

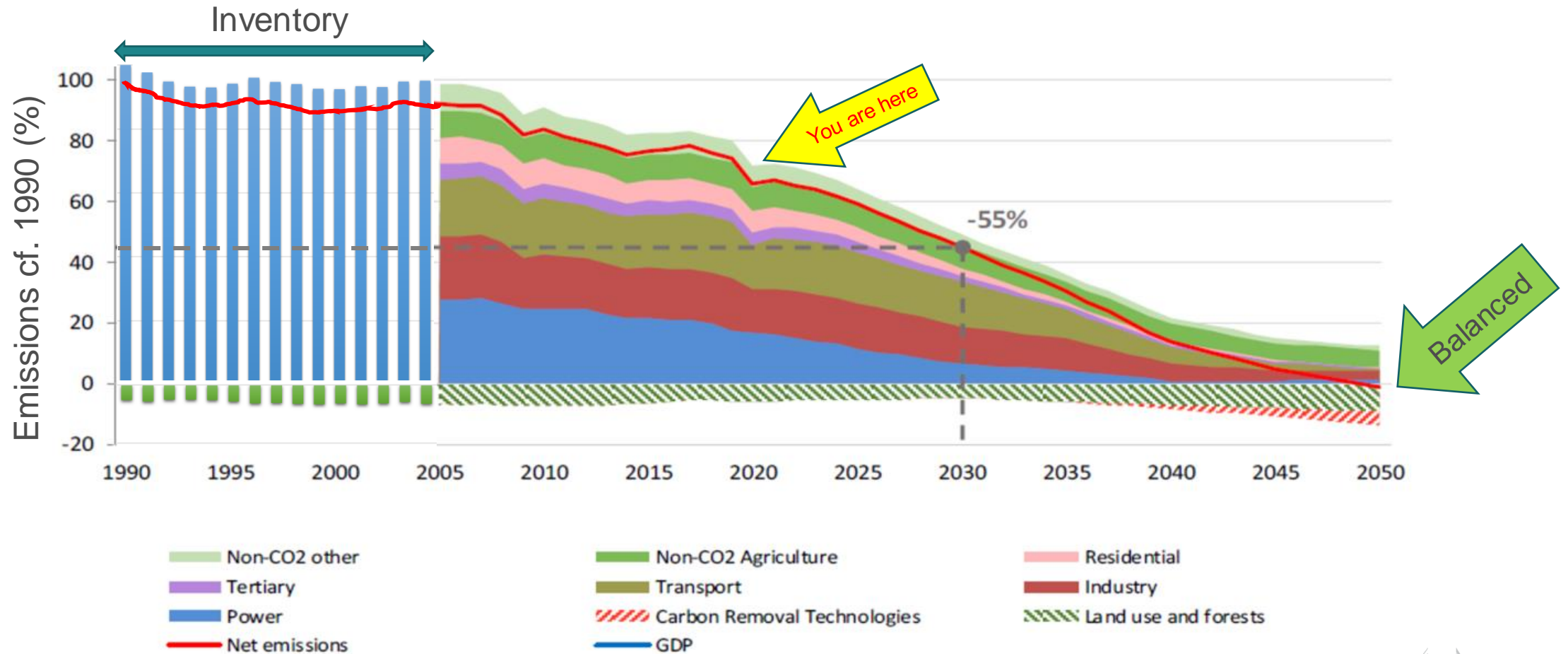
EU support for development of CCUS

Danish CCS Alliance

1 March 2022

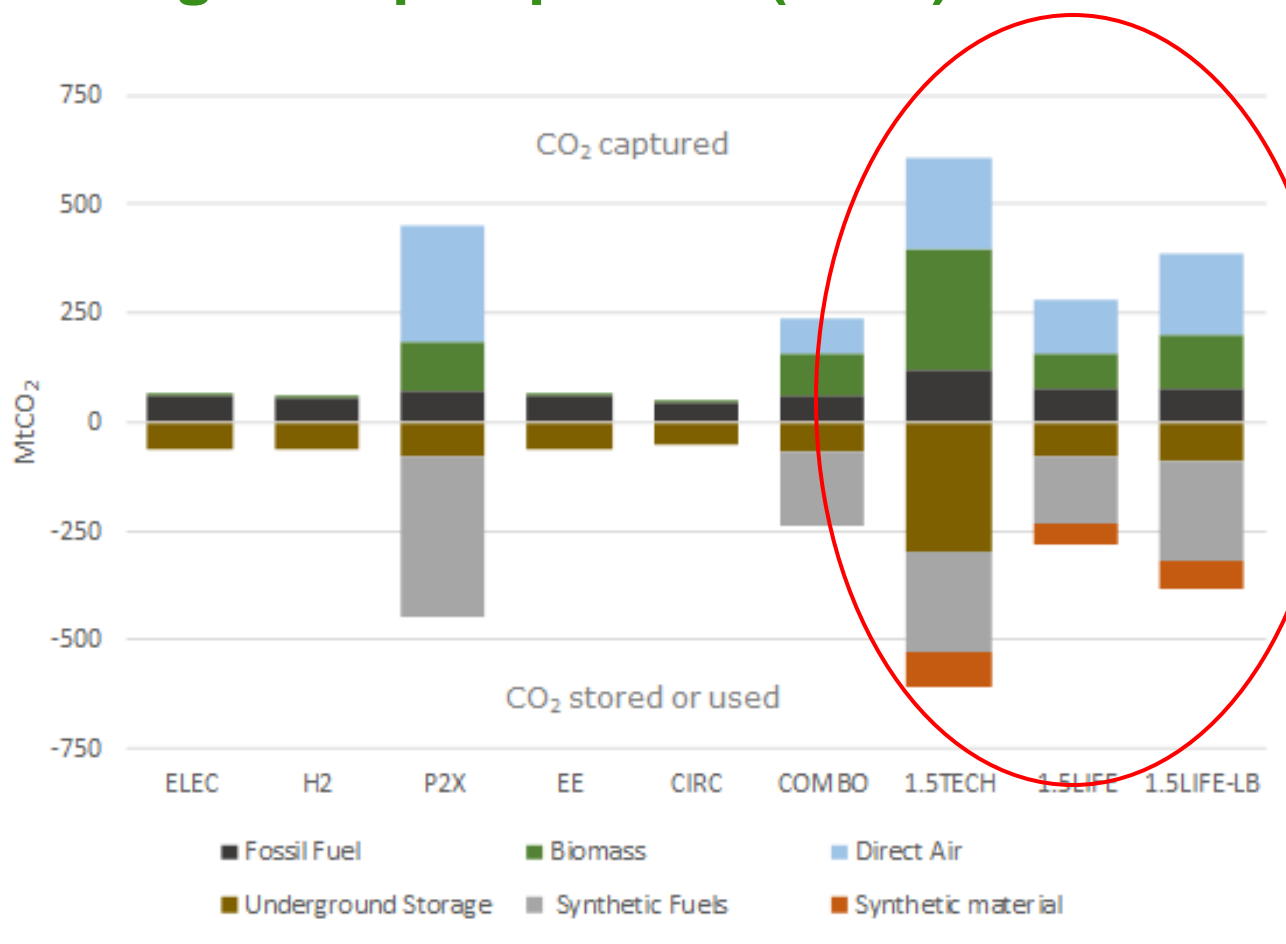


Pathway to climate neutrality



Increased ambition (2030): *Zero or very low carbon technologies and business concepts need to be developed and tested at scale in this decade*

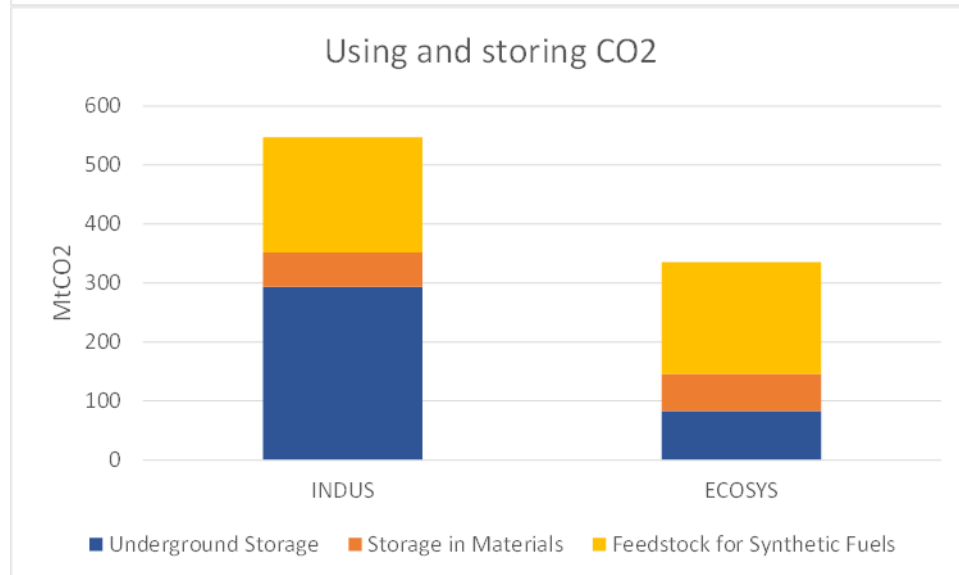
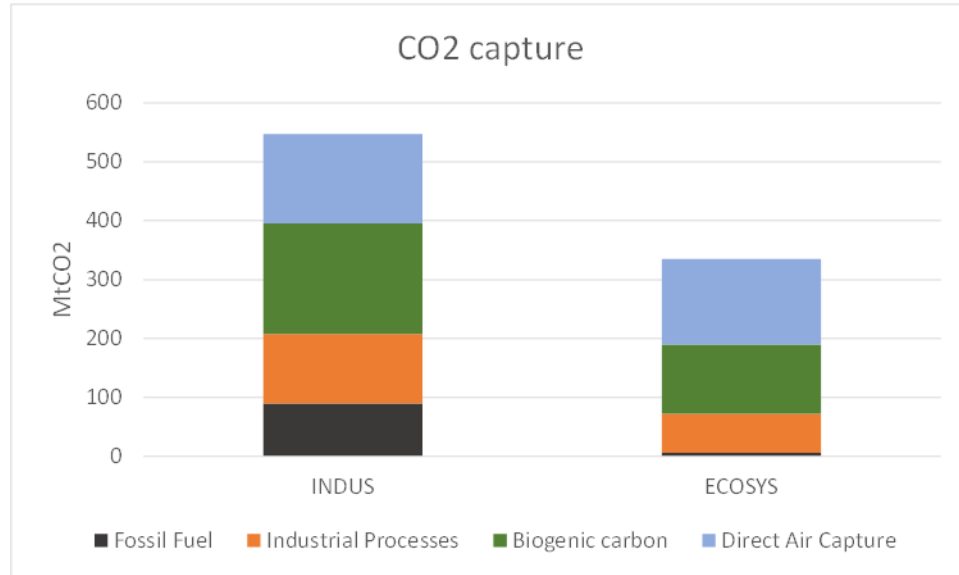
Long-term perspective (2050): *Climate neutrality*



- CCS will be required to reduce emissions of any remaining fossil fuels use (power sector, industry)
- Necessary for certain hard to decarbonize industrial processes
- CCS combined with biomass (BECCS) or direct air capture (DACCS): required to generate net carbon removals if we are to achieve climate neutrality
- Storage in materials (e.g. in plastics) is also seen as an option
- CCU fuels in some scenarios

Source: Scenario Analysis Results for CCUS, 2018 Vision for a Clean Planet by 2050

Geological CO₂ storage



By 2050, EU would need to **industrially capture 300 to 550 Mt CO₂/y**

CO₂ will be used **as a feedstock** to produce chemicals and fuels

Annual **geological storage** of CO₂: up to **300 MtCO₂/y***

- ✓ 1st IF projects: **3,5 Mt/y CO₂ for geological storage**, but many more projects in preparation
- ✓ **by 2030**, 30 projects in preparation can deliver about **50Mt/y CO₂**
- ✓ Reaching climate neutrality in Europe will need at least **6 times more CO₂ to be stored per year by 2050**



* Depending on availability of natural carbon sinks

EU Policy for CCUS

- **CCS Directive:** ensures CCS is done safely for the environment and human health
- Current **EU ETS:** allowances do not need to be surrendered when CO₂ is geologically stored (CCS) but not for CCU (unless for production of PCC)
 - Updated EU ETS will strengthen the carbon signal
- **CCU fuels** are encouraged through the Renewable Energy Directive (RED2) as of 2021
 - But it will depend on available support mechanisms in the different MS
- EU certification systems based on the GHG performance for low-carbon basic materials and for carbon removals will be developed, so called '**carbon removal certificates**': it may create incentives for CCU, DACCS, BECCS
- Dedicated funding: **Horizon Europe, Innovation Fund, Connecting Europe Facility**
- **Sustainable taxonomy:** CCS in, CCU maybe in the future

Sustainable carbon cycles communication: CCUS

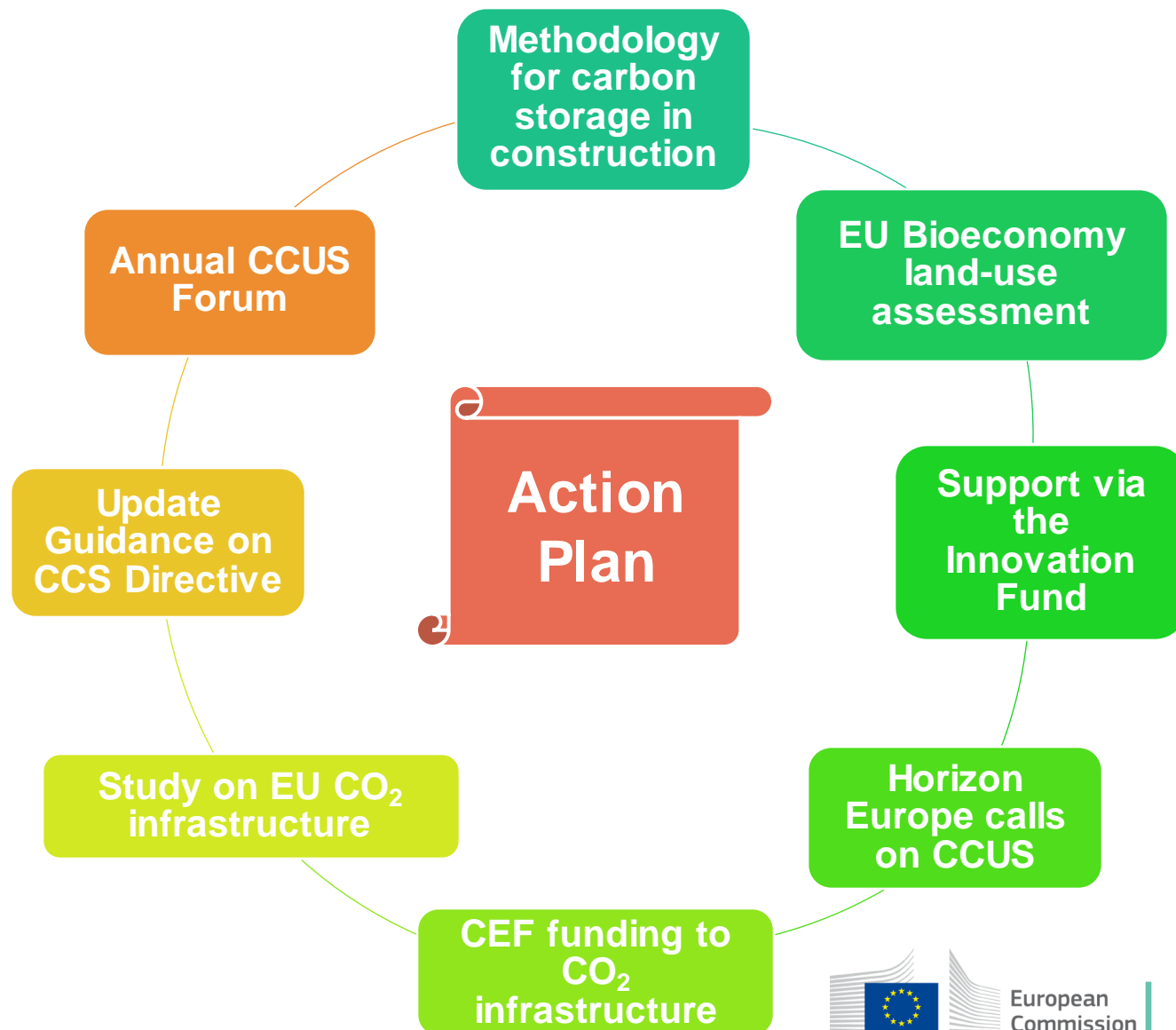
Challenges

By 2028:

- All CO₂ captured, transported, used and stored should be reported and accounted

By 2030:

- 20% of non-fossil carbon used in chemicals and plastics
- 5Mt of industrial net carbon removals



Innovation Fund

2021-2030: €25 billion at carbon price €50/tCO₂

Production and use of
Renewable energy

*including manufacturing plants for
components*

Carbon Capture Use and
Storage

Scaling up clean tech

Energy-intensive
industries

including substitute products

Energy storage

*including manufacturing plants for
components*

Innovation Fund (IF) grants of € 1145 million for seven first-of-a-kind projects

Kairos-at-C - Port of Antwerp (BE)

- Carbon capture from hydrogen, ammonia and ethylene oxide production and storage in North Sea, innovative shipping

BECCS Stockholm (SE)

- Bio-energy carbon capture at a combined heat and power plant and storage in North Sea – negative emissions

K6 (FR)

- CCUS at cement plant with storage in North Sea and carbon use for concrete production

SHARC (FI)

- Green hydrogen from water electrolysis and blue hydrogen with CCS, storage in North Sea

Hybrit (SE)

- Hydrogen-based direct reduction for steelmaking, including electrolyser

ECOPLANTA (ES)

- Bio-based methanol from municipal waste

TANGO (IT)

- Bifacial heterojunction photovoltaic cells production at GW scale

Projects of common interest

5th list published on 19 November 2021

CO2 TransPorts

- Infrastructure to facilitate large-scale capture, transport and storage of CO2 from Rotterdam, Antwerp and the North Sea Port

Northern lights

- Commercial CO2 cross-border transport connection project between several European capture initiatives (United Kingdom, Ireland, Belgium, the Netherlands, France, Sweden) and transport the captured CO2 by ship to a storage site on the Norwegian continental shelf

Athos

- Infrastructure to transport CO2 from industrial areas in the Netherlands and is open to receiving additional CO2 from others, such as Ireland and Germany. Developing an open-access cross-border interoperable high-volume transportation structure.

Aramis

- Cross-border CO2 transport and storage project (intake from emitters in the hinterland of Rotterdam harbour area and storage to location on the Dutch continental shelf)

Dartagnan

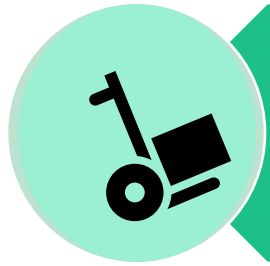
- CO2 export Multimodal HUB from Dunkirk and its hinterland (emitters from the industrial cluster in the area of Dunkirk, France with storage where available in the North Sea country territories)

Poland – EU CCS Interconnector

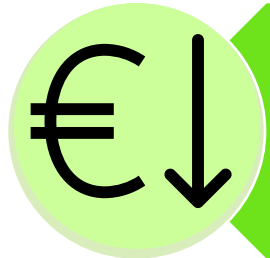
- Emitters from the industrial cluster in the area around Gdansk, Poland with storage where available in the North Sea country territories

A number of projects already received [funding from CEF](#)

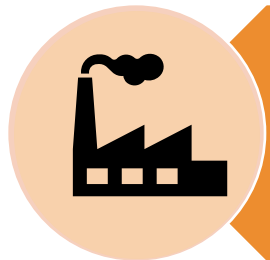
Open-access cross-border CO₂ infrastructure



Connect CO₂ sources with sinks, including storage sites and production sites using CO₂ as a feedstock

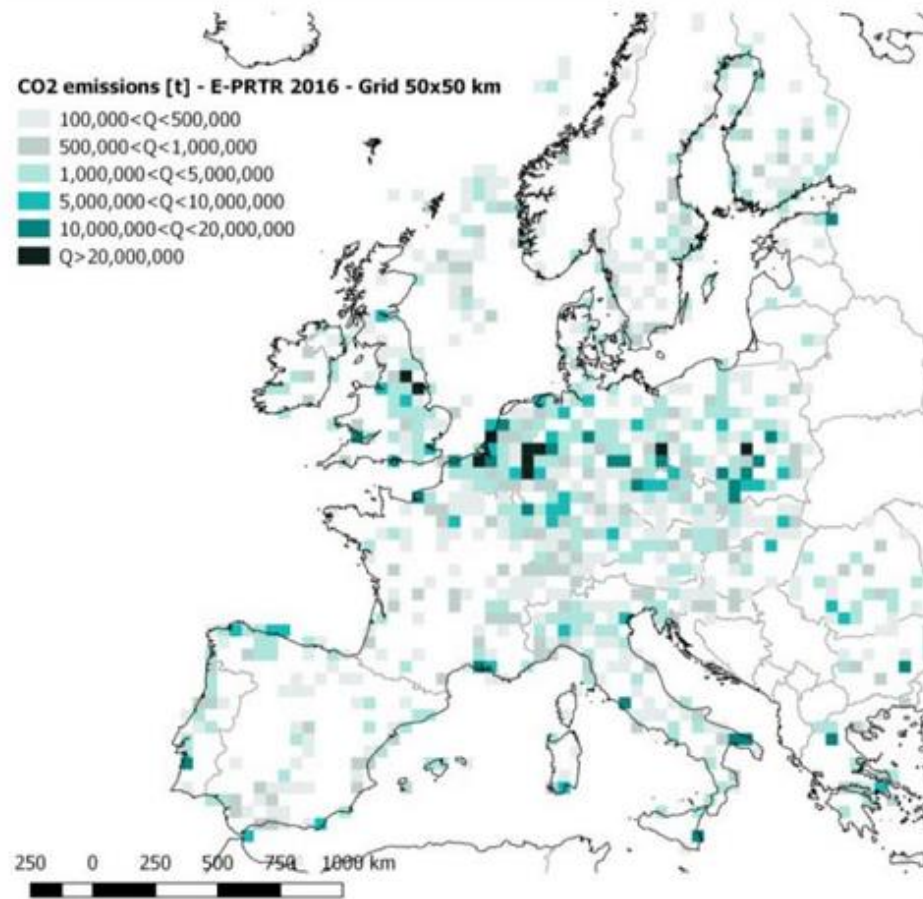


Drive down costs through competition in an open EU market

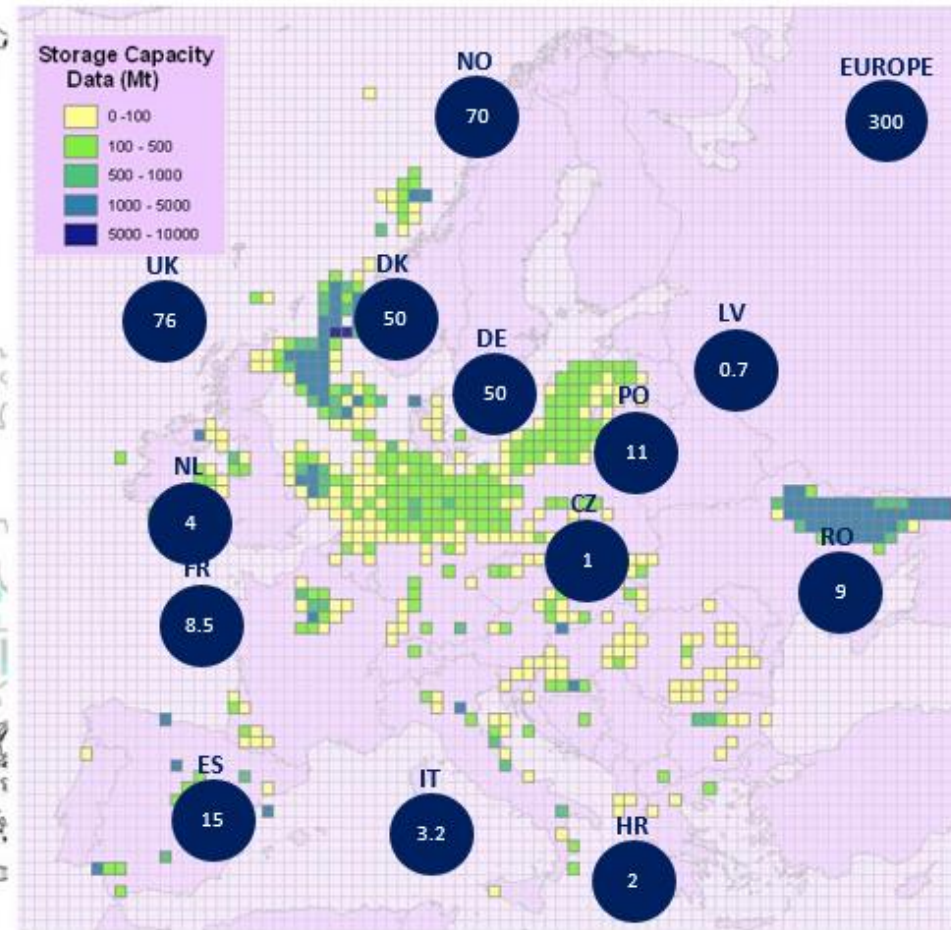


CCUS hubs to leverage economies of scale across the EU

- Europe has 300 GtCO₂ theoretical storage potential. However, the storage potential is not uniformly distributed and storage sites have long lead times.



Map 1: Emission Clusters¹



Map 2: Approximate Storage Capacity²
blue circles: CO₂ storage resource in GtCO₂

Links

- Call for Evidence on Carbon Removal Certification [Certification of carbon removals – EU rules \(europa.eu\)](#)
- Conference on Sustainable Carbon Cycles, 31 January 2021 [Sustainable Carbon Cycles Conference - About \(b2match.io\)](#)
- Our [webpage](#) and our [press release](#) on the Sustainable Carbon Cycles communication
- Our webpage on [Carbon Farming \(europa.eu\)](#)
- Commission list of potential eco-schemes <https://europa.eu/!yb74nC>
- Study on Carbon Farming: <https://data.europa.eu/doi/10.2834/594818>
- Study on Wood in construction: <https://dx.doi.org/10.2834/421958>
- Legislative proposal on a new Regulation for Land use, forestry, and agriculture [Delivering the European Green Deal | Climate Action \(europa.eu\)](#)

Where to find more information on the Innovation Fund?



All (past) call documents available on the Funding and Tenders Portal including:

- ✓ Guidance and calculation tools on GHG emissions and relevant costs
- ✓ Frequently asked questions

<https://europa.eu/!QB67by>



Further info, planning of new calls, recorded webinars and videos available on the IF Website:

<https://europa.eu/!rx34Dt>



Innovation Fund - YouTube

<https://bit.ly/2WxK8w7>

