Value chain reality check:
Is CO_2 storage the real bottleneck for scaling CCS in Europe?

14 April, 2026

This side event is organised as part of the Knowledge Sharing Summit 2026, CCS & CDR Summit.

Driving CO_2 storage demand
Insights from the EU Innovation Fund Projects

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The EU Innovation Fund is the leading indicator of CO_2 storage demand in Europe

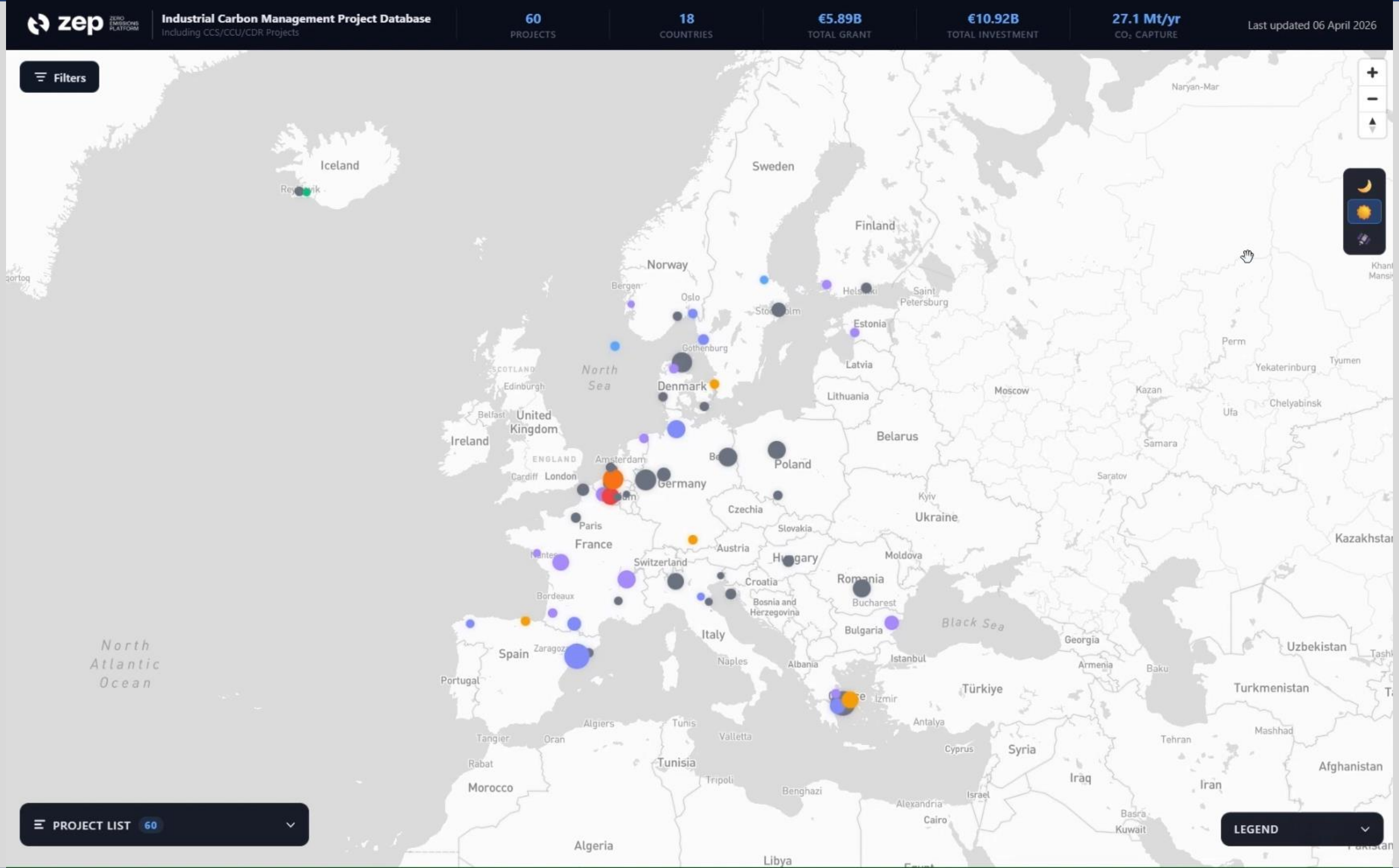
EU targets outline significant ambition for **CO_2 storage development** in Europe

- Net Zero Industry Act: **50 Mtpa by 2030**
- Industrial Carbon Management Strategy: **250 Mtpa by 2050**

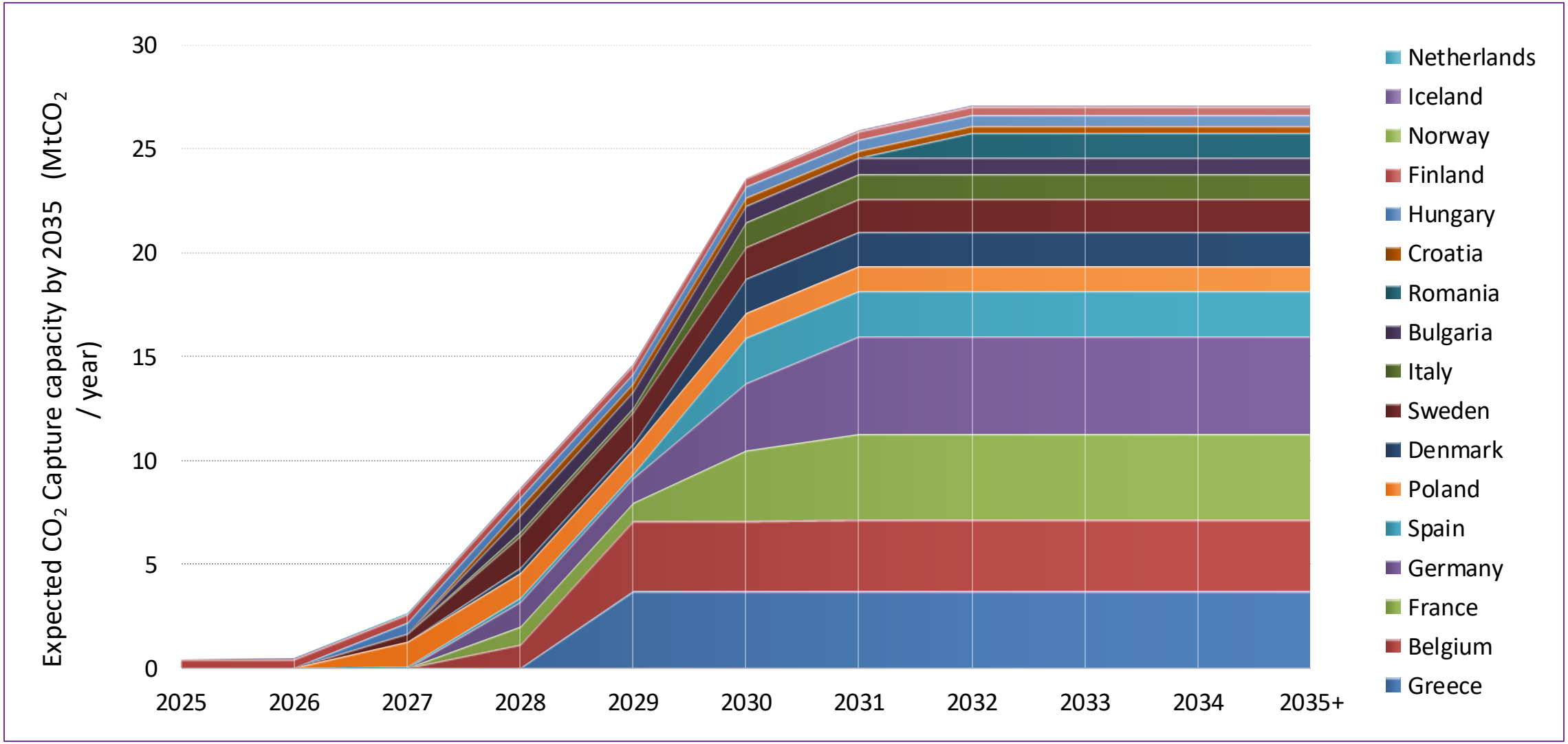
Identifying and supporting demand for storage capacity is a critical first step for storage resource development.

The Innovation Fund ICM Project Database

- **Interactive web map** of 60 EU Innovation Fund CCS/CCU projects across **16 European countries**
- Displays **key metrics per project**: CO_2 capture capacity, grant size, total investment, technology type, and operational status
- Filter by country, funding call, sector, scale, category, and status
- Data sourced exclusively from EU Commission, CINEA, and official company sources
- Built to **support** policy analysis, stakeholder communication, and transparency around Europe's industrial decarbonisation pipeline


zep
ZERO EMISSIONS PLATFORM
Industrial Carbon Management Project Database
Including CCS/CCU/CDR Projects
60
PROJECTS
18
COUNTRIES
€5.89B
TOTAL GRANT
€10.92B
TOTAL INVESTMENT
27.1 Mt/yr
CO_2 CAPTURE
Last updated 06 April 2026
Filters
PROJECT LIST 60
LEGEND
Iceland
Sweden
Finland
Norway
Bergen
Oslo
Stockholm
Helsinki
Saint Petersburg
Estonia
Latvia
Lithuania
Belarus
Moscow
Perm
Yekaterinburg
Tyumen
Kazan
Ufa
Chelyabinsk
Samara
Saratov
Naryan-Mar
Gothenburg
Denmark
North Sea
SCOTLAND
Edinburgh
Belfast
United Kingdom
Ireland
ENGLAND
Amsterdam
Cardiff
London
Germany
Poland
Czechia
Slovakia
Ukraine
Kyiv
Paris
France
Austria
Switzerland
Hungary
Moldova
Romania
Bucharest
Croatia
Bosnia and Herzegovina
Bordeaux
Italy
Naples
Albania
Bulgaria
Black Sea
Georgia
Armenia
Baku
Istanbul
Uzbekistan
Turkmenistan
Türkiye
Izmir
Antalya
Cyprus
Syria
Iraq
Iran
Afghanistan
Tehran
Mashhad
Kuwait
Basra
Alexandria
Cairo
Israel
Spain
Zaragoza
Portugal
North Atlantic Ocean
Algiers
Tunis
Tangier
Oran
Rabat
Morocco
Tunisia
Valletta
Tripoli
Benghazi
Algeria
Libya

Innovation Fund ICM Project Database



Expected CO_2 capture volumes, sorted by country ($MtCO_2$/year)

ICM project database – *Key statistics*

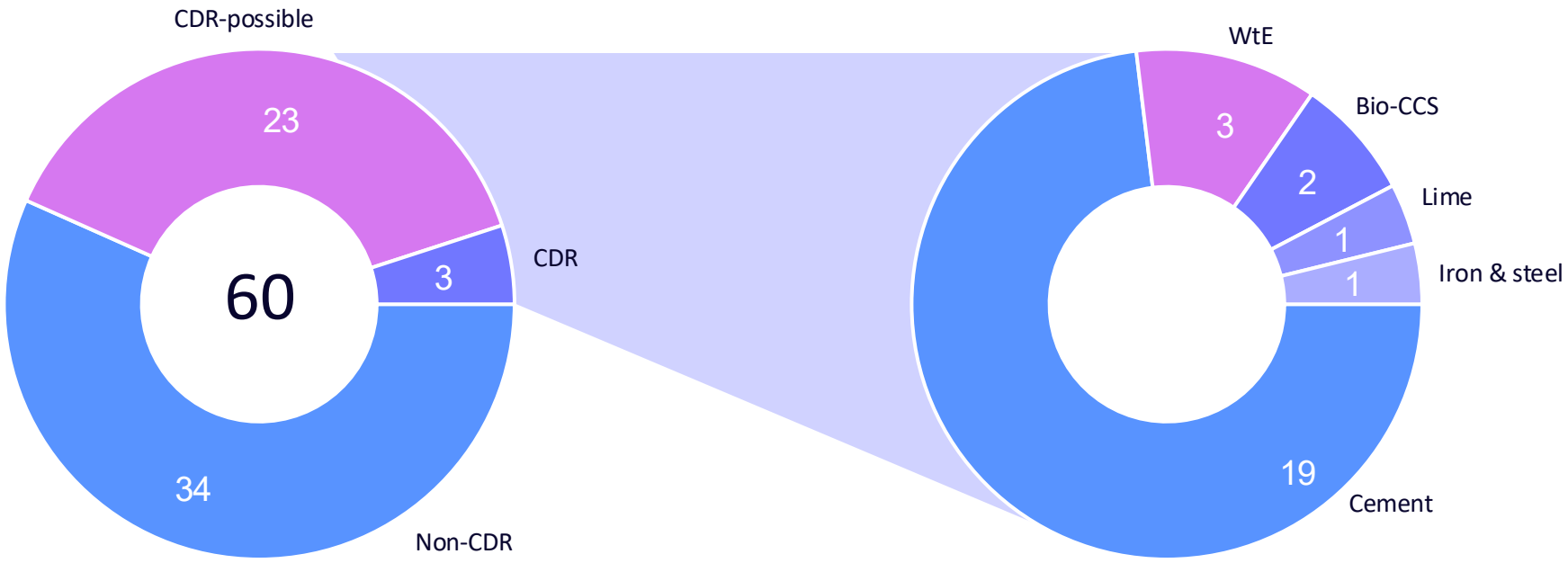
Sector	Amount
Cement	**19**
CO_2 transport & storage	8
Other	8
Bioenergy	**7**
Refineries & Chemicals	6
Lime	**4**
Iron & Steel	3
Waste-to-energy	**3**
Metals & Mining	1
Fertilisers	1

Category	Amount
CCS (geological storage)	**25**
CCU (SAF, mineralisation, e-fuels, methanol)	15
CO_2 transport & storage infrastructure	8
CCS & CCU	4
Power-to-X	3
Carbon Removal (CDR)	**3**
Other	2

Status	Amount
Pre-FID / Advanced Development	**16**
Engineering & Design	11
Early Development	10
FEED & Permitting	9
Under Construction	5
On Hold / Cancelled	4
Grant Preparation	4
Operational	1

Unlocking CDR Potential

Potential CDR projects funded under the Innovation Fund



Europe

There are **171** capture projects under development **in Europe** that include biogenic **CO_2**; fully capturing and geologically storing this stream could deliver up to **47 Mtpa** of removals.*

*CaptureMap

IFESTOS

- IFESTOS CCS project aims to capture all biogenic CO_2 from alternative fuels, and transport it for permanent storage.

Cement

Greece

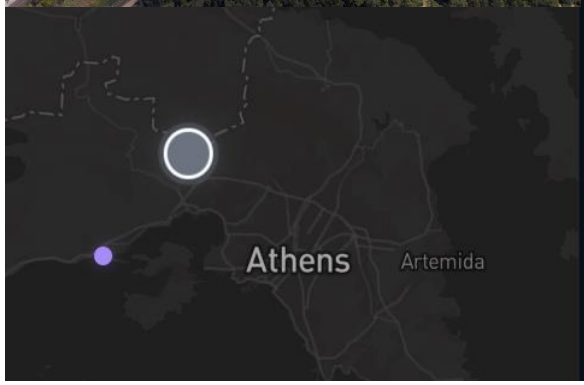
Large-scale

Titan Cement Company S.A.

2025 Start

2029 Operational

2039 End of Evaluation



FEED / Pre-FID | IF22 | large-scale

IFESTOS

80 km of Oinois - Magoulas Provincial Road, 19 600 Magoula, (PO Box 18)

1.90 CO_2 Capture Mt/yr	0.68 CO_2 Avoided Mt/yr
1.90 CO_2 Stored Mt/yr	19.0 Total Capture Mt (lifetime)
€234.0M EU Grant	Not Disclosed Total Investment

INNOZHERO

- A WtE CCS project, with biogenic share from organic waste streams, enabling negative emissions through permanent storage.

WtE

Sweden

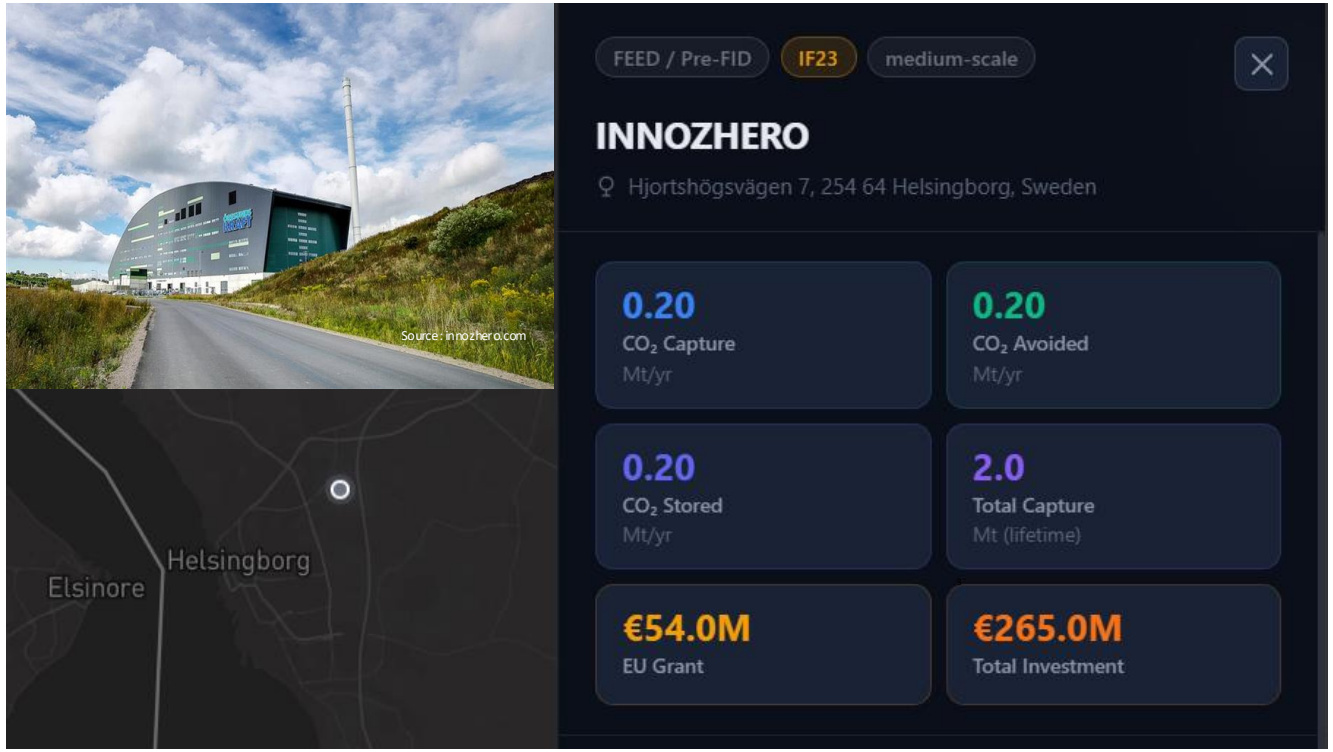
Medium-scale

Öresundskraft Kraft & Värme AB

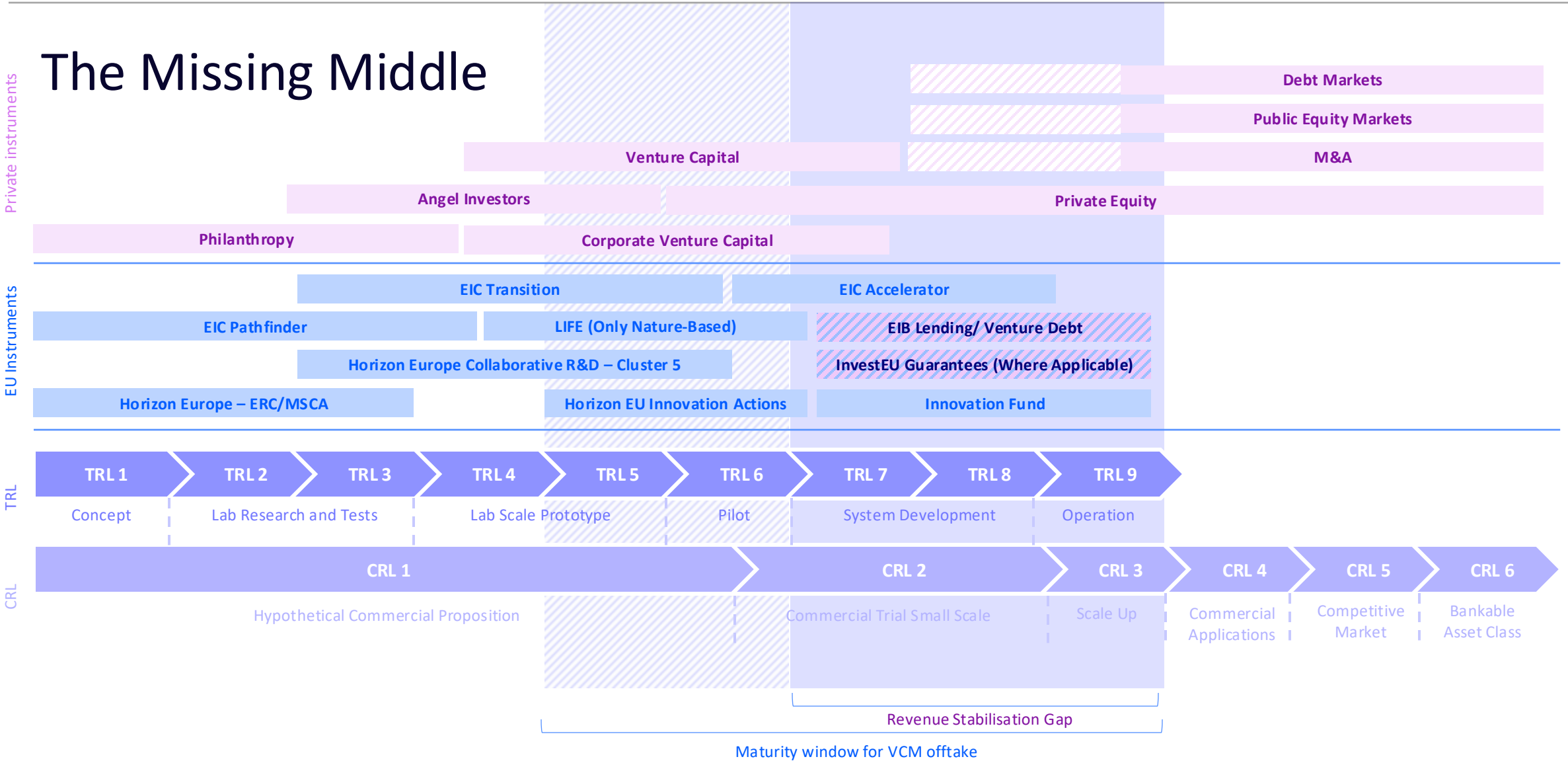
2025 Start

2028 Operational

2038 End of Evaluation



The Missing Middle



Unlocking private capital for CDR with coordinated, long-term demand signals through EU Carbon Removal Buyers' Club

R&D

Pilot

Deployment

EU Carbon Removal Buyers' Club

What it is?

A coordinated demand-side mechanism to create a credible early market for high-quality CDR in Europe.

- Club of corporate and institutional buyers interested to purchase CDR
- Focus on high-quality, CRCF-aligned carbon removal credits
- An early market-building instrument

Why it matters?

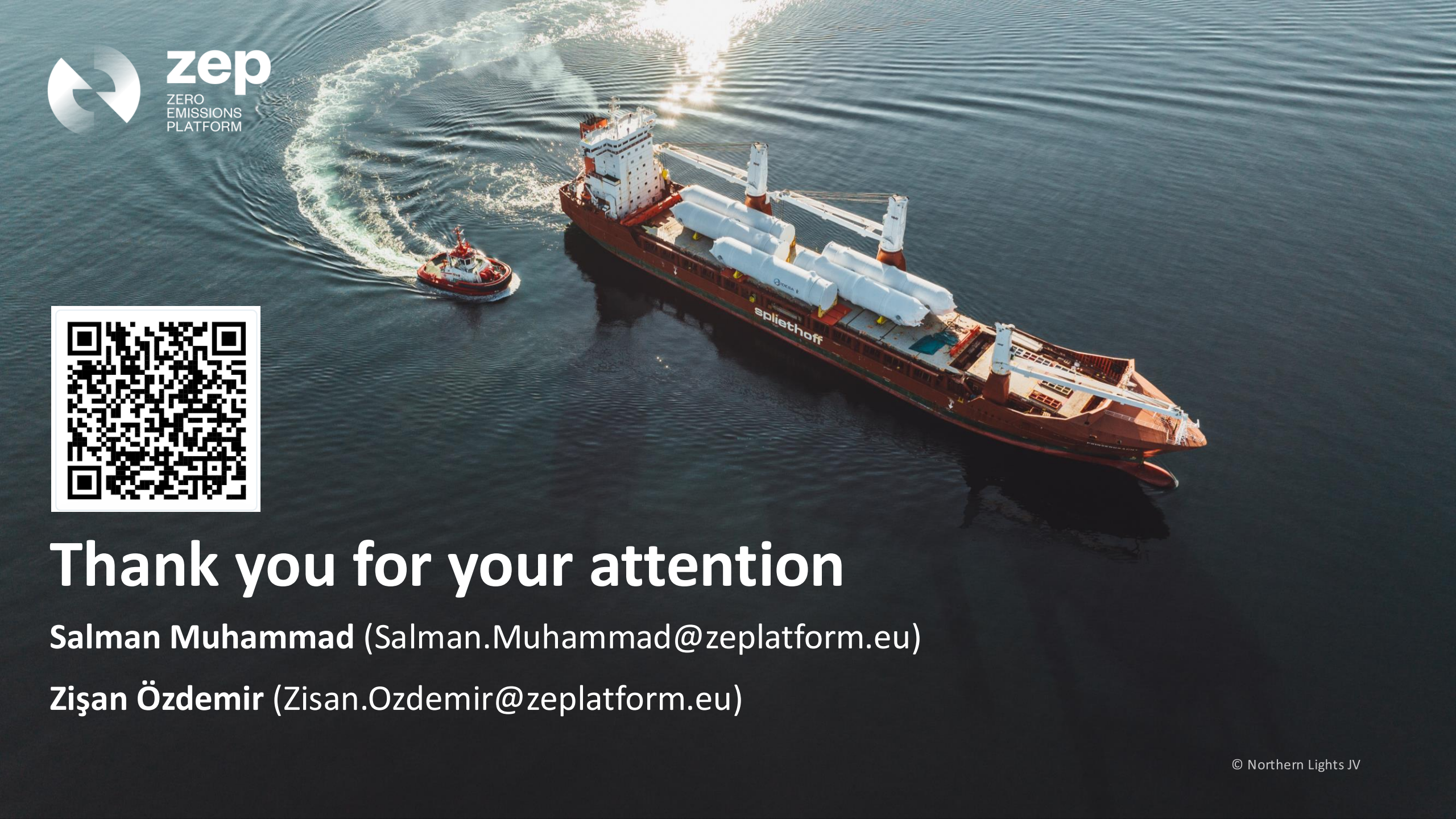
Without predictable demand, CDR projects remain high-risk and struggle to scale despite public support.

- Demand for CDR remains insufficient and uncertain
- Projects lack revenue visibility
- Public funding alone (e.g. Innovation Fund) is not enough to scale supply

What it does?

Translates buyer interest into bankable demand signals that unlock private capital for CDR.

- Aggregates demand → *reduces fragmentation*
- Provides long-term offtake signals → *enables financing*
- Ensures credibility → alignment with EU methodologies



Thank you for your attention

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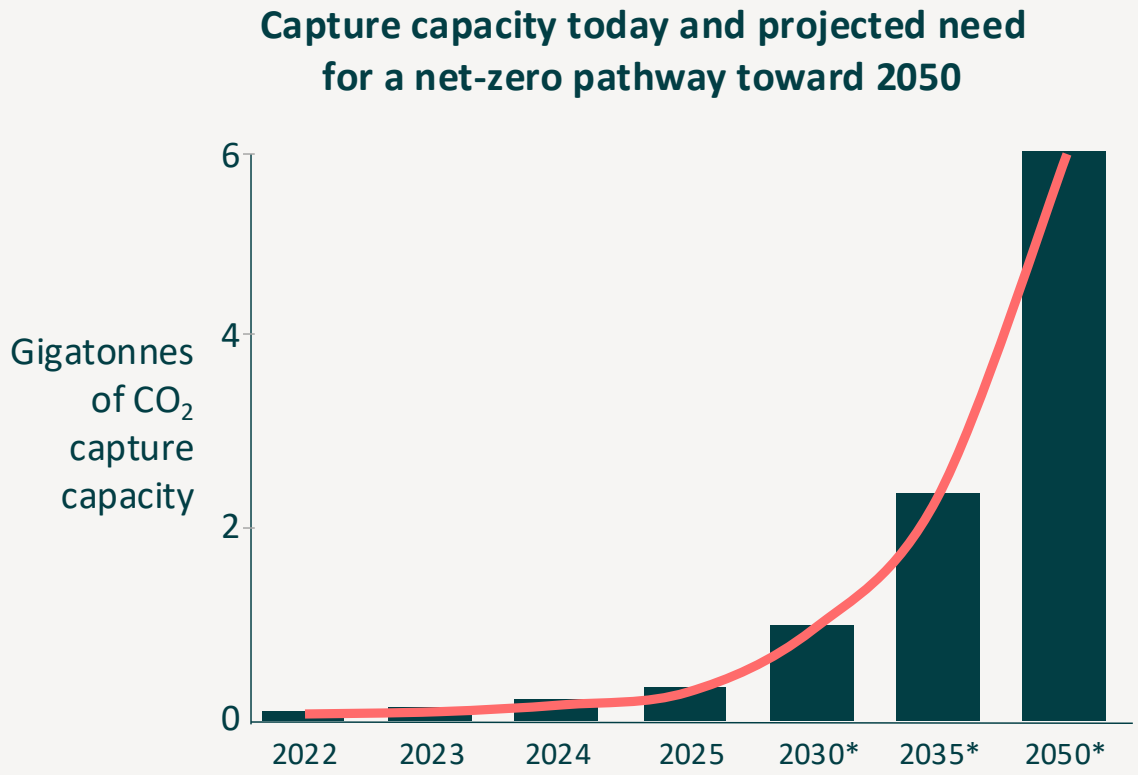
Market overview:
What the CCS pipeline tells us

Eric Rambech
Co-founder and Commercial Lead
CaptureMap/Endrava

CCUS is scaling, but **data** is holding it back

To unlock CCUS at scale, the industry needs trusted, up-to-date intelligence



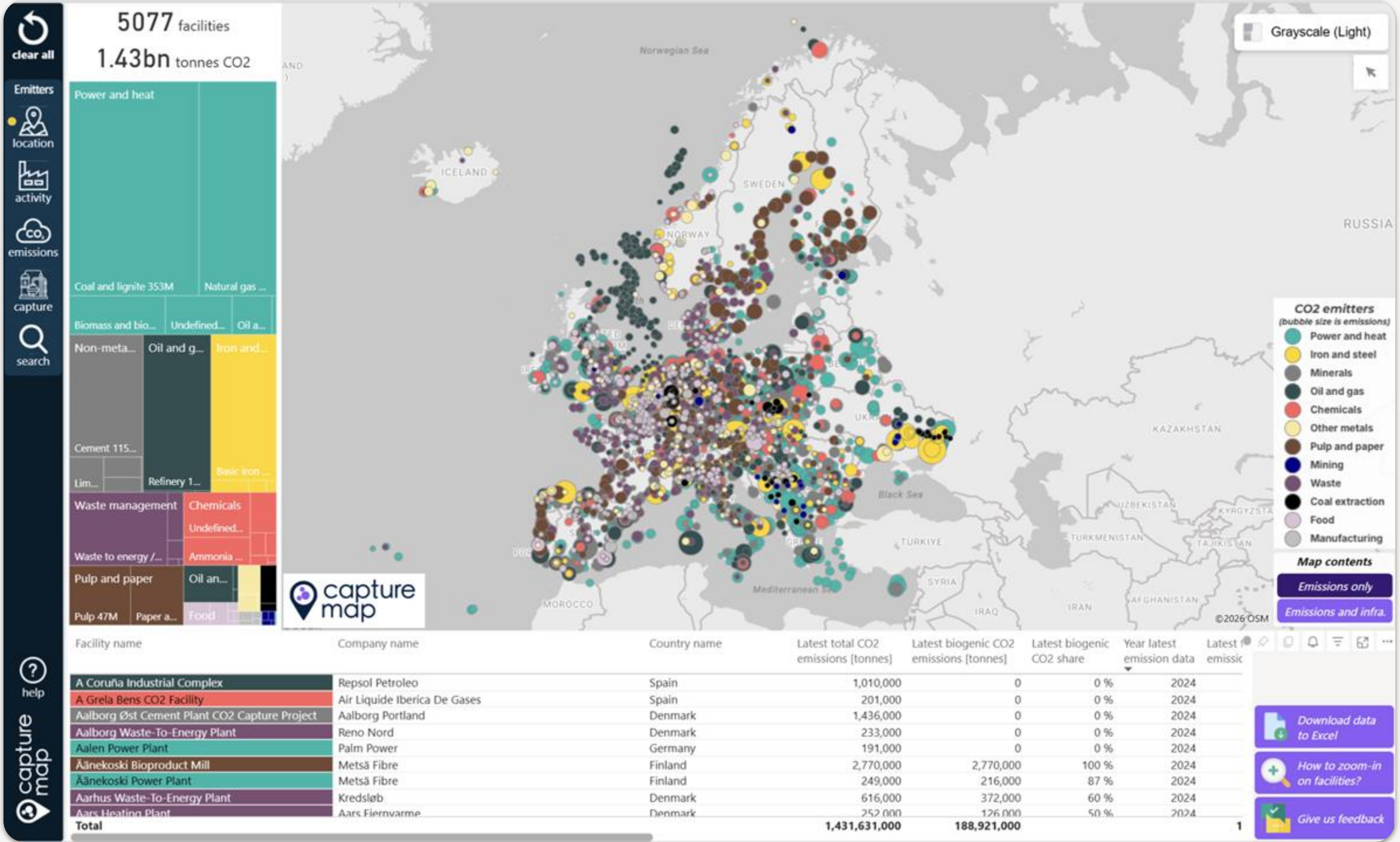
**Various scenarios by IEA, IRENA, McKinsey, IPCC estimate 5-10 Gt capture capacity required for net-zero by 2050*

capture map

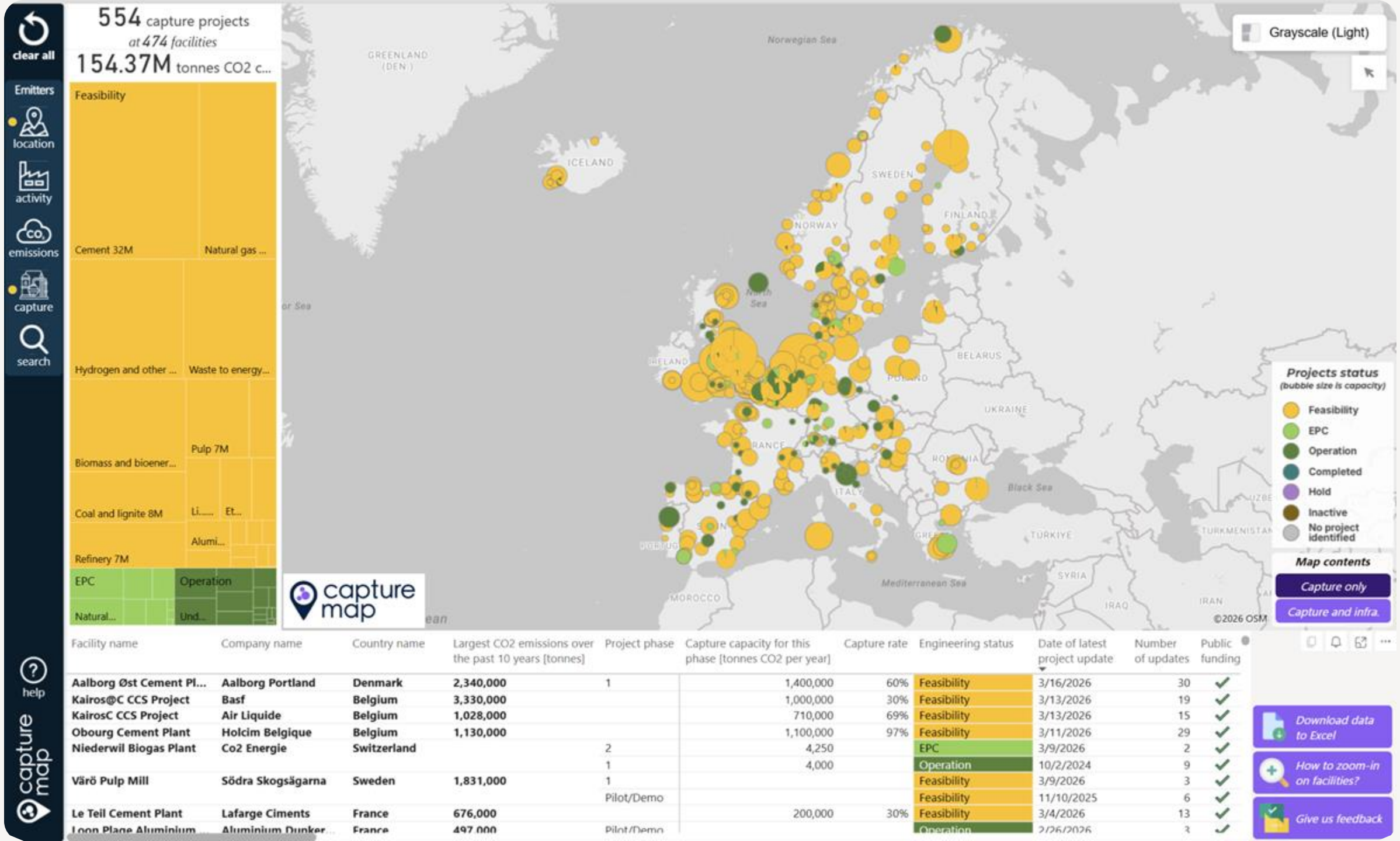
CaptureMap: the industry standard for CCUS market intelligence

For finance, there's Bloomberg
For CCUS, there's CaptureMap

capture map

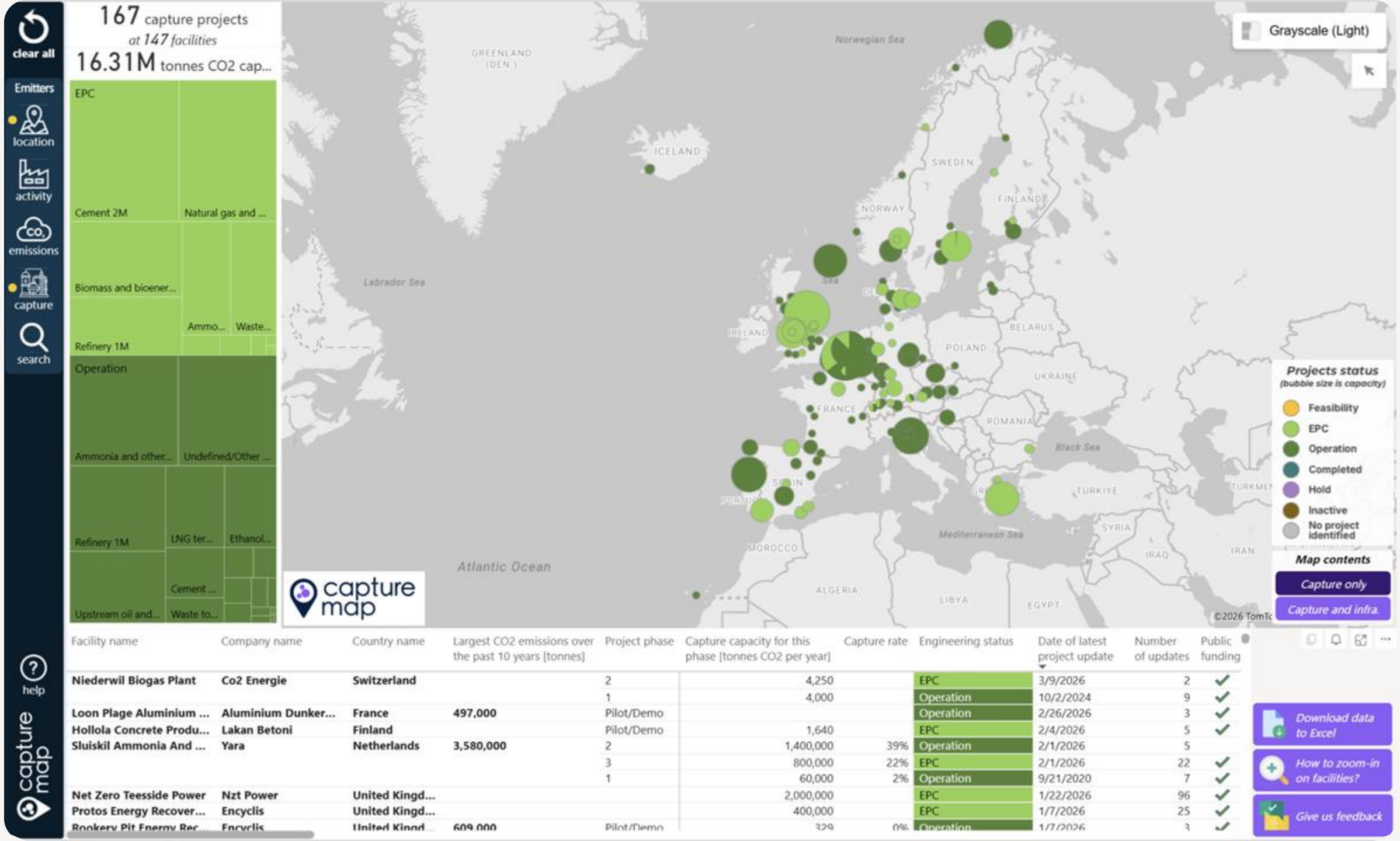


Facility name	Company name	Country name	Latest total CO2 emissions [tonnes]	Latest biogenic CO2 emissions [tonnes]	Latest biogenic CO2 share	Year latest emission data	Latest emissic
A Coruña Industrial Complex	Repsol Petroleo	Spain	1,010,000	0	0 %	2024	
A Grela Bens CO2 Facility	Air Liquide Iberica De Gases	Spain	201,000	0	0 %	2024	
Aalborg Øst Cement Plant CO2 Capture Project	Aalborg Portland	Denmark	1,436,000	0	0 %	2024	
Aalborg Waste-To-Energy Plant	Reno Nord	Denmark	233,000	0	0 %	2024	
Aalen Power Plant	Palm Power	Germany	191,000	0	0 %	2024	
Äänekoski Bioproduct Mill	Metsä Fibre	Finland	2,770,000	2,770,000	100 %	2024	
Äänekoski Power Plant	Metsä Fibre	Finland	249,000	216,000	87 %	2024	
Aarhus Waste-To-Energy Plant	Kredsløb	Denmark	616,000	372,000	60 %	2024	
Aars Heating Plant	Aars Fjernvarme	Denmark	252,000	126,000	50 %	2024	
Total			**1,431,631,000**	**188,921,000**			**1**



Facility name	Company name	Country name	Largest CO2 emissions over the past 10 years [tonnes]	Project phase	Capture capacity for this phase [tonnes CO2 per year]	Capture rate	Engineering status	Date of latest project update	Number of updates	Public funding
Aalborg Øst Cement Pl...	Aalborg Portland	Denmark	2,340,000	1	1,400,000	60%	Feasibility	3/16/2026	30	✓
Kairos@C CCS Project	Basf	Belgium	3,330,000		1,000,000	30%	Feasibility	3/13/2026	19	✓
KairosC CCS Project	Air Liquide	Belgium	1,028,000		710,000	69%	Feasibility	3/13/2026	15	✓
Obourg Cement Plant	Holcim Belgique	Belgium	1,130,000		1,100,000	97%	Feasibility	3/11/2026	29	✓
Niederwil Biogas Plant	Co2 Energie	Switzerland		2	4,250		EPC	3/9/2026	2	✓
				1	4,000		Operation	10/2/2024	9	✓
Värö Pulp Mill	Södra Skogsägarna	Sweden	1,831,000	1			Feasibility	3/9/2026	3	✓
				Pilot/Demo			Feasibility	11/10/2025	6	✓
Le Teil Cement Plant	Lafarge Ciments	France	676,000		200,000	30%	Feasibility	3/4/2026	13	✓
Loon Plage Aluminium	Aluminium Dunker...	France	497,000	Pilot/Demo			Operation	2/26/2026	3	✓

Download data to Excel
How to zoom-in on facilities?
Give us feedback



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Niederwil Biogas Plant	**Co2 Energie**	**Switzerland**		2	4,250		EPC	3/9/2026	2	✓
				1	4,000		Operation	10/2/2024	9	✓
Loon Plage Aluminium ...	**Aluminium Dunker...**	**France**	**497,000**	Pilot/Demo			Operation	2/26/2026	3	✓
Hollola Concrete Produ...	**Lakan Betoni**	**Finland**		Pilot/Demo	1,640		EPC	2/4/2026	5	✓
Sluiskil Ammonia And ...	**Yara**	**Netherlands**	**3,580,000**	2	1,400,000	39%	Operation	2/1/2026	5	
				3	800,000	22%	EPC	2/1/2026	22	✓
				1	60,000	2%	Operation	9/21/2020	7	✓
Net Zero Teesside Power	**Nzt Power**	**United Kingd...**			2,000,000		EPC	1/22/2026	96	✓
Protos Energy Recover...	**Encyclis**	**United Kingd...**			400,000		EPC	1/7/2026	25	✓
Rookery Pit Energy Rec...	**Encyclis**	**United Kingd...**	**609,000**	Pilot/Demo	329	0%	Operation	1/7/2026	3	✓

Download data to Excel

How to zoom-in on facilities?

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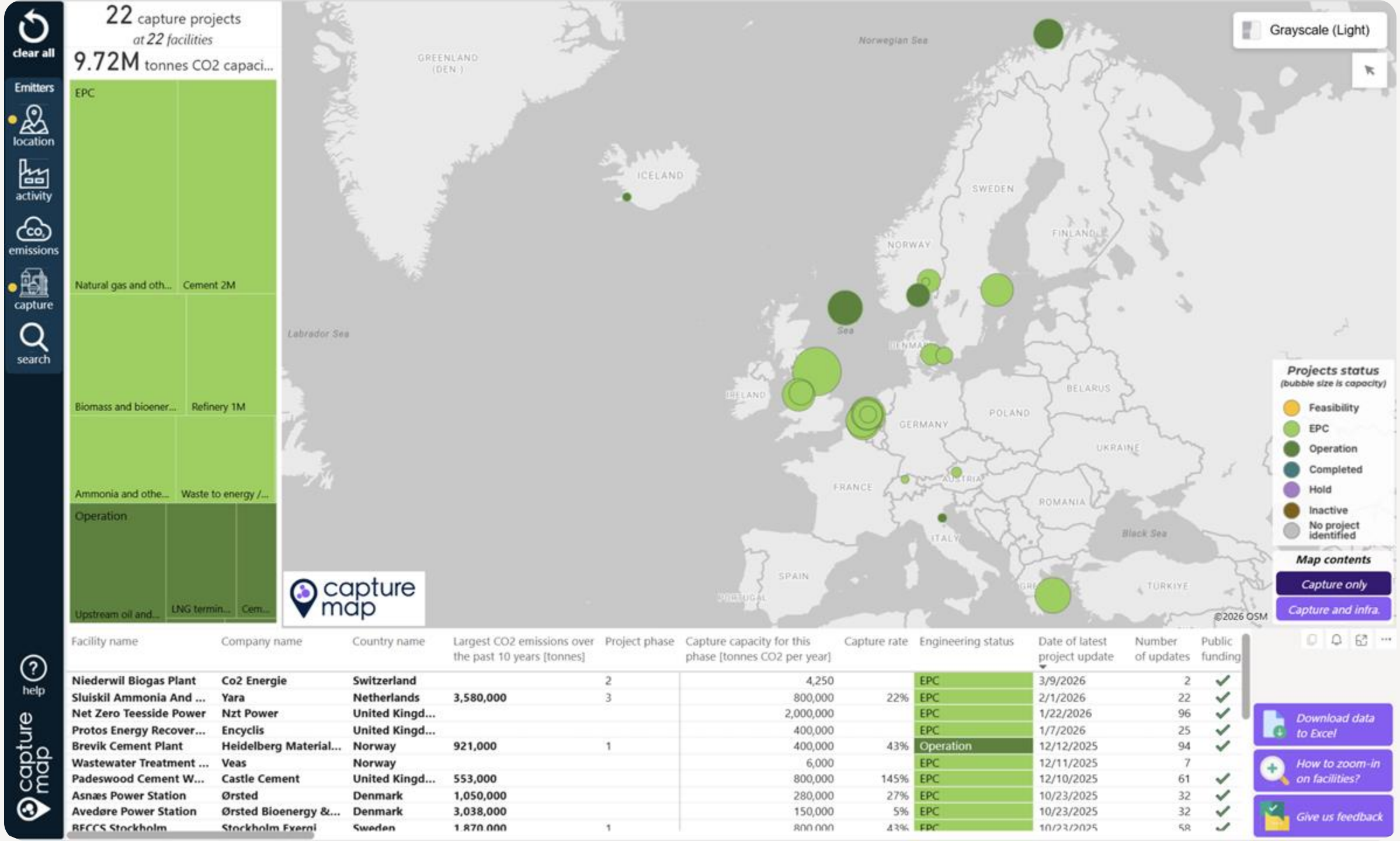

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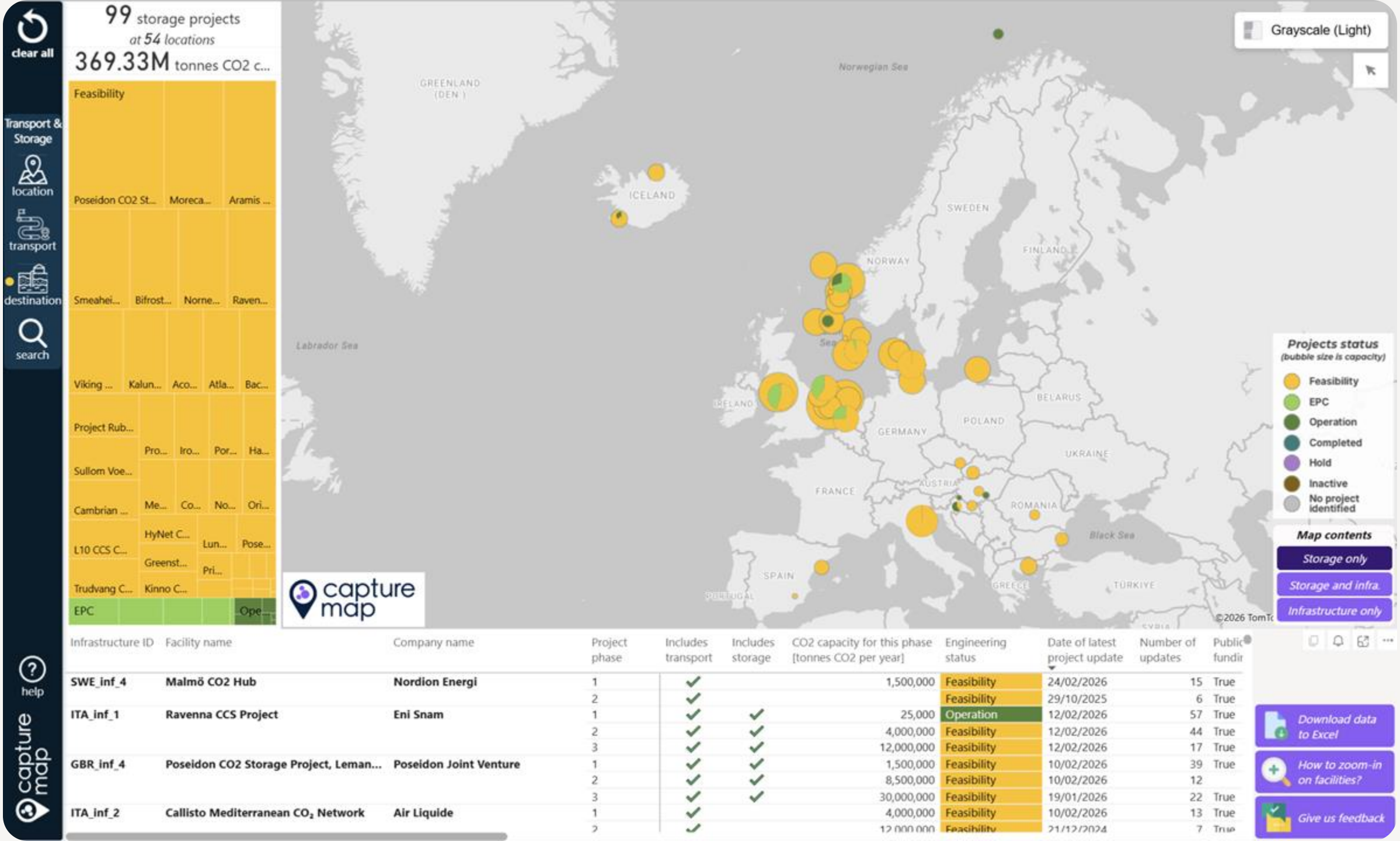
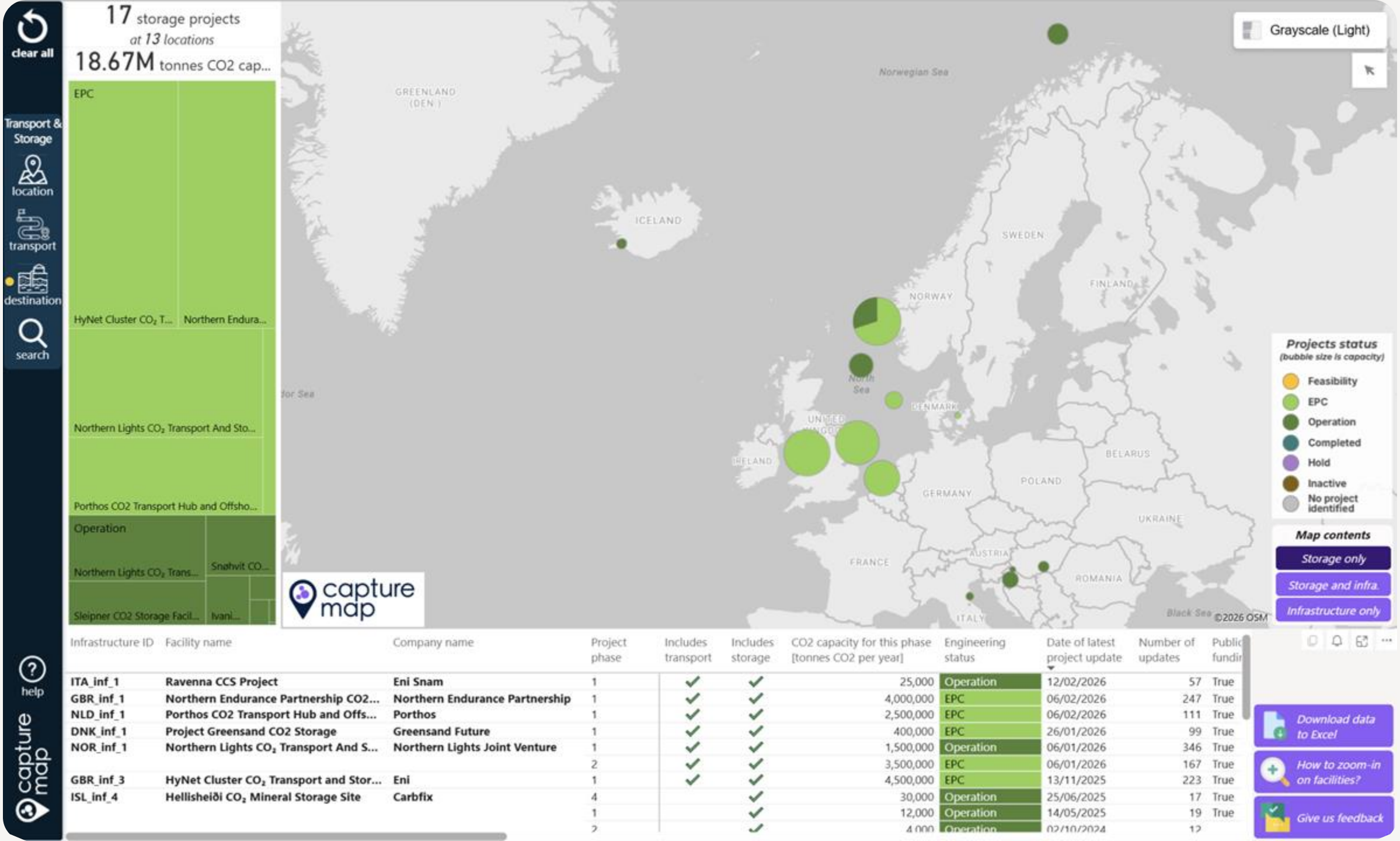
Niederwil Biogas Plant	Co2 Energie	Switzerland		2	4,250		EPC	3/9/2026	2	✓
Sluiskil Ammonia And ...	Yara	Netherlands	3,580,000	3	800,000	22%	EPC	2/1/2026	22	✓
Net Zero Teesside Power	Nzt Power	United Kingd...			2,000,000		EPC	1/22/2026	96	✓
Protos Energy Recover...	Encyclis	United Kingd...			400,000		EPC	1/7/2026	25	✓
Brevik Cement Plant	Heidelberg Material...	Norway	921,000	1	400,000	43%	Operation	12/12/2025	94	✓
Wastewater Treatment ...	Veas	Norway			6,000		EPC	12/11/2025	7	
Padeswood Cement W...	Castle Cement	United Kingd...	553,000		800,000	145%	EPC	12/10/2025	61	✓
Asnæs Power Station	Ørsted	Denmark	1,050,000		280,000	27%	EPC	10/23/2025	32	✓
Avedøre Power Station	Ørsted Bioenergy &...	Denmark	3,038,000		150,000	5%	EPC	10/23/2025	32	✓
BECCS Stockholm	Stockholm Exergi	Sweden	1,870,000	1	800,000	43%	EPC	10/23/2025	58	✓

Download data to Excel
How to zoom-in on facilities?
Give us feedback



Infrastructure ID	Facility name	Company name	Project phase	Includes transport	Includes storage	CO2 capacity for this phase [tonnes CO2 per year]	Engineering status	Date of latest project update	Number of updates	Public fundi
SWE_inf_4	Malmö CO2 Hub	Nordion Energi	1	✓		1,500,000	Feasibility	24/02/2026	15	True
			2	✓			Feasibility	29/10/2025	6	True
ITA_inf_1	Ravenna CCS Project	Eni Snam	1	✓	✓	25,000	Operation	12/02/2026	57	True
			2	✓	✓	4,000,000	Feasibility	12/02/2026	44	True
			3	✓	✓	12,000,000	Feasibility	12/02/2026	17	True
GBR_inf_4	Poseidon CO2 Storage Project, Leman...	Poseidon Joint Venture	1	✓	✓	1,500,000	Feasibility	10/02/2026	39	True
			2	✓	✓	8,500,000	Feasibility	10/02/2026	12	
			3	✓	✓	30,000,000	Feasibility	19/01/2026	22	True
ITA_inf_2	Callisto Mediterranean CO_2 Network	Air Liquide	1	✓		4,000,000	Feasibility	10/02/2026	13	True
			2	✓		12,000,000	Feasibility	21/12/2024	7	True



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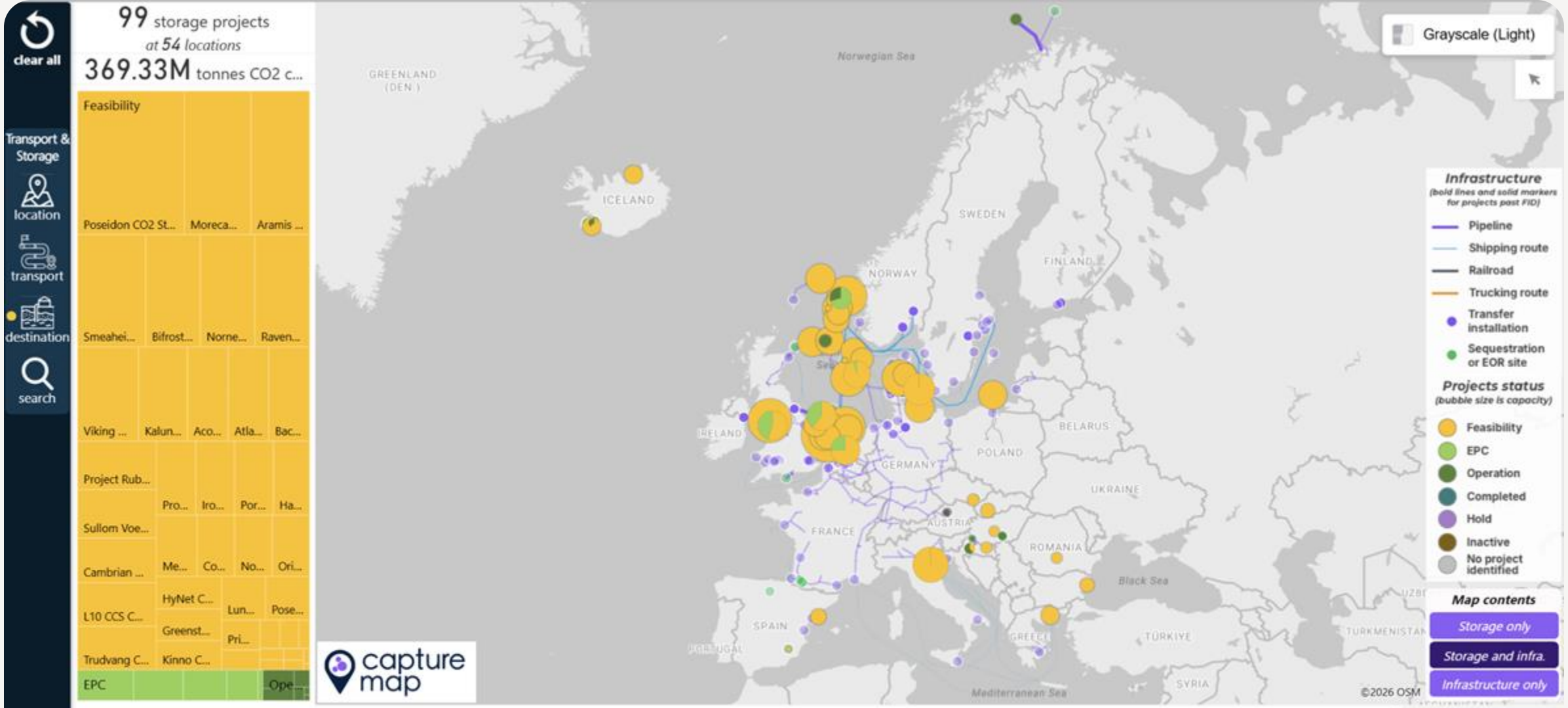
ITA_inf_1	Ravenna CCS Project	Eni Snam	1	✓	✓	25,000	Operation	12/02/2026	57	True
GBR_inf_1	Northern Endurance Partnership CO2...	Northern Endurance Partnership	1	✓	✓	4,000,000	EPC	06/02/2026	247	True
NLD_inf_1	Porthos CO2 Transport Hub and Offs...	Porthos	1	✓	✓	2,500,000	EPC	06/02/2026	111	True
DNK_inf_1	Project Greensand CO2 Storage	Greensand Future	1	✓	✓	400,000	EPC	26/01/2026	99	True
NOR_inf_1	Northern Lights CO2 Transport And S...	Northern Lights Joint Venture	1	✓	✓	1,500,000	Operation	06/01/2026	346	True
			2	✓	✓	3,500,000	EPC	06/01/2026	167	True
GBR_inf_3	HyNet Cluster CO2 Transport and Stor...	Eni	1	✓	✓	4,500,000	EPC	13/11/2025	223	True
ISL_inf_4	Hellisheiði CO2 Mineral Storage Site	Carbfix	4		✓	30,000	Operation	25/06/2025	17	True
			1		✓	12,000	Operation	14/05/2025	19	True
			2		✓	4,000	Operation	02/10/2024	12	



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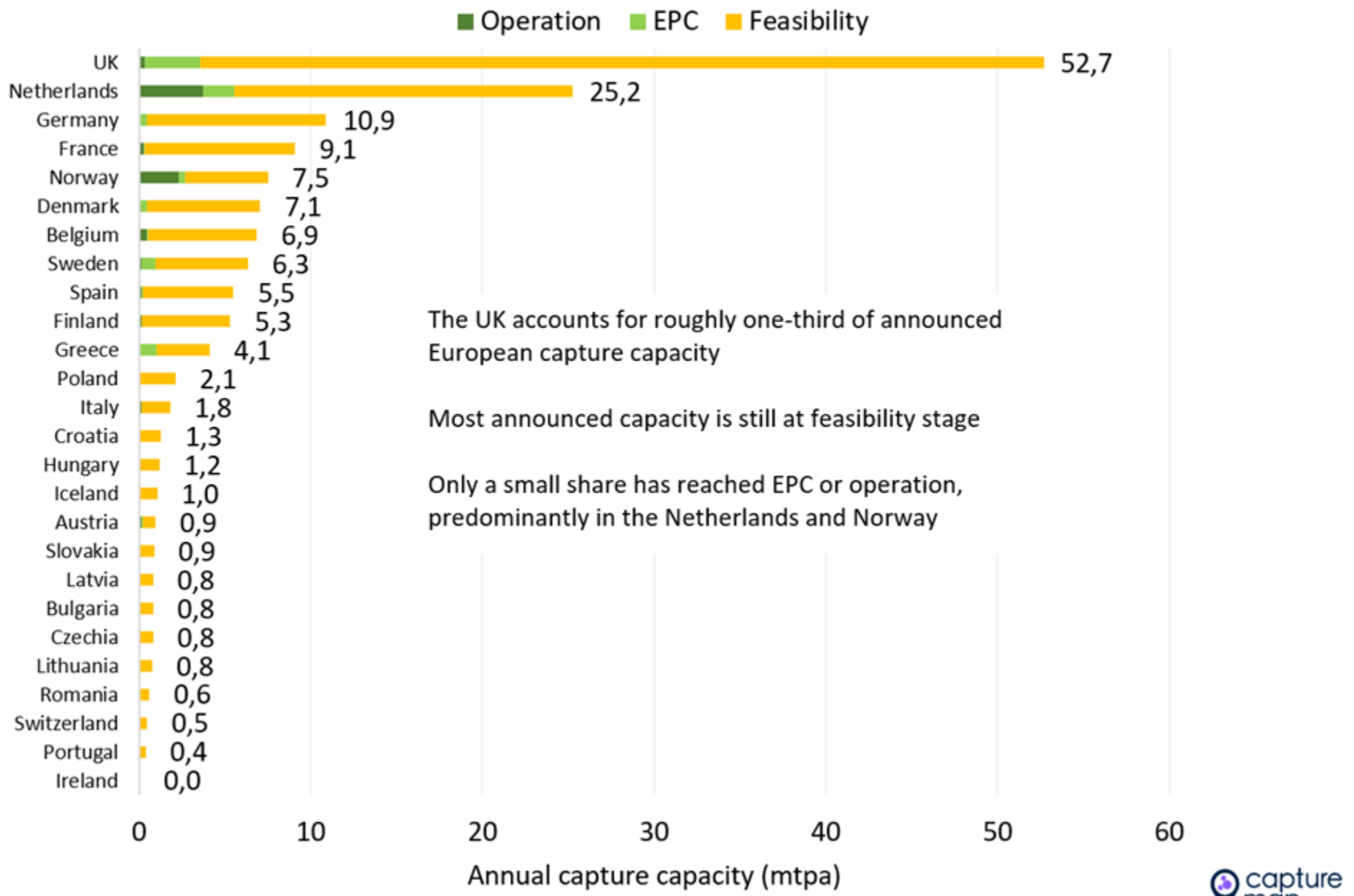
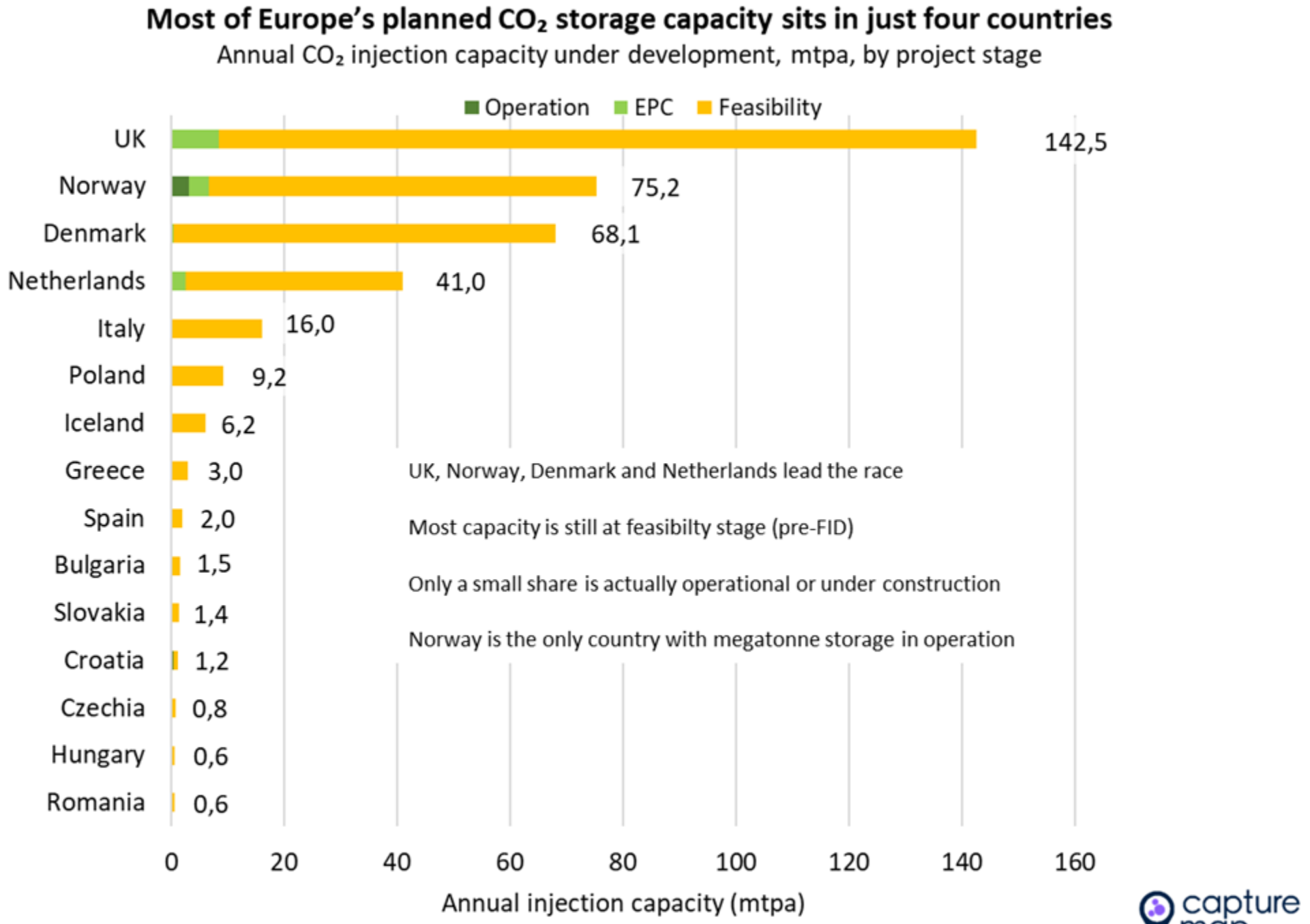
SWE_inf_4	Malmö CO2 Hub	Nordion Energi	1	✓		1,500,000	Feasibility	24/02/2026	15	True
			2	✓			Feasibility	29/10/2025	6	True
ITA_inf_1	Ravenna CCS Project	Eni Snam	1	✓	✓	25,000	Operation	12/02/2026	57	True
			2	✓	✓	4,000,000	Feasibility	12/02/2026	44	True
			3	✓	✓	12,000,000	Feasibility	12/02/2026	17	True
GBR_inf_4	Poseidon CO2 Storage Project, Leman...	Poseidon Joint Venture	1	✓	✓	1,500,000	Feasibility	10/02/2026	39	True
			2	✓	✓	8,500,000	Feasibility	10/02/2026	12	
			3	✓	✓	30,000,000	Feasibility	19/01/2026	22	True
ITA_inf_2	Callisto Mediterranean CO_2 Network	Air Liquide	1	✓		4,000,000	Feasibility	10/02/2026	13	True
			2	✓		12,000,000	Feasibility	21/12/2024	7	True

Europe's capture funnel is led by the UK—and still largely early-stage

Annual capture capacity, mtpa, by project stage

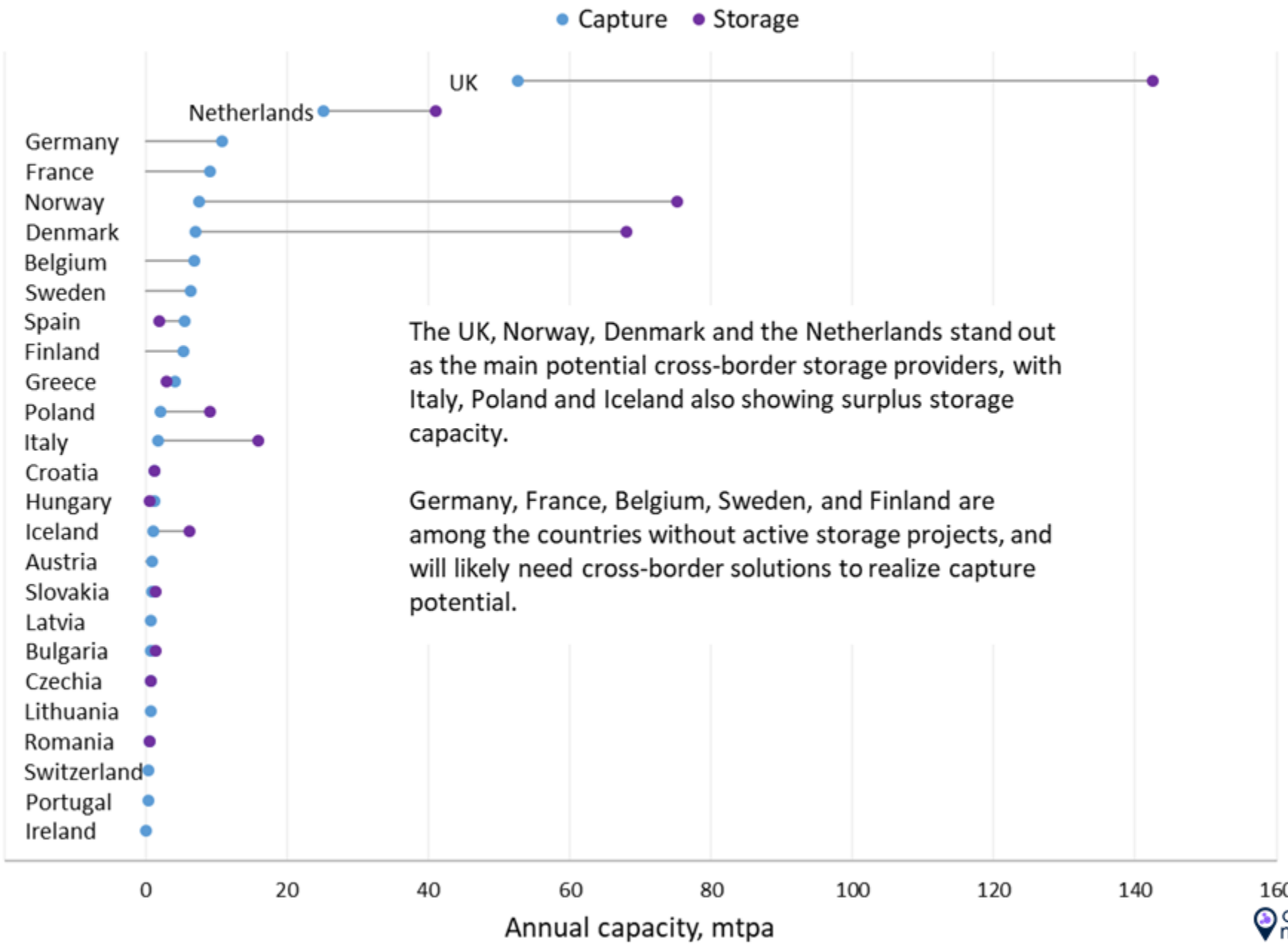


capture map


Most of Europe's planned CO_2 storage capacity sits in just four countries
Annual CO_2 injection capacity under development, mtpa, by project stage
Operation
EPC
Feasibility
UK
Norway
Denmark
Netherlands
Italy
Poland
Iceland
Greece
Spain
Bulgaria
Slovakia
Croatia
Czechia
Hungary
Romania
142,5
75,2
68,1
41,0
16,0
9,2
6,2
3,0
2,0
1,5
1,4
1,2
0,8
0,6
0,6
UK, Norway, Denmark and Netherlands lead the race
Most capacity is still at feasibilty stage (pre-FID)
Only a small share is actually operational or under construction
Norway is the only country with megatonne storage in operation
0
20
40
60
80
100
120
140
160
Annual injection capacity (mtpa)
capture map

Capture is spread across Europe; storage is concentrated in a few countries

Annual CO_2 capture and storage capacity, mtpa



capture map

Next step?

Book a demo meeting through our website
or reach out to us below

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Valentin Vandenmolden

Co-founder, technical lead

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capture map

The role of the Net Zero Industry Act

Codie Rossi
Europe Policy Manager
Carbon Capture

Project Article 23 Watch

Joint initiative of CATF, Carbon Balance Initiative, and Bellona

ANALYSE ARTICLE 23 IMPLEMENTATION

Assess how the EU and Member States **implement Article 23**, including Delegated Acts and national legislation.

COMMUNICATE IMPORTANCE

Highlight Article 23's role in reaching net zero by 2050 to policymakers, civil society, and industry stakeholders.

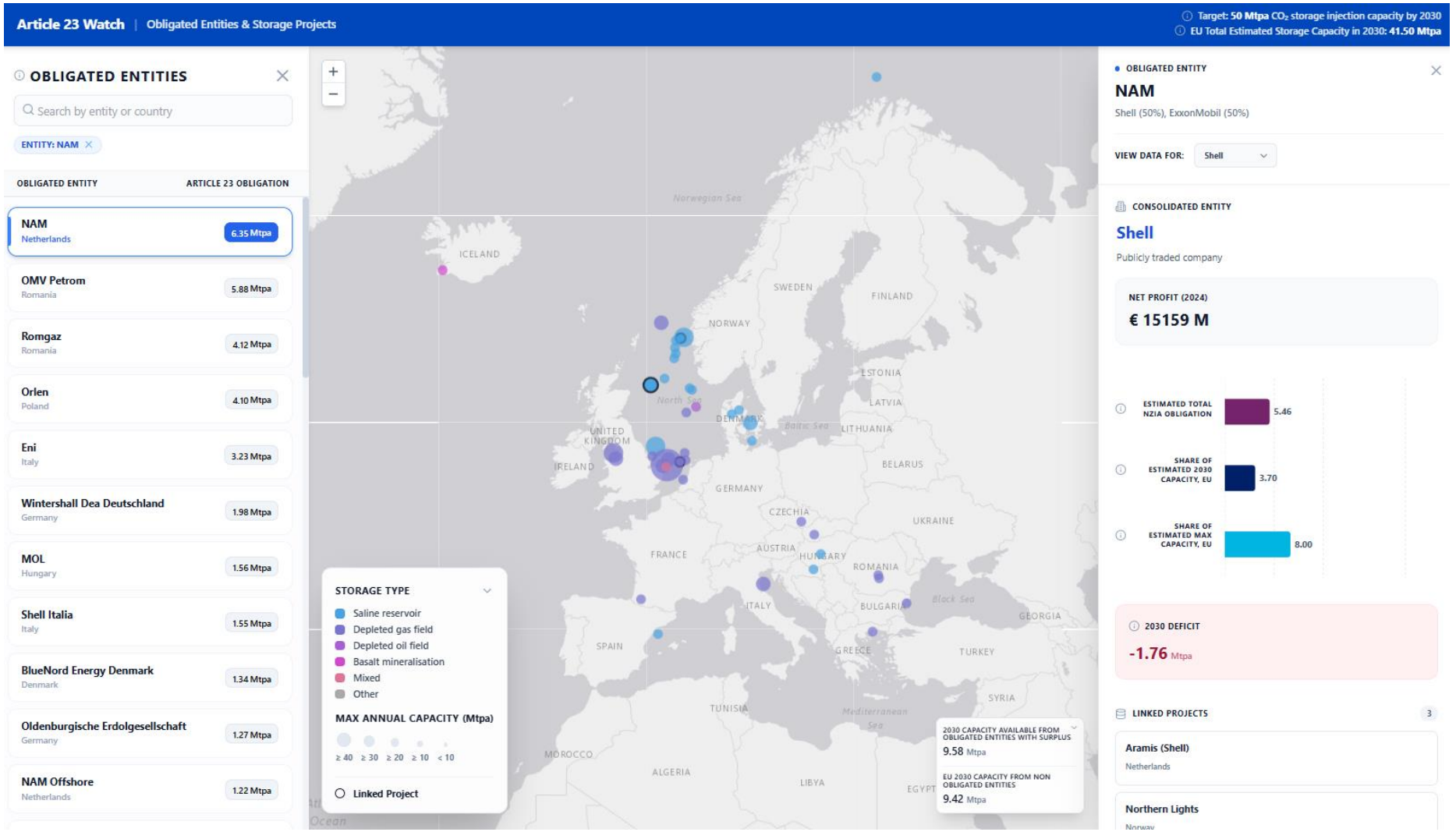
EVALUATE SECTOR COMPLIANCE

Identify challenges and best practices in oil and gas sector compliance, focusing on permitting, planning, and governance.

PREPARE FOR 2030 POLICY PACKAGES

Prepare a **policy-ready package by 2030**, drawing lessons from the early implementation to inform long-term strategies post-2030.

Tool: Tracking CO_2 storage projects and progress of NZIA obligated entities



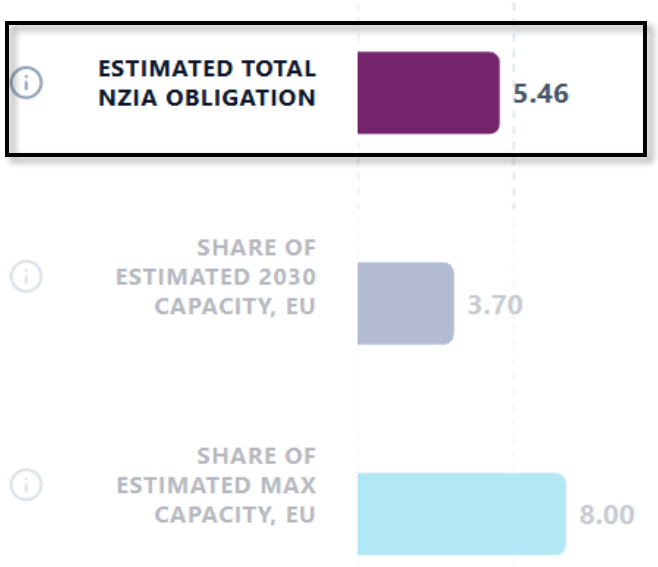
Article 23 Watch Tracker

A23 Estimated Total NZIA Obligation

Example of Consolidated Entity - Shell

- Storage **obligation** for a **consolidated entity**, including **subsidiaries and estimated share from joint ventures**

Consolidated Entity
Shell

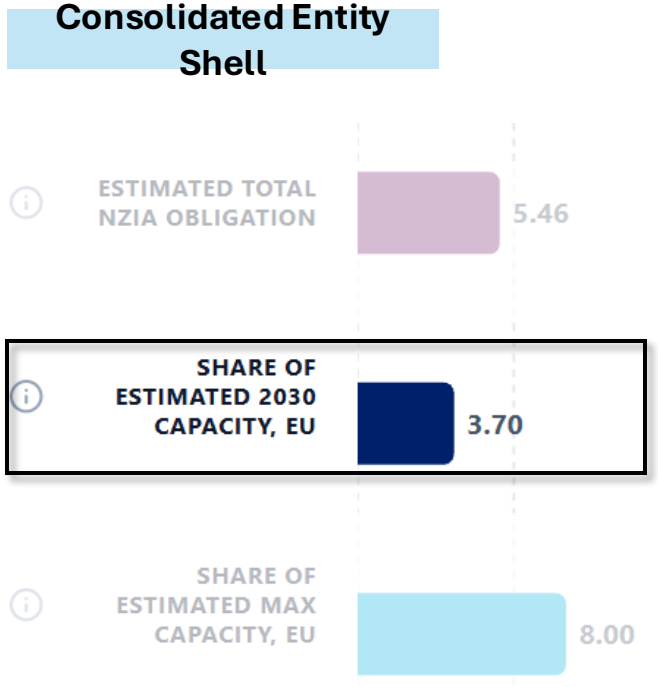


Obligated Entity	(Mtpa)	Shell Shares (%)	Shell Obligation (Mtpa)
NAM	**6.35**	50%	3.175
Shell Italia	**1.55**	100%	1.55
Oldenburgische Erdolgesellschaft	**1.27**	33%	0.419
BEB	**0.63**	50%	0.315

A23 Share of Estimated 2030 Capacity, EU

Example of Consolidated Entity - Shell

- Estimated injection **capacity achievable by 2030** from storage projects belonging to the consolidated entity, **based on announced projects and ownership shares**. Project shares belonging to non-obligated entities are distributed among obligated entities.

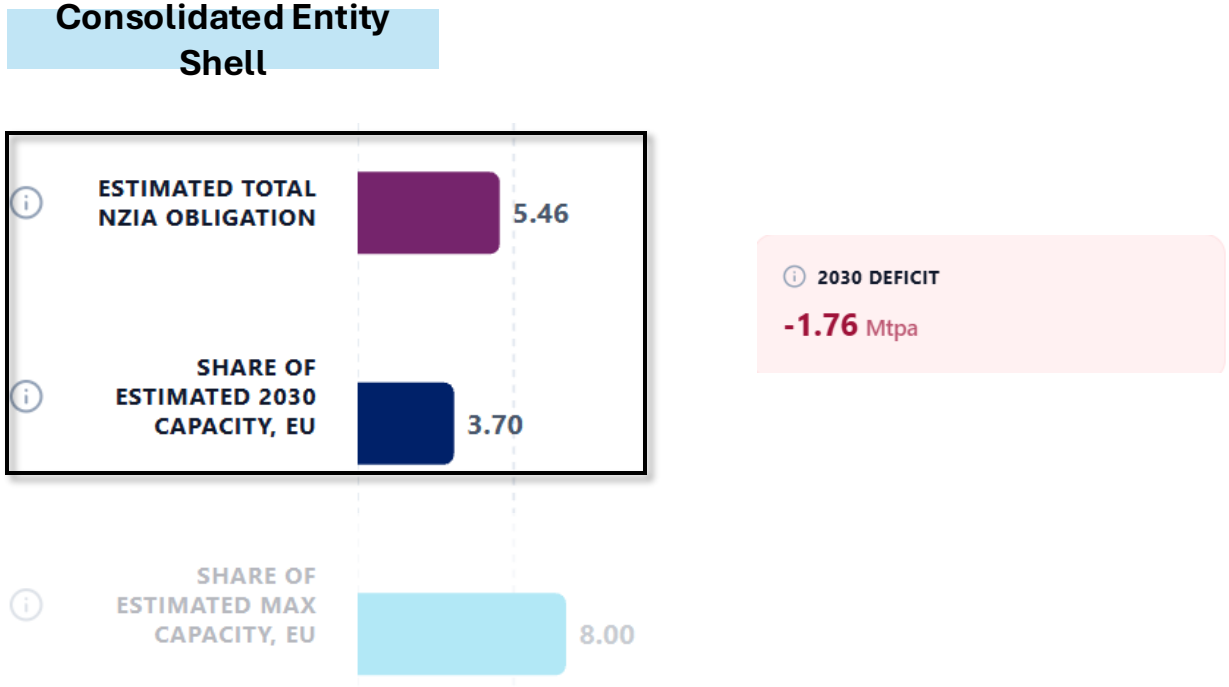


Project	Ownership	Max Capacity (Mtpa)	Shell Shares (%)
Aramis	Shell, EBN	3.70	100%

2030 Surplus or Deficit

Example of Consolidated Entity - Shell

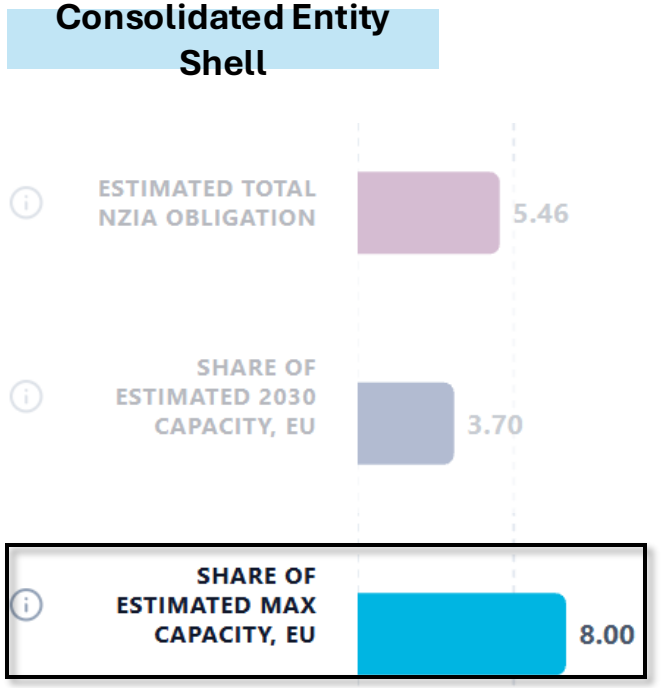
- Difference between a consolidated entity's NZIA storage obligation and its projected CO_2 storage injection capacity in 2030.



A23 Share of Estimated Max Capacity, EU

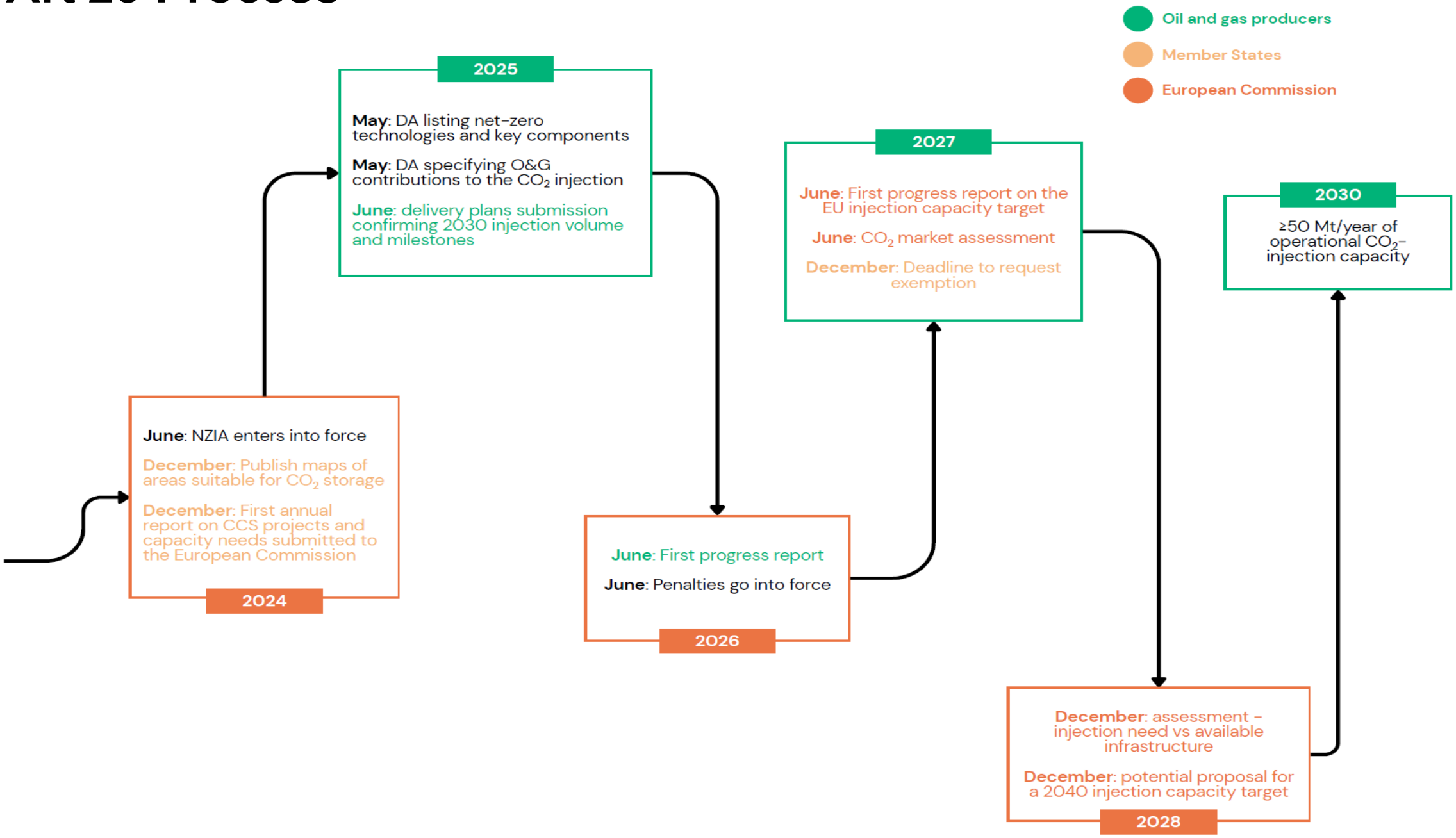
Example of Consolidated Entity - Shell

- The estimated **maximum annual CO_2 storage injection** capacity associated **with projects belonging to the consolidated entity, based on their ownership shares in announced projects**. Project shares belonging to non-obligated entities are distributed among obligated entities.

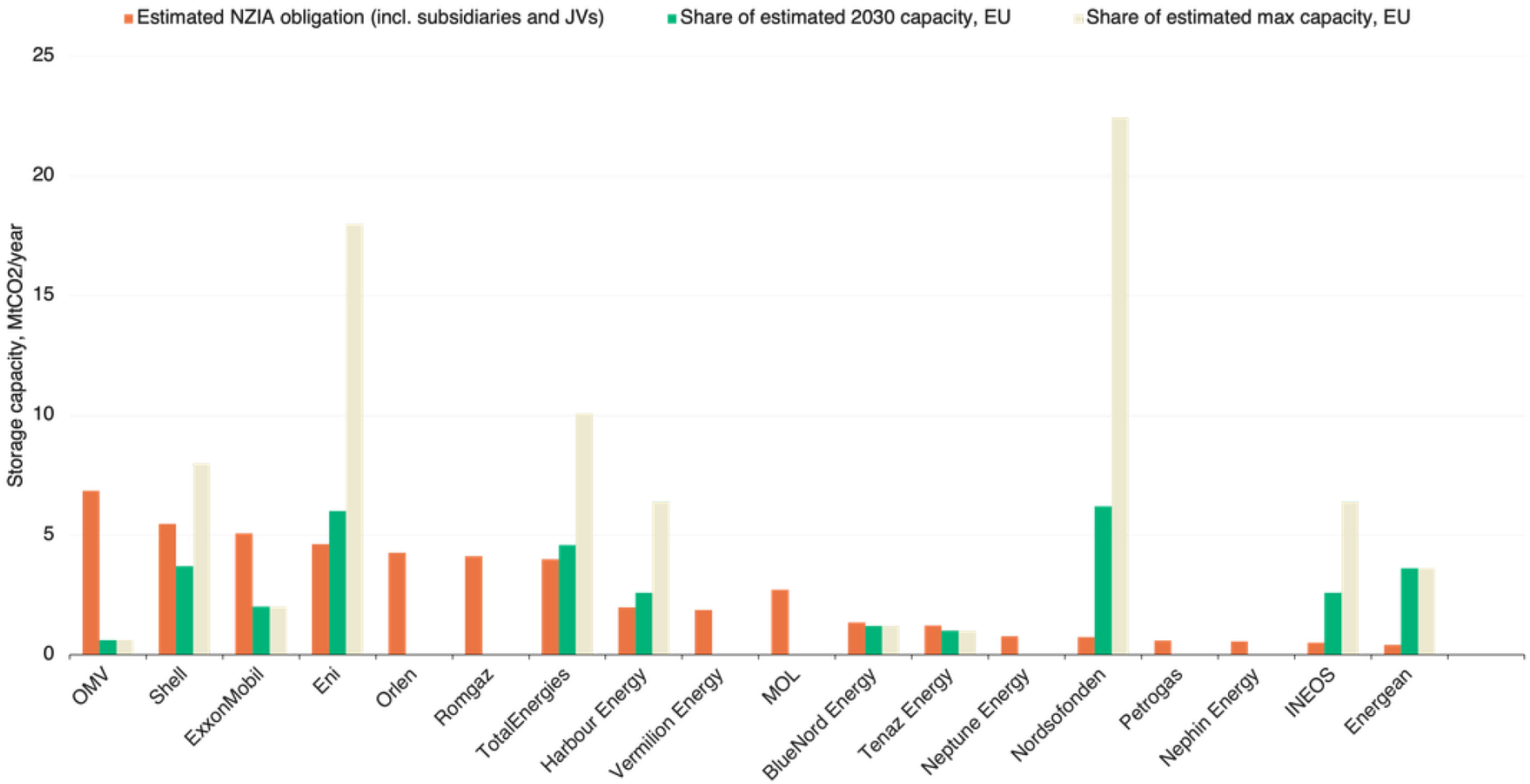


Project	Ownership	Max Capacity (Mtpa)	Shell Shares (%)
Aramis	Shell, EBN	8.00	100%

Art 23 Process



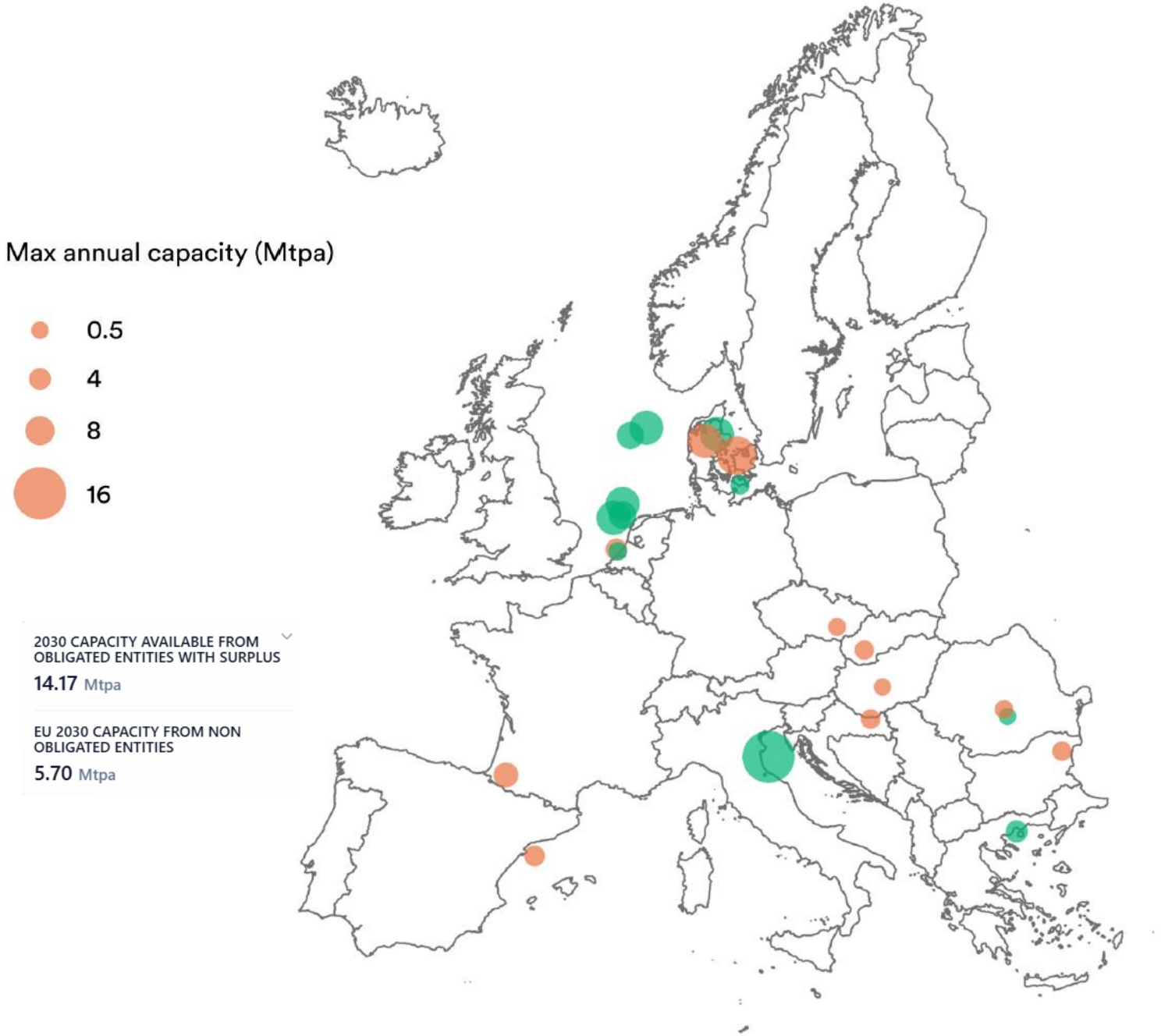
The estimated obligation for each *consolidated* entity, compared with its share of planned CO storage capacity in the EU



CO storage sites currently planned in the EU, showing:

→ sites with partial or whole ownership by obligated entities (green)

→ and sites developed by other entities (orange)

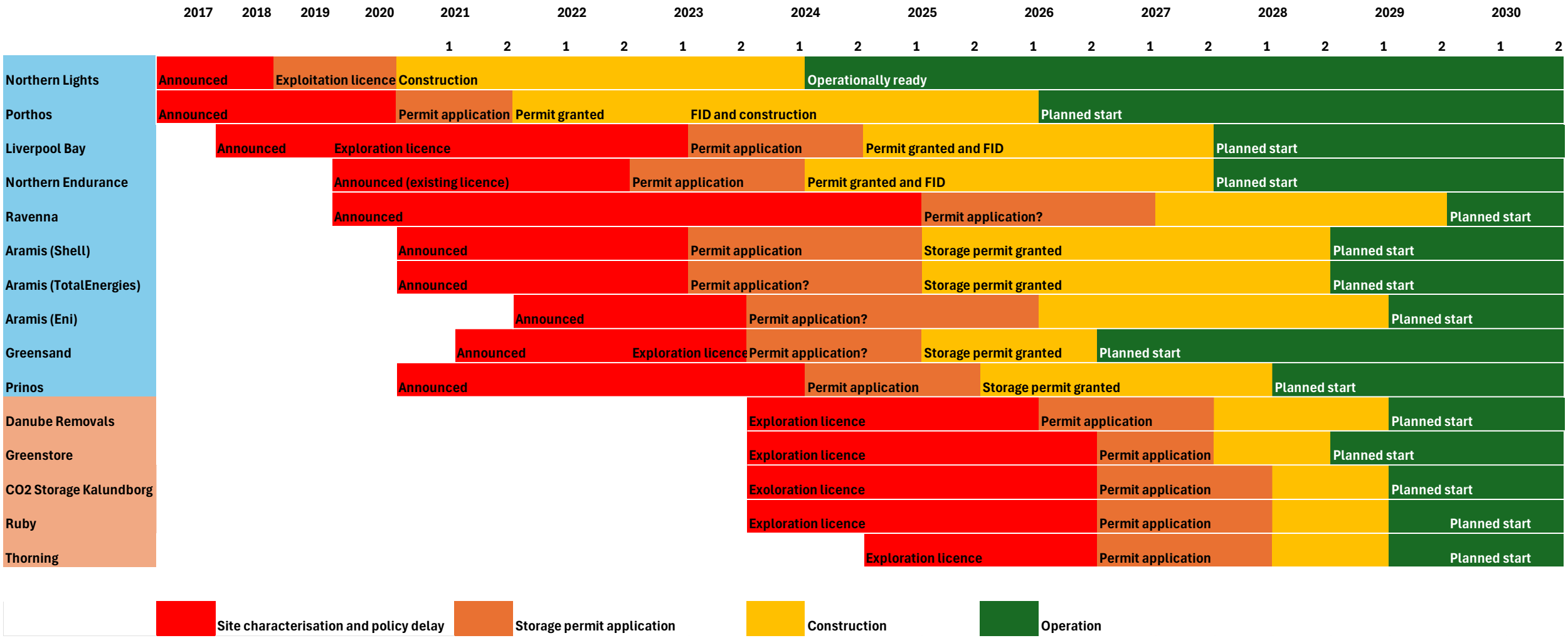


How fast can storage projects be developed?

- Obligated entities have ~6.5 years to be compliant from entry into force of the regulation.
- Nearly all of the current project pipeline (~42 Mtpa) was already under development in 2024, with most developers targeting the policy-significant date of 2030 (at the latest).
- Apparent development times are distorted by early projects which were conceived before favourable national policies were developed. Projects like Porthos, Northern Lights, Ravenna, and the UK projects were proposed as a means to push for supportive policy.
- More recent projects still appear to postpone FID as developers wait for a critical mass of funded capture projects or further state support (Aramis, Prinos, Bifrost etc.)
- **These factors should not determine the feasible development timeline for Article 23 compliance**
  - The obligation would be meaningless if it merely reflected current policy-dependent lead times.
  - The obligation should ensure developers accelerate project development, e.g. by progressing with fewer committed initially users.

Comparison with current project timelines

- The Commission's recent guidance indicates projects with a storage permit and at least one contracted capture project can be Article 23 compliance.
- The NZIA requires storage permits to be processed in 18 months. Some current projects have achieved this (Prinos, Greensand), while others have taken longer.
- Most permitted projects have completed pre-permit application characterisation work in ~3 years, with similar timelines targeted for projects under development.
- Construction timelines of 2-3 years are targeted by most projects. Porthos and Greensand appear to be on track for this. Onshore projects are likely to have shorter timelines, while large offshore hubs and pipelines may take longer. Northern Lights construction was around 3.5 years, but includes relatively complex new infrastructure.
- **Conclusion: 6.5 years is a stretch target for projects with favourable conditions and 18-month permitting enforced. However, attaining a storage permit in this time (without construction phase) is eminently feasible. Most of the current pipeline of >40 Mtpa had begun characterisation by 2024.**



- Onshore projects target shorter construction periods
- Permit processing for Aramis storage appears relatively lengthy

Value Chain Reality Check

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Thank you for your attention