BEIS Session on Energy from Waste with CCUS

18th May 2021

Agenda

Time	Item	Duration	Lead
10:30	Introduction from BEIS	5 mins	Will Lochhead
10:35	ICC Business Model & EfW eligibility position	10 mins	Treasure Udabor
10:45	**Commercial Questions**	45 mins	Emma Robinson
11:30	**Technical Questions**	25 mins	Treasure Udabor
11:55	AOB	5 mins	Will Lochhead
12:00	End		

Meeting Procedure

Please:

- ✓ Turn off your video
- ✓ Mute your microphone
- ✓ Raise questions via raising your hand or via the chat function
- ✓ Meeting will be recorded

ICC Business Model Update – Overview

In December 2020, we set out our minded-to position on the design of an Industrial Carbon Capture (ICC) business model, which incorporates:

- an up to 15-year contract (the 'ICC Contract') that provides the emitter with a payment per tonne of captured CO_2, which is intended to cover operational expenses, Transport and Storage (T&S) fees and repayment of, and a rate of return on, capital investment in carbon capture equipment; and
- capital grant co-funding for a portion of the capital cost of capture projects, which will be available for initial projects only and is intended to mitigate against certain risks associated with these projects.

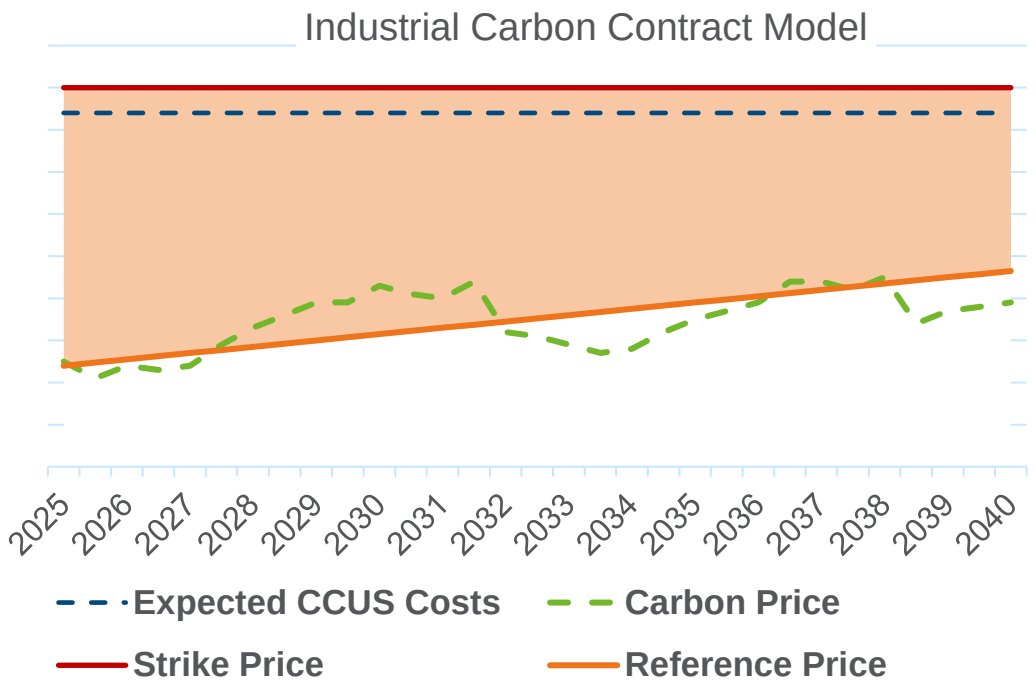
Last week, we published another update, which focused on the following areas of the ICC business model:

- eligibility criteria,
- reference price trajectory,
- treatment of free allowances,
- recovery of and return on capital investment, and
- 'capture-as-a-service' delivery models.

Updates were also published on the Cluster Sequencing Process, CCS Infrastructure Fund, and T&S and Power business models, as well as a roadmap for the CCUS Supply Chain.

Current ICC business model

- The contract payment will be calculated based on the difference between a ‘strike price’ and a ‘reference price’.
- The ICC Contract will have an **overall duration of up to 15 years** (with extension or reopener at 10 years), with capex repayment within a target 5 year period.
- The **strike price** will be **negotiated bilaterally** for FOAK projects.
- The **reference price** proposed is a fixed **price trajectory** that is defined in advance of contract negotiation, removing the emitter’s risk exposure to the market carbon price for the CO_2 they capture by providing certainty over revenues per tonne of captured CO_2.
- The model will also include specifications on how ETS free allowances will be treated.
- In the long-term we anticipate that the model will evolve, including introduction of a competitive allocation process and a market-driven carbon price to promote permanent CO_2 abatement.



Eligibility Criteria

The eligibility criteria set out below have been specifically developed for ICC projects entering Phase-2 of the CCUS Cluster Sequencing process. Only eligible projects will progress to the evaluation and bilateral negotiation stages of Phase-2.

- ✓ The project must be located in the UK.
- ✓ The project must meet the definition of an industrial facility.
- ✓ The project must have access to a carbon transport solution and storage site.
- ✓ The project must have commenced pre-FEED studies or be ready to commence pre-FEED no later than the end of December 2022.
- ✓ The project must be operational no later than the end of December 2027.
- ✓ The project must meet a range of technical eligibility criteria.

Further clarification on the definition of terms and evidence required to demonstrate this eligibility criteria will be set out in the next update (planned for summer).

Energy from Waste (EfW) Minded-to Position

- Our current minded-to position, subject to further work, is to support the application of CCUS at the following facilities via the ICC business model:
  - Waste incineration facilities with plans for energy recovery.
  - Energy from Waste facilities (used by eligible industrial facility or with outputs sold to grid or heat networks)
- Support will only be provided to the most energy efficient waste management facilities (i.e. only those facilities with energy recovery included) and to plants that are existing or already fully committed to being established
- We will continue to consider the interactions with wider government priorities, including net zero, waste strategy, air quality, clean transport and value for money as we develop our approach.
- We are still conducting further work to consider this application and will aim to provide an update in the summer.

Objectives for Expert Group session

- We need more information to determine whether government support for CCUS in EfW is needed, and if so, whether the ICC contract/a potential adaptation of the contract is the best model for support.
- As part of this, we need to better understand what the specific barriers to CCUS deployment in the EfW sector are.
  - We hope to use this session to build a clearer picture of the commercial and technical considerations and barriers.
  - We also hope to use this session to discuss some of the wider waste sector policy context, to ensure we are taking a joined-up approach.
- **Your written responses to the questions outlined on the next slides are welcomed**. These will help us better understand the reasons why support may be needed to deploy CCUS in EfW, and if that is the case, how any government support should be designed.

What support does the EfW sector need?

- Importantly, the EfW sector has a number of differences to the Energy Intensive Industries that the ICC business model has thus far been designed to support.
- The ICC business model was developed to remove the commercial barriers for industrial facilities subject to carbon pricing and with limited ability to pass the costs of CCUS through to consumers without increasing the risk of carbon leakage.
- As EfW isn't currently subject to carbon pricing, there is no clear economic incentive for the EfW sector to install and operate CCUS at this moment, though the Energy White Paper set out the Government's intention to explore extending the scope to other sectors.
- We need to further understand the ability of the EfW sector to pass the costs of CCUS through to consumers and how this may change as we move from initial projects to Nth of a kind projects, in addition to interactions with other markets (e.g. electricity revenues) and government support mechanisms that may not be applicable to other sectors.

	Refineries, iron and steel, cement, lime, and chemicals	**EfW**
Currently subject to carbon pricing	Yes	No
Currently receiving support to mitigate risk of carbon leakage	Yes	No
Potential to achieve negative emissions via CCUS	Limited (for some sectors)	Yes

What other waste sector considerations need to be balanced?

- There will be a continuing role for EfW plants in the future as part of our waste management approach. There are decarbonisation benefits of supporting CCUS in EfW, though we need to carefully consider the implications of this.
- When considering what government support is necessary to install CCUS at EfW sites, there is a need to ensure that the waste hierarchy is not undermined, for example:
  - By re-routing fossil-based plastics/recyclable waste towards the waste incineration stream.
  - Or, by making the cost of incineration too high for consumers and diverting waste towards landfill.

We are working closely with Defra to balance these policy considerations.

Q. How can we work with stakeholders across the waste sector to ensure this?

Commercial Questions

Plans and developments so far

- What do you view as the benefits of installing CCUS at your EfW plants?
- What are your long-term plans for deploying CCUS at your EfW plants? When do you expect the start of commercial operations for the CCUS system?
- What work has been conducted so far in developing plans/feasibility studies to deploy CCUS?
    - In your existing EfW plants
    - In ensuring new EfW plants will be CCUS-enabled
- Have you made an assessment of the costs associated with installing CCUS in existing and future EfW plants? If so, it would be very helpful if you could share these.

Written responses welcomed

Commercial Questions

Barriers to investment and support required

- What, if anything, is preventing your firm from investing in CCUS in EfW plants?
  - What are the key cost barriers?
  - What are the key commercial risks in investing in EfW?
  - How do you expect these barriers and risks to evolve over time? For example, as the market for CCUS develops and the costs of technology come down.
  - How would fitting carbon capture impact the revenue your plants generate from electricity and heat generation?
- Why is support needed for installing CCS at EfW plants?
  - Is the ICC business model the right model to support initial EfW CCUS projects?
  - Do you think adaptations are needed to reflect the specific context of EfW plants, and if so, what? For example, how the business model should interact with gate fees.
- Would you expect that capital support is necessary to deploy CCUS in your EfW plants?

Written responses welcomed

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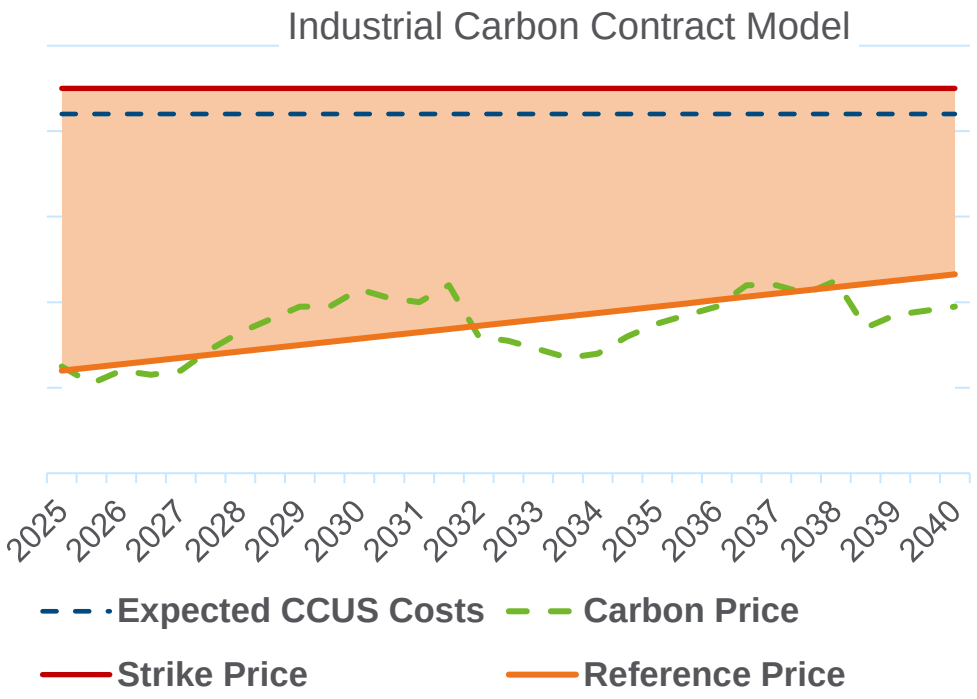


Should the nature of the EfW sector lead to a different approach on:

- *Contract length?*
- *Capex co-funding and capex repayment period?*
- *Reference price?*

Commercial/Technical Questions

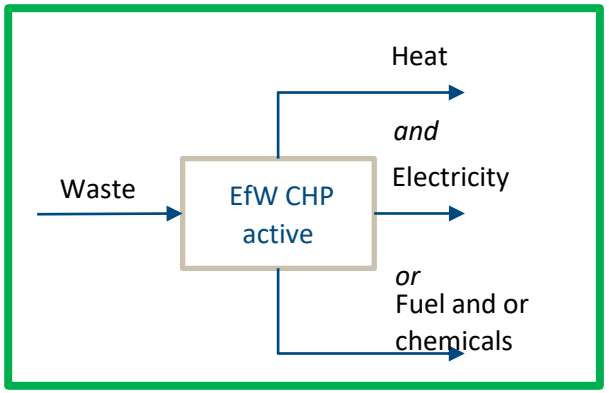
In order to help us progress the work on how the ICCUS business model could support the EfW sector, we need to gather better information on the following:

- Gate fees (£/t)
- Income from electricity generation (and how this may change with the deployment of CCS)
- Plant emission levels (tCO_2pa)
- Captured emission proposal (tCO_2pa)
- Maximum installed capacity (tonnes of waste)
- Maximum amount of waste incinerated per hour, variability over the course of the day and year, and factors influencing this variability
- Start of commercial operations for CCS system
- Assumptions around IRR

Written responses welcomed

Technical overview

- We are looking to develop detailed eligibility criteria in order to provide industry with a signal of what EfW plants will be in scope. This may include details on:
  - Technology type
  - Efficiency of the EfW plant
  - Parasitic load of CCS plant
  - Size
  - Total CO2 abated
  - Location
  - Ability to install on site or / any space constraints
  - Air quality (regulatory requirement i.e. EA permits)
  - Plans and readiness to install energy recovery- what should this look like



Q: are there any other factors worth considering?

Technical Questions

- How long do you expect it to take to develop CCUS at an EfW plant? Do you have any information on timelines?
- What is the efficiency rating of your EfW plants? (e.g. R1 rated)
- How many of your plants are CHP-active? (assuming they are CHP-ready?) If so, do you have any heat offtakers?
- What is the electricity generation and/or heat generation capacity of your plants (MW)?
- What are the potential reductions in electricity and heat generation resulting from the application of the CCUS?
- Do you have view of what EfW technology types should be eligible for support? (e.g. incineration, gasification, etc.)
- Do have detailed information on the proportion of biogenic content for both the input and flue gas streams?

Written responses welcomed

AOB

End