CCS Knowledge Sharing Workshop by the Innovation Fund

Realising opportunities along the value chain

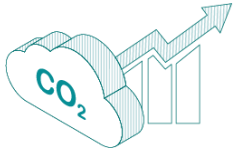
Innovation Fund

Deploying innovative net-zero technologies for climate neutrality

Funded by the EU Emissions Trading System (EU ETS)

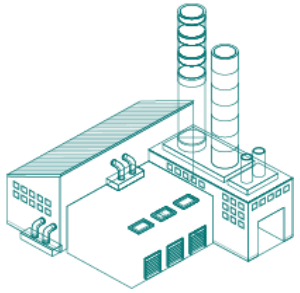
Funding through Grants and Actions

€40 billion* to invest from 2020 to 2030 in EU's climate neutral future

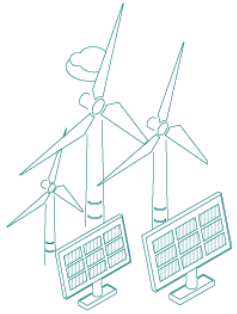


Avoid emissions and boost competitiveness

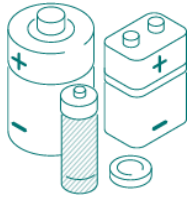
Supporting manufacturing, production and use in:



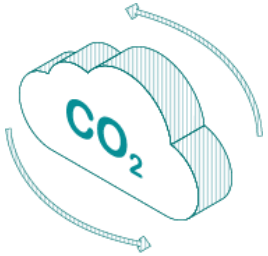
Energy intensive industries



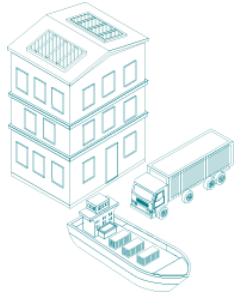
Renewables



Energy storage



Carbon capture, use and storage



Net-zero mobility and buildings

* Based on a carbon price of 75 € /tonne

European Commission

Evolution of the Innovation Fund

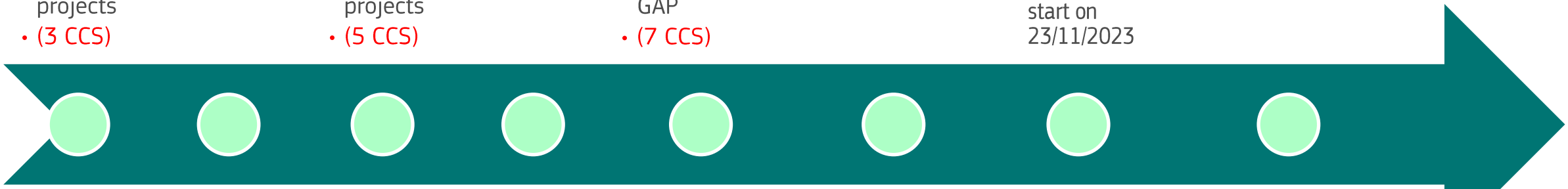
70 proposals received for CCS projects from LSC-2020 to LSC-2022

LSC 2020
- EUR 1.1 billion
- 7 granted projects
- (3 CCS)

LSC 2021
- EUR 1.8 billion
- 16 granted projects
- (5 CCS)

LSC 2022
- EUR 3.6 billion
- 41 invited to GAP
- (7 CCS)

IF 2023 Call
- EUR 4 billion
- Application start on 23/11/2023



SSC 2020
- EUR 109 million
- 30 granted projects
- (1 CCS)

SSC 2021
- EUR 60 million
- 16 granted projects
- (0 CCS)

SSC 2022
- EUR 100 million
- 72 applications submitted

IF 2023 Auction
- EUR 800 million to renewable hydrogen producers
- Application starts on 23/11/2023

Over EUR 3 bn already provided for low-carbon innovation projects and EUR 3.5 bn under GAP (2.6 bn in total for CCS projects)

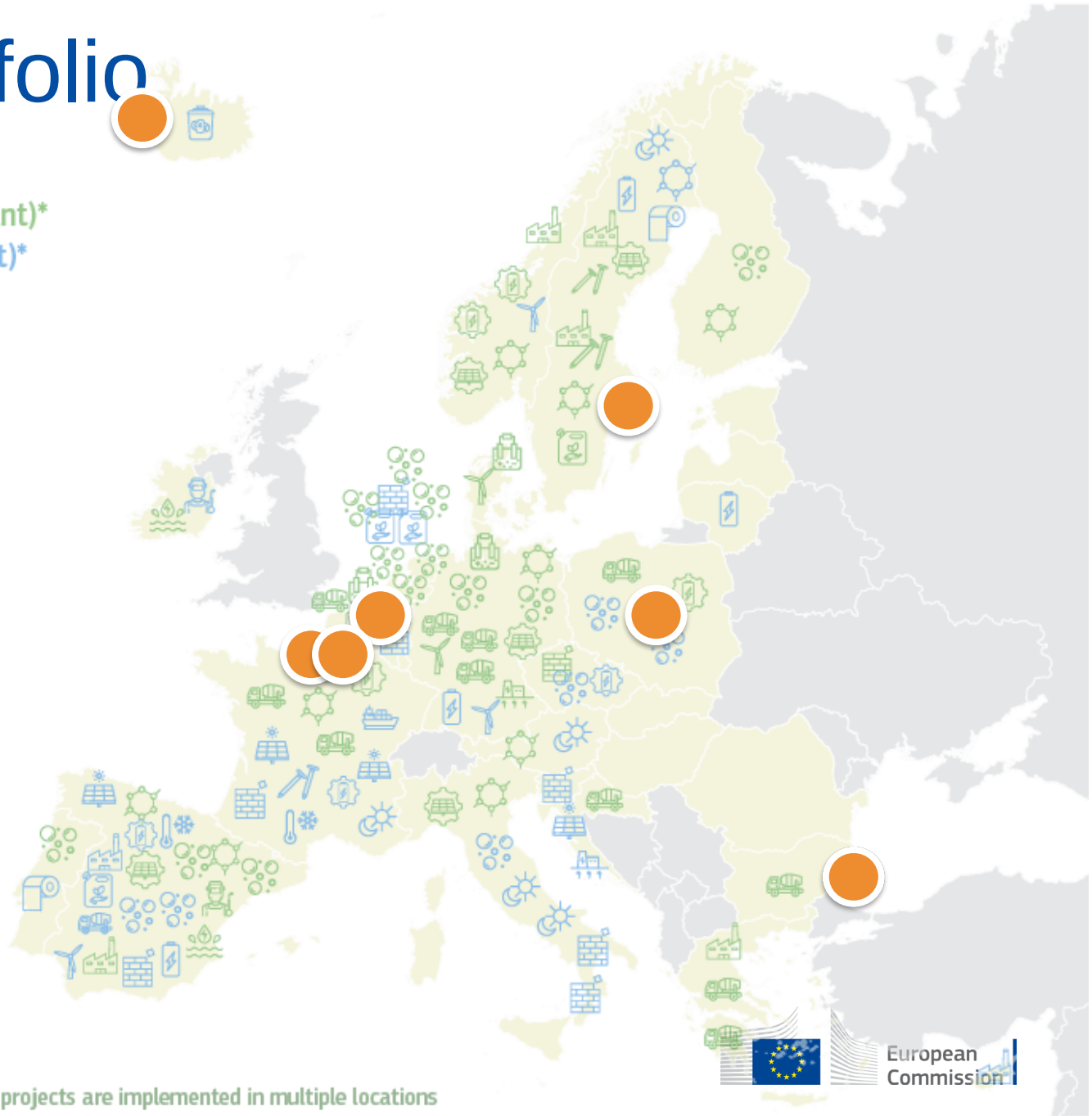
European Commission

Innovation Fund Portfolio

Green: Large-scale projects (62 awarded or pre-selected for grant)*
Blue: Small-scale projects (46 awarded or pre-selected for grant)*

- Biofuels and biorefineries
- Cement and lime
- Chemicals
- CO_2 transport and storage
- Geothermal energy
- Manufacturing of components for energy storage
- Manufacturing of components for renewable energy
- Non-ferrous metals
- Other energy intensive industries
- Other energy storage
- Intra-day electricity storage
- Iron and steel
- Manufacturing of components for energy intensive industries
- Solar energy
- Use of renewable energy outside Annex 1
- Wind energy

4.6 Mt/a CO_2 with EU support on offer by 2030



*The number of symbols is higher than the number of projects, as some projects are implemented in multiple locations

European Commission

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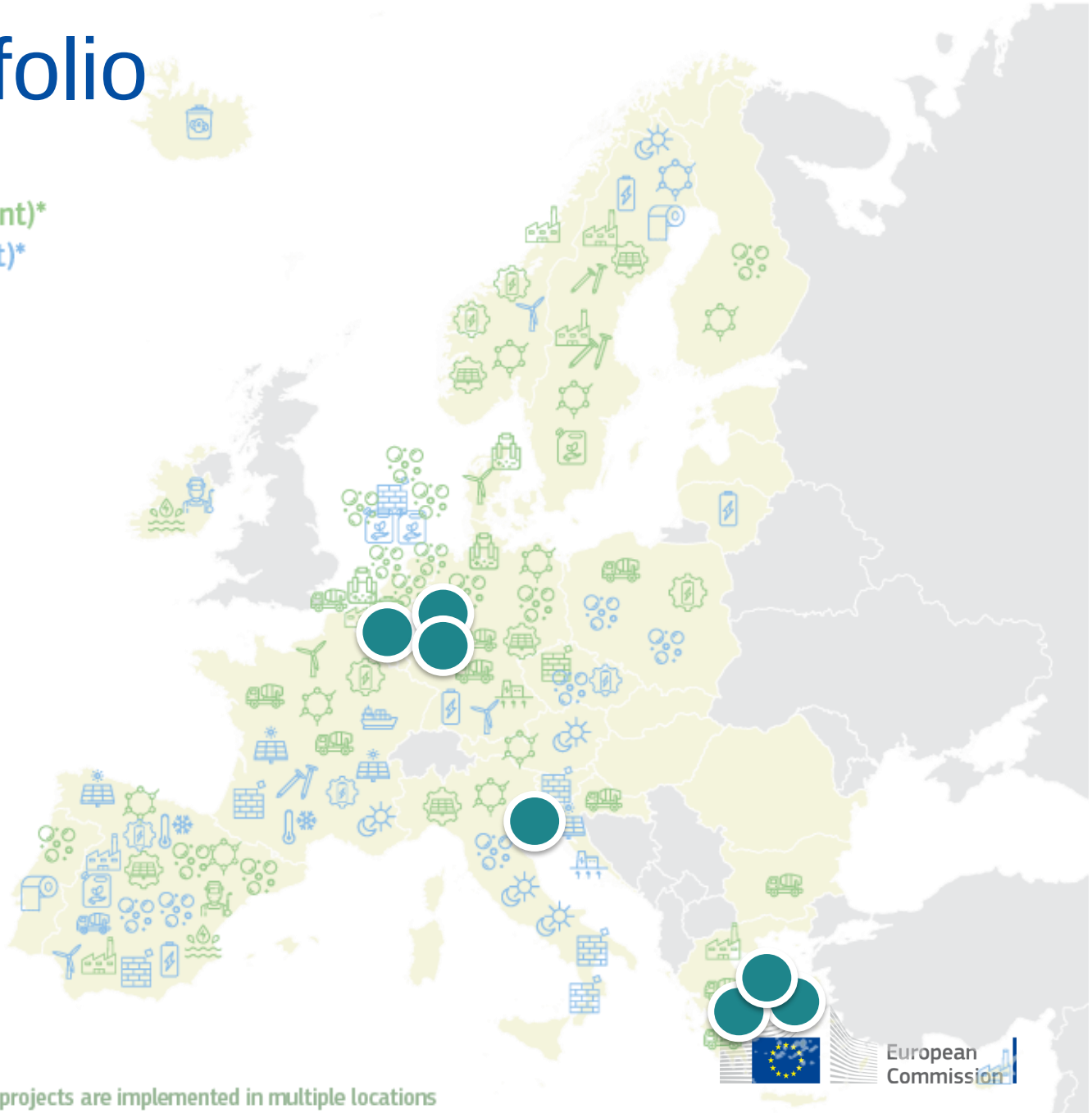
Additional 6.5 Mt/a CO2 by 2030 under GAP



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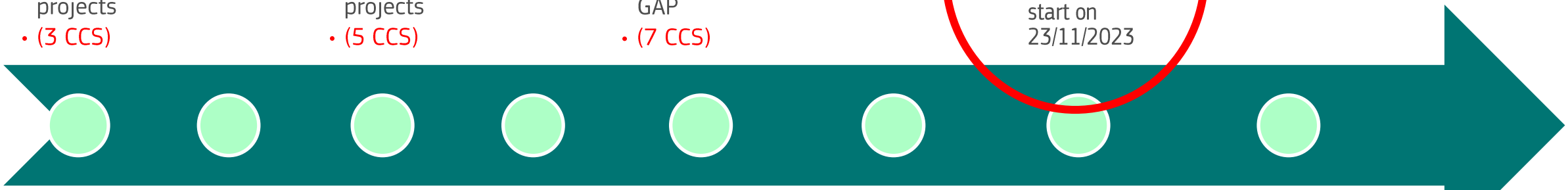

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European Commission

Innovation Fund 2023 call in a nuthshell

Timeline

- Launch: 23 November 2023
- Deadline for application: 9 April 2024
- Results to be announced: Q4 2024

Grant distribution

- LUMP-SUM contribution grant up to 60% of relevant costs
- Up to 40% of grant at financial close
- Remaining amount of at least 60% after financial close
- Generally, at least 10% after Entry into operation.

Links

- Link to the information day and recording
- Link to Funding and Tenders portal

Topic	Topic budget
Large-scale projects	EUR 1 700 million
Medium-scale projects	EUR 500 million
Small-scale projects	EUR 200 million
Clean-tech manufacturing	EUR 1 400 million
Pilot projects	EUR 200 million
IF23 Call Total Budget	**EUR 4 billion + PDA**

European Commission

Forthcoming events

IF SSC 2022

- Results to be announced in January 2024 on the CINEA website

IF23 Auction

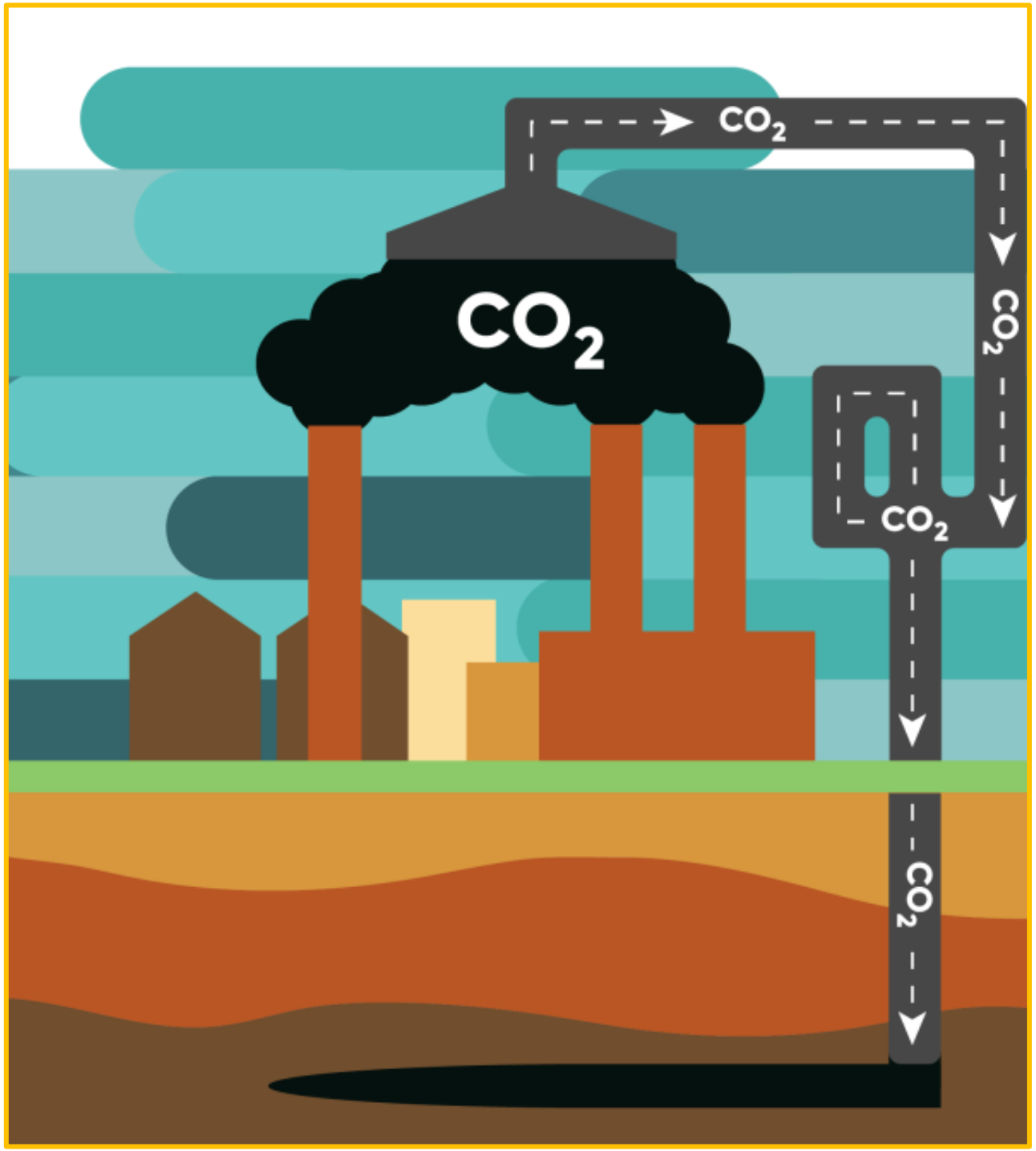
- Application period 23 November 2023 - 8 February 2024
- Register and listen to the Info Day on 30 November 2023

IF23 Call

- 23 November 2023 - 9 April 2024
- Register and listen to the Info Day on 7 December 2023

Innovative Clean Tech Conference 2024

- 11 April 2024
- Hybrid event



Agenda

14:00	**Introductory remarks**
14:20	Panel 1 *Connecting Central, Eastern and Southern Europe*
15:35	*Networking break*
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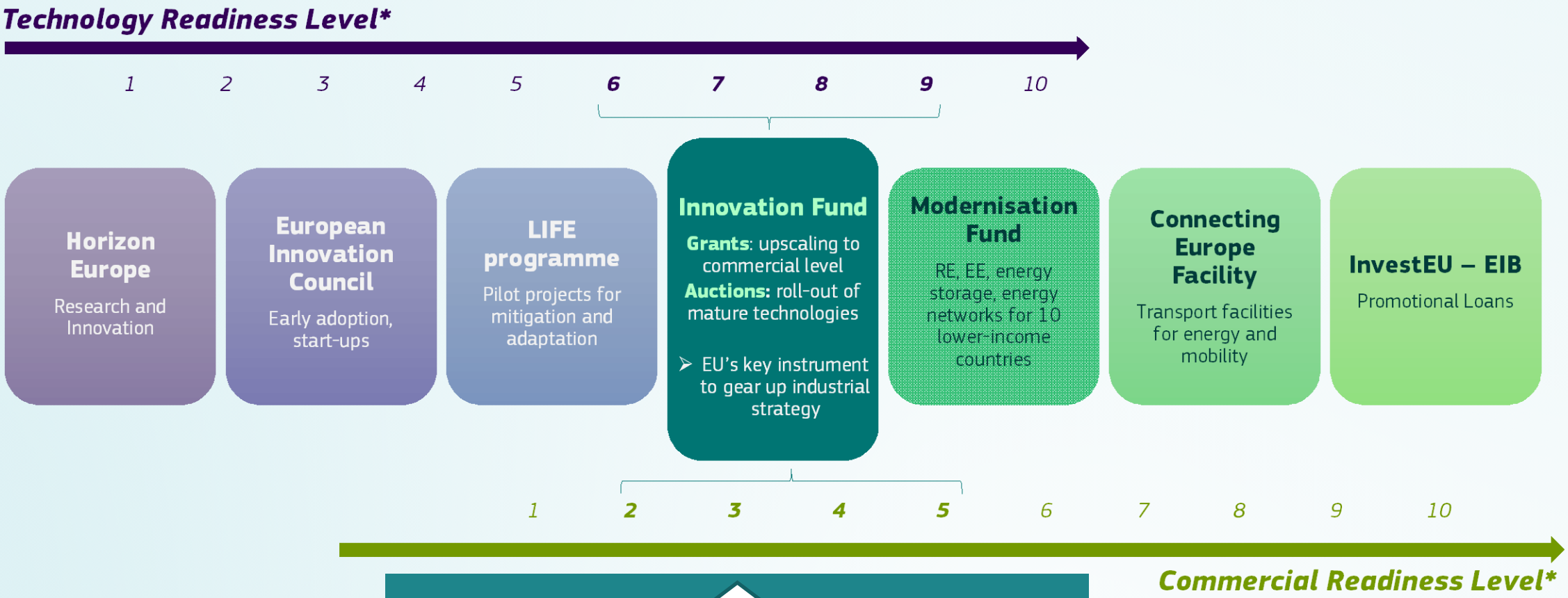
European Commission

A portfolio going beyond R&I efforts

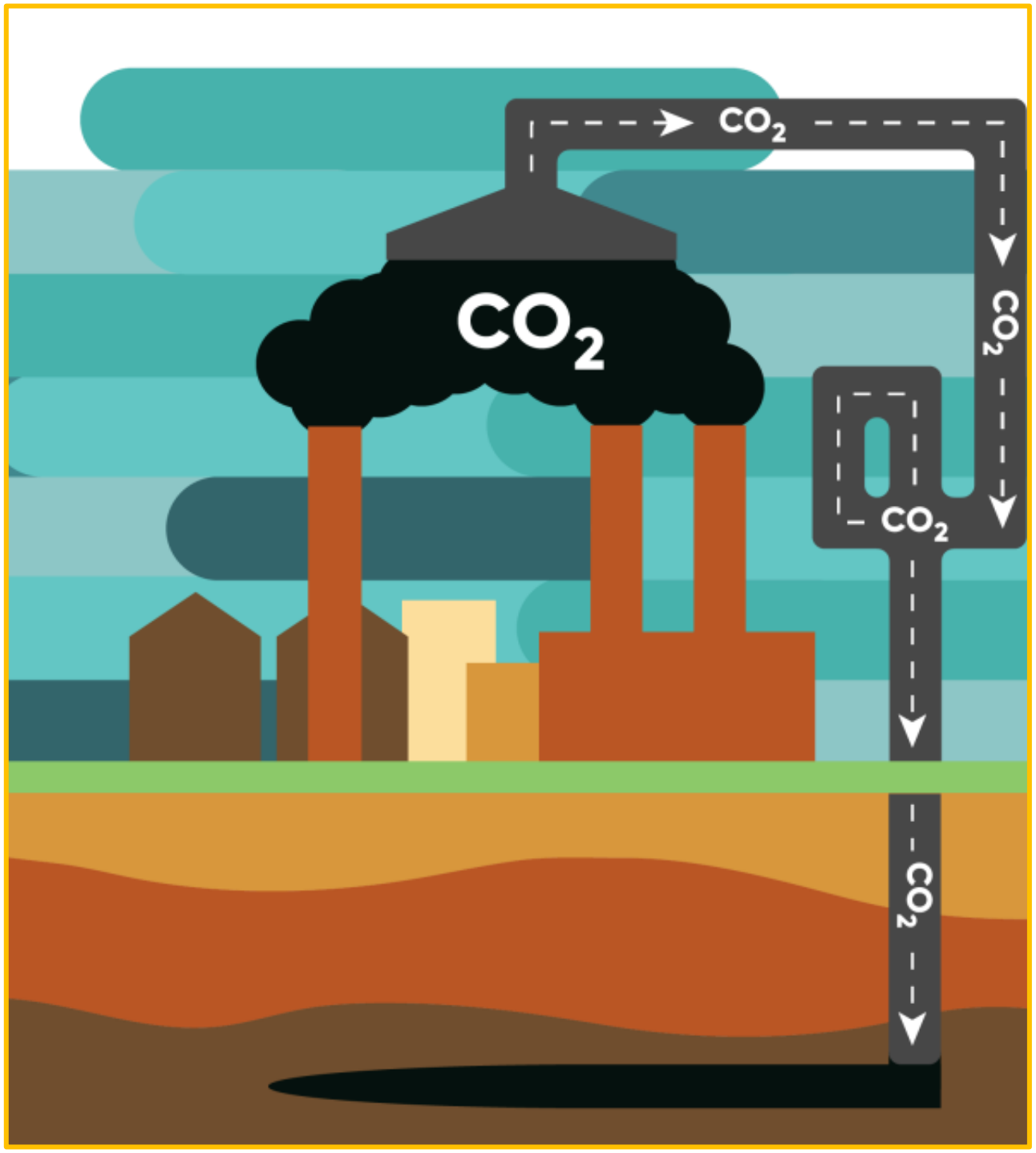
...towards commercial technology roll-out



*TRL and CRL are indicative.

EU policies meant to incentivise the deployment of CCS projects

- **Incentivizing emission reductions through the more ambitious EU ETS by 2030** → CCS can be a solution: emissions allowances need not be surrendered where CO2 is successfully captured and stored.
- **2022 revision of the EU ETS Directive** → all modes of transporting CO2 to storage are included.
- **Net Zero Industry Act** → 2023 proposal to guarantee accelerated permitting for CO2 storage hubs as Net-Zero Strategic Projects and a EU legal target to establish at least 50 million tonnes of annual injection capacity by 2030.
- **Industrial Carbon Management Strategy** → aiming at establishing by 2030 a single market for CO2 transport and storage services
- **Update of the CCS Directive Guidance Documents** → essential clarifications addressing technical and financial aspects



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European Commission

NEXE d.d. – CO_2NTESSA

Details about the project

- Project location: **Našice/Slavonia/Croatia**
- Date of entry into operation: **December 2028**
- Volume of CO2 captured for storage by 2030 (Mtpa): **approx. 0.7 Mtpa (per year)**

Options for transport & storage

- GT CCS Croatia – future on-shore storage site located only 38km far from project CO2NTESSA

Regulatory challenges identified

- No, as project CO2NTESSA is named as strategic project of Republic of Croatia (to speed up the implementation only EU grants are needed to close the financial structure of the project)

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CO2NTESSA

Heidelberg Materials CZ – CCS Moravia

Details about the project

- Project location: Czech Republic, South Moravia Region
- Date of entry into operation: 2031
- Volume of CO2 captured for storage by 2030 (Mtpa): 0

Options for transport & storage

- New pipeline from our cement plant to the storage in saline aquifers located in South Moravia Region (Czech Republic)

Regulatory challenges identified

- General legislation allowing carbon capture and storage concept is adopted; special (detailed) regulations needs to be prepared

Tomáš Mazálek

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CCS MORAVIA

Heidelberg Materials MND

Motor Oil (Hellas) Corinth Refineries SA - IRIS

Details about the project

- Project location:
  Agioi Theodoroi, Corinth, Greece
- Date of entry into operation:
  July 2028
- Volume of CO_2 captured for storage by 2030 (Mtpa): 1.2Mt

Options for transport & storage

- Energean's Prinos Geological Storage facility and wider Med region
- Shipping options under investigation

Regulatory challenges identified

- Transboundary maritime CO_2 transport
- Storage site permitting procedures

George Daskalakis, Head of New Technologies
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HERACLES GCC – OLYMPUS

Details about the project

- Project location: Aliveri – Evia - Greece
- Date of entry into operation: 1/1/2029
- Volume of CO2 captured for storage by 2030 (Mtpa): 2.0-2.3

Options for transport & storage

- Prinos
- Wider med region
- Seaborne transportation to be tendered

Regulatory challenges identified

- Sequestration permitting
- Transboundary maritime CO2 transport
- National licensing process to be narrowed down, possibly via NZIA

Nikolaos Bozos
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HERACLES GROUP OF COMPANIES A MEMBER OF HOLCIM GROUP

CEMEX – SOMZERO CO2

Details about the project

- Project location: Alcanar, Spain
- Date of entry into operation: ~2030
- Volume of CO2 captured for storage by 2030 (Mtpa): ~1.1

Options for transport & storage

- MP Shipping to sites in Mediterranean or North sea.

Regulatory challenges identified

- Cross border CO2 transport.
- No regulation around CO2 storage in Spain.
- No bilateral agreements on CCS with other EU countries.
- London protocol ratification.

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ORLEN S.A. – Storage at the Baltic Sea

LOTOS Petrobaltic (company from ORLEN Capital Group) as a storage Operator

Details about the project

- Project location: Baltic Sea
- Entry into operation: 2030
- Total storage capacity (Mt): tbd
- Injection capacity in (Mtpa): tbd
- CO_2 delivery means: pipeline (preferable) / ship

Discussions with capture plants

- ORLEN, Rafineria Gdańska, Lafarge Cement etc.
- Possible also CO_2 from Baltic countries (in future)

Risks:

- Regulatory risks
- Social awareness

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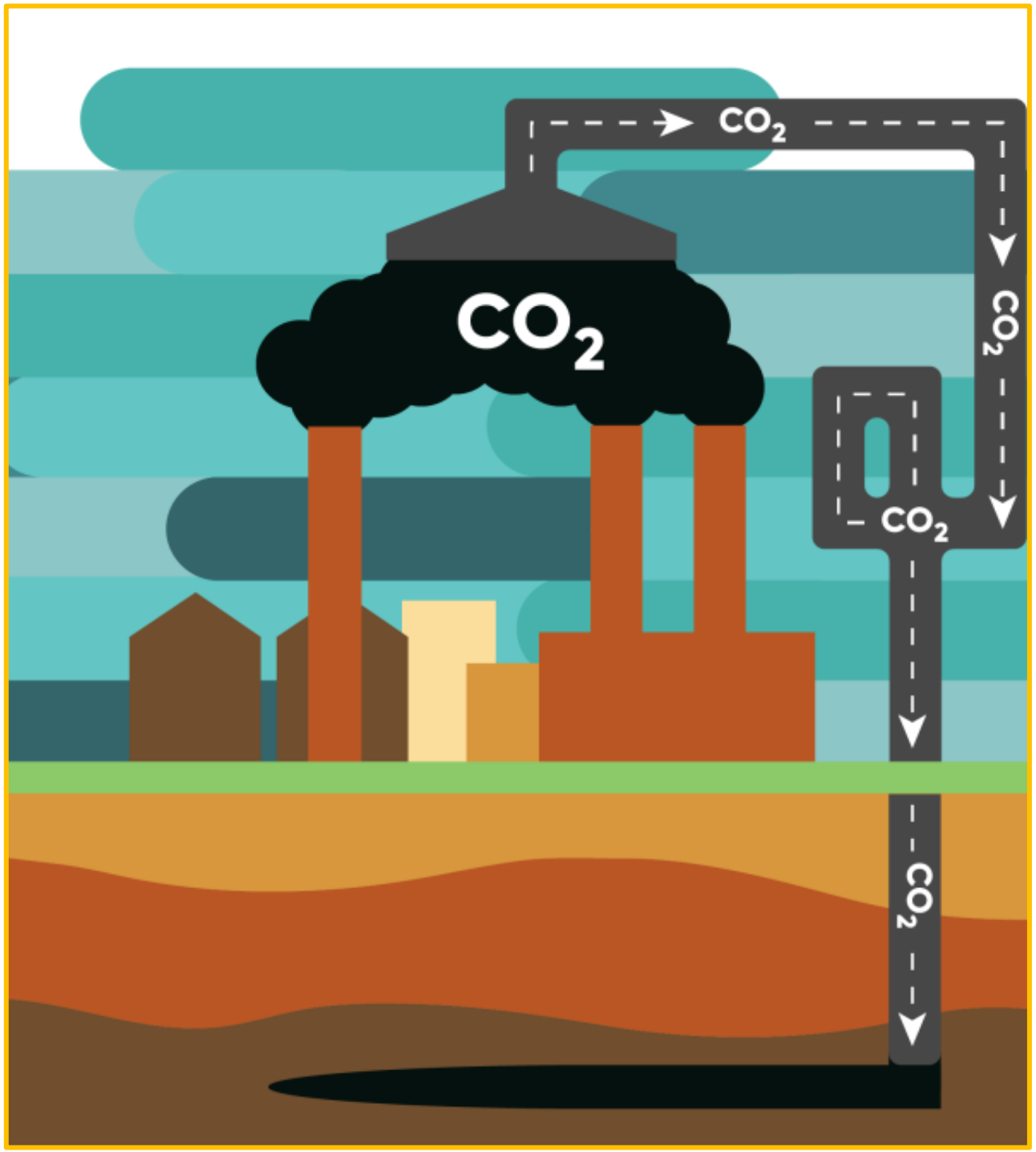

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European Commission

Heidelberg Materials Benelux – ANTHEMIS

Details about the project

- Project location: Antoing (Tournai), Belgium
- Date of entry into operation: 2029
- CO_2 captured for storage by 2030: 0,8Mtpa

Regulatory challenges identified

- Lack of CCfD in Belgium
- Interdependency between CO_2 transport infrastructures & feasible capture solutions

Options for transport & storage

- Fluxys onshore network
- CO_2 Highway to Norway (Equinor)
- Pipeline transport source-to-sink strengthens Business Case
- Alternative: inland barge transport to Rotterdam

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Heidelberg Materials

Anthemis

Holcim Belgium – GO4ZERO

Details about the project

- Project location : Obourg (Mons)
- Date of entry into operation : 01/01/2029
- Volume of CO2 captured for storage by 2030 (Mtpa) : 1.03

Options for transport & storage

- Sea shipping to onshore injection hub or to offshore direct injection rig
- Offshore sink (depleted oil/gas fields or saline aquifers) or onshore sink

Regulatory challenges identified

- Difficulties to freeze CO2 specifications along the value chain (pipeline, terminal, shipping, sink) ⇨ need for a standard to allow emitters for fixing capture basis of design / to agree on contracts on a fair level playing field
- Long-term contracts with aggressive deliver or pay conditions and capping of value-chain players financial liability ⇨ need for solutions to de-risk CCS for emitters (e.g. infrastructure public financing, standard contractual framework)
- Additional complexity for authorities delivering permits (e.g. CPU emissions, integration of CO2 backbone) ⇨ new standards/principles needed
- Legal framework not fully deployed (chain losses handling in ETS, full ratification of London protocol between countries)

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CEMEX – CO2LLECT

Details about the project

- Project location: Rüdersdorf, Rüdersdorf, Germany
- Date of entry into operation: 2030
- Volume of CO2captured for storage by 2030 (Mtpa): 1.2

Options for transport & storage

- Onshore transport by train to hubs in north Germany + MP shipping to storage sites in the North Sea

Regulatory challenges identified

- Train transport is not optimum. Pipeline planning limits site, leading to high costs.
- Cross border CO2transport.
- London protocol ratification.
- Storage not allowed in German territory

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Växjö Energi – POSCLIMB

Details about POSCLIMB

- Project location: Växjö, Sweden
- Combined heat and power plant
- All CO2 are biogenic
- Volume of CO2 captured for storage by 2030: 0,26 Mtpa
- Date of entry into operation: 2028

Options for transport & storage

- Train from site to harbour.
- Storage west of Sweden.

Regulatory challenges identified

- The market for carbon removal
- Procurement of storage sites onshore/offshore
- Railway infrastructure

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VEAB VÄXJÖ ENERGI

POSCLIMB
Positive Climate Impact with Bioenergy Carbon Capture Integrated with Combined Heat and Power

Wintershall Dea – Greensand (GeZero)

Details about the project

- Danish North Sea
- Injection start 2026-2031
- Total storage capacity 70-90 Mt
- Injection capacity up to 8 Mtpa (Net WD: 3 Mtpa) in 2031; ramping up from 2026
- Transport from costal hub by ship transport (pipeline)
- Operator: INEOS Energy, DK

Discussions with capture plants

- CO2 quality
- Mode of transport (pipeline, ship, rail)
- Delivery point
- Legal framework
- Alignment of maturation of value chain elements among partners
- Timeline of investment decisions

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wintershall dea

More information

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

CCS Directive

Information about European Commission policy directions, including:

- ✓ Implementation of the CCS Directive and revision of the Guidance Documents
- ✓ Up to date policy information

Carbon capture, use and storage (europa.eu)

Direct email contact:

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European Commission