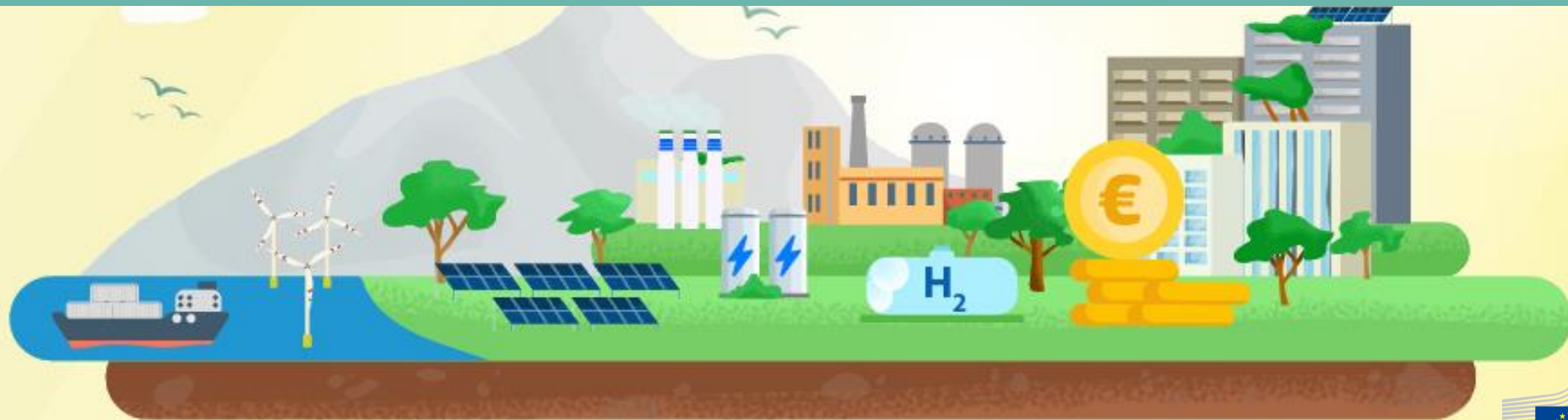




# Innovation Fund

Welcome: the event will start at 14:00 CET

Please indicate your MS/organisation followed by  
name/surname in Webex



*Please note the event is recorded*



# Agenda

## Session One: 2pm – 3:30pm

- 1) Welcome and introduction (Alexandre PAQUOT, Director CLIMA C) 10min
- 2) Mandate of the Expert Group and Rules of Procedure (Maria VELKOVA, Acting HoU) 5min
- 3) Revision of the Innovation Fund Delegated Act (Samuel VERSCHRAEGEN, Legal officer; Ewelina DANIEL, Policy officer, Roxana CHESOI, Policy assistant) 30min  
Q&A 45min

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- 4) Hydrogen Bank and deep-dive on new Competitive Bidding Mechanism (“Auctions”) (Johanna SCHIELE, Policy officer) 30min  
Q&A 15min
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Q&A 10min

# Innovation Fund

INNOVATION FUND EXPERT GROUP – 1<sup>ST</sup> MEETING after renewal

29 MARCH 2023



# Agenda

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# INNOVATION FUND

Deployment of net-zero and innovative technologies

Funded by: EU Emissions Trading System



Funding through  
Grants and Auctions



EUR 40 billion\* to invest from 2020-2030  
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

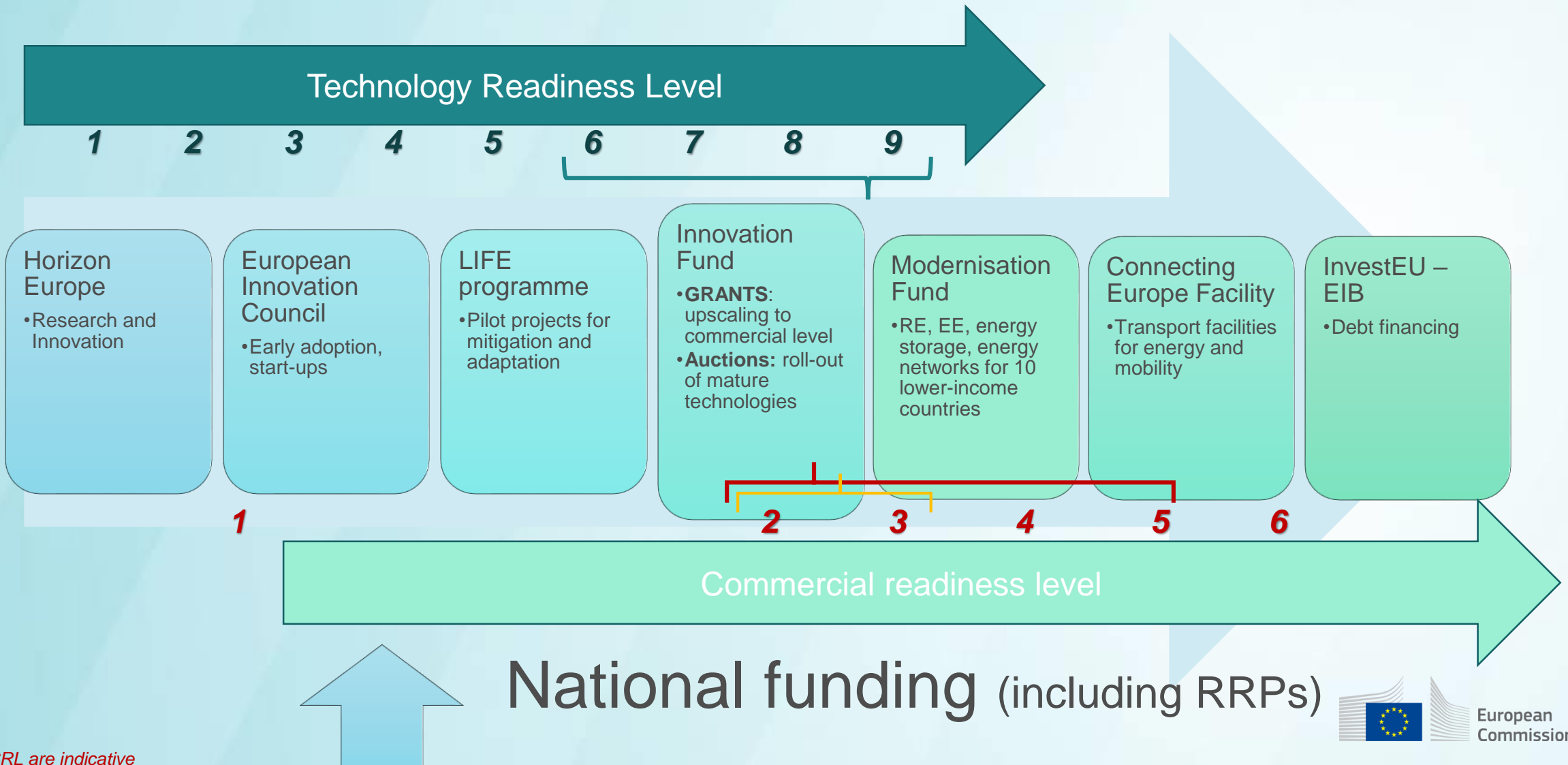


Net-zero mobility  
and buildings

\*based on a carbon price of 75 EUR/tonne









# Innovation Fund – targeted project portfolio

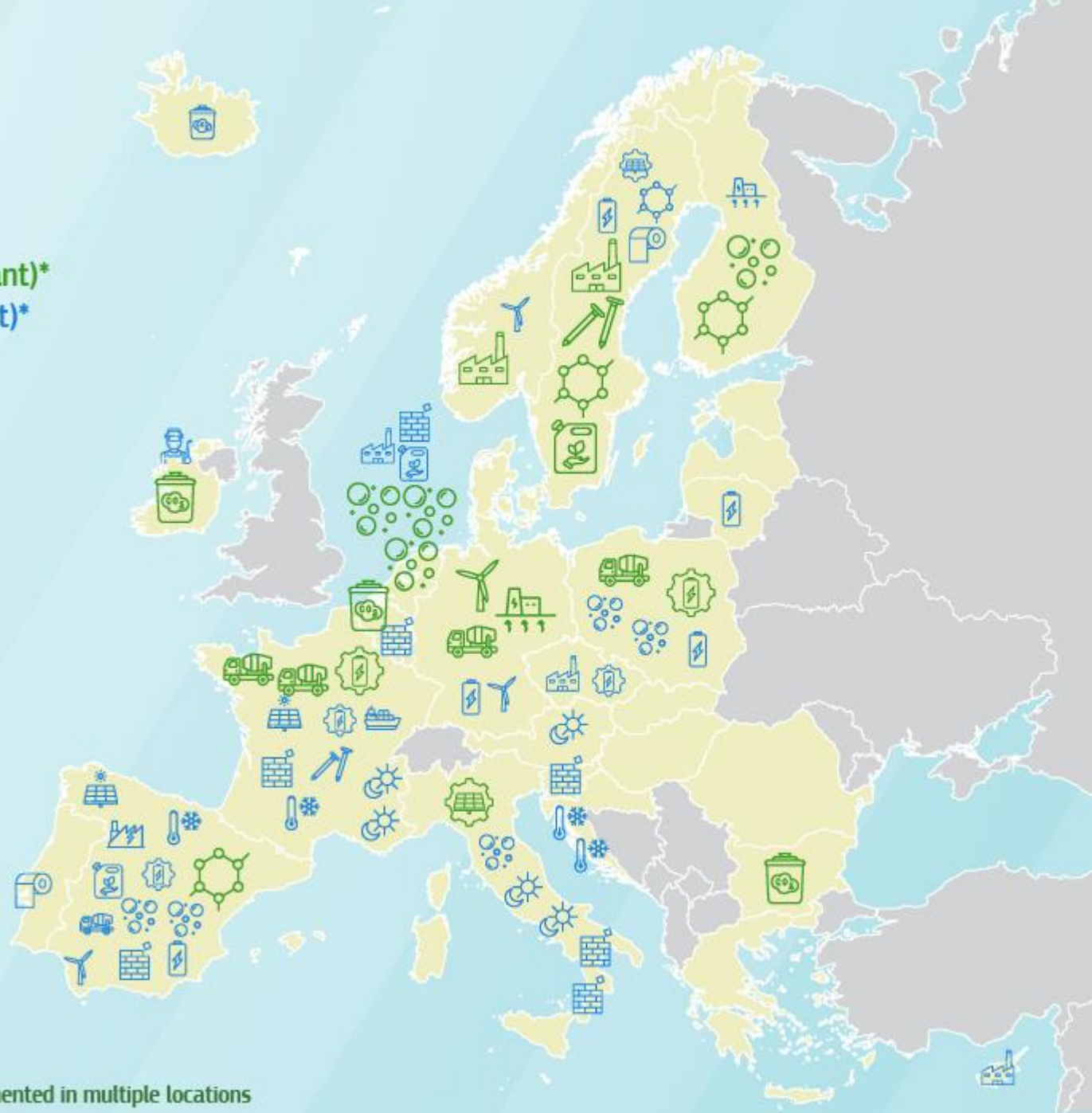


# Innovation Fund project portfolio

**Green:** Large-scale projects (23 awarded or pre-selected for grant)\*

**Blue:** Small-scale projects (47 awarded or pre-selected for grant)\*

- |  |   |
|--|---|
|  Biofuels and biorefineries                         |  Other energy storage                      |
|  Chemicals  |  Geothermal energy                         |
|  CO <sub>2</sub> transport and storage              |  Pulp and paper                            |
|  Hydrogen   |  Refineries                                |
|  Intra-day electricity storage                      |  Renewable heating/cooling                 |
|  Iron and steel                                     |  Solar energy                              |
|  Non-ferrous metals                                |  Wind energy                              |
|  Glass, ceramics and construction material        |  Cement and lime                         |
|  Manufacturing of components for renewable energy |  Use of renewable energy outside Annex 1 |
|  Manufacturing of components for energy storage   |  Other energy intensive industries       |



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

# Key changes to the Innovation Fund following the ETS Directive revision

Revised ETS Directive includes changes on:



1. The overall size of the Innovation Fund increase from 450 million ETS allowances to ca. 530 million ETS allowances.



2. Scope changes: new sectors (e.g. Maritime); medium scale projects; DNSH from 2025; stronger reference to multiple environmental impacts



3. The introduction of new financial instruments under the Fund (“Competitive Bidding”): Fixed premium, Contracts for Difference (CfDs) or Carbon Contracts for Difference (CCfDs), covering up to 100% of the funding gap

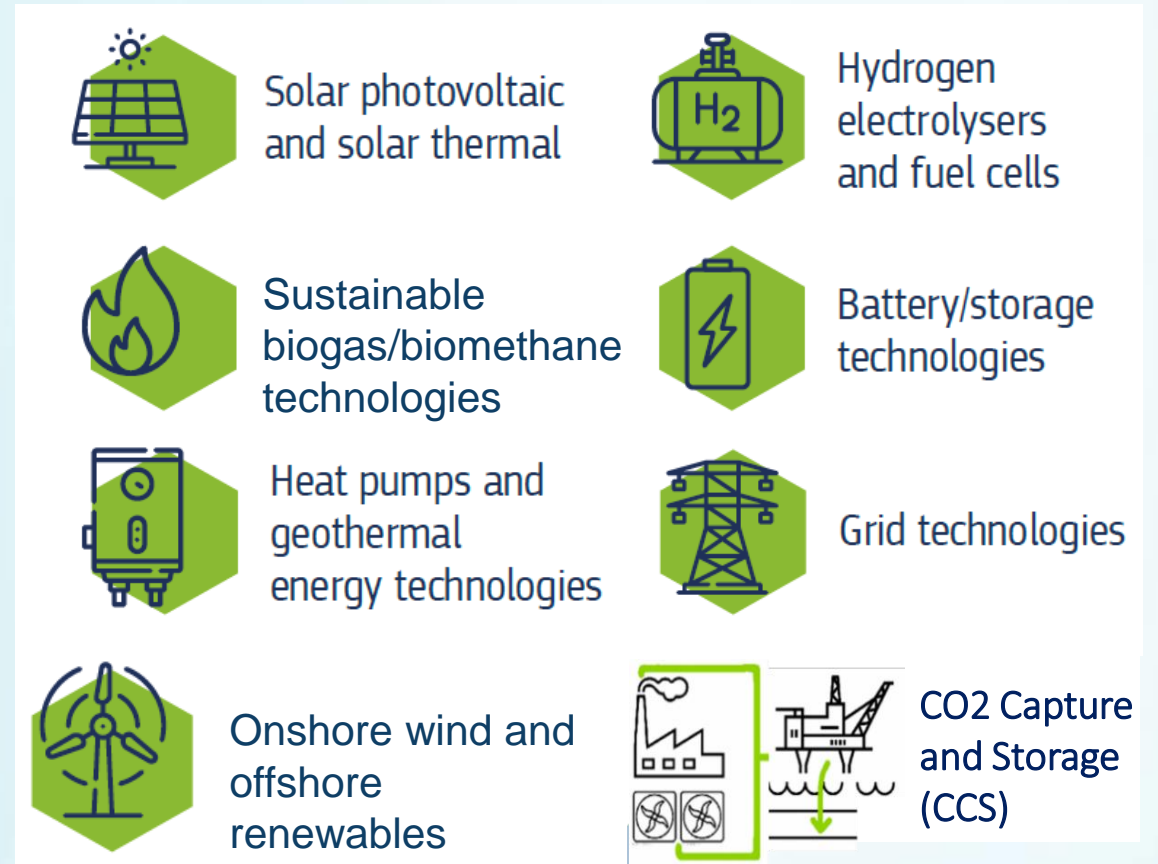


4. Stronger attention to geographical balance



# Net-Zero Industry Act (NZIA) adopted 16 March 2023

- **Wide definition for net-zero technologies** with nevertheless a focus on 8 specific areas
- Ambition: scale up net-zero technology manufacturing in the EU to provide at least 40% of the EU's annual deployment needs by 2030
- Target: 50 Mt/y CO<sub>2</sub> storage capacity in 2030



# European Hydrogen Bank

## European Hydrogen Bank

### 1. Domestic market creation

Green premium auction(s) under the EU ETS Innovation Fund (DG CLIMA)

### 2. Imports to the EU

Green premium auction(s) for renewable hydrogen imports (DG ENER)

### 3. Transparency and coordination

- Demand assessments
- Hydrogen flows

- Infrastructure needs
- H2 cost data

### 4a. Existing European financing instruments

- InvestEU
- Structural funds
- Innovation fund grants

### 4b. Existing international financing instruments

- Concessional loans
- Blending
- Guarantees

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Q&A 10min
- 7) Back-up: NZIA deep-dive

# Mandate of the expert group

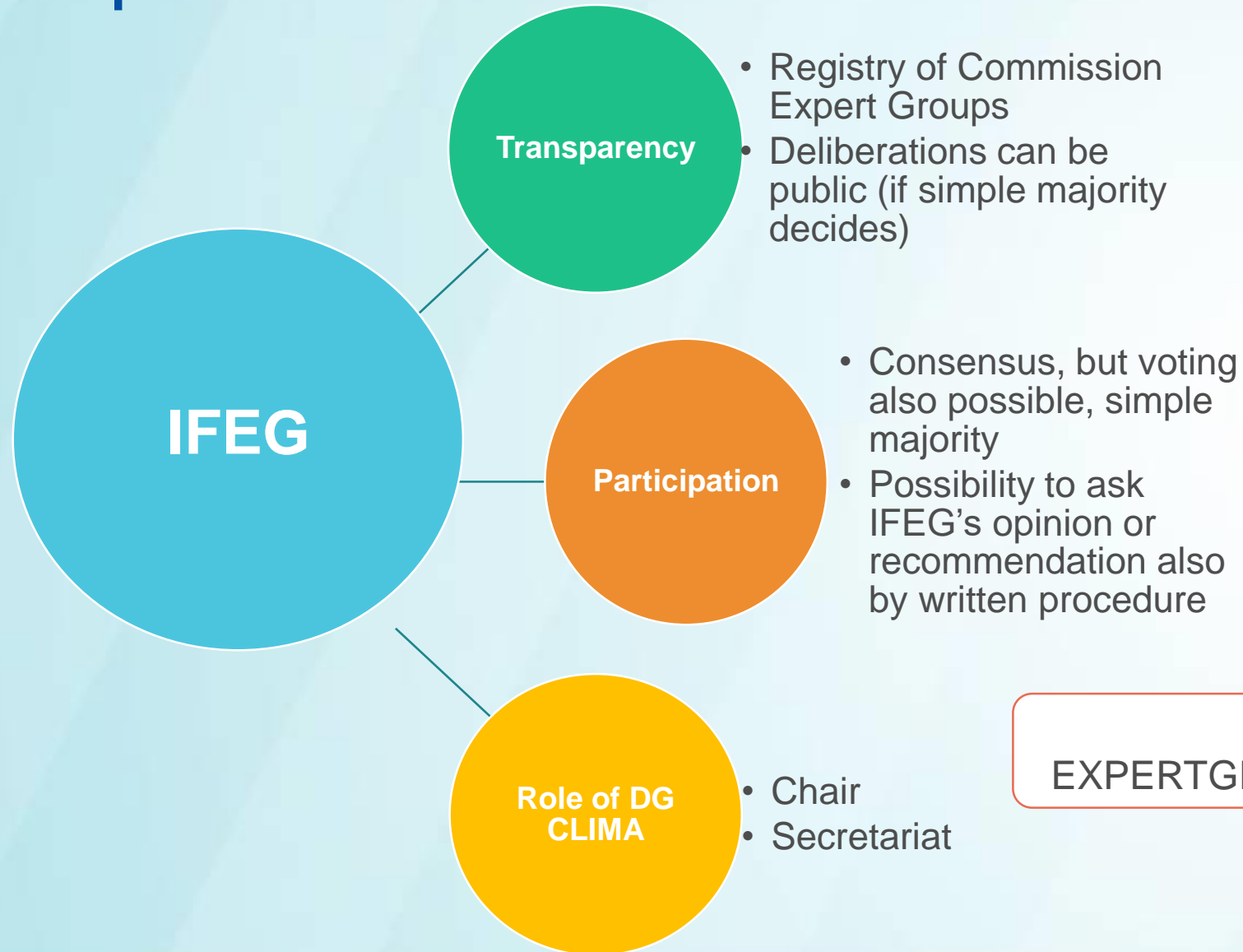
- New IFEG Terms of Reference published in the [Register of Commission Expert Groups and Other Similar Entities](#)

## IFEG tasks

- ✓ assist the Commission in the preparation of delegated acts related to the Innovation Fund
- ✓ assist the Commission in the preparation of calls for bids/projects, including in the newly eligible sectors
- ✓ ensure cooperation/coordination between the Commission, Member States and stakeholders on questions relating to the implementation of the Innovation Fund
- ✓ Member States coordination: facilitate consultation of and reporting to Member States; technical assistance etc.



# Rules of procedure – main features



CLIMA-IF-  
EXPERTGROUP@ec.europa.eu

# Agenda

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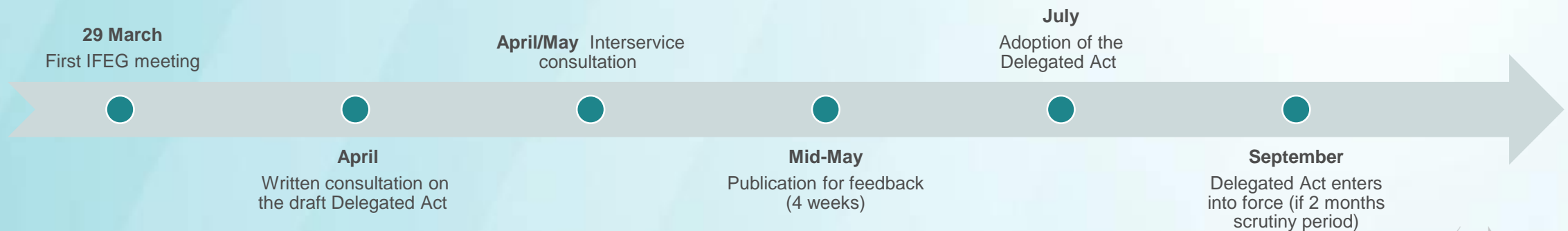
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# Overview of the draft delegated act revision

- This Delegated Act will:
  1. Introduce the basic rules for competitive bidding (first pilot auctions for renewable hydrogen can only be launched after the entry into force of the Delegated Act)
  2. Bring the Innovation Fund Regulation in line with the new requirements of the revised ETS Directive.
  3. Improve the overall functioning of the Innovation Fund.
- Tentative timeline:



# Overview of the draft delegated act revision

## “Regular” grants

Award criteria  
Definition of relevant costs  
Small- and large-scale projects

## Competitive bidding

General framework  
Calls for proposals,  
qualifications, ranking and  
other issues

Technical assistance  
for Member States  
with low effective  
participation

Project development  
assistance

Strengthened  
governance



# Grants – award criteria

- Rewording of the "cost-efficiency" criterion.

*“(e) efficiency in terms of requested Innovation Fund grant amount plus any other public support that is part of the project’s financial model, divided by the total projected amount of greenhouse gas emissions to be avoided in the first 10 years of operation”.*

- DG CLIMA considers enabling the possibility of using additional award criteria for sector-specific calls or topics, in line with EU Green Deal objectives.
  - *E.g., additional criteria may be used for maritime projects*

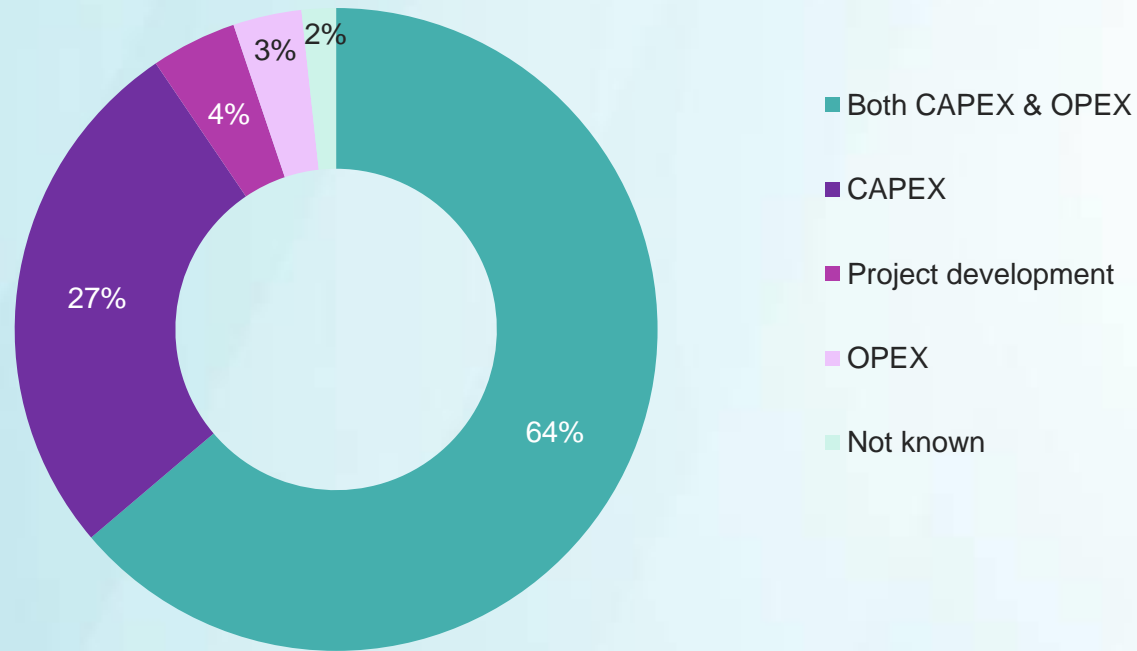
# Grants - Relevant costs

- 1. Update of Relevant Costs definition:** mention of « economic revenues » and « operational benefits »
- 2. Preparation for simplification of the guidance on Relevant Costs (Annex B) as of the 4 LSC**
  - ✓ « **No Reference** » to become default methodology (the sum of actual costs/benefits/revenues)
  - ✓ « Reference Plant » methodology (the sum of actual costs/benefits/revenues compared to a counterfactual scenario) would still be possible
  - ✓ « Levelised costs » methodology would no longer be used.
- 3. Simplified methodology would apply to large, medium and small scale projects**

# Grants - Relevant costs

*Insights from market survey on relevant costs calculation for project proponents*  
%

**Type of costs that should be covered by the EU ETS Innovation Fund**



Total # of respondents 347

# Grants - Definition of small and medium-size projects

	Small-scale projects	Medium-size projects (NEW)	Large-scale projects
Current IF Regulations	Up to EUR 7.5 million	n/a	Above 7.5 million
Proposed changes	Up to EUR 20 million	Above EUR 20 million and up to EUR 100 million	Above EUR 100 million

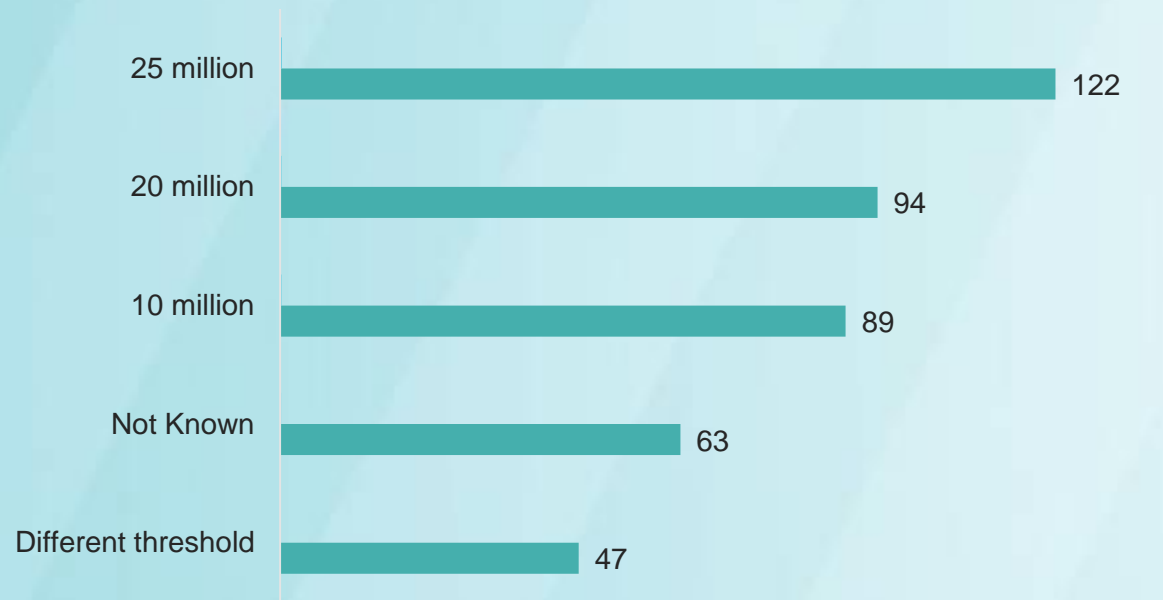


# Grants - Definition of small and medium-size projects,

## *Insights from market survey*

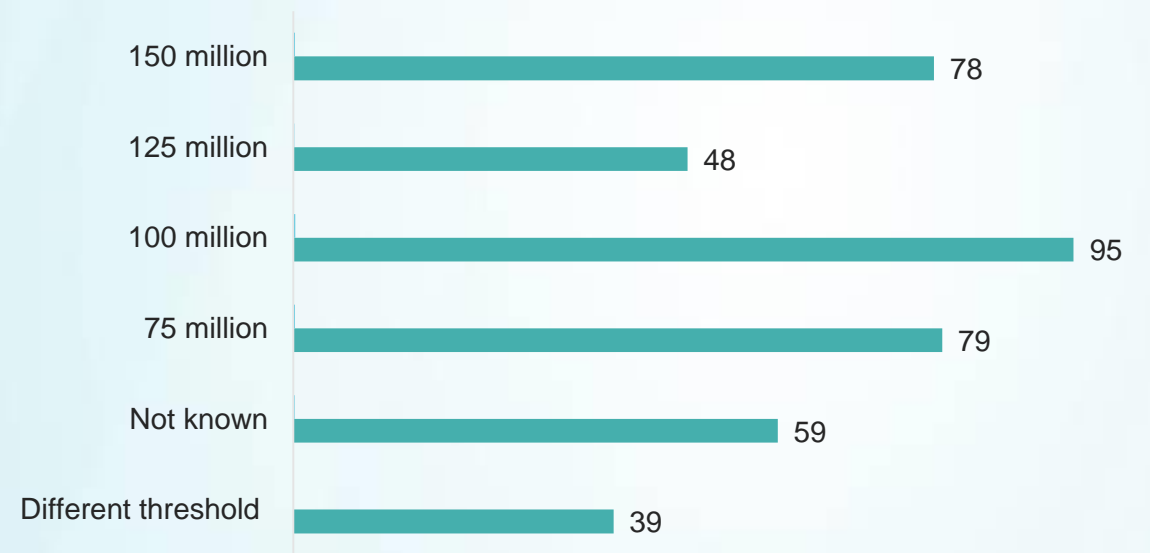
Number of respondents

### CAPEX threshold for small-scale calls



	Different threshold	Not Known	10 million	20 million	25 million
Percentage	11%	15%	21%	23%	29%
Absolute number	47	63	89	94	122

### Most appropriate maximum CAPEX threshold for new medium-scale calls



	Different threshold	Not known	75 million	100 million	125 million	150 million
Percentage	10%	15%	20%	24%	12%	20%
Absolute numbers	39	59	79	95	48	78

Total # of respondents for each question 398

# Grants - Definition of small and medium-size projects

*Insights from market survey (question about future projects' CAPEX+OPEX size)*

**Range of project's CAPEX over a 10-year operational period**



# Competitive bidding procedures chapter

- **New chapter** mirroring the “provisions applicable to grants”: “provisions applicable to support awarded on basis of a competitive bidding procedure”
- **Competitive bidding = auctions**
- Types of support:
  - contracts listed in Article 10a(8) of ETS Directive
  - **pilot auctions** will award fixed premiums for renewable hydrogen (grants under the Financial Regulation) → **the European Hydrogen Bank**
  - in the future, Contracts for Difference or Carbon Contracts for Difference could be awarded
  - In the future other types of low-carbon products could be auction goods



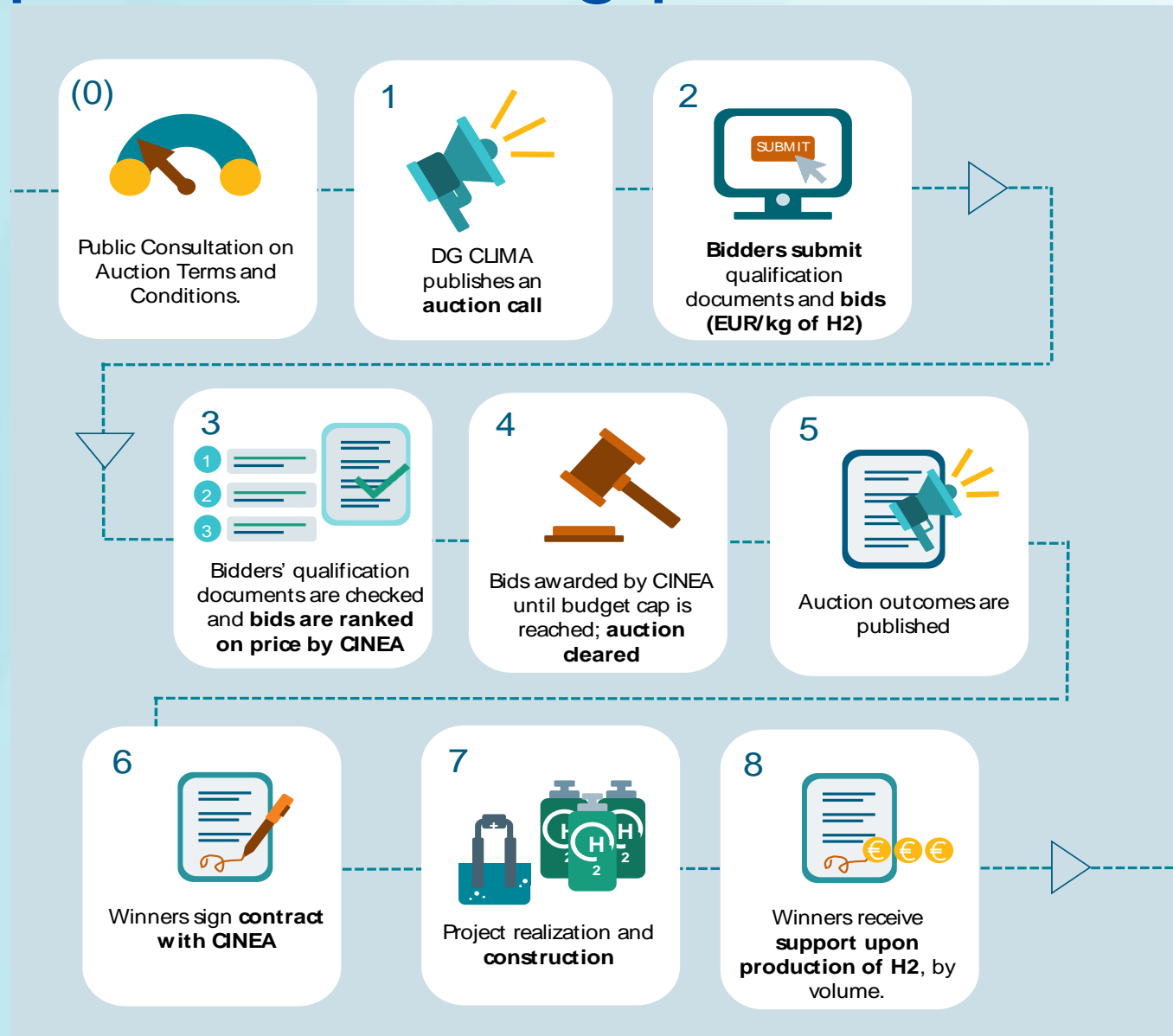
# Competitive bidding procedures principles

## Auction design and principles (aligned with CEEAG guidelines)

- Auctions need to be **competitive** (open, clear, transparent and non-discriminatory)
- Auctions need to be **based on objective criteria** defined *ex ante* in accordance with the objectives of the ETS Directive.
- Auctions need to be **designed in a way to minimise the risk of speculative bidding**.
- Auctions need to be have a binding constraint (budget or volume) → **not all bidders will receive aid**
- **ex-post adjustments** to the bidding process outcome must be avoided



# Competitive bidding procedures stages



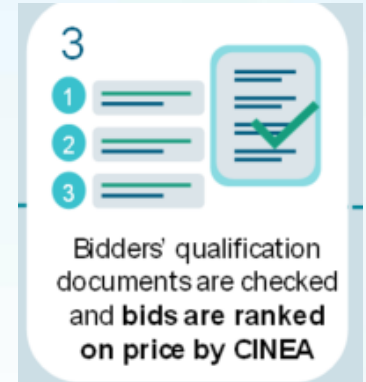
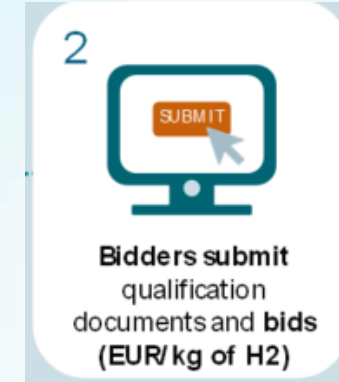
# Competitive bidding procedures – calls for proposals

- **Open calls for proposals**
- The calls for proposals preceded by a **market consultation**.
- **Terms & conditions** published sufficiently in advance to enable effective competition.
- The **call text** (and already the **decision launching the call**) must set out:
  - The objective of the call and the definition of the auctioned products
  - The overall budget available for the auctions call
  - The qualification requirements
  - Possible maximum price ceiling and overall support ceiling per project, if applicable
  - The maximum duration of the support
  - A description of the application procedure (deadlines, list of information and documentation to be submitted)
  - A description of the selection procedure
  - The possible restrictions to cumulation with national and EU funding,
  - The model grant agreement



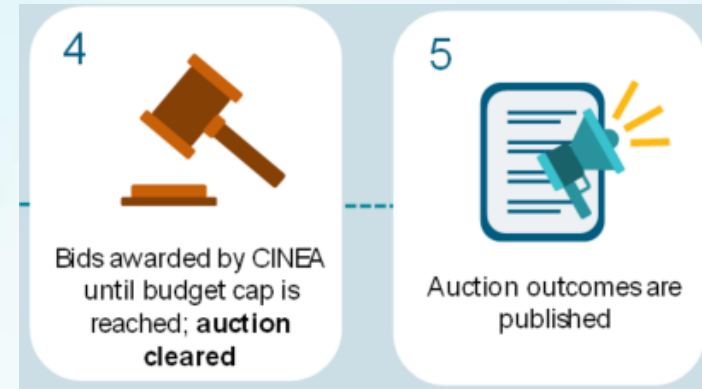
# Competitive bidding procedures – qualification requirements

- Only **applications that meet the qualification requirements are considered for ranking**
- Qualification requirements are to ensure that project proponents participating in the competitive bidding procedure are able to complete the proposed project
- Qualification requirements limited to what is necessary to **attain the objectives of the calls** for proposals, in order to ensure the **highest degree of competition and quality of submitted bids**.
- Qualification requirements may be eligibility, selection, and award criteria within the meaning of the Financial Regulation



# Competitive bidding procedures – ranking

- Proposals that meet the qualification requirements are **ranked from the lowest offered price to the highest**
- The Commission may decide to use **additional criteria for the ranking** of the offered bids, provided that price remains the predominant criterion in the ranking of the bids.
- The use of additional criteria must be clearly set out and justified
- **Auction outcomes (winning bids) will be published**
  - At the request of the Commission, the implementing body shall also communicate the ranking of proposals that meet the qualification requirements but whose price is above the clearing price → **enabling “auctions as a service”**



# Competitive bidding procedures – other issues

- **Failure of competitive bidding procedure** - in case of severely insufficient or distorted competition.
- **Deposits** (bid and/or completion bonds)
  - Form: cash deposits, bank guarantees, guarantees from a mother company, etc
  - Used to **deter speculative bidding** and **guarantee the seriousness and quality of bids** → lighter and faster evaluation procedure.
- **Cumulation rules**
  - Cumulation either restricted or support recalculated to avoid overcompensation (to be specified in the call text)
  - Cumulation to be excluded in pilot auctions



# Technical Assistance to Member States with low effective participation

## Eligibility

- Only available to **MSs with low effective participation**
- On request
- Delegated Regulation defines the concept of 'technical assistance'

## Objectives

- Improve the quality of proposals for projects located in the Member States through:
  - Capacity building for MS
  - Dedicated assistance to support activities leading to better quality proposals

## Implementation

- The NCP will have the freedom (within limits) to design activities that best cater to the needs of their MSs  
This may be implemented entirely at NCP level, or through an assigned contractor

## Results expected

- Effective, quality-based geographical coverage

Technical Assistance available only to MS with low effective participation would be complemented by trainings/workshop organised centrally by the Commission for all MS/NCPs on a regular basis

# How to define 'low effective participation'

Number of projects awarded grants and the budget awarded proportional to the respective MSs ETS share

Defined by 30 June 2023 and every 2 years after that

List of eligible countries included in the Financing Decision + respective budget allocated

# Project development assistance (PDA)

## Enlarge eligibility



- All rejected projects that are above all thresholds or fulfil at least the criteria on innovation and GHG
- Fail maturity criteria (define lower threshold in the call text)
- The support provided can be technical and/or financial (as until now)

## Introduce 'open' PDA



- All projects considered: eligible under the Innovation Fund, innovative, and have identified clear project maturity needs, technical and/or financial
- Irrespective of a possible future application for Innovation Fund support
- Ongoing basis, first come first served, similar to NER300 advisory

KPIs related to geographical and sectoral balance of the projects supported

# Strengthened governance

## Reinforced knowledge-sharing requirements

- ⑩ Projects funded by the Innovation Fund shall be required to share knowledge with other relevant projects as well as with Union-based researchers having a legitimate interest
- ⑩ The terms of knowledge-sharing shall be defined by the Commission in calls for proposals

## Reinforced visibility requirements

- ⑩ Projects financed by the Innovation Fund must clearly advertise the origin of the EU ETS funds they have received
- ⑩ Obligation to use the label '(co-) funded from by the EU Emissions Trading System (the Innovation Fund)'

## Synergies between IF and Horizon Europe

- ⑩ Commission and CINEA to further foster especially Horizon Europe-Innovation Fund synergies

# Strengthened governance

## Information-sharing with Member States

- ⑩ After the closure of each call, the Commission will provide Member States with detailed information on the applications for projects on their respective territories.
- ⑩ Subject to applicants' consent.
- ⑩ The information might cover project abstract, requested grant amount / offered price, GHG abatement potential (only for "regular" grants), planned date for entry into operation, location, contact details.

## Commission's reporting

- ⑩ The Commission shall report every year to the Climate Change Committee on the implementation of the Innovation Fund, providing an analysis of projects awarded funding, by sector and by Member State, and the expected contribution of those projects towards the EU climate neutrality objective.

# Application of the Do No Significant Harm requirement

*‘Article 10f)*

*‘Do no significant harm’ principle*

*From 1 January 2025, the beneficiary Member States and the Commission shall use the revenues generated from the auctioning of allowances destined for the Innovation Fund pursuant to Article 10a(8), and of the allowances referred to in Article 10(1), third and fourth subparagraphs, in accordance with the ‘do no significant harm’ criteria set out in Article 17 of Regulation (EU) 2020/852, where such revenues are used for an economic activity for which technical screening criteria for determining whether an economic activity causes significant harm to one or more of the relevant environmental objectives have been established pursuant to Article 10(3), point (b), of that Regulation.’;*



# Innovation Fund

Discussion; Questions and answers



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# European Hydrogen Bank: Proposed activities

## European Hydrogen Bank

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Green premium auction(s) under the EU ETS Innovation Fund (DG CLIMA)

### 2. Imports to the EU

Green premium auction(s) for renewable hydrogen imports (DG ENER)

### 3. Transparency and coordination

- Demand assessments
- Hydrogen flows

- Infrastructure needs
- H2 cost data

### 4a. Existing European financing instruments

- InvestEU
- Structural funds
- Innovation fund grants

### 4b. Existing international financing instruments

- Concessional loans
- Blending
- Guarantees

# Objectives of Hydrogen Supply Auctions: Scaling up the EU Hydrogen Economy

1



Cost-efficient, market based instrument for financial support

2



De-risking projects and maximising leverage of private capital

3



Price discovery and market formation

4

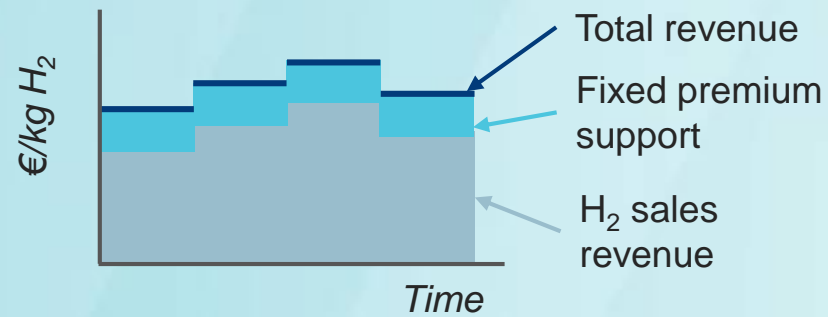


Reduced administrative burden

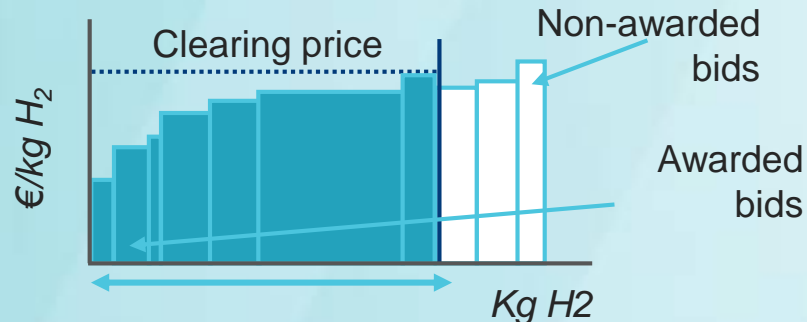
# 2023 Auction in a nutshell

Final Consultation  
May 16

## Fixed-premium auction



## Bids ranked on price



- Budget: **EUR 800 million**
- Auctioned good: **Renewable Hydrogen**
- Support in form of a **fixed premium** in EUR/kg of renewable hydrogen produced, over **10 years**
- Bids **ranked on price** – budget allocated to the projects with the lowest specific support requirements
- **Pay-as-bid**
- **Output based support** (upon verified and certified production of volumes), no payments before entry into operation
- **Maximum realisation period** (time to entry into operation) of 3.5 years, can be prolonged to **4 years** under penalty

# Key qualification requirements

Final Consultation  
May 16

Only bids that meet the qualification requirements will be ranked.

- Memorandum of Understanding (MoU) of a **10 year power purchasing agreement (PPA)**, covering 90% of the electricity volume needed
- MoU of a **5 year hydrogen off-take agreement** with one or several off-takers, covering 100% of the volume
- MoU for **electrolyser delivery**
- MoU with a bank on a **bank guarantee** to cover the deposit requested at grant signature
- Proof of advanced conversation with environmental **permit authority** and **grid provider**



# Termination rules, deposits and ceilings

Final Consultation  
May 16

- **Deposit** required at signature: 7.5% of total grant value
- **Maximum realisation period** (expected time until entry into operation): 3.5 years.
  - If delayed by less than 6 months, volume penalty.
  - If delayed 6 months or more, deposit is kept and contract terminated.
- **Ceiling price** of the auction: 4 EUR/kg hydrogen
- Other termination reasons: severe under-production over 3 consecutive years

# Cumulation rules: level playing field between projects from all Member States

✓ Previous funding for electrolyser manufacturer

✓ Previous CAPEX funding for off-taker

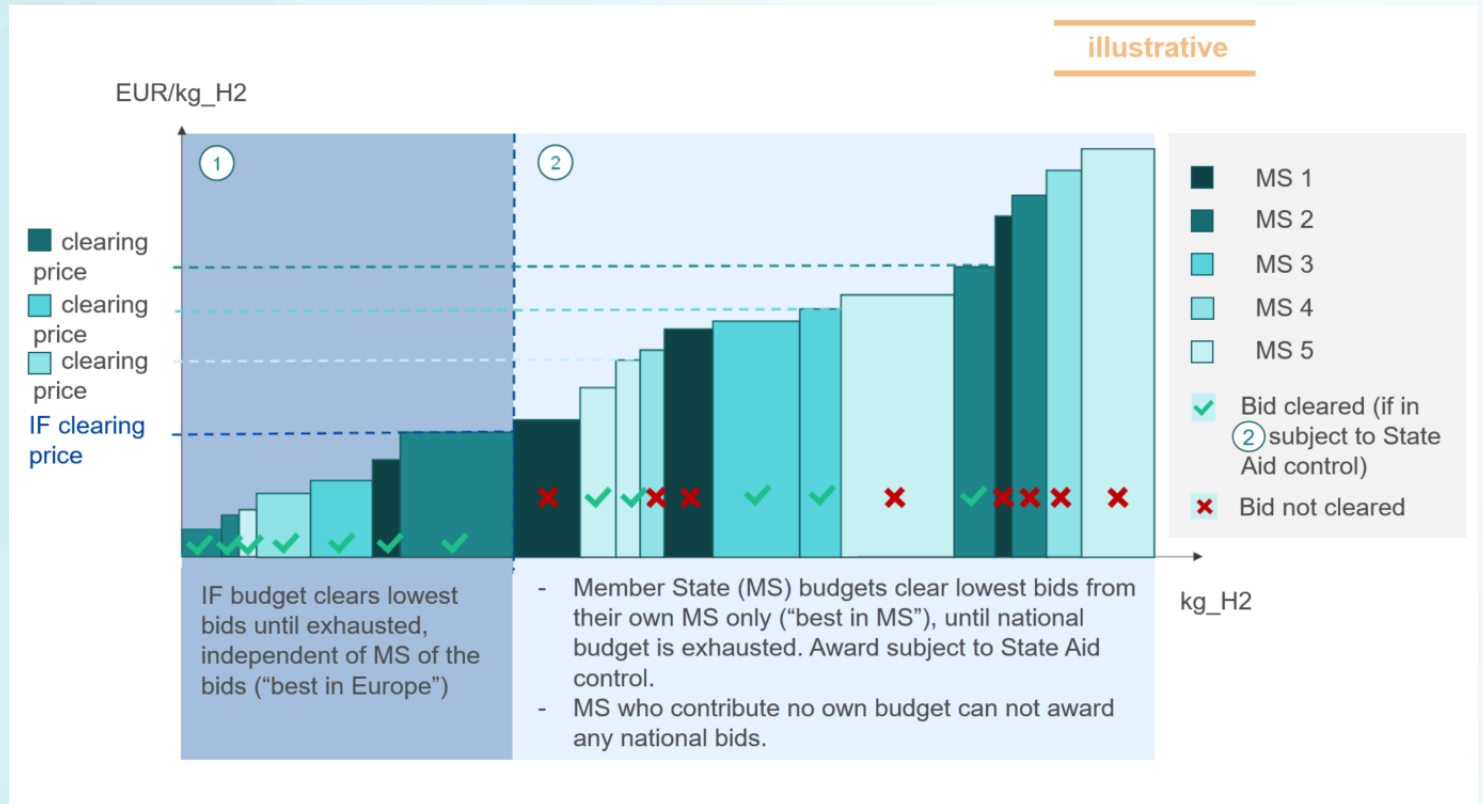
✓ Previous funding for non-dedicated infrastructure

✗ Previous funding for the same hydrogen production project

✗ Previous OPEX funding to the offtaker covering the same costs (i.e. OPEX cost of H<sub>2</sub>)

# Look into the future: potential to expand auctions beyond hydrogen sector, and as a service for Member States

- H2 Strategy communication proposes to offer an EU-wide auction mechanism through “auctions-as-a-service”.
- Member States can clear projects that are outside of the IF budget.
- Less market fragmentation, less administrative cost
- Work with DG COMP as national schemes subject to State Aid rules.
- Auctions concept – if successful – could be extended to other sectors, such as clean-tech manufacturing and industry decarbonisation.



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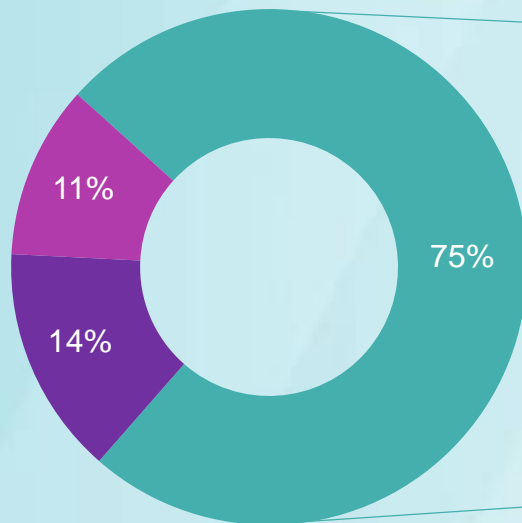
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Q&A 10min

# Number of projects and funding support

75% of respondents envisage **projects that would need public funding**, of those, 80% predict they would be involved in more than 1 project

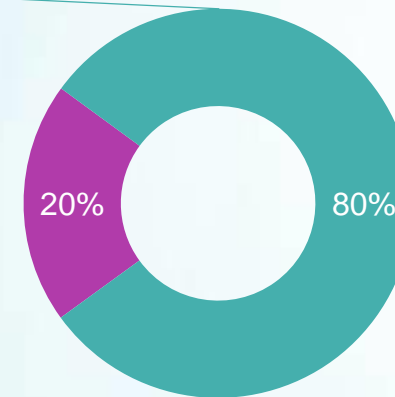
%

### Entities envisaging projects



■ Yes ■ No ■ Not known

### Number of envisaged projects



■ 1 project ■ More than 1 project

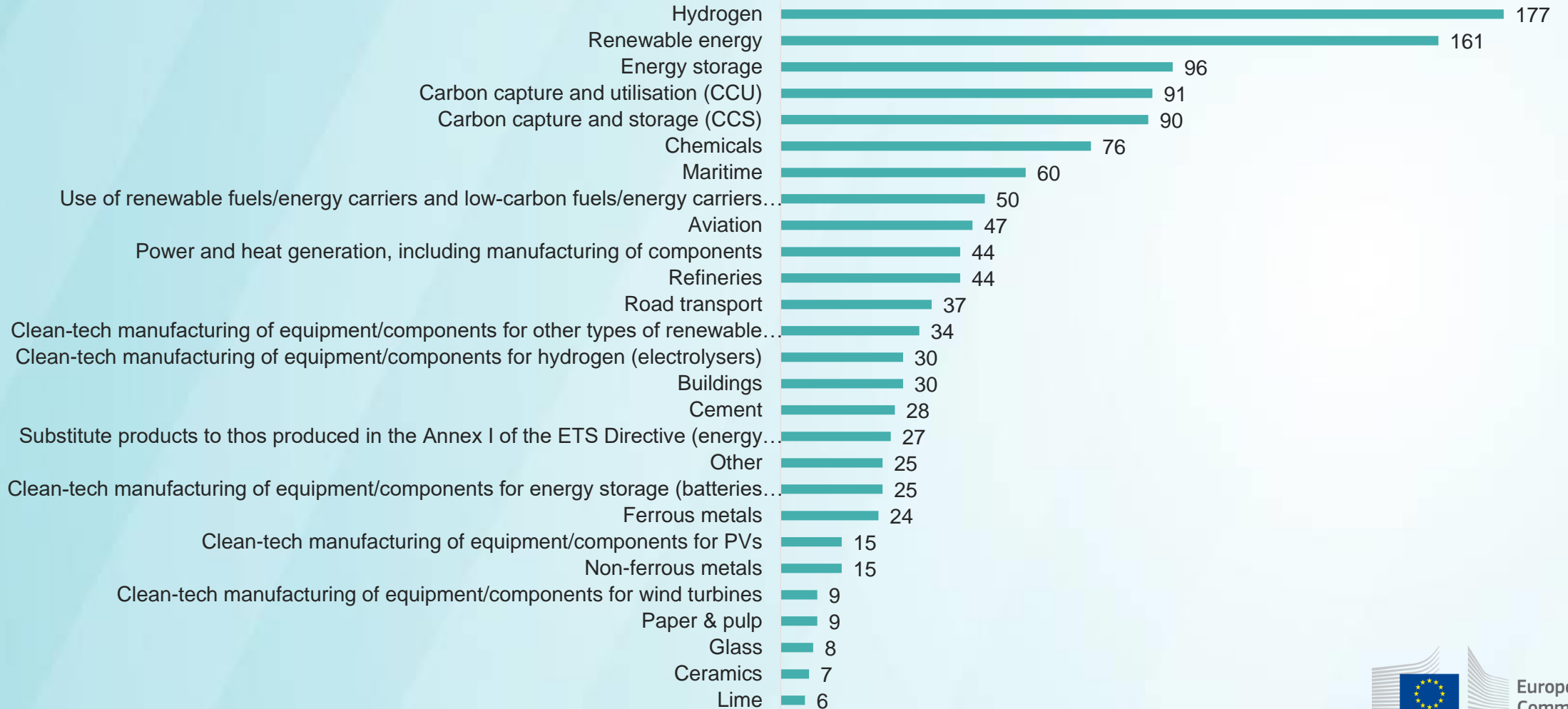
Total # of respondents 460

Total # of respondents 344

# Project sectors

Hydrogen, Renewable energy, Energy Storage, CCU and CCS are the main sectors that respondents agree will need **public funding support**

*Number of responses*



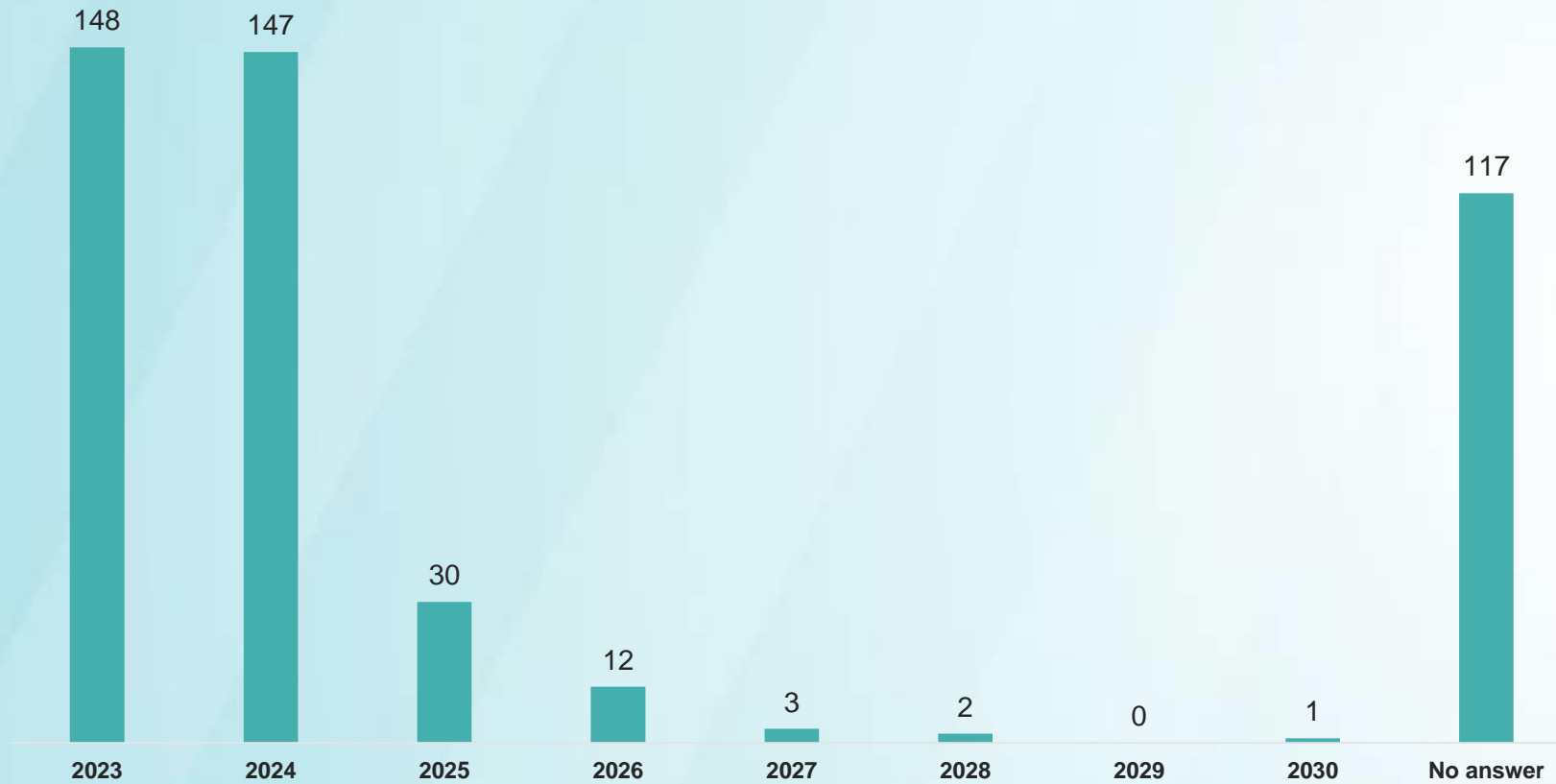
Total # of responses 1265



# Expected year for funding applications

The next **three years** show a high demand for expected applications

*Number of respondents*






Total # of respondents 460

# Countries for project deployment

The **main countries** where the projects are expected to be deployed are: Germany, France, Spain, Italy, Belgium and the Netherlands

*Number of responses*



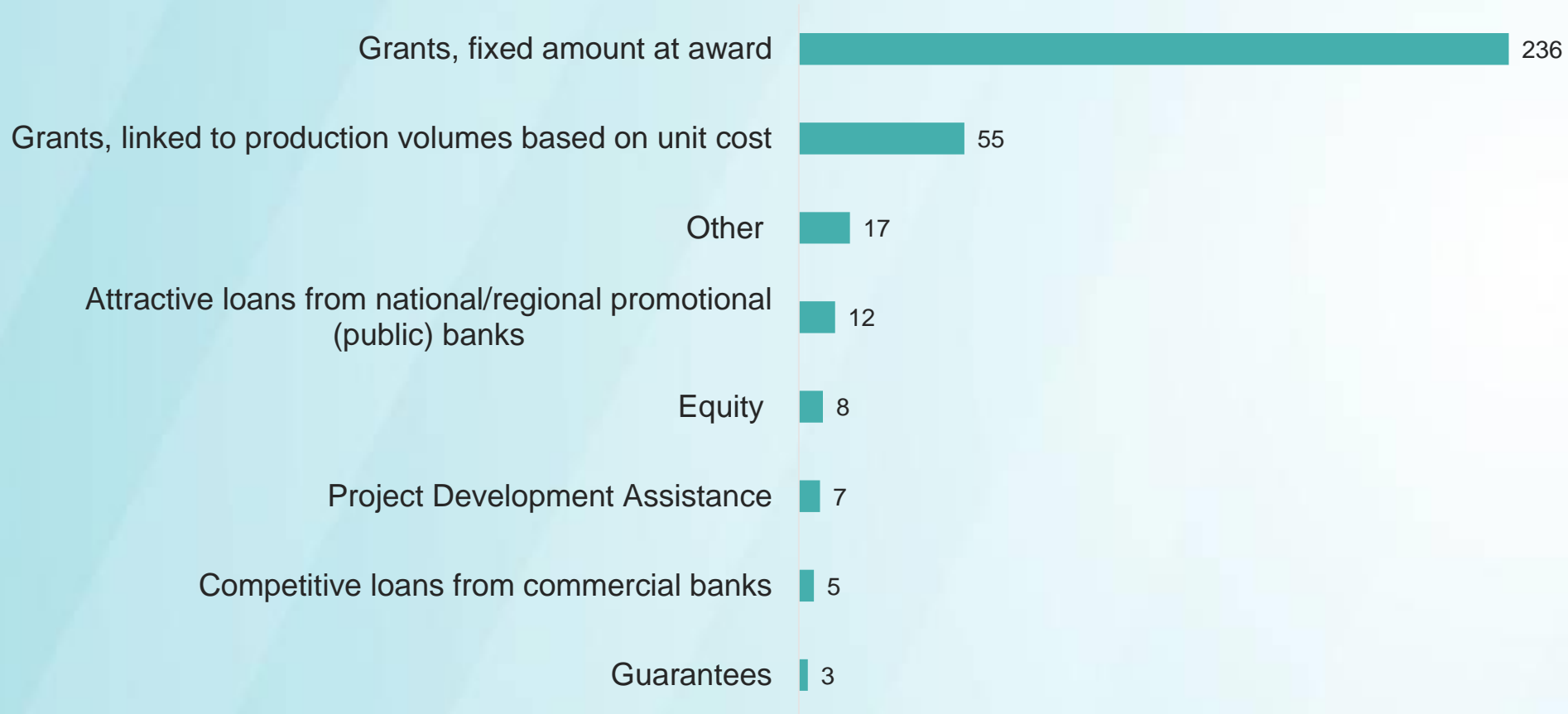
Number of projects expected to be deployed	Colour code
Between 0 and 10	
Between 11 and 50	
More than 50	

Total # of responses 973 (a respondent may expect to deploy more than one project in more than one country)

# Type of funding support needed

**Grants** to either a fixed amount award or linked to production volumes based on unit cost are the **main type of needed support** in order for the projects to progress

*Number of respondents*



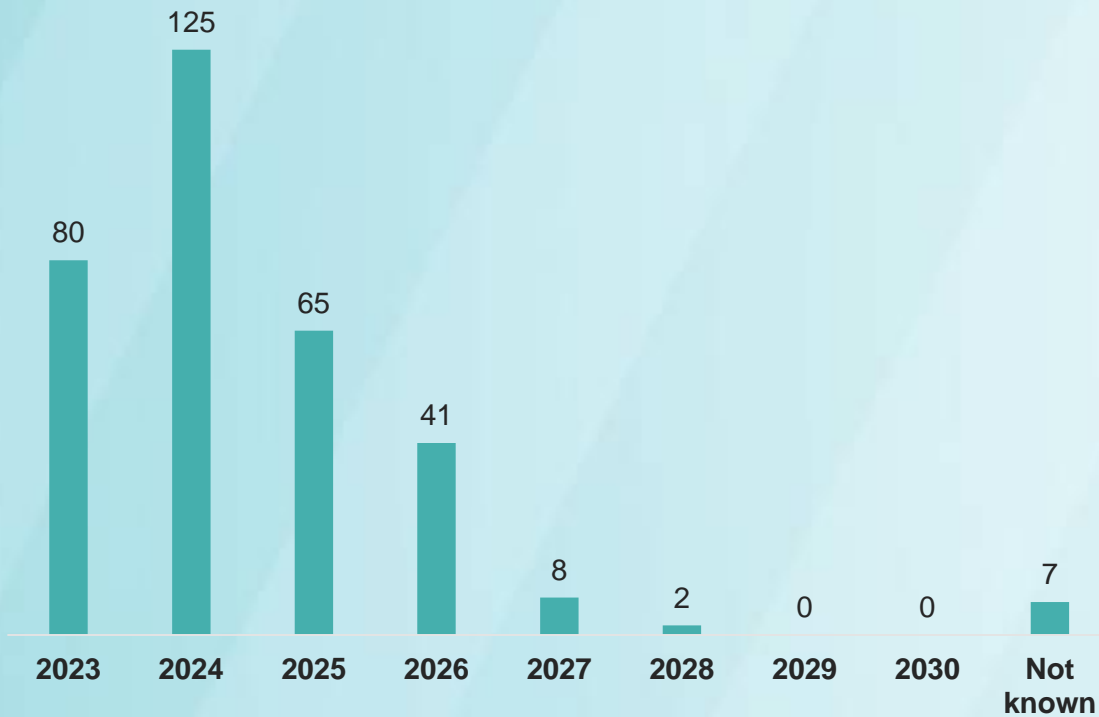
Total # of respondents 343

# Key financial and operational dates

82% of respondents plan to **reach final investment decision** between 2023 and 2025. In addition, 80% expect their projects to **enter operation** between 2024 and 2028.

*Number of respondents*

Expected year to reach the final financial decision



Total # of respondents 327

Expected year to enter into operation

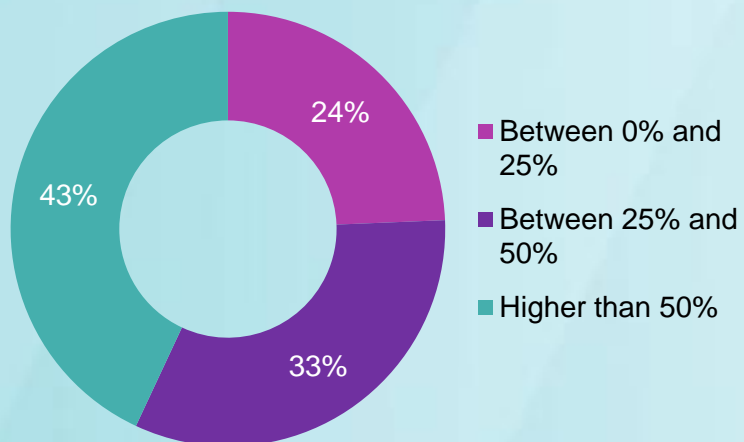


Total # of respondents 331

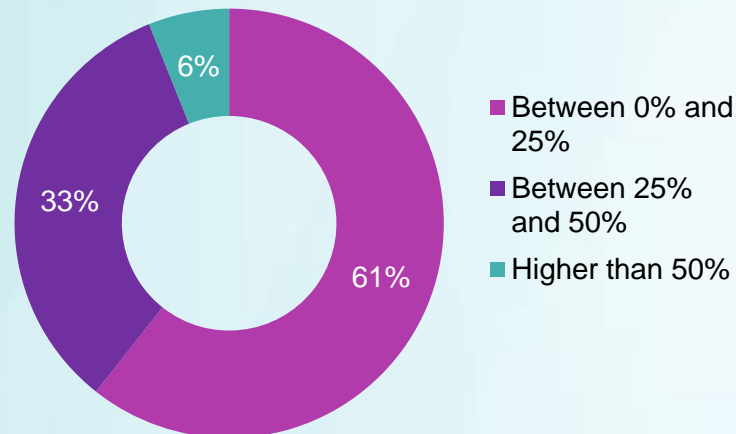
# Preferences in spending Innovation Fund criteria

EU ETS IF spending show different distributions depending on what type of funding is analysed. Majority of respondents (43%) agree that for **grants**, spending should be higher than 50%. On the other hand, only 2% of respondents agree that spending should be higher than 50% for **Financial instruments**.

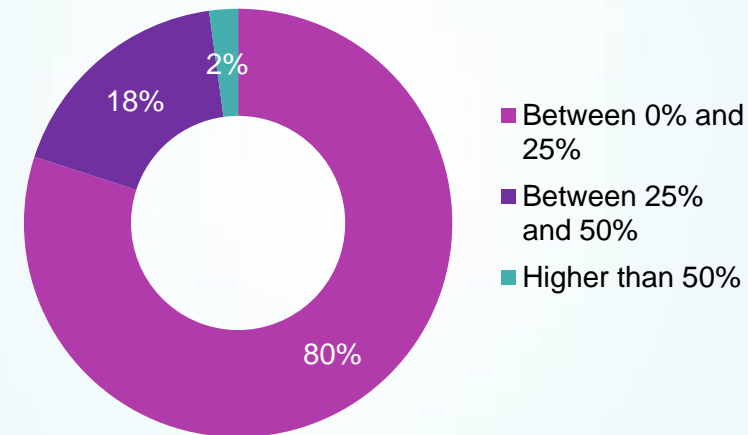
### Grants



### Auctions



### Financial instruments

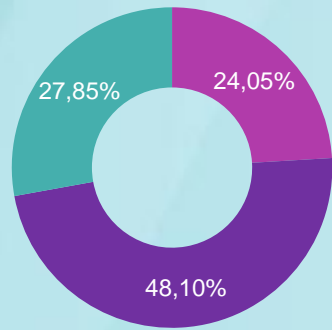


Total number of respondents per spending criteria 460

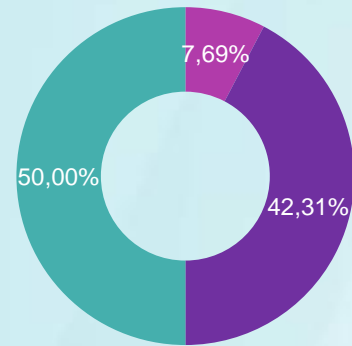
# Preferences in Innovation Fund grant spending - per sector

Renewable energy, energy storage and CCU show the highest share for desired grant spending over 50%, while Maritime and Aviation show the lowest shares.

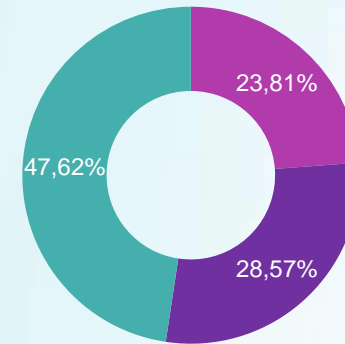
### Hydrogen



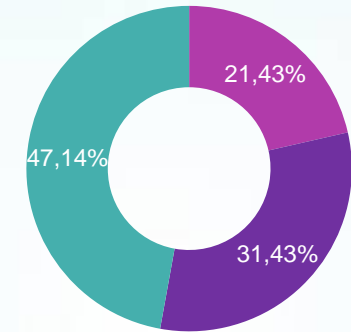
### Carbon capture and utilisation (CCU)



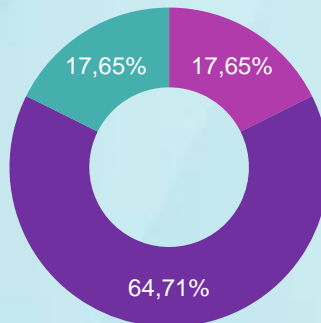
### Energy storage



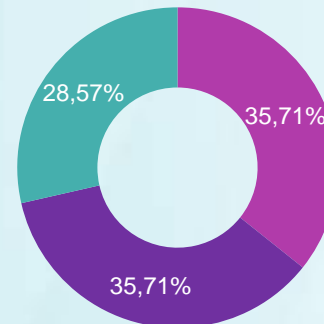
### Renewable energy



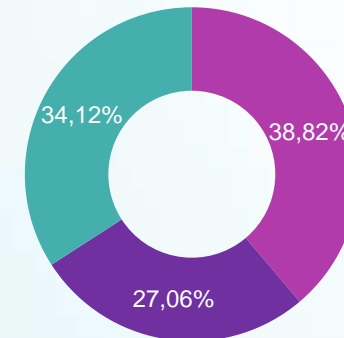
### Aviation



### Maritime



### Other type of respondent\*



\*For example: NGO's, academia, member states etc.

● Between 0% and 25%      ● Between 25% and 50%      ● Higher than 50%

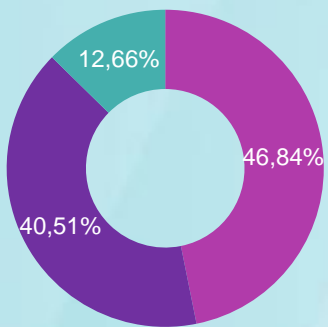
Multiple responses per sector. Each respondent can assign multiple sectors where they envisage they would need public funding support. However max 3 sectors per respondent was considered for this analysis



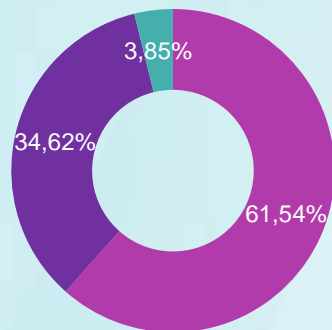
# Preferences in Innovation Fund auction spending - per sector

Overall there is an apparent prevalence of spending between 0% and 25% throughout all sectors in auction spending. Aviation, Maritime and Energy Storage show highest share for auction spending between 0% and 25%. Spending over 50% of IF resources is the minority for all analysed sectors.

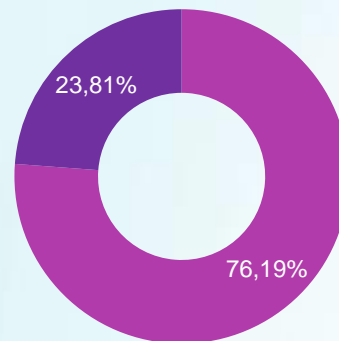
Hydrogen



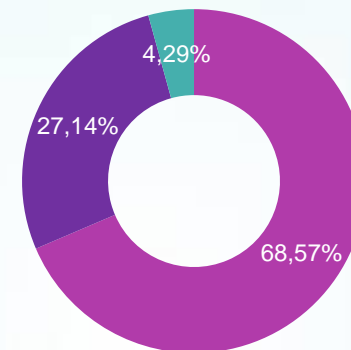
Carbon capture and utilisation (CCU)



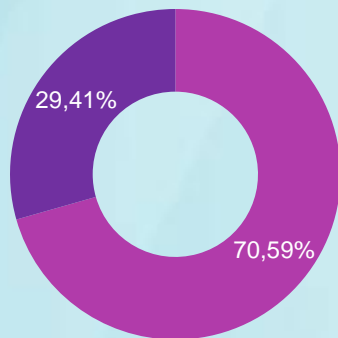
Energy storage



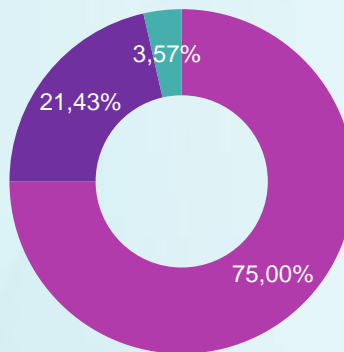
Renewable energy



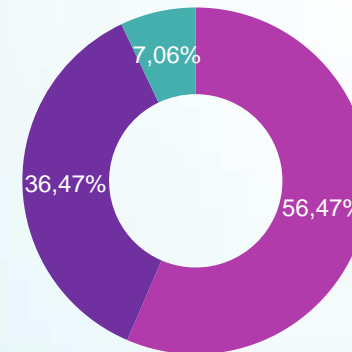
Aviation



Maritime



Other type of respondent\*



\*For example: NGO's, academia, member states etc.

● Between 0% and 25%
 ● Between 25% and 50%
 ● Higher than 50%

Multiple responses per sector. Each respondent can assign multiple sectors where they envisage they would need public funding support. However max 3 sectors was considered per respondent for this analysis

# Agenda

## Session One: 2pm – 3:30pm

- 1) Welcome and introduction (Alexandre PAQUOT, Director CLIMA C) 10min
- 2) Mandate of the Expert Group and Rules of Procedure (Maria VELKOVA, Acting Head of Unit) 5min
- 3) Revision of the Innovation Fund Delegated Act (Samuel VERSCHRAEGEN, Legal officer; Ewelina DANIEL, Policy officer, Roxana CHESOI, Policy assistant) 30min  
Q&A 45min

## Session Two: 3:45pm – 5pm

- 4) Hydrogen Bank and deep-dive on new Competitive Bidding Mechanism (“Auctions”) (Johanna SCHIELE, Policy officer) 30min  
Q&A 15min
- 5) Main Highlights Market Testing Survey (Ewelina DANIEL, Policy officer) 15min
- 6) Next Steps (Maria VELKOVA, Acting Head of Unit) 5 min**  
Q&A 10min

# Implementation Timeline 2023



30 March

3<sup>rd</sup> call for small scale projects opens

Beginning of April

Publication of auctions' T&C for stakeholders' feedback

April

Draft Delegated Regulation (DR) send to IFEG members for comments in writing

20 April

Info Day 3<sup>rd</sup> call for small scale projects

Mid-May

Publication for feedback of revised IF DR

16 May

Workshop on stakeholder feedback on pilot auctions' T&C

17 May

Workshop with Member States on "auctions as a service"

Mid-June

End of publication for feedback

13 June

Workshop on next calls and auctions

4 July

Workshop on Small Scale Call for proposals

July

Adoption of IF DR + results of 3 LSC evaluation

Early September

Auctions - Final Terms and Conditions published

Mid-September

DR enters into force

September

IFEG meeting + Consultation of MS on draft Financing Decision

19 September

Deadline 3<sup>rd</sup> small-scale call

December

First pilot auction launched

TBC

4<sup>th</sup> Calls for proposals for grants launched

# Thank you



[https://climate.ec.europa.eu/eu-action/funding-climate-action/innovation-fund\\_en](https://climate.ec.europa.eu/eu-action/funding-climate-action/innovation-fund_en)

[https://cinea.ec.europa.eu/programmes/innovation-fund\\_en](https://cinea.ec.europa.eu/programmes/innovation-fund_en)



[@EUClimateAction](https://twitter.com/EUClimateAction)  
[@cinea\\_eu](https://twitter.com/cinea_eu)



[European Climate, Infrastructure and Environment Executive Agency](#)



[EUClimateAction](#)  
[CINEATube](#)

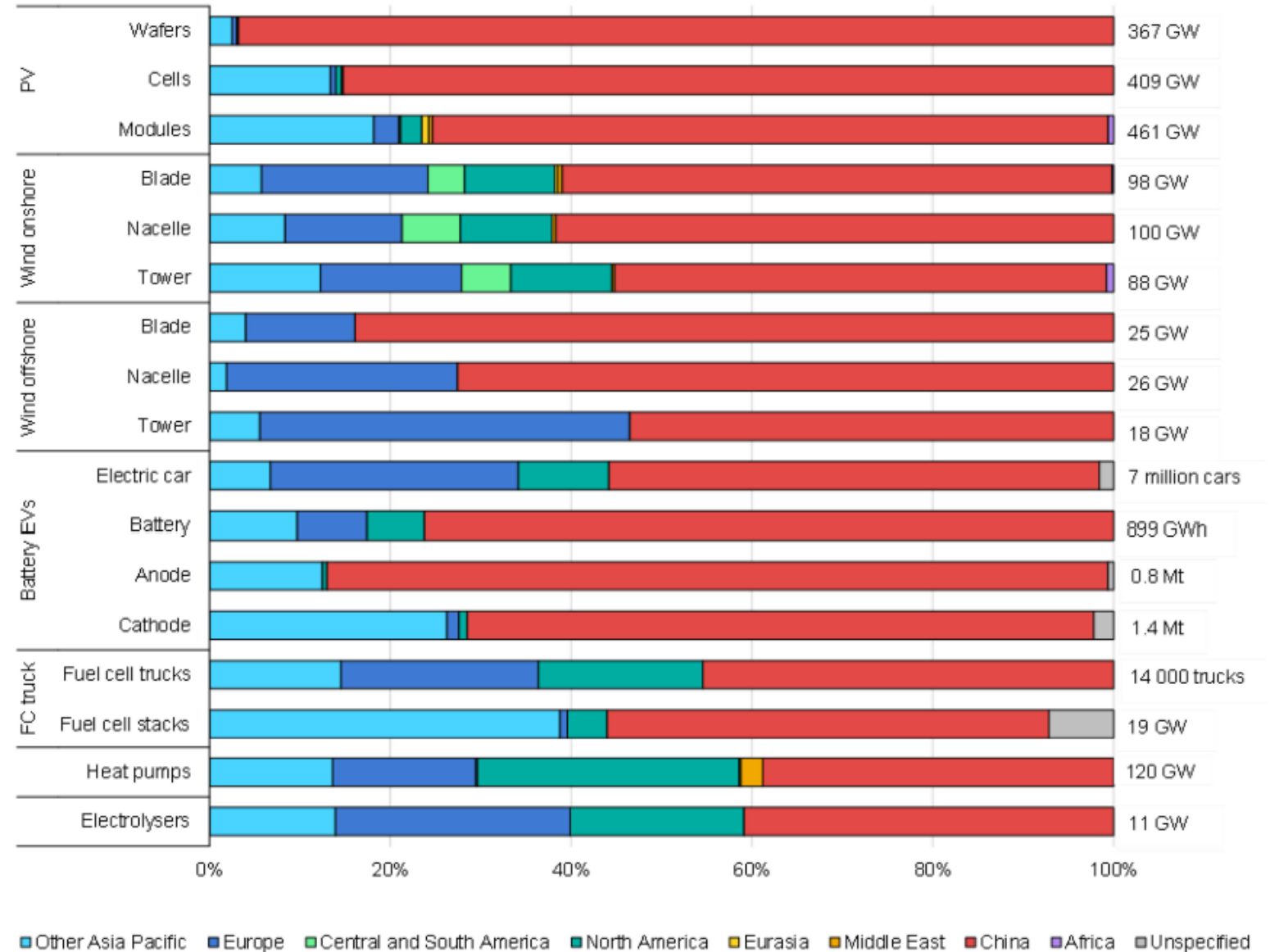


# Back-up slides

# NZIA

Aims at innovating and scaling up the manufacturing capacity of net-zero technologies in the EU & reducing dependencies on imported components

**Figure 2.7** Regional shares of manufacturing capacity for selected mass-manufactured clean energy technologies and components, 2021



# Key actions under the Net-zero Industry Act



**Simpler and faster permitting** procedures, in particular for strategic projects, for a rapid scale-up in manufacturing net-zero technologies



## **Access to markets**

Sustainable and resilience in procurement procedures and auctions to boost demand



# Key actions under the Net-zero Industry Act



## **Enhancing skills**

Net-Zero Industry Academies to provide training and education on net-zero technologies, and lead to quality job creation



## **Innovation**

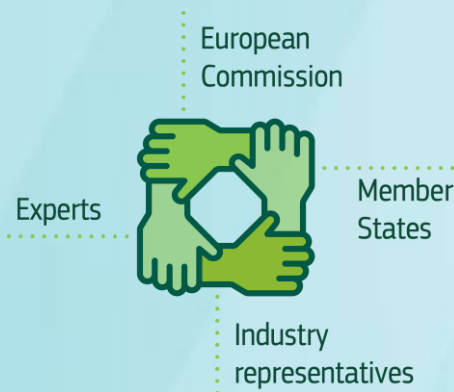
Regulatory sandboxes to help develop and test innovative net-zero technologies and create a level playing field for innovation

# Key actions under the Net-zero Industry Act



## CO<sub>2</sub> injection capacity objective

Carbon capture and storage projects will be supported, notably by enhancing the availability of CO<sub>2</sub> storage sites

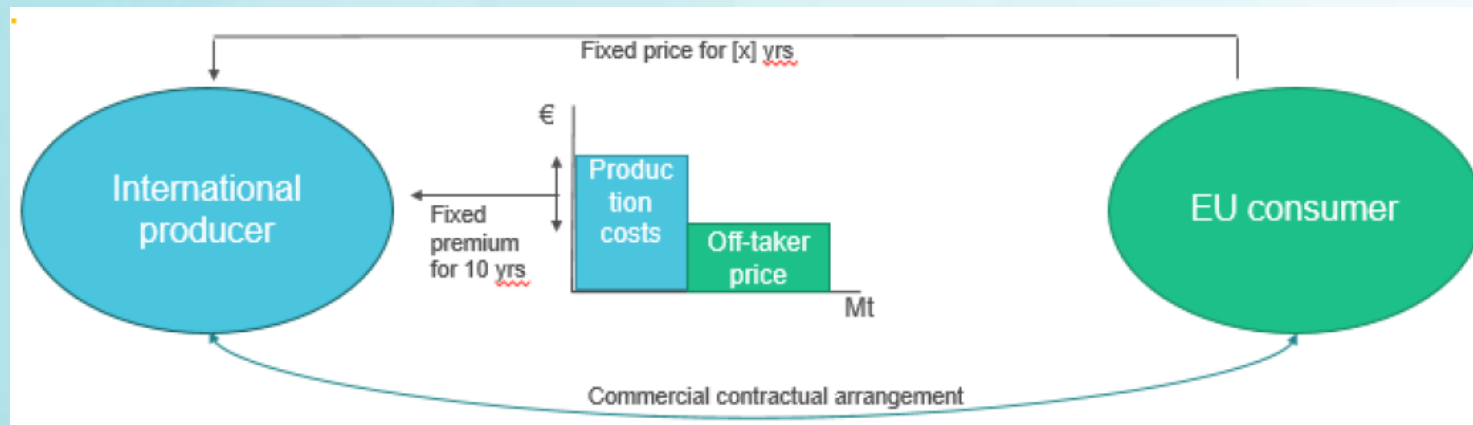


## Net-Zero Industry Platform

Address bottlenecks, attract investment, coordinate the Net-Zero Industrial Partnerships, serve as a knowledge sharing hub and help develop skills in Net-Zero Industry Academies

## 2. Imports to the EU

- **Green premium auctions** for production of renewable hydrogen imported into the EU.
- Pays a fixed premium that tops-up the project-specific off-take price.
- Hydrogen producers need to have commercial contractual arrangement with European off-taker.
- Auction will consider sustainability criteria.



# 3. Transparency and coordination



The European Hydrogen Bank can increase transparency and strengthen coordination on:

- Hydrogen demand and supply assessment
- Infrastructure needs and development/hydrogen flows
- Price information

Based on existing tools the Commission will coordinate such information to strengthen confidence in the developing hydrogen market.

# 4. Existing project financing



The European Hydrogen Bank will play a coordination role and facilitate blending with the existing financial instruments to support hydrogen projects.

- Existing European financing instruments (InvestEU, structural funds, Innovation Fund grants)
- Existing EU international cooperation financing instruments and Team Europe Initiatives with EU Member States (NDICI-GE, IPA III, incl. EFSD+ grants and guarantees)

# Project fiches for on-going projects

# Innovation Fund Dashboard

**INNOVATION FUND**  
Driving clean innovative technologies towards the market

**Beccs Stockholm: Bio Energy Carbon Capture and Storage by Stockholm Exergo**

The Innovation Fund is 100% funded by the EU Emissions Trading System

**COORDINATOR**  
Stockholm Exergo

**LOCATION**  
Stockholm, Sweden

**SECTOR**  
Bio-electricity

**AMOUNT OF INNOVATION FUND GRANT**  
EUR 180 000 000

**RELEVANT COSTS**  
EUR 608 863 394

**CAPEX**  
EUR 455 661 141

**TOTAL PROJECT COSTS**  
EUR 2 707 453 271

**EMISSION AVOIDANCE**  
7.8 Mt CO<sub>2</sub>eq

**STARTING DATE**  
01 July 2021

**PLANNED DATE OF ENTRY INTO OPERATION**  
Q3 2026

**Project summary**

The Beccs Stockholm project will create a world-class, full-scale Bio-Energy Carbon Capture and Storage (BECCS) facility at its existing heat and power biomass plant in Stockholm. The project will combine CO<sub>2</sub> capture with heat recovery, making the process much more energy-efficient than the process in a conventional Carbon Capture Storage (CCS) plant. It will capture and permanently store large quantities of biogenic CO<sub>2</sub>, leading to carbon removals from the atmosphere, also called negative emissions. The Beccs Stockholm project has a potential to remove around 7.0 Mt CO<sub>2</sub>eq over the first ten years of operation. Net carbon removals are seen as an increasingly important technology-based solution to climate mitigation, indispensable to reach climate neutrality in 2050. The project will also be a catalyst for paving the way for a new market of net carbon removals. Besides the actual negative emissions achieved, Beccs Stockholm will also have a positive impact on the balance for renewable heat and electricity, resulting in additional reduction of around 0.8 Mt CO<sub>2</sub>eq over the same period.

Climate Action

**A world-class, full-scale Bio-Energy Carbon Capture and Storage (BECCS) plant**

Beccs Stockholm will make use of a novel combination of existing technologies (Hot Potassium Carbonate for CCS and bio-fueled CHP) on a new scale, to develop the first, large commercial BECCS plant in Europe. The HPC-technology is well proven with multiple installations over the years. Its application with flue-gases from a bio-fueled CHP-plant is, however, not tested in full scale. Therefore, Stockholm Exergo has designed, constructed and now operates a smaller-scale R&D facility at the plant site with support from the Swedish Energy Agency with the objective to gain practical experience and results before designing the full scale plant. The Beccs Stockholm implementation will represent the first-of-a-kind global integration of CO<sub>2</sub> capture in an existing combined heat and power (CHP) plant that uses biomass-based fuels. By using the excess heat of the CO<sub>2</sub> capture facility to supply Stockholm's district heating network, the extra energy required for the CCS process (i.e. the energy penalty) will be greatly reduced. This energy penalty is normally in the range of 15-29% of the energy produced, while Beccs Stockholm will reduce it to a mere 2%. Importantly, 90% of the CO<sub>2</sub> in the flue gas will be captured by use of the HPC technology. Stockholm Exergo selected this CO<sub>2</sub> absorption technology based on several advantages, such as its non-toxicity, the high selectivity for CO<sub>2</sub> and as a result high purity of captured CO<sub>2</sub>, its low regeneration heat, and, the compact layout of the technology in comparison to other CO<sub>2</sub> absorption solutions. After liquefaction and buffering, the CO<sub>2</sub> will be transported by ship to an underground storage site in the North Sea (although being part of relevant cost-calculation, this part of the technology chain is not part of the project).

**Beccs Stockholm actively supports the climate neutrality goal and multiple European strategies**

The scaling up of carbon removal solutions that capture CO<sub>2</sub> from the atmosphere and store it for the long term is vital to achieve the EU objective of economy-wide Climate Neutrality by 2050. Beccs Stockholm will support the achievement of this climate goal by capturing and storing almost 800 000 tonnes of biogenic CO<sub>2</sub> per year, with the aim to further improve the technology in the future. CCS, as well as bioenergy – the building blocks of the project – are among the ten main priority actions of the European Strategic Energy Technology Plan (SET Plan) to accelerate the energy system's transformation. In particular, the SET Plan highlights

that CCS needs to become a cost-competitive technology and gain public acceptance, to be eventually commercially deployed. Beccs Stockholm will remove/avoid the emissions of 7.8 Mt CO<sub>2</sub>eq of absolute GHG emissions during its first ten years of operation. This is the equivalent to more than the 2018 GHG emissions from public electricity and heat production in Sweden. From the overall emissions removed/avoided, 90% will come from CO<sub>2</sub> capture and storage (removal), and 10% will be associated with renewable electricity and heat generation from a renewable source.

At site-level, the project will implement solutions in line with the Circular Economy Action Plan, using locally-sourced biomass waste, as a feedstock in the electricity and heat generating plant, reusing process water to eliminate or diminish the use of fresh water, and with the opportunity to supply sustainably managed forests with fly ash coming from the co-incineration of the current biomass waste with phosphorus-rich sludge, with the potential to increase Swedish forest sequestration of carbon by 0.45 Mt CO<sub>2</sub>eq per year. In line with the EU recovery ambition, the project will also create direct jobs locally and outside Sweden, acting as a springboard for many more highly-skilled engineering, construction and operation-related jobs throughout the CCS value chain.

Measures taken during the preparation phase increased the support of the project among citizens, living as close as 1.40 metres from the facility. For Stockholm Exergo, nurturing a strong and transparent relation with citizens, is and has always been a priority. One example of this, was the launch of a public acceptance survey at an early stage in the project's planning. This is an essential prerequisite for successful implementation within the boundaries of a populated city. Stockholm Exergo, which is already active in the field, will continue its efforts to establish a market for net CO<sub>2</sub> removals as a novel product. This will make the net carbon removals at Beccs Stockholm profitable for a CHP-plant, paving the way for other actors to join.

**Strategic location to support scalability and technology transfer**

The Beccs Stockholm technology can be replicated in other sites. For example, two locations have already been identified in the region where the solution could be implemented by 2030. These two sites have the potential to avoid 1.1 Mt CO<sub>2</sub>eq per year, of which 0.8 Mt from biogenic sources, thereby contributing to the necessary net carbon removals foreseen by relevant scenarios reaching climate neutrality.

The solution also has the potential to be scaled up across the economy, by replicating the technology in other industries, such as the pulp and paper industry, waste incinerators and heat plants. The project overall will help to establish a new European market for net carbon removals. By contributing to the establishment of all necessary links in the CCS value chain in Northern Europe including transport by ship of the CO<sub>2</sub> for storage in saline aquifers or depleted gas/oil-fields in the North Sea basin, Beccs Stockholm projects – are among the ten main priority actions of the European Strategic Energy Technology Plan (SET Plan) to accelerate the energy system's transformation. In particular, the SET Plan highlights

**Beneficiaries and EU contribution by beneficiary country/pr...**

Country	Number of beneficiaries	EU contribution (M€)
Belgium	~10	~300
France	~15	~250
Italy	~5	~100
Finland	~2	~50
Spain	~25	~100

**Number of projects / EU Contribution by signature and call...**

Year	Number of projects
2021	28
2022	7

**Number of projects and EU contribution by type**

Type	Percentage
Large Scale P...	18.9%
Small Scale P...	81.1%

**Project location country name**

Country	Percentage
Belgium	28.4%
Sweden	26.6%
France	11.6%
Spain	10.5%
Italy	10.1%
Finland	7.6%
Poland	1.6%
Others	1.5%

**Table:**

Project acronym	Number of beneficiaries
Project title	Average beneficiaries per project
Project description	
Project location country code	
Project free keywords	
Project structured keywords	
Project signature date	
Project signature year	
Project start date	
Project start year	

[Link Innovation Fund Dashboard](#)

[Link Innovation Fund Project fiches](#)



# Innovation Fund Country fact-sheets:

fully updated in mid-December

The screenshot shows the 'Innovation Fund projects per country' page. It features a grid of 16 country fact-sheets, each with a national flag and a link to 'Overview of supported projects'. The countries listed are: Austria, Belgium, Croatia, Finland, France, Germany, Iceland, Ireland, Italy, Netherlands, Norway, Poland, Portugal, Spain, and Sweden.

[Link Innovation Fund country fact-sheets](#)

The screenshot shows the 'Innovation Fund Programme' fact-sheet for Spain. It includes the following information:

- Overview of awarded projects in Spain:** Funded by the revenue of the EU Emissions Trading System, the Innovation Fund's goal is to help businesses investing in innovative low-carbon technologies with significant GHG emissions reduction potential. The Innovation Fund currently supports **8 projects** located in Spain, which will contribute to the decarbonisation of European industries with a total expected GHG emission reduction of **3.8 Mt CO<sub>2</sub> equivalent in the first 10 years of operation**. The total Innovation Fund grant in Spain is of **EUR 131.3 million**, out of the total relevant costs of **EUR 230.2 million**, as defined in Art 5 of the Delegated Regulation 2019/856 on the Innovation Fund<sup>1</sup>.
- Projects per category:** A donut chart showing the distribution of projects: Energy intensive industries (EII) at 75% (60 projects), Renewable Energy (RES) at 12% (1 project), and Energy Storage (ES) at 12% (1 project).
- Projects per sector:** A horizontal bar chart showing the number of projects in various sectors, categorized by Small Scale (yellow) and Large Scale (green). Hydrogen has the highest number of projects (2), followed by Solar energy (1), Refineries (1), Other energy storage (1), Glass, ceramics & construction material (1), Chemicals (1), and Biofuels and bio-refineries (1).
- Projects per phase<sup>2</sup>:** A horizontal bar chart showing the number of projects in different phases: Preparation (7 projects) and Operation (1 project).
- Top 5 technology pathways<sup>3</sup>:** A horizontal bar chart showing the number of projects in the top 5 technology pathways: Recycling/reuse: municipal solid waste (3 projects), Energy intensive industries: New process/New product (2 projects), Renewable energy: fuels (2 projects), Renewable energy: electricity (1 project), and Hydrogen production: renewable H<sub>2</sub> - other technologies (1 project).

<sup>1</sup> OJ L 140, 28.5.2019, p. 9  
<sup>2</sup> Preparation means the period before financial close is reached; construction means the period between financial close and entry into operation; operation means that the construction is finished and the project has already started production  
<sup>3</sup> Projects may employ several technological pathways, only the top 5 per country are kept in the graph.  
 State of play: 06/07/2022



# Join as project evaluator

**INNOVATION FUND**

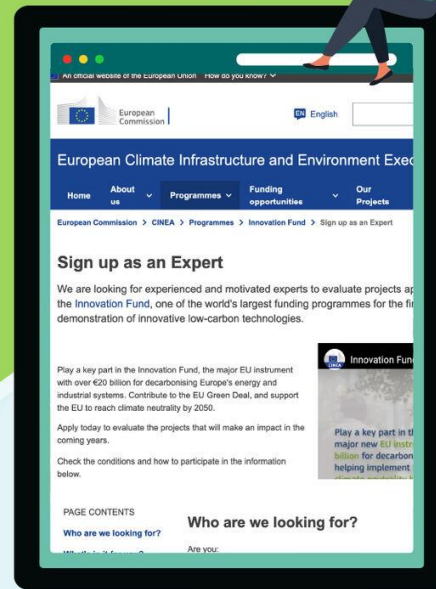
**SIGN UP AS A**

**TECHNICAL EXPERT**

**FINANCIAL EXPERT**

**GHG EXPERT**

**RAPPORTEUR**



**MORE INFO:** <https://europa.eu/!RTnFrw>

- Individual evaluation from your office/home at your best convenience
- Consensus group with other experts from your office/home

[Sign up as an Expert](https://europa.eu/!RTnFrw)  
[europa.eu](https://europa.eu)

# Where to find more information?



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>

