

POLICY BRIEF

Carbon Contracts for Difference (CCfDs), presentation of ERCST's survey results.

This policy brief aims to better understand the rationale and purpose of this instrument while at the same time providing further guidance on CCfDs key design and implementation features. This will be done through the presentation of the results of a ERCST survey carried out among relevant stakeholders.

Highlights:

- At the European level, CCfDs' concrete design and implementation features are still taking shape.
- Further details will be provided in secondary legislation (Delegated Act) once the legislative process for the EU-ETS Directive revision is completed.
- It is likely that an EU wide scheme for CCfDs within the framework of the Innovation Fund will coexist with national schemes that may differ from one another and from the EU wide scheme.
- The technological scope for the EU scheme was further specified in REPowerEU, namely renewable hydrogen production and its application in industry.
- EU industry needs solutions that guarantee both decarbonization and competitiveness vis-à-vis other parts of the world.
- CCfDs implementation should be done carefully and upon conducting a thorough impact assessment to avoid Member States granting unfair advantages to their national industries.

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1. Introduction

Carbon Contracts for Difference (CCfDs) are seen as one of the most promising alternatives for the decarbonization of EU industry.

At the European level, CCfDs' concrete design and implementation features are still taking shape.¹ At the level of EU Member States just a few Member States are currently working on the design of national schemes. The Netherlands is the frontrunner and has already put forward a scheme (SED ++)² which for some technologies closely resembles a CCfD scheme.

It is very likely that an EU wide scheme for CCfDs within the framework of the Innovation Fund will coexist with national schemes. While some key design features may vary across different European countries, they will all share the same purpose, namely the subsidization of the abatement costs of high-emitting processes and technologies.

As CCfDs carry an implicit subsidy, EU State Aid regulation will determine to what extent Member States will be allowed to subsidize their industries.

This policy brief aims to better understand the rationale and purpose of this instrument while at the same time providing further guidance on CCfDs key design and implementation features. This will be done through the presentation of the results of a ERCST survey carried out among relevant stakeholders.

2. Policy framework

2.1. Policy framework at the EU level

As part of the Fit for 55 package the EC (European Commission) proposed specific amendments to the Innovation Fund. In the revision of the EU-ETS Directive, the Commission proposed to extend the scope of the Innovation Fund, allowing to provide support through competitive tendering mechanisms (such as CCfDs), whereby up to 100% of the relevant costs of the projects may be supported.

Further details will be provided in secondary legislation (Delegated Act) once the legislative process for the EU-ETS Directive revision is completed. In preparation for this Delegated Act, DG Clima published in March 2022 a tender for assistance on the analysis and set-up of a competitive bidding mechanism for contracts for difference, carbon contracts for difference and other comparable schemes under the Innovation Fund.² The European Commission further specified in the REPowerEU communication the technological scope for CCfDs, namely renewable hydrogen production and its application in industry.

With regards to the State Aid dimension of CCfDs, at the beginning of 2022 the European Commission adopted new State Aid Guidelines for Environmental Protection and Energy. These guidelines included CCfDs among the new aid instruments available for Member States in line with State Aid rules.

² European Commission 2022, Call for tenders DG Clima, Assistance in the analysis and set-up of a competitive bidding mechanism for Contracts for Difference, Carbon Contracts for Difference or other comparable schemes under the Innovation Fund. [\(See more\)](#)

Further references to CCfDs in other EC non-legislative documents can be found below:

- **Updating the 2020 new Industrial strategy for Europe:** *As part of the proposal for a revised ETS Directive, the Commission is considering proposing a European approach to **carbon contracts for difference**, using ETS revenues and complementing other forms of support under the Innovation Fund.*
- **Hydrogen strategy:** *Develop a pilot scheme – preferably at EU level – for a **Carbon Contracts for Difference** programme, in particular to support the production of low carbon and circular steel, and basic chemicals.*
- **REPower EU Communication:** *To support hydrogen uptake and electrification in industrial sectors, the Commission will roll out **carbon contracts for difference** and dedicated REPowerEU windows under the Innovation Fund **to support a full switch of the existing hydrogen production in industrial processes from natural gas to renewables and the transition to hydrogen-based production processes in new industrial sectors, such as steel production.***

2.2. Policy framework at the national level

I. The Netherlands

The SED ++³ defines a support scheme similar to CCfDs for low-carbon technologies, where the subsidy is calculated by multiplying the maximum annual tonnes of CO₂ avoidance by the difference between the maximum application amount⁴ and the ETS price. From a State Aid perspective the European Commission gave the green light to SED ++ in December 2020.⁵

II. Germany

Germany announced, as part of its National Hydrogen Strategy⁶, the launch of a new pilot project (Klimaschutzverträge) targeted at the steel and chemical industries. Through this mechanism funding amounting to the difference between the actual cost of avoided emissions and EU-ETS prices will be paid by the German government.

On April 2021, the BMUV (*Bundesministerium für Umwelt, Naturschutz, nukleare Sicherheit und Verbraucherschutz*) provided further information on the German scheme in a white paper on the implementation of a CCfD pilot program.⁷ According to the new German government coalition agreement, the German CCfDs should have been ready by the summer of 2022.⁸ It is worth mentioning that the envisaged German CCfDs scheme does not involve an auction, which differs from the European Commission approach (competitive bidding). Some stakeholders feel that a scheme that does not involve an auction, should not be called CCfDs. Moreover, Germany has a local ETS that complements the European one. It is still to be clarified how the German local ETS may interact with the German Scheme when/if applied to projects in the transport and building sector.

³ <https://business.gov.nl/subsidy/sustainable-energy-production/>

⁴ The application amount considers the cost price for the production of renewable energy or the reduction of CO₂ emissions.

⁵ https://ec.europa.eu/competition/state_aid/cases1/20212/287356_2229457_158_2.pdf

⁶ <https://www.bmwk.de/Redaktion/DE/Publikationen/Energie/die-nationale-wasserstoffstrategie.html>

⁷ https://www.bmuv.de/fileadmin/Daten_BMU/Download_PDF/Klimaschutz/eckpunkt Papier_klimaschutzvertraege_ccfd_bf.pdf

⁸ <https://www.dena.de/newsroom/meldungen/2022/vertraege-fuer-den-klimaschutz-ccfds-als-erfolgsmodell/>

III. The UK

Following the 2019 consultation on Business Models for Carbon Capture Usage and Storage, the UK published several updates on the proposed incentives framework for Industrial Carbon Capture (ICC) business model. In the outlined business model, the UK presented its conceptual design for a CCfDs scheme, where the reference price should follow a fixed trajectory based on the projected carbon market price under the UK ETS for the contract lifetime. Initial projects under this scheme will receive funds from the CCS Infrastructure Fund (the “CIF”).

The UK department for Business, Energy and Industrial Strategy has also published two documents that should be read together with the ICC business model: a draft Standard Terms and Conditions for ICC contracts⁹, as well as a draft Front-End Agreement¹⁰. The proposals were open to public consultation until June 10th 2022. The Government is seeking to publish the final generic ICC Contract later this year. The exact timetable for negotiations is to be confirmed, with the first projects expected to be awarded contracts from mid-2023.

It is worth mentioning that the UK has ruled out Carbon Contracts for Difference to support the uptake of clean hydrogen, favoring the use of Contracts for Difference (CfDs) for this technology.

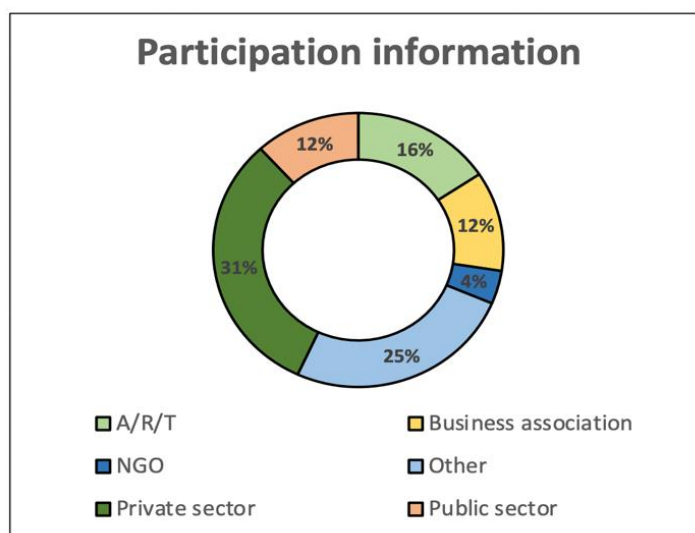
IV. France

The French Ministry for the Economy and Finance launched a public consultation which closed in April 2022, as part of France’s 2030 investment plan. The consultation document asked relevant questions regarding potential support mechanisms for decarbonization, including CCfDs. The document also mentions that CCfDs are a more suitable instrument for the deep decarbonization of industry, while support for projects with more moderate investments could be granted on simpler schemes.¹¹

3. Analysis of ERCST survey’s results

3.1. Survey’s participation information

52 responses from a broad range of ERCST stakeholders were considered, including industrial enterprises, business associations, NGOs, public administrations, research institutions, academia and think tanks (A/R/T).



⁹https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/106843/5/Industrial_Carbon_Capture_Front_End_Agreement_Annex_B_April_2022.pdf

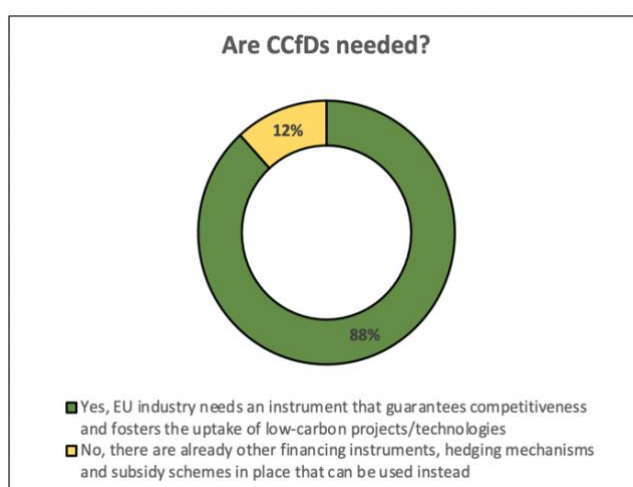
¹⁰https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/106843/5/Industrial_Carbon_Capture_Front_End_Agreement_Annex_B_April_2022.pdf

¹¹<https://www.entreprises.gouv.fr/fr/industrie/consultation-publique-sur-la-decarbonation-de-l-industrie>

3.2. Does the EU need an instrument that facilitates industrial decarbonization?

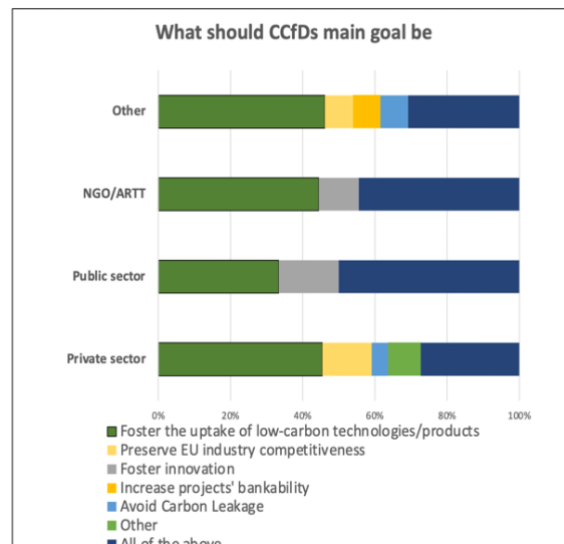
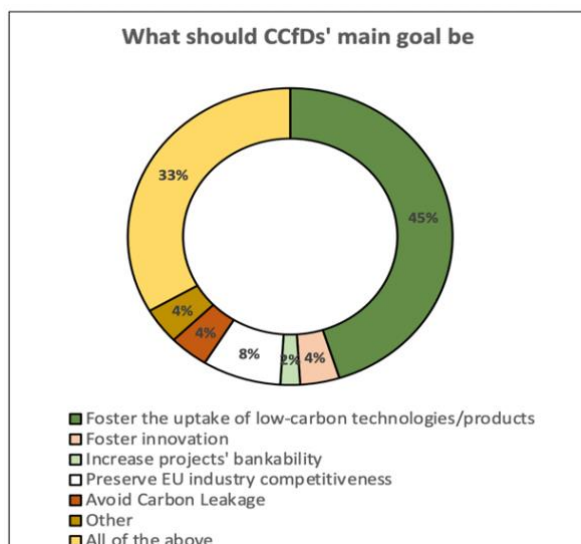
Certain low carbon technologies require a very high carbon price. EU ETS prices are currently not yet high enough to trigger this switch in some hard-to-abate sectors. This can partially be explained by the fact that the EU-ETS price signal first gives an incentive to deploy solutions that are already close to the market or undergo certain fuel-switching. The EU ETS is designed to stimulate the lowest-cost emission reductions first, and its short-term price signal therefore is less likely to directly support pre-commercial demonstration of promising technologies. Such technologies require more reliable medium to long term carbon price signals which are failing to emerge.

In this context respondents agreed almost unanimously upon the need to introduce an instrument that guarantees competitiveness and fosters the uptake of low-carbon technologies, helping industry to decarbonize. It is key to find mechanisms that guarantee EU industrial competitiveness vis-à-vis other parts of the world. However, fostering industrial competitiveness and at the same time ensuring a level playing field in the internal market is a complex task.



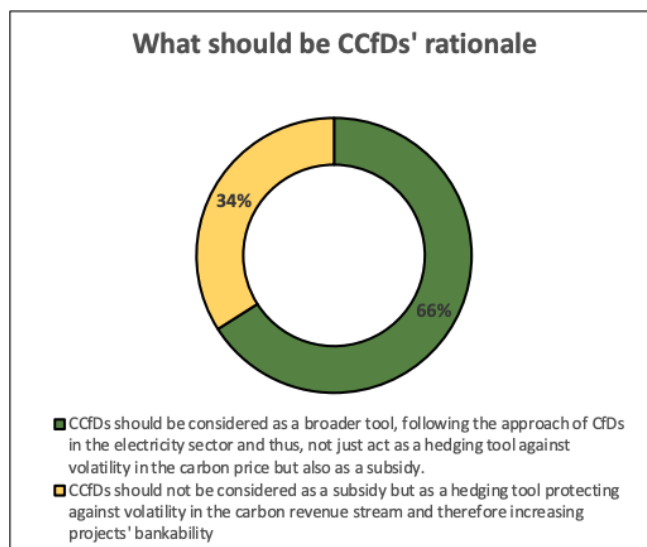
3.3. What should CCfDs' main goal be?

When asked about CCfDs main goal, almost 1/3 of respondents indicated that CCfDs should not pursue a single goal but a combination of them. These include the uptake of low-carbon technologies/products, fostering innovation, increasing projects' bankability, preserving EU industry competitiveness, or avoiding carbon leakage. As CCfDs at the EU level are discussed within the framework of the Innovation Fund, it is striking that just 4% of respondents selected the option "foster innovation".



3.4. CCfDs as a subsidy vs. hedging tool

Current EUA prices are not triggering the switch to less carbon intensive technologies in some hard-to-abate sectors. To allow for low carbon technologies to compete with cheaper “high-carbon” alternatives, policies that complement and reinforce the role of carbon pricing are needed. These policies are needed with urgency, as a big share of cement, steel, and steam cracker plants in the EU27 will require major reinvestments by 2030, thus increasing the risk of CO₂ lock-in if current production methods remain unchanged.¹² However the implementation of CCfDs should be done carefully and upon conducting a thorough impact assessment to avoid Member States granting unfair advantages to their national industries and distorting competition in the internal market.

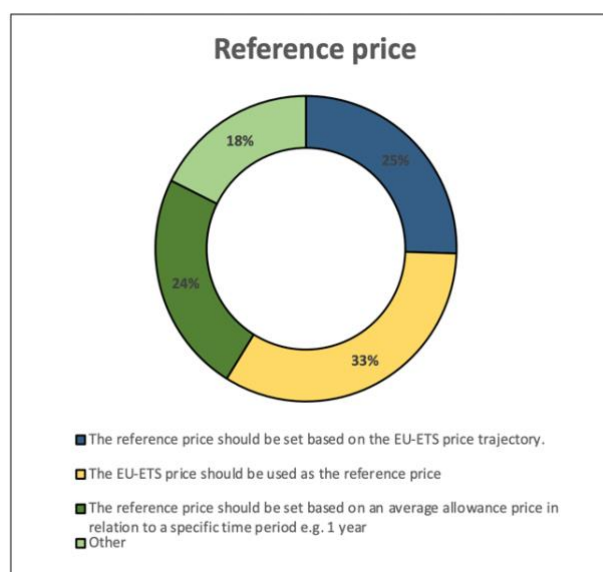


A considerable amount of Member States' resources was channeled into the decarbonization of the power sector. EU industry would now like to receive a similar level of support. However, there are significant differences between the power and industrial sector. Although subsidies were widely granted for the decarbonization of the power sector, a parallel approach to industry would have much bigger implications and risk distorting the level playing field in the EU.

When asked whether CCfDs should be considered as a subsidy vis-à-vis a hedging tool protecting against volatility in the carbon revenue stream, 66% of respondents argued that CCfDs should be considered as a broader tool, like the finance that transformed the electricity sector. On the contrary, 34% of respondents stated that CCfDs should just be considered as a hedging tool.

3.5. Reference price and strike price

On the reference price: Most respondents agreed upon using the EU-ETS price as the reference price. Conversely, 25% of respondents argued that the EU-ETS price should not be used as reference. One example of the latter would be using CCfDs to cover the full abatement costs of a specific low-carbon process (i.e. the “difference” should be calculated between production costs of low carbon technologies and production costs of conventional ones, without discounting the avoided ETS-related costs)¹³. However, this approach increases the risks of CCfDs being used as pure subsidies. Moreover, calling CCfDs to an scheme that does not include



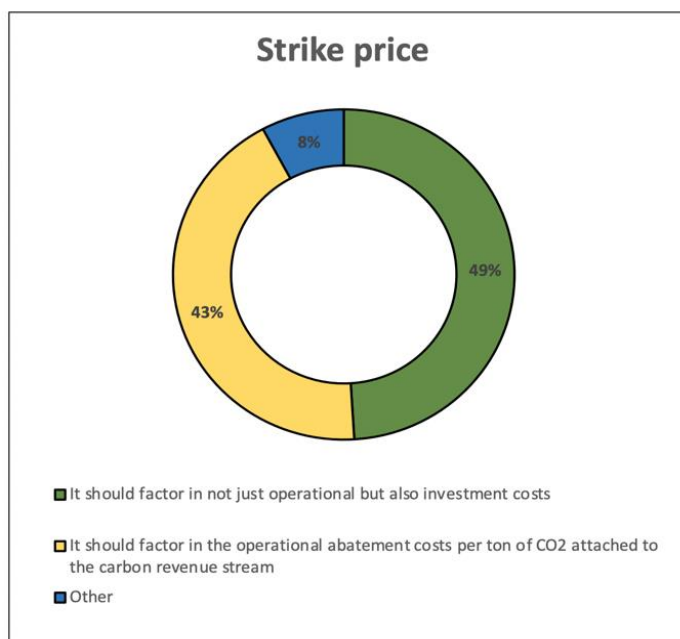
¹² Agora Energiewende 2020, A Clean industry package for the EU.

¹³ Eurofer 2021, position paper on CCfDs, [\(See more\)](#)

a clear reference to the carbon price would be difficult to justify.

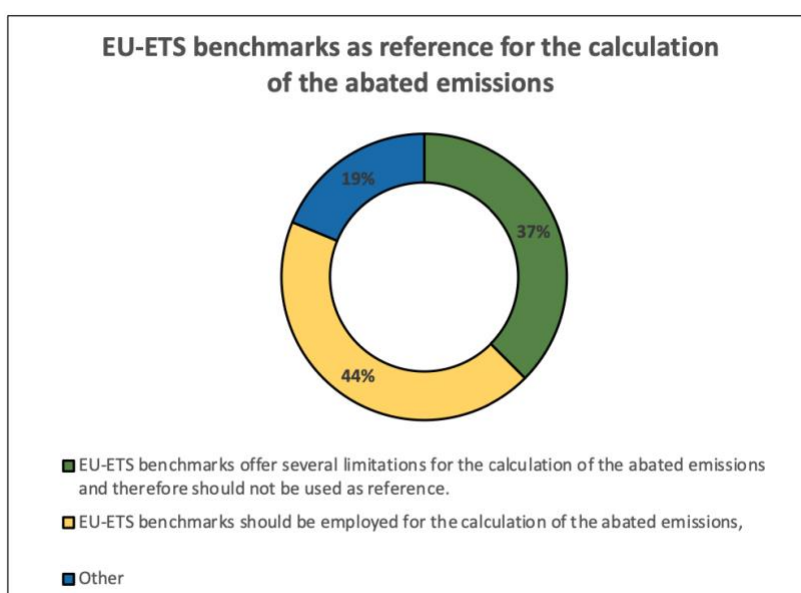
On the strike price: The support for CCfDs will be calculated based on the difference between a strike price and a reference price. This means that the higher the costs factored-in to calculate the strike price, the greater the support of the scheme will be. In other words, the costs considered to calculate the strike price will to a large extent determine the level of support, and therefore should be defined as accurately as possible to avoid over-compensation.

A relevant aspect that should be further clarified is the treatment of free allowances under such schemes, and if these should be factored-in when calculating the strike price. It is still to be clarified if CCfDs awarded projects may lose its entitlement to free allowances.



In the ERCST survey, respondents were almost equally divided between on the one hand those supporting a strike price which considers just the operational abatement costs attached to the carbon revenue stream and those supporting the inclusion of further costs such as investment costs on the other hand.

3.6. EU ETS Benchmarks for the calculation of the yearly support



In Annex 11 of the EU-ETS impact assessment the EC refers to the following formula as an example of how the yearly support in a CCfD scheme could be calculated.

$$\text{Yearly support} = (\text{strike price} - \text{av. ETS price}) * (\text{ETS benchmark} - \text{actual em.}) * \text{annual production}$$

Considering the above, stakeholders have been asked if EU-ETS benchmarks should be considered in the calculation of the yearly support. 44% of respondents supported this option, while 37% of respondents argued that EU-ETS benchmarks offer several limitations, and therefore should not be used as a reference. One of the main limitations is that some clean technologies do not have a benchmark yet. As an example, the current benchmark for hydrogen is linked with the predominant production process today for the refineries sector.

3.7. Competitive bidding

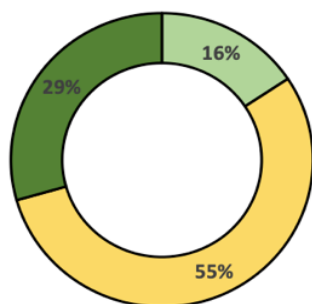
The proposed EU-ETS Directive mentions competitive bidding as the main awarding mechanism for CCfDs at the EU Level. However, the concrete design features of such a scheme are still being discussed. Designing a competitive bidding mechanism for CCfDs is a complex task, especially in view of the wide differences between products and projects.

As an example, some products may have comparable additional costs on the CAPEX (renewable power) while others may be more cost intensive in the OPEX (synthetic fuels) or in both CAPEX and OPEX (green steel). Moreover, some products may already have stable and liquid benchmark prices whereas for other products, such as renewable hydrogen and CCS, markets are still in a nascent stage. A call for tender by DG Clima requiring assistance in the analysis and set-up of a competitive bidding mechanism for CCfDs was closed in April 2022.¹⁴ At the national level Germany is also considering direct awards.

Competitive bidding design features for an EU Scheme	
General considerations	• Which technologies could be included? • Should the mechanisms be technology-neutral, technology-specific or multi-technology? • Choice of auctioned volumes (fixed volume vs. fixed budget) • How much funding will be required?
Auction design	• Competitive bidding procedure/auction design • Requirements for minimum level of competition • Winner selection • Clearing mechanism • Remuneration
Contractual design	• Selection and definition of reference price • Selection and definition of strike price • Volume protection • Incentives • Contractual parties • Contract length

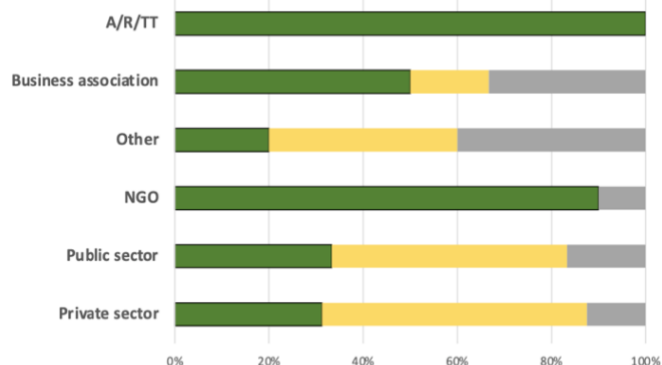
¹⁴ European Commission 2022, Call for tenders DG Clima, Assistance in the analysis and set-up of a competitive bidding mechanism for Contracts for Difference, Carbon Contracts for Difference or other comparable schemes under the Innovation Fund. [\(See more\)](#)

Competitive bidding



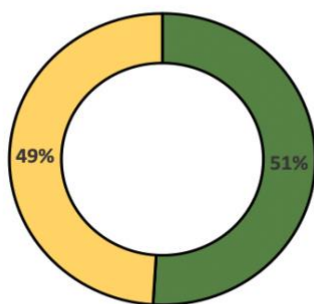
- Competitive bidding should take place at the regional level
- Competitive bidding should take place at the EU level
- Competitive bidding should take place at the national level

Competitive bidding



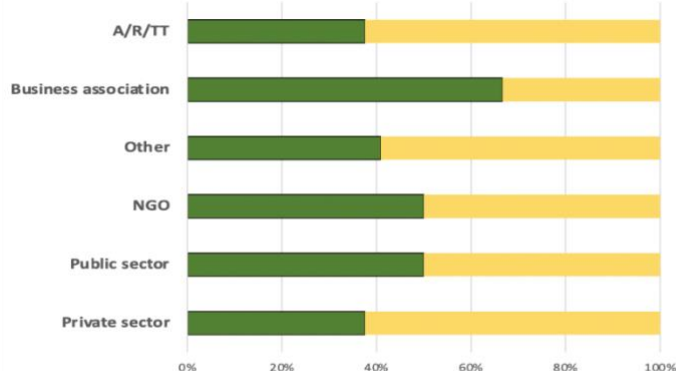
- Competitive bidding should take place at the EU level
- Competitive bidding should take place at the national level
- Competitive bidding should take place at the regional level

Competitive bidding



- Competitive bidding processes should be technology neutral, allowing competition between different technologies/processes
- Competitive bidding processes should be technology specific

Competitive bidding



- Competitive bidding processes should be technology neutral, allowing competition between different technologies/processes
- Competitive bidding processes should be technology specific

3.8. Funding

Funding for CCfDs is one of the key components of the equation. There are two main questions that should be assessed together:

- Will there be enough money to deliver the decarbonization of the EU industry?
- Where will the money come from?

The amount of funding for CCfDs in the EU is still uncertain. A Brussels based think tank suggests that the annual funding in the EU at strike prices of EUR 70, 100 and 150 / ton for low-carbon production processes to replace 20 % of existing installations across all industrial emissions would range between

EUR 4 and 16 billion a year¹⁵¹⁶. Other studies suggest that up to almost EUR 2 billion would be necessary to decarbonize half of the production of a large member state (representing 20% of the total EU market) for primary crude steel and Portland cement.¹⁷ However these estimates would be significantly higher if support is given to other sectors, such as certain basic chemicals or non-ferrous metals. Variation in the EUA prices and electricity prices will also affect the total funding requirements.

In the proposal for the revision of the EU-ETS, the EC proposes an increase of the Innovation Fund from 450 to 650 million allowances, of which 150 million will come from the new ETS for the road transport and building sectors. In addition, the revenues from the allowances which have previously been allocated for free to those industry sectors which will now be covered by the Carbon Border Adjustment Mechanism (CBAM) will be added on top, from 2026 to 2030. The increased number of ETS allowances will lead to a budget of €47bn (calculated at a €50/tCO₂ EU ETS allowance price) available over the period 2020-30.¹⁸

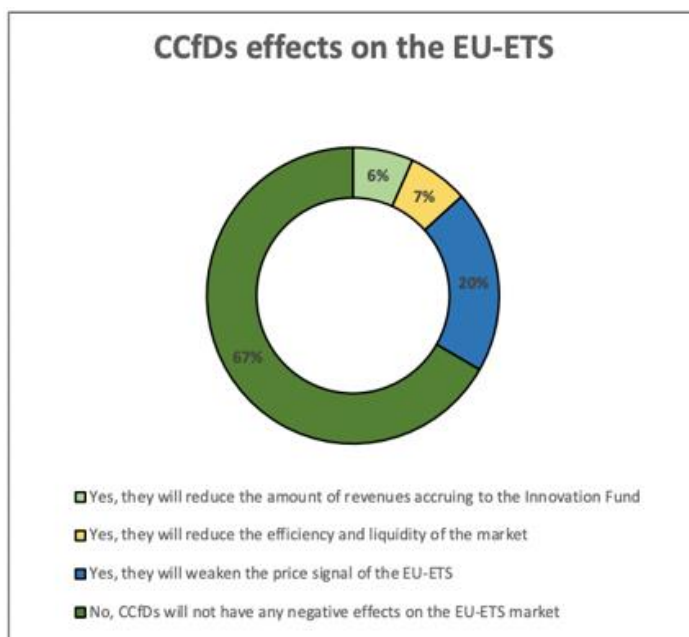
Considering that the last calls for proposals of the Innovation Fund have been oversubscribed, which reflects the current market's funding needs, and that funding for CCfDs will increase the budgetary pressure on the innovation fund, it is very unlikely that enough EU funding will be available. This could translate into national schemes filling the budgetary gap. It is therefore relevant that the Innovation Fund overall financial envelope is adequately increased to avoid a different multi-speed industrial decarbonization in Europe.

3.9. Impact on EU-ETS

The impact that such an instrument may have on the EU-ETS is unclear and insufficiently analyzed, which should serve as a caveat against a rushed implementation. Some of the potential negative effects on the EU-ETS that such an instrument may bring are summarized below:

- **Reducing efficiency and liquidity of the EU ETS market.**

Industrial market participants benefiting from CCfDs would have a reduced need for acting/hedging on the secondary carbon market, leading to reduced liquidity and thus less efficient price-formation.¹⁹



¹⁵ Bruegel 2021, Commercialization contracts: European support for low-carbon technology deployment ([See more](#))

¹⁶ A constant price of EUR 45 / per tone of CO₂ has been assumed.

¹⁷ Agora Energiewende 2020. A Clean Industry Package for the EU. ([See more](#))

¹⁸ European Commission 2022, Call for tenders DG Clima, Assistance in the analysis and set-up of a competitive bidding mechanism for Contracts for Difference, Carbon Contracts for Difference or other comparable schemes under the Innovation Fund. (See more)

¹⁹ EEX 2021, Carbon Contracts for Difference – Too many open questions for implementation? ([See more](#))

- **Surplus of EU allowances and weakening of the EU-ETS price.**

Supported projects will lead to emission savings and thus to a surplus of EUA. While emissions may decrease at project level, the overall cap will not. Instead, this will lead to freeing up EUAs, which will then be bought and used by other emitters in Europe. It is still unclear what the treatment of these allowances would be.

- **Interaction with free allowances.**

It is still unclear how such an instrument will interact with the granting of free allowances. If free allowances are not factored in the strike price, there may be a risk of overcompensation.

- **Long term price signal.**

CCfDs may support projects within variable timeframes of over 10 years depending on the technology being implemented. The strike prices associated with CCfDs will contribute to the emergence of a stronger long term carbon price signal supporting the markets in their price discovery journey.