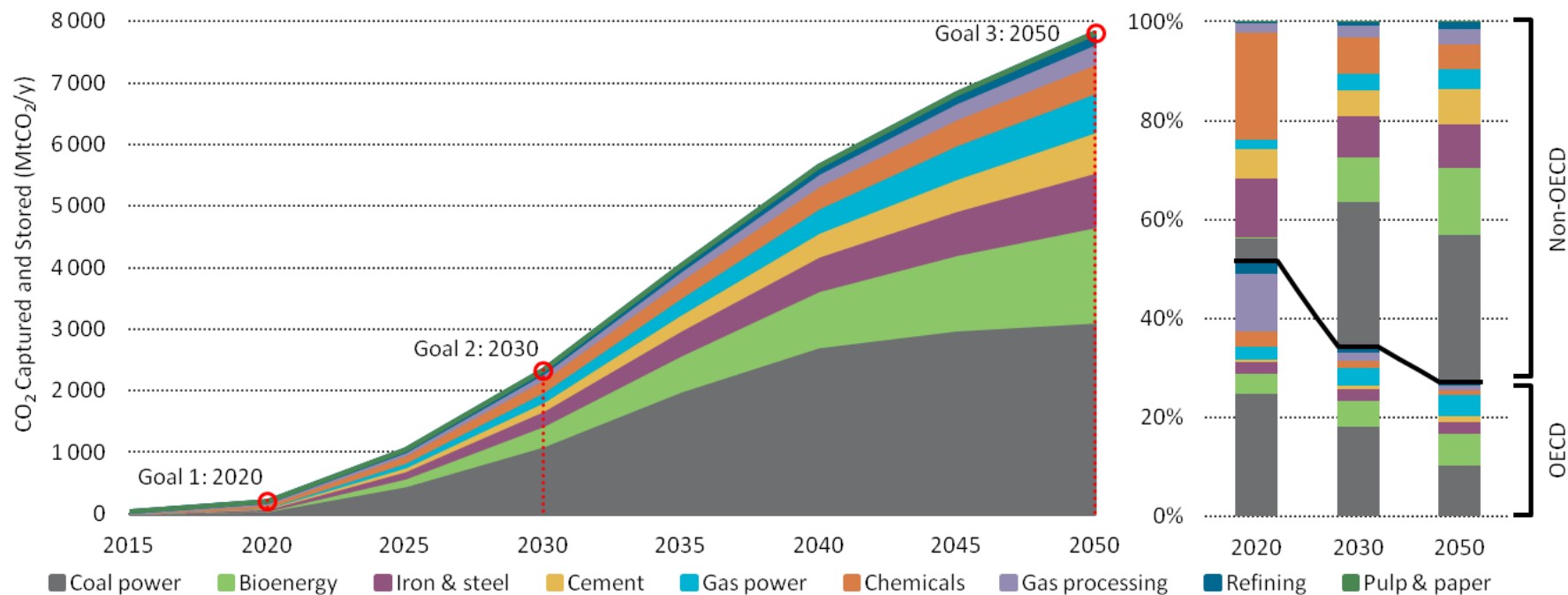


Actions to deliver deployment

5th IEA International CCS Regulatory Network Meeting
Paris, 18 June 2013

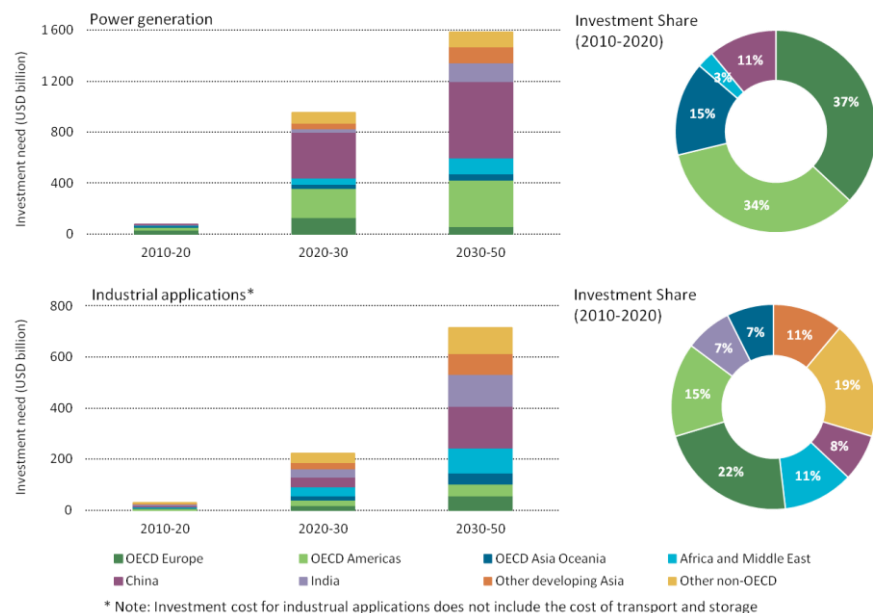
Sean McCoy
Energy Analyst, CCS Unit
International Energy Agency

Three goals that would deliver 120Gt of CO₂ storage



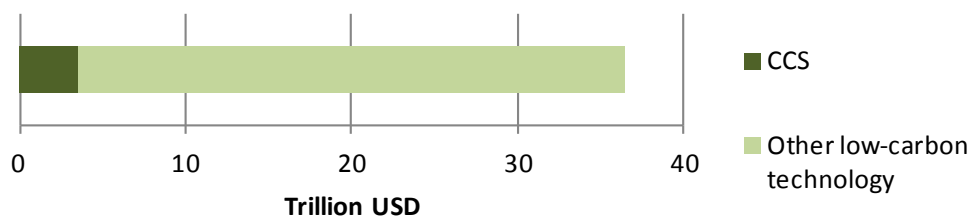
- 2020** CO₂ capture is successfully **demonstrated in at least 30 projects across many processes**, including coal- and gas-fired power generation, gas processing, bio-ethanol, hydrogen, and DRI for steelmaking.
- 2030** CCS is **routinely used to reduce emissions in power generation and industry**, having been successfully demonstrated in all other industrial applications.
- 2050** CCS is routinely used to reduce emissions from power generation and industrial applications at sites around the world, with **over 7 000 MtCO₂ annually stored**.

Total investment in CCS: 3.6 trillion USD



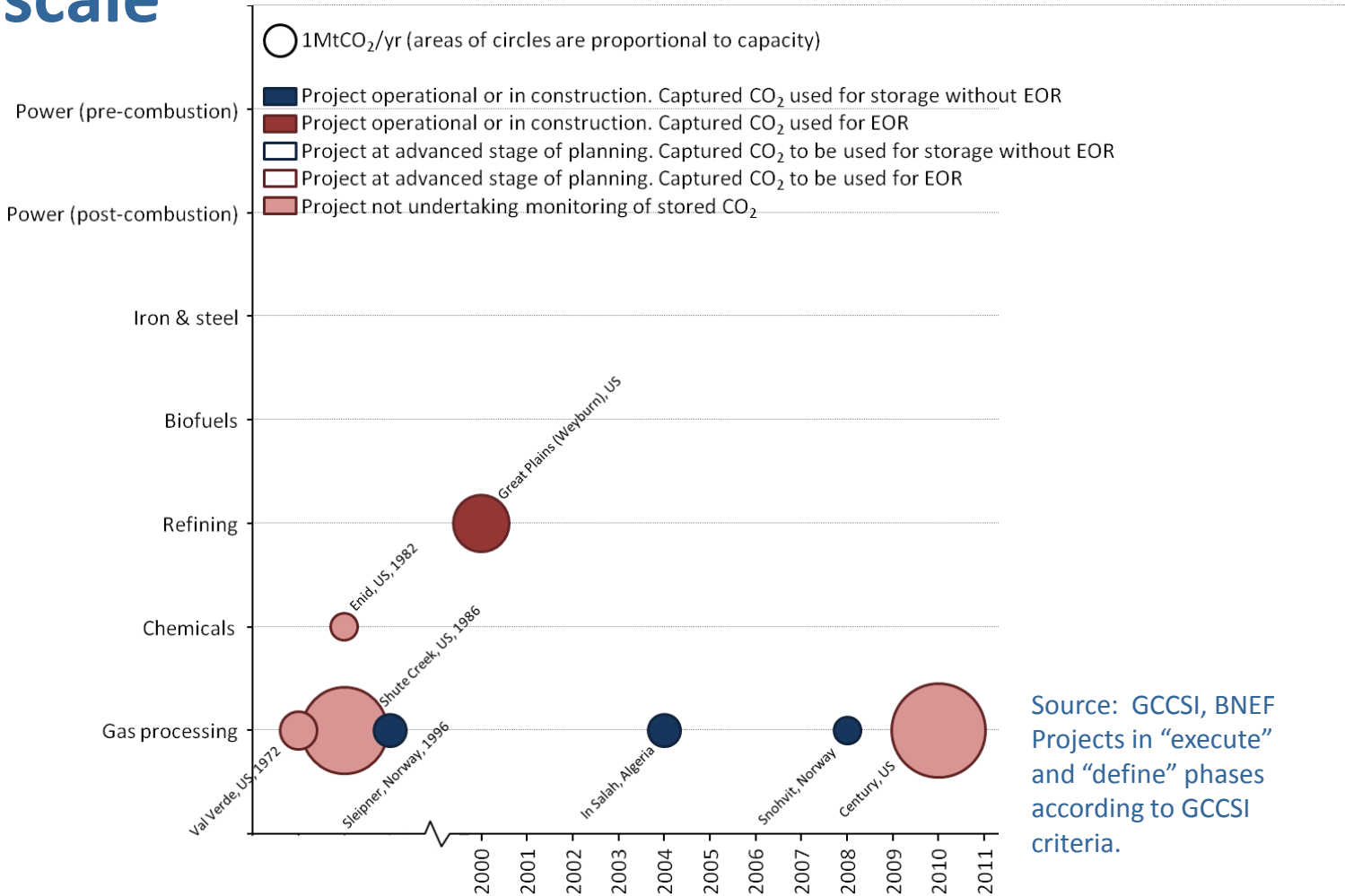
- 2013-2020: **USD 100 bn**
- 2020-2050: **USD 3,5 trn**
- Economic benefit: if CCS removed from portfolio, investment cost in the power sector increases by 40% through 2050

Additional investment requirements to reach 2DS scenario goals



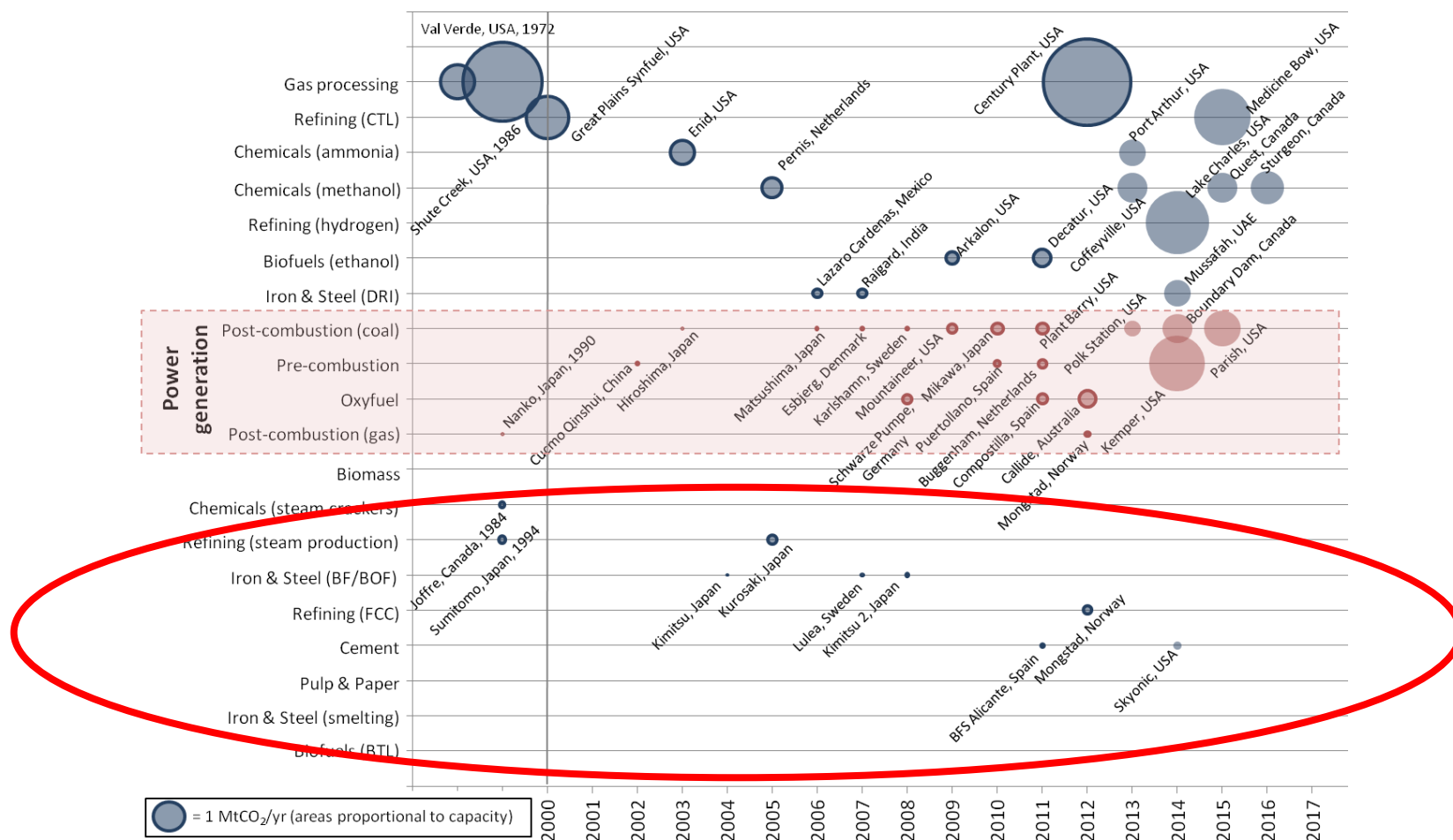
- Investment needs in other low-carbon energies are equally significant!

Good progress in demonstrating CO₂ capture at scale



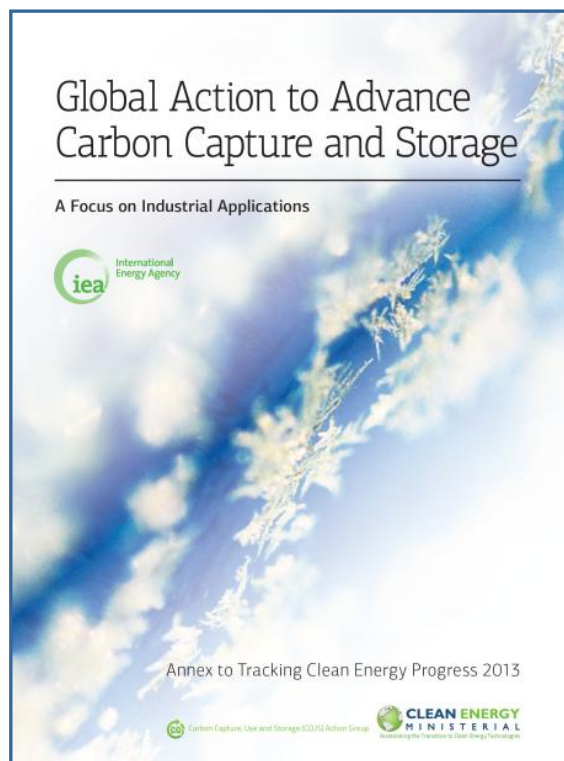
Source: GCCSI, BNEF
Projects in “execute”
and “define” phases
according to GCCSI
criteria.

More experience in industrial applications is needed!



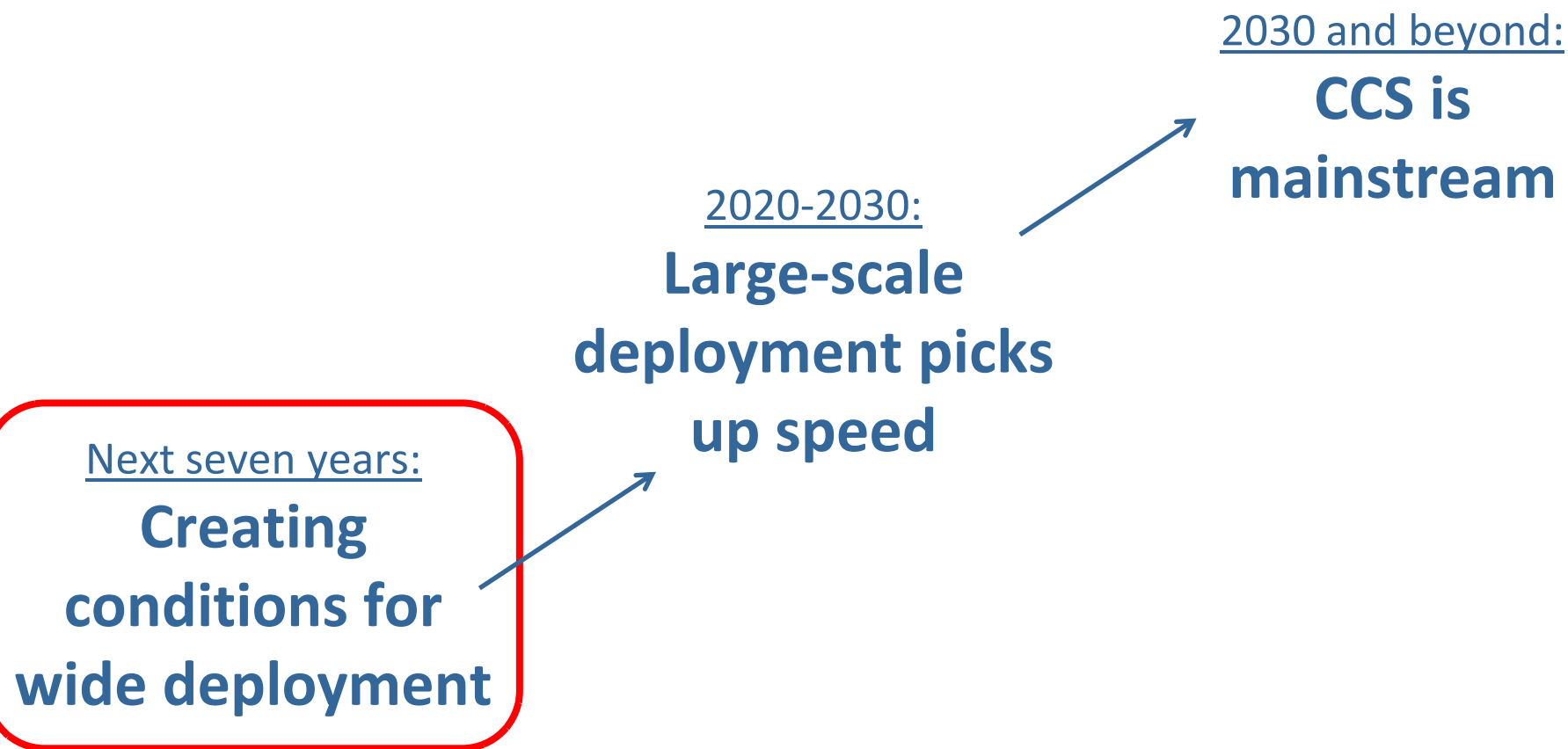
Source: Industry-CCS annex to IEA TCEP report 2013.

Recommendations to deliver deployment in industry



1. Commit public funding to around 10 pilot and demo-scale projects in cement, steel, etc.
2. Support projects according to their contribution to knowledge (not immediate CO₂ emission reductions)
3. Incorporate CCS in forward-looking industrial strategies
4. Address competitiveness concerns of sectors in global competition
5. Better exploit synergies between sectors
6. Involve all industry sectors in actions to advance CCS

A pathway for wide deployment of CCS



A comprehensive policy commitment to CCS is necessary

Long-term vision for CCS deployment

Technology
RD&D framework

Demonstration funding

Incentive framework

Targeted
deployment
incentives

Prices of
limits on
emissions

Permitting
framework

Efficient
resource
management

Regulation
for safe,
effective
storage

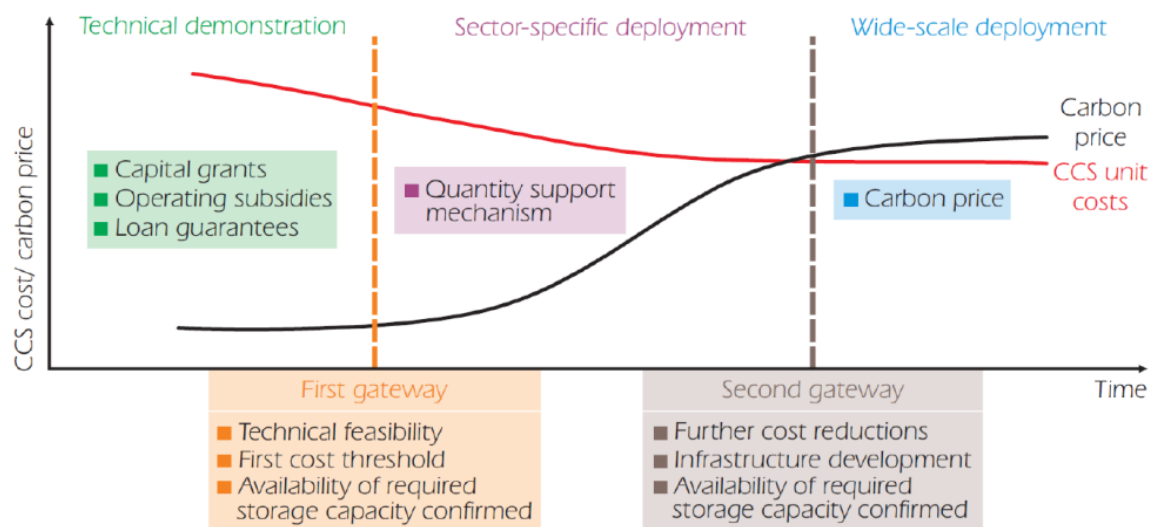
All parts of the policy puzzle must be in place if CCS is to excel, starting with a clear vision for the future for CCS

Where should we concentrate our efforts?

- Introduce **financial support mechanisms** for demonstration and **early deployment of CCS** that drive private financing of projects
- Implement policies that **encourage storage exploration, characterisation and development**
- Develop national law and regulation that **require new base-load fossil-fuel power generation capacity to be CCS-ready**
- Prove capture systems at pilot scale in industrial applications where CO₂ capture has not yet been demonstrated
- Implement governance **frameworks that ensure safe and effective storage** and ensure that the public is appropriately consulted in the development of storage projects
- Reduce the cost of electricity from power plants equipped with capture through **continued technology development and use of highest possible efficiency power generation cycles**
- **Encourage efficient development of CO₂ transport infrastructure** anticipating locations of future source and sink centres

Creating the business case is *the* most critical action in the near-term

- Emphasis during this decade must be technology learning
- The main policy mechanisms should provide mid-term revenue certainty
 1. Direct financial support by governments for CAPEX: grants, loans, equity etc.
 2. Direct support for operations, e.g.: feed-in tariffs, production tax credits, certificates, portfolio standards.
 3. Leveraging existing markets for CO₂ (such as EOR)
 4. Specific policy to incentivise sectors exposed to global competition (e.g., cement, steel)
- Take inspiration from successful policies for renewables



The role of the IEA International CCS Regulatory Network

- Much rests on the smart design and implementation of good policies that will allow industry to create a business case for CCS
- The Network is meant to be a forum in which participants—primarily those who are involved in the design and implement policies—can learn from one another's experiences

We hope that participants will go home with new ideas on how government policy can support CCS demonstration and deployment

Themes for the 5th meeting of the IEA International CCS Regulatory Network

Day 1: Focussed sessions on lessons-learnt in both CCS permitting and incentive frameworks and how these lessons can be applied

Day 2: Issue-based sessions on challenging aspects of CCS regulation

- Pre-competitive exploration, leasing and subsurface conflicts
- Enhanced oil recovery for CO₂ storage
- Role of government and learning from best-practice in stakeholder engagement
- **Topics, TBD, of common interest in the open session**