

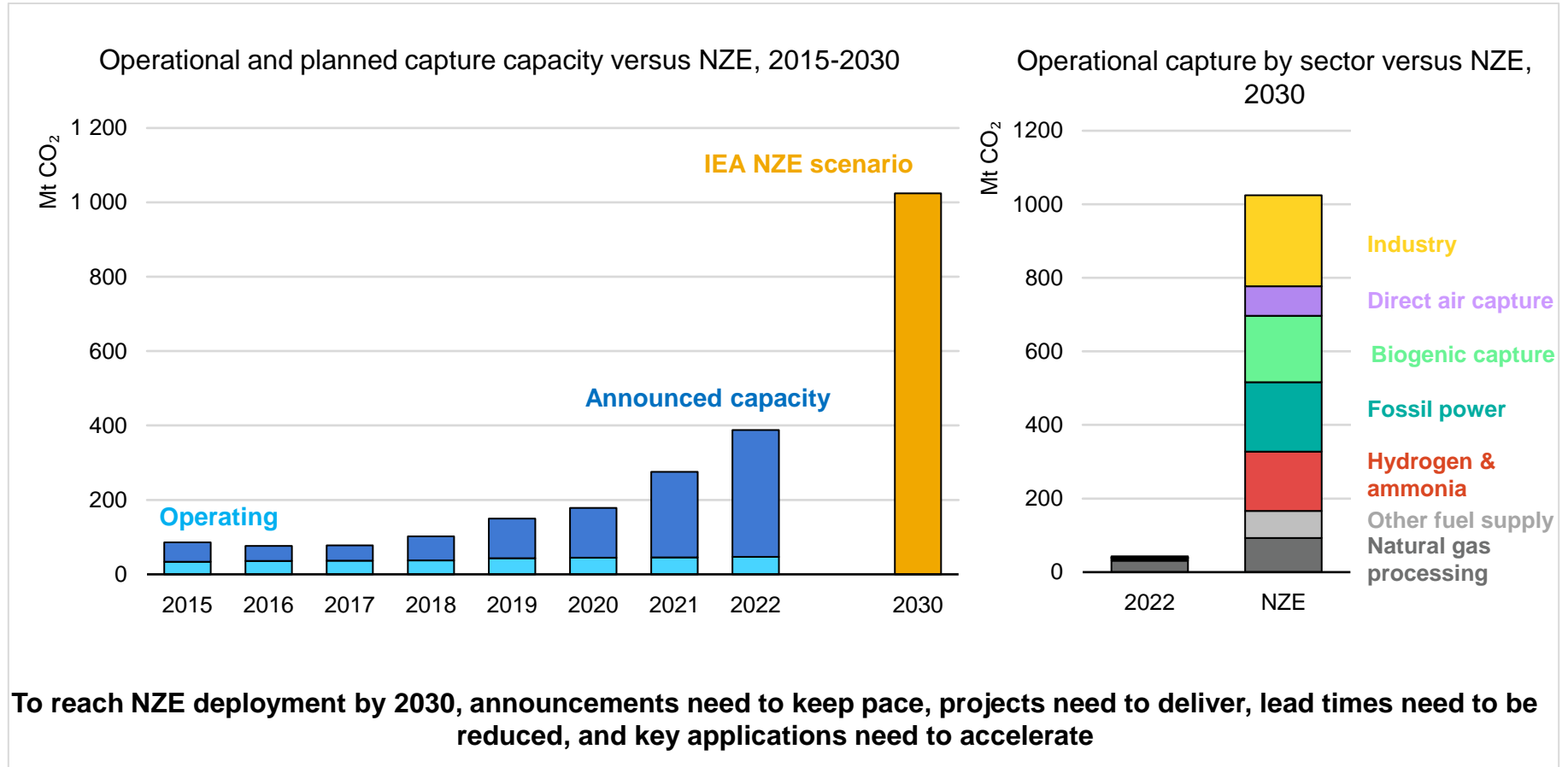


CCUS Policies and Business Models – building a commercial market

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Fondation Tuck, IDées - Transitions vers le bas carbone, CCUS, 5 Février 2024

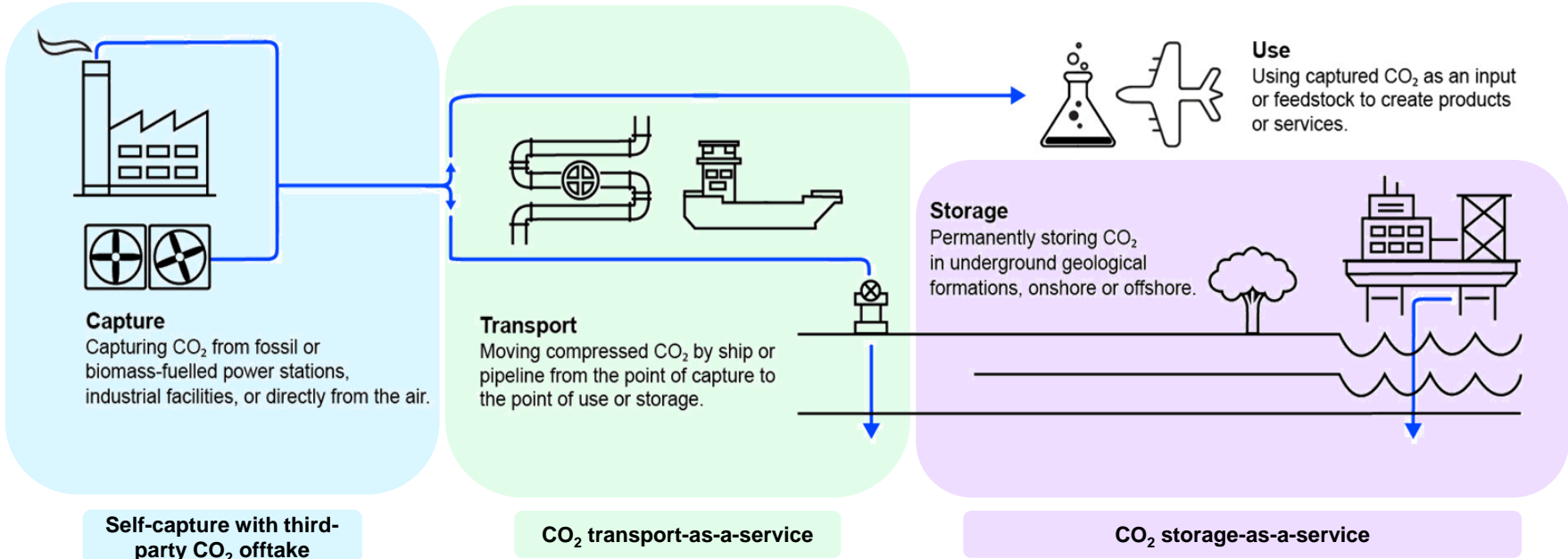
Flat deployment but a growing momentum



To reach NZE deployment by 2030, announcements need to keep pace, projects need to deliver, lead times need to be reduced, and key applications need to accelerate

From full-chain to part-chain business models

CCUS value chain



New players specialising in parts of the value chain are entering the market, allowing more emitters to access CCUS solutions

Existing policies are not enough to scale CCUS

Map of projects in operation and under construction and CCUS policies

Project type

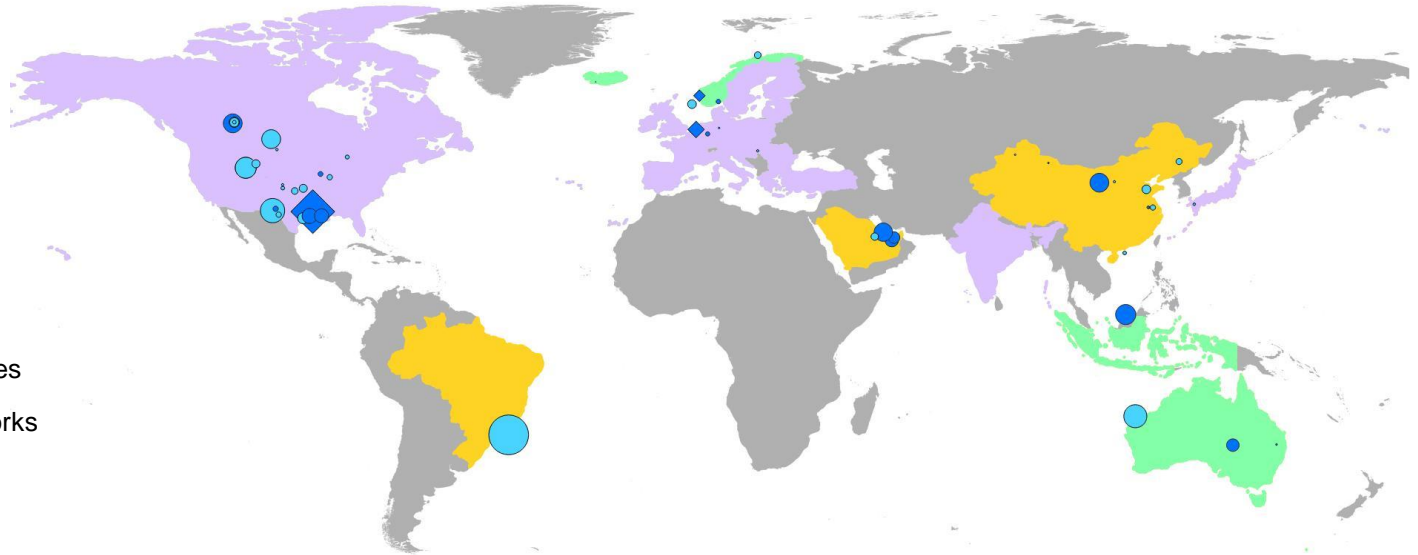
- Capture or full chain
- ◆ Storage

Project Status

- Operating
- Under construction

Policies

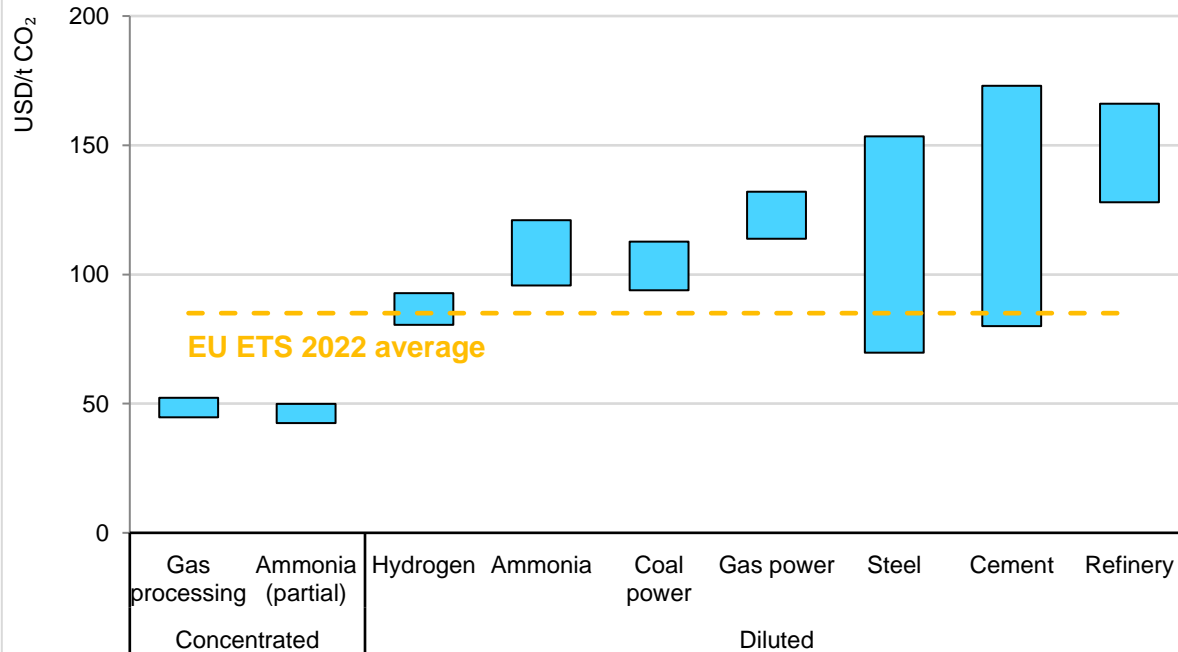
- Cost reduction measures
- Enabling legal frameworks
- Carbon management strategies in place and in planning



Cost reductions and legal frameworks have helped many CCUS projects to date. But with less than 20% of captured CO₂ injected in dedicated storage, these alone cannot scale up CCUS in areas that are key for NZE

Challenge I: economic viability

Levelised cost of carbon avoided for a range of applications



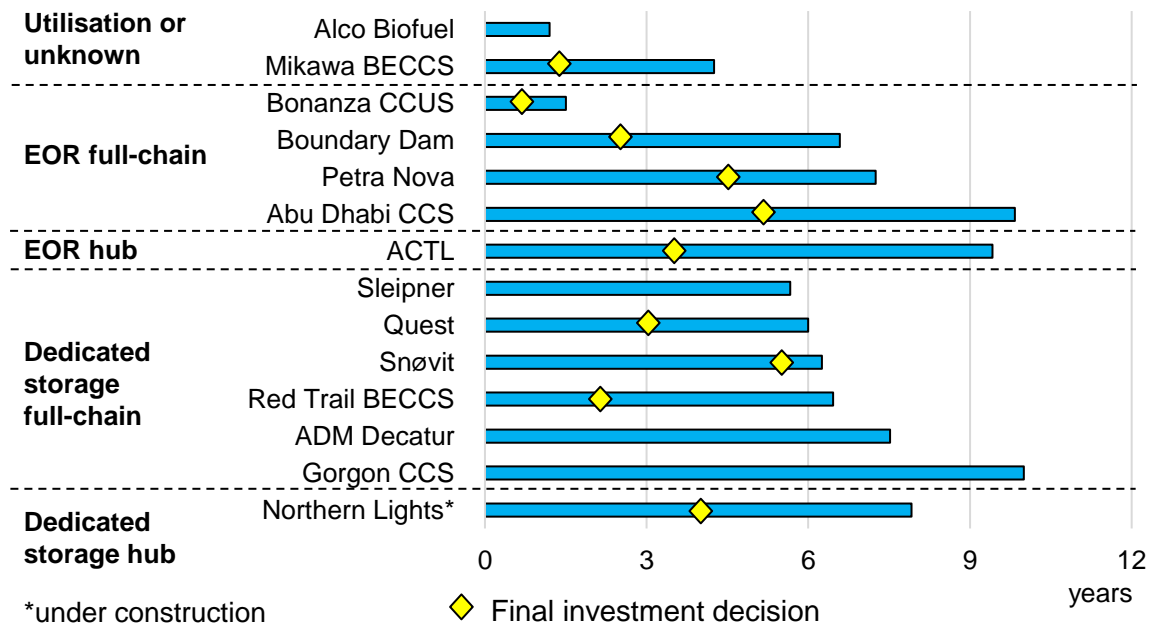
Policy tools

- ✓ Grants, tax credits, loans
- ✓ State-owned enterprises
- ✓ Carbon pricing and leakage policy
- ✓ Public procurement and mandates
- ✓ (Carbon) contracts-for-difference
- ✓ Regulated asset base
- ✓ Emerging markets considerations

Carbon prices in the European Union currently have limited ability to incentivise dilute applications. Policy tools are available to support higher-cost projects

Challenge II: reducing lead times

Lead times of projects in operation



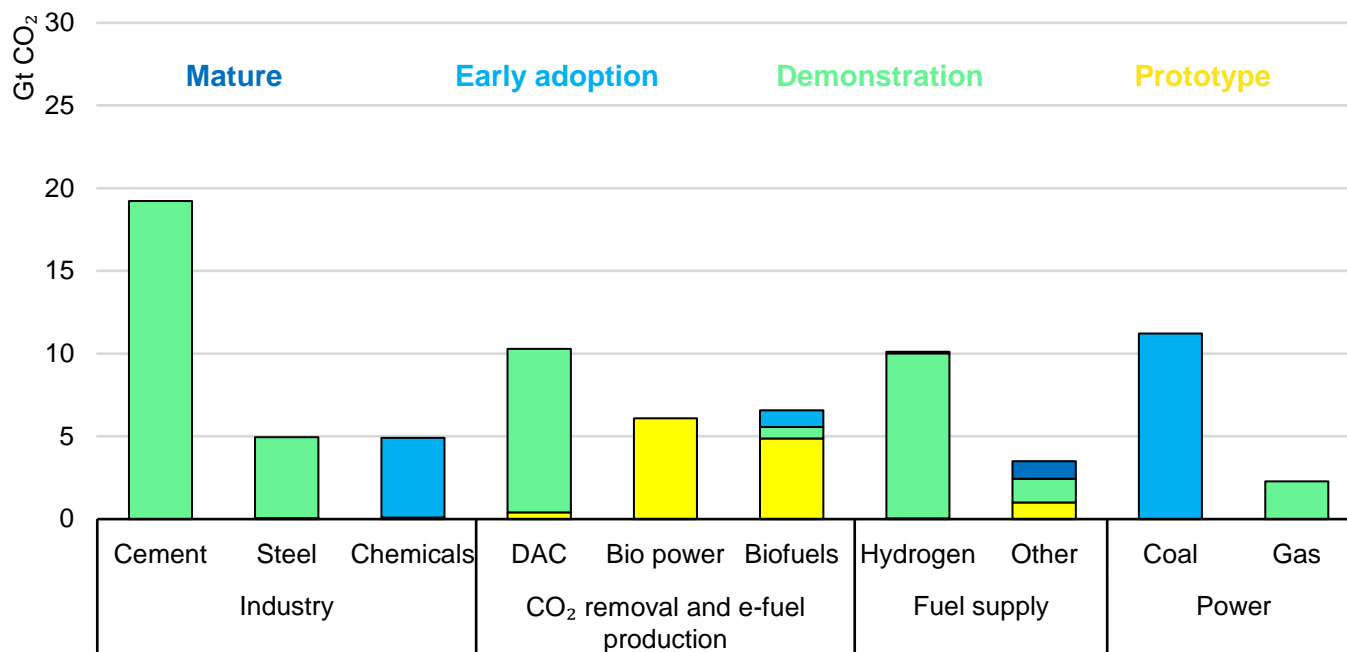
Policy tools

- ✓ One-stop shop for permitting
- ✓ Clear approval timelines
- ✓ Regulatory capacity
- ✓ Precompetitive resource assessments
- ✓ Data sharing and transparency
- ✓ Community engagement

Projects have taken between 2 and 10 years to reach completion, with a median around 6 years. Lead times can be reduced where infrastructure is in place (hubs), but efforts are required to streamline procedures

Challenge III: bridging the innovation gap

Cumulative capacity to 2050 in the NZE Scenario by maturity level



Policy tools

- ✓ Research, development and demonstration
- ✓ Platforms for international co-operation
- ✓ Foreign direct investment for technology co-development

75% of planned capture capacity to 2050 in the NZE is in applications that are at the demonstration stage or below. RD&D investment is required to bridge this gap and continue to reduce costs and energy penalty of CCUS

Challenge IV: tackle new project complexities

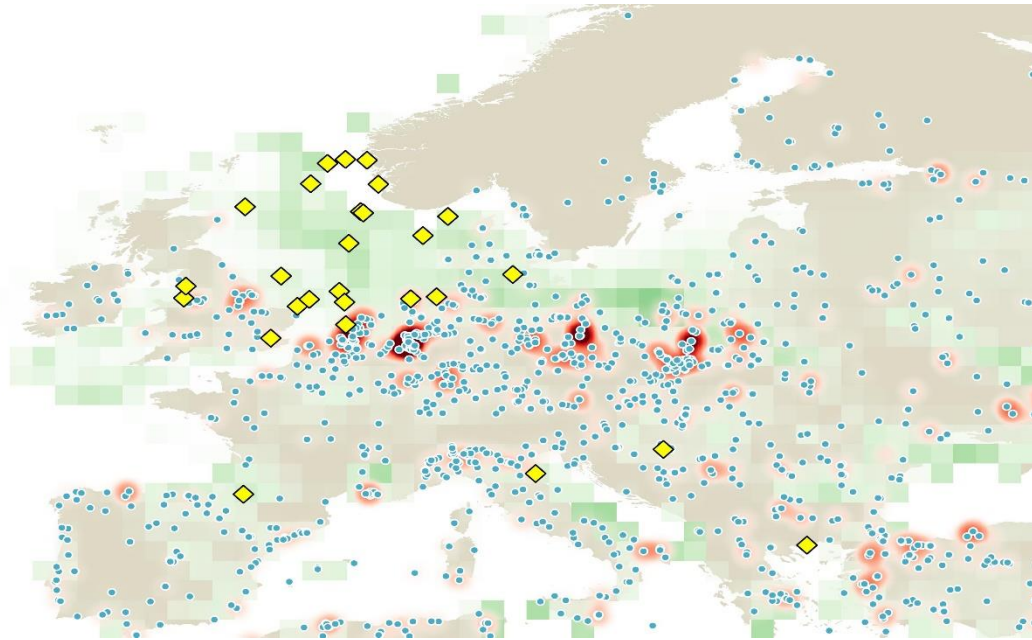
CO₂ emissions clusters and storage hubs in planning in Europe, 2023

Storage

- Potential
- ◆ Planned hubs

Emissions

- Clusters
- Sources



Policy tools

- ✓ Long-term liability
- ✓ Competitive solicitations for hubs
- ✓ One-off backstop agreements for first movers
- ✓ London Protocol
- ✓ Definition of high-quality removals
- ✓ Monitoring, reporting and verification

**Infrastructure deployment needs to adapt to sectoral requirements and regional contexts.
Governments have a central role to play in co-ordinating hub development**

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