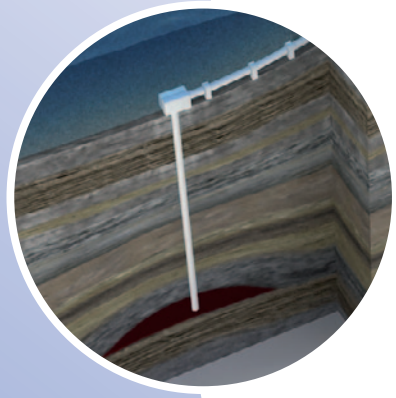
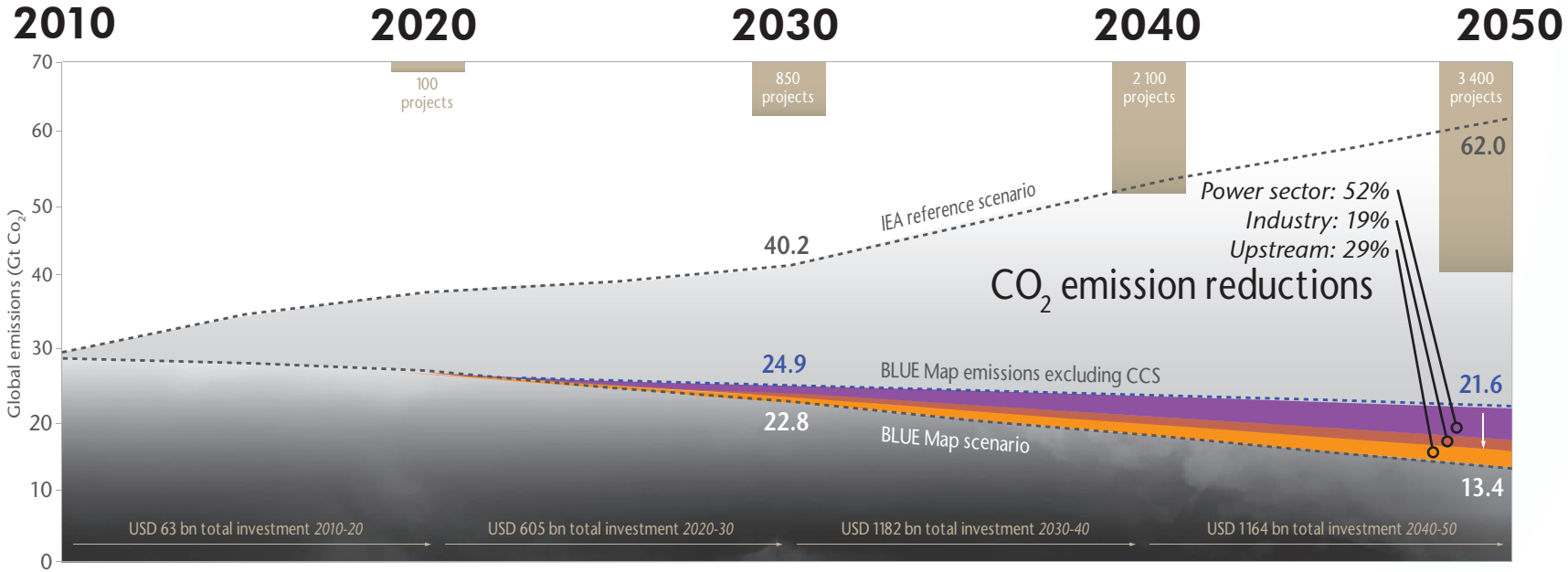
CARBON CAPTURE AND STORAGE ROADMAP

International Energy Agency



CCS contribution in BLUE Map by sector 2010-50

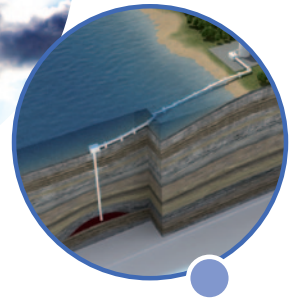
Total CCS contribution to the BLUE Map scenario is 8.2 $GtCO_2$ avoided in 2050.
This is 19% of the total mitigation effort needed.



Key findings

- CCS is an important part of the lowest-cost greenhouse-gas mitigation portfolio. Without CCS, overall costs to halve emissions by 2050 rise by 70%. This roadmap envisions 100 projects globally by 2020 and over 3 000 projects in 2050.
- This roadmap's level of project development requires an additional investment of over USD 2.5 to USD 3 trillion from 2010 to 2050, which is about 6% of the overall investment needed to achieve a 50% reduction in greenhouse-gas emissions by 2050.
- The developed world must lead in the next decade by investing an average of USD 3.5 to USD 4 billion annually between 2010 and 2020. However, CCS technology must spread rapidly to the rest of the world through expanded international collaboration and financing for CCS demonstrations in developing countries at an average annual level of USD 1.5-2.5 billion between 2010 and 2020.
- CCS is more than a strategy for "clean coal". CCS technology must be adopted by biomass and gas power plants, in the fuel transformation and gas processing sectors, and in emissions-intensive sectors like cement, iron and steel, and chemicals manufacturing.
- The milestones in this roadmap will only be achievable via expanded international collaboration. New efforts to provide developing country knowledge/technology transfer are needed. Industry sectors with a global reach should also expand their CCS collaborative efforts.

Global map of CO_2 storage prospectivity



Stored 2050
26.1 Gt
Viable capacity
365 Gt

United States
Max. theoretical capacity: **3 650 Gt**

Stored 2050
12 Gt
Viable capacity
101 Gt

Other OECD North America
Max. theoretical capacity: **1 010 Gt**

Stored 2050
15.6 Gt
Viable capacity
94 Gt

OECD Europe
Max. theoretical capacity: **940 Gt**

Stored 2050
10.3 Gt
Viable capacity
207 Gt

Eastern European Union and Former Soviet Union
Max. theoretical capacity: **2 070 Gt**

Stored 2050
4.6 Gt
Viable capacity
200 Gt

Central and South America
Max. theoretical capacity: **2 000 Gt**

Stored 2050
6.8 Gt
Viable capacity
53 Gt

Africa
Max. theoretical capacity: **530 Gt**

Stored 2050
5.3Gt
Viable capacity
170 Gt

Middle East
Max. theoretical capacity: **1 700 Gt**

Stored 2050
11.5Gt
Viable capacity
100 Gt

India
Max. theoretical capacity: **1 000 Gt**

Stored 2050
25.9 Gt
Viable capacity
202 Gt

China
Max. theoretical capacity: **2 020 Gt**

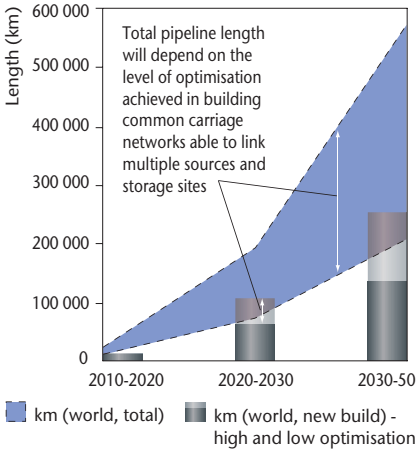
Stored 2050
12.2 Gt
Viable capacity
100 Gt

Other Developing Asia
Max. theoretical capacity: **1 000Gt**

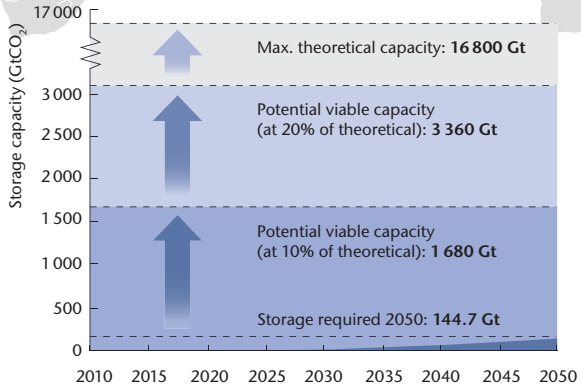
Stored 2050
14.3Gt
Viable capacity
90 Gt

OECD Pacific
Max. theoretical capacity: **900 Gt**

World total CO_2 pipelines developed



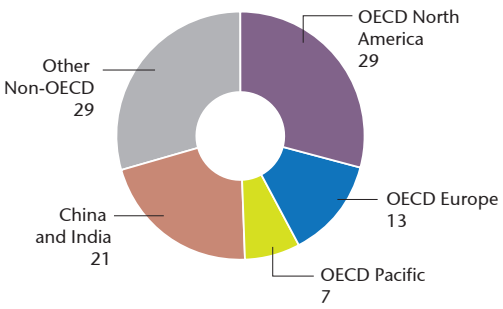
World total storage capacity



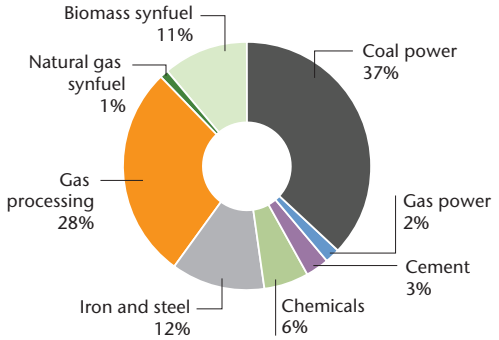
Next ten years: a critical period for CCS

Achieving this roadmap's vision will require an ambitious investment in CCS demonstration over the next decade. The developed world will need to lead, working in close collaboration with developing countries to share knowledge and best practices for technology, regulatory and public engagement strategies.

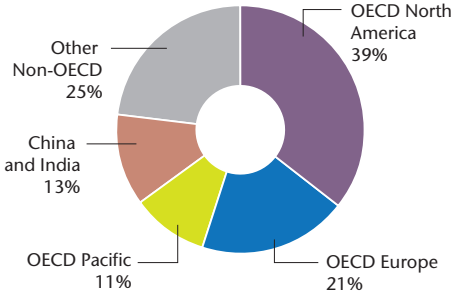
Number of projects needed by 2020: 100



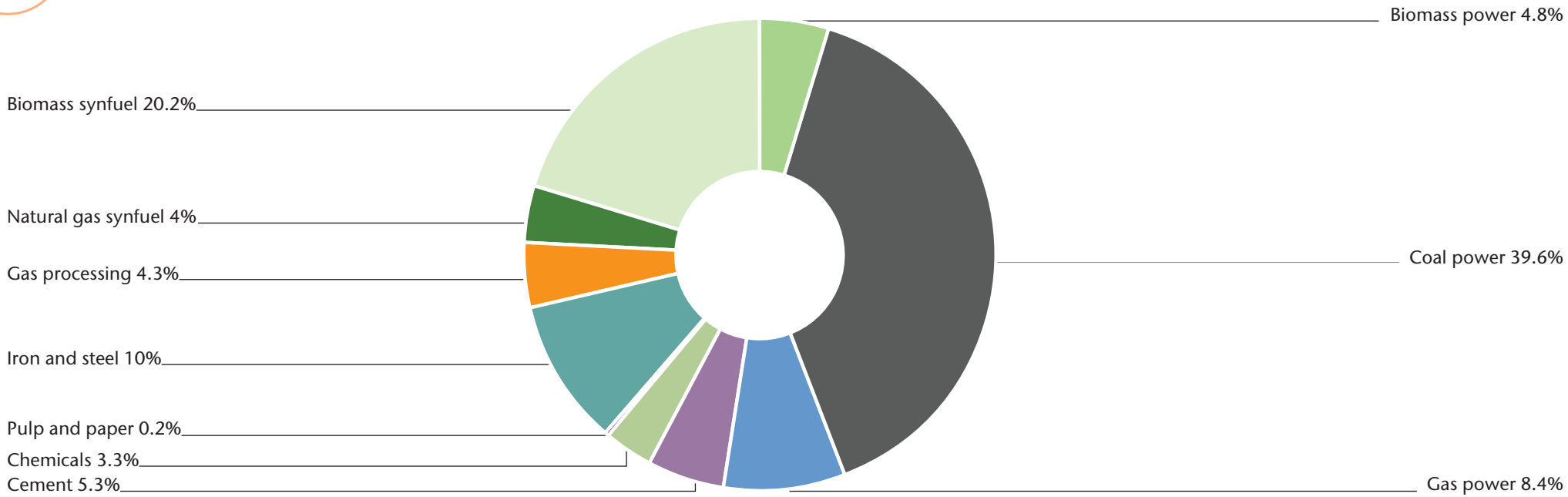
CO_2 emissions avoided by sector in 2020: 255 Mt/yr



Additional investment needed by 2020: USD 42 bn



Sector CCS contibution in 2050



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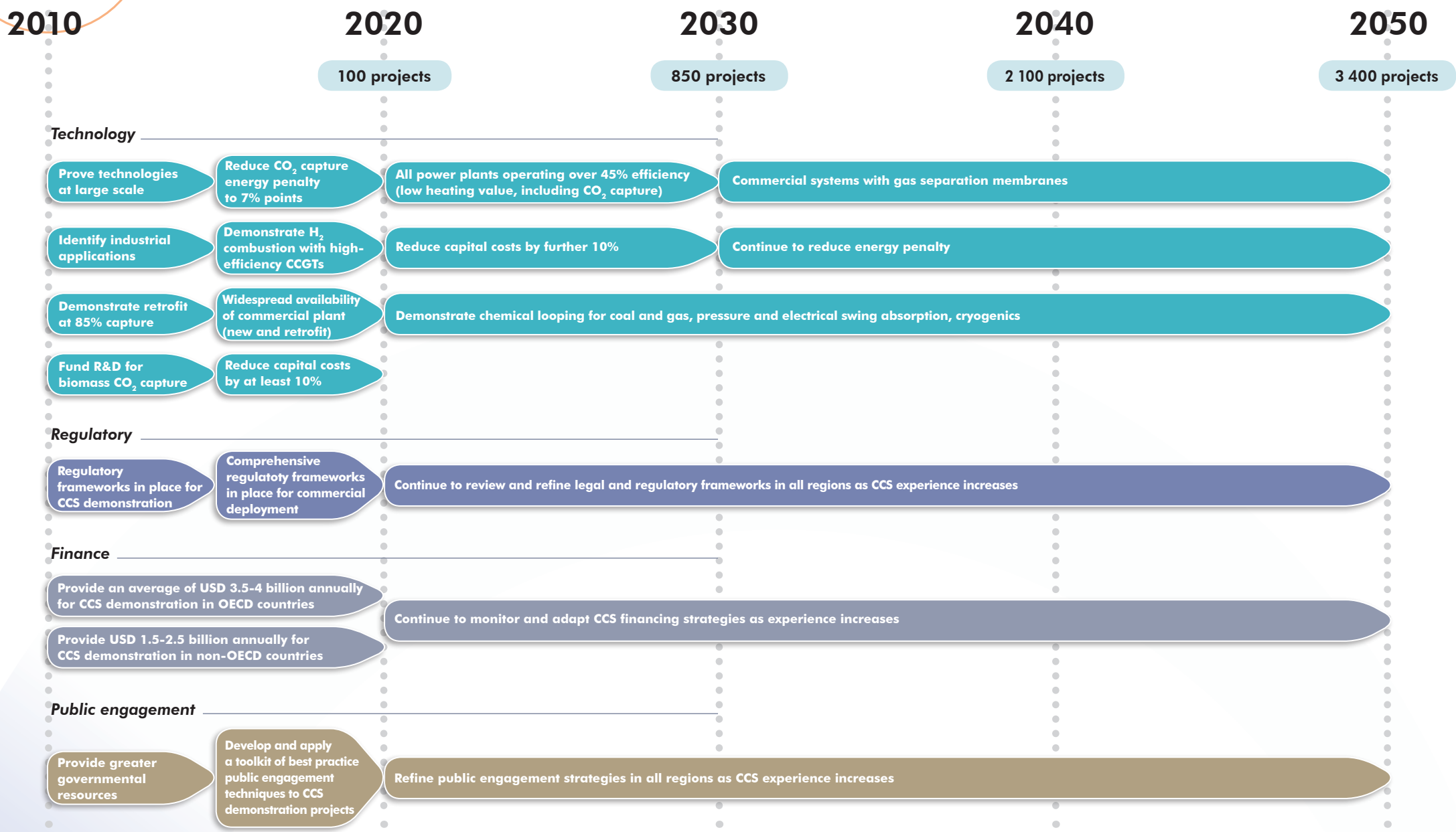
CCS roadmap milestones



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