



UK Government

Carbon Capture, Usage and Storage

Industrial Carbon Capture Business Models Update

November 2025



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Introduction

Carbon capture, usage and storage (CCUS) will decarbonise power and industry in a way that drives growth, with CCUS projected to support up to 50,000 jobs and add £5 billion of value annually by 2050, and is part of the lowest cost pathway to Net Zero. CCUS is a crucial technology in the mission to accelerate to Net Zero and the meeting of the UK's Carbon Budget 6 (CB6) objectives. This is because CCUS is the only solution to the deep decarbonisation of 'hard-to-abate' industrial sectors (e.g. chemicals, cement and waste management). As the Climate Change Committee sets out, CCUS is a "necessity, not an option"¹ to achieving net zero. Deployment of CCUS will be pursued in a way that supports wider environmental goals, including biodiversity, ecosystem health, and sustainable land use.

The development of business models for industrial carbon capture (ICC) to unlock private investment and scale up the deployment of CCUS at industrial and waste management facilities in the UK (the "ICC business models"), can help to achieve these goals and importantly deliver growth to our industrial heartlands.

The government's ambition to kickstart the UK's CCUS industry was demonstrated in October 2024, when the government announced up to £21.7 billion of available funding over 25 years. This funding is to be allocated between the HyNet and East Coast Clusters (ECC). This was further demonstrated in December 2024 when we successfully delivered the first Final Investment Decisions for ECC, in April 2025 when financial close was reached with the HyNet Transport and Storage Network (operated by Eni). Together these two clusters will help remove up to 8.5 million tonnes of carbon dioxide (CO₂) emissions each year.

Following successful negotiations, the UK's first carbon capture-enabled cement plant at Padeswood, developed by Heidelberg Materials UK, and one of the world's first full-scale carbon capture-enabled waste-to-energy facilities at Protos in Ellesmere Port, developed by Encyclis, have signed the first final ICC and Waste ICC contracts with government to begin construction².

This document provides an update on key areas of the ICC business model contracts for initial projects where policy design has evolved since the publication in October 2023 of draft ICC and Waste ICC contract standard terms and conditions³ and accompanying summary of the ICC business models⁴. The revenue support contracts entered into between LCCC and each of Padeswood and Protos, the two beneficiaries of support under, respectively, the ICC and Waste ICC business models, are expected to be published on LCCC's website⁵ in due course.

¹ The Climate Change Committee set this out in its 2019 report "[Net Zero – The UK's contribution to stopping global warming.](#)"

² <https://www.gov.uk/government/news/pioneering-carbon-capture-projects-ready-for-construction>

³ <https://www.gov.uk/government/publications/carbon-capture-usage-and-storage-ccus-business-models>

⁴ [Industrial Carbon Capture business model: summary \(October 2023\)](#)

⁵ <https://www.lowcarboncontracts.uk/>

A standard version of the ICC and Waste contract standard terms and conditions have also been published alongside this document. In this document, capitalised terms have the meaning given to them in those published contracts.

Disclaimer

The positions set out in this document relate only to the standard terms and conditions for the ICC and Waste ICC revenue support contracts for initial projects.

The design of the business models intended to be used to support ICC and Waste ICC projects in the future remain subject to development and the positions set out here should not create any expectation as to the design of those business models. We reserve the right to amend all positions set out within this document for any reason, and in particular to ensure that proposals in future provide value for money, are consistent with subsidy control principles and government is comfortable with any balance sheet implications.

Purpose of this document

This publication follows on from the publication in October 2023 of standard terms and conditions and Front End Agreements for the ICC business models. This publication provides an update on important commercial provisions which have been finalised since the previous terms were published, and explains the rationale behind the updated positions included in the published contracts. Updates to key policy positions have been developed by the department in collaboration with relevant stakeholders, and have evolved following feedback received in the negotiations process.

Please note that the department is not seeking formal responses on the positions set out.

Summary of the Business Models

The ICC business models have been designed to incentivise the deployment of carbon capture technology by industrial users who often have no viable alternative to achieve deep decarbonisation. They comprise revenue support funded by the Exchequer and, for initial projects only, capital grant co-funding via the CCS Infrastructure Fund. The evolution of the ICC business models will include working with the National Wealth Fund and Great British Energy to understand how they can support delivery of CCUS and drive Value for Money.

There are two variants of the revenue support contracts; (1) the 'generic' "ICC Contract" for all eligible industrial sectors apart from successful waste management CCUS projects; and (ii) the "Waste ICC Contract" for successful waste management CCUS projects.

The revenue support contracts are based on a Contract for Difference (CfD) style framework. The ICC Contract and Waste ICC Contract are private law contracts of up to 15-years (a 10-year initial period with possible annual extensions for up to a further 5 years) and each provides the Emitter with revenue support through a payment per tonne of captured CO₂. This is intended to cover operational expenses (Opex); Transport and Storage (T&S) charges; and repayment of, and a rate of return on, capital investment (Capex) in carbon capture equipment. The Low Carbon Contracts Company Ltd (LCCC) was designated as the ICC/Waste ICC Contract Counterparty for the revenue support contracts on 5 August 2024.

Updates to the Standard Terms and Conditions and Front End Agreement

The sections below set out updates to the ICC and Waste ICC Contracts for initial projects, since draft versions were published in October 2023. These updates are relevant to both the ICC and Waste ICC Contracts, unless stated otherwise.

Capture Rate Requirements

OCP Capture Rate Requirements

Operational Conditions Precedent (OCPs) are contractual requirements that the Emitter needs to fulfil (unless waived by the ICC Contract Counterparty) before the Emitter can trigger the Start Date and receive payments for capturing and storing CO₂. The OCPs include a requirement relating to the demonstration of the Achieved CO₂ Capture Rate, which is a measure of the proportion of CO₂ captured by the Capture Plant (and therefore of the Capture Plant's performance).

In the ICC and Waste ICC Contracts, the Achieved CO₂ Capture Rate is calculated by dividing the Metered CO₂ Output by the Measured CO₂ Input, for the relevant Settlement Unit (i.e. day). The Metered CO₂ Output is the mass quantity of CO₂ captured by the Capture Plant and entering the T&S Network (or being directed to CO₂ Utilisation, if applicable) in the relevant Settlement Unit, as measured by the Outlet CO₂ Metering Equipment. The Measured CO₂ Input is the mass quantity of CO₂ in streams intended to be routed to the Capture Plant in the relevant Settlement Unit, as measured by the Inlet CO₂ Measurement Equipment.

The draft ICC and Waste ICC Contracts published in October 2023 included an OCP requiring the Emitter to demonstrate, via a twenty-four hour performance test, that they can achieve a minimum "OCP Required CO₂ Capture Rate". The OCP Required CO₂ Capture Rate was defined as an Achieved CO₂ Capture Rate equal to or greater than the higher of:

- (i) five (5) percentage points lower than the CO₂ Capture Rate Estimate; and
- (ii) eighty five per cent. (85%);

where the CO₂ Capture Rate Estimate is the Emitter's estimate of the CO₂ Capture Rate that their Capture Plant will be able to achieve, as set out in their original application for an ICC or Waste ICC Contract.

However, following feedback received during the negotiations process, this position has been revised. The OCP Required CO₂ Capture Rate has been lowered to an Achieved CO₂ Capture Rate which is equal to or greater than the higher of:

- (i) ten (10) percentage points lower than the CO₂ Capture Rate Estimate; and
- (ii) eighty per cent. (80%).

This means that the Emitter may start to receive business model payments having demonstrated a lower OCP Achieved CO₂ Capture Rate than the October 2023 position, recognising that it may take some time to optimise the Capture Plant performance, but still requiring the Emitter meeting a minimum performance standard.

However, there is now an additional obligation on the Emitter to incentivise higher performance standards to eventually be reached, which is called the “CO₂ Capture Rate Condition Subsequent”. This requires the Emitter to demonstrate, via a twenty-four hour capture rate test, that they have achieved a CO₂ Capture Rate which is equal to or greater than the higher of

- (i) five (5) percentage points lower than the CO₂ Capture Rate Estimate; and
- (ii) eighty five per cent. (85%).

The CO₂ Capture Rate Condition Subsequent may be satisfied before the Start Date, including as part of the OCP Performance Test, however, unlike the OCP Required CO₂ Capture Rate, the Emitter can still trigger the Start Date before the CO₂ Capture Rate Condition Subsequent has been satisfied, and there is no time limit for achieving the CO₂ Capture Rate Condition Subsequent.

Capex payments under the ICC and Waste ICC Contracts are made to cover the project Capex and a return component. The Capex Payment Rate is the payment the Emitter receives per tonne of CO₂ which is captured and stored. The Capex Payment Rate is calculated as follows:

$$CPR = \frac{TCP + r}{CO2_Out_T\&S_E}$$

Where:

CPR = Capex Payment Rate (£/tCO₂)

TCP = Total Capex Payment (£)

r = Total Return Component (£)

CO2_Out_T&S_E = Metered CO₂ Output to T&S Estimate (tCO₂) (note that if the project is a hybrid CCS/CCU project, the Metered CO₂ Output Estimate will be used instead, i.e. the estimate of total Metered CO₂ Output to T&S and CCU)

If the Start Date is triggered before the CO₂ Capture Rate Condition Subsequent has been satisfied, then, until the date on which it has been fulfilled, the return component will be reduced in line with the CO₂ Capture Rate achieved in the OCP performance test. Under these circumstances, the Capex Payment Rate for the purposes of the calculation of the Capex Payment shall include and be calculated on the basis of a “CS Reduced Total Return Component” (replacing the Total Return Component in the above equation), which will be calculated as follows:

$$CSRr = r \times (OCPACR \times 0.8)$$

Where:

$CSRr$ = CS Reduced Total Return Component (£);

r = Total Return Component (£);

$OCPACR$ = OCP Achieved CO₂ Capture Rate (*expressed as a decimal fraction*)

Together, these changes incentivise early operations and allow for time to optimise the Capture Plant, while providing an incentive for projects to achieve higher capture rates as soon as possible.

Operational Capture Rate Requirements

Changes have also been made to the ongoing minimum capture rate requirements during operations.

Average Achieved CO₂ Capture Rate

The methodology for calculating the Average Achieved CO₂ Capture Rate has been changed. Previously, the Average Achieved CO₂ Capture Rate was calculated by summing the Achieved CO₂ Capture Rate from each Settlement Unit (i.e. a day) in a Calculation Period (in most cases, a month), and dividing by the total number of Settlement Units. This methodology has been changed, such that the Average Achieved CO₂ Capture Rate is now calculated as the sum of the Metered CO₂ Output, divided by the sum of the Metered CO₂ Input during the relevant Calculation Period, including a factor to account for any Invalid Settlement Units. The equation will be as follows:

$$AACR = \frac{\sum_{i=1}^n ACO2_Out_i}{\sum_{i=1}^n ACO2_In_i} \times \frac{Vn}{n}$$

Where:

$AACR$ = Average Achieved CO₂ Capture Rate (*expressed as a percentage (%)*);

$ACO2_Out_i$ = Achieved Metered CO₂ Output in each relevant Settlement Unit (i) in the relevant Calculation Period (CP);

$ACO2_In_i$ = Achieved Measured CO₂ Input in each relevant Settlement Unit (i) in the relevant Calculation Period (CP);

Vn = total number of Valid Settlement Units in the relevant Calculation Period; and

n = total number of Settlement Units in the relevant Calculation Period;

The rationale for this change is to avoid a risk of the Average Achieved CO₂ Capture Rate being skewed by Settlement Units in which there was a relatively small period of time where the Capture Plant was operating, or where the Capture Plant was operating at a low throughput.

Minimum CO₂ Capture Rate and Termination Threshold Capture Rate

In addition to this change to the calculation methodology, the Minimum CO₂ Capture Rate has been amended. The Minimum CO₂ Capture Rate sets a threshold for the minimum CO₂

Capture Rate which the Emitter should aim to exceed during normal operations. Previously, the Minimum CO₂ Capture Rate was defined as an Average Achieved CO₂ Capture Rate which is equal to or greater than the higher of:

- (i) ten (10) percentage points lower than the OCP Achieved CO₂ Capture Rate; and
- (ii) eighty per cent. (80%).

This has now been amended to remove the link between the Minimum CO₂ Capture Rate and the OCP Achieved CO₂ Capture Rate (limb (i) above). The Minimum CO₂ Capture Rate is now defined as an Average Achieved CO₂ Capture Rate in respect of a Billing Period which is equal to or greater than eighty per cent. (80%).

This change ensures that an Emitter that performs particularly well during their OCP Performance Test is not subsequently subjected to more stringent requirements as a consequence of their good performance.

An additional “Termination Threshold Capture Rate” has been introduced, which is defined as an Average Achieved CO₂ Capture Rate of sixty per cent. (60%).

The consequences of breaching the Minimum CO₂ Capture Rate and Termination Threshold Capture Rate are outlined in the next section.

Minimum CO₂ Capture Rate Breach

There has been a change to the rights of the ICC/Waste ICC Contract Counterparty (the “Contract Counterparty”) to terminate the ICC/Waste ICC Contract in the event of sustained poor performance of the Capture Plant. As with the draft contracts published in October 2023, a Minimum CO₂ Capture Rate Breach will be deemed to have occurred if the Emitter’s Average Achieved CO₂ Capture Rate is lower than the Minimum CO₂ Capture Rate for three consecutive months, or three non-consecutive months in any six-month period.

Previously, following a Minimum CO₂ Capture Rate Breach, the Emitter would have a window of opportunity to rectify the breach by the Capture Rate Breach Deadline, set at 18 months after the Minimum CO₂ Capture Rate Breach (or longer if agreed with the Contract Counterparty). If the Emitter failed to rectify the breach by this date, the Contract Counterparty would have the right, but not the obligation, to terminate the ICC/Waste ICC Contract.

In this update to the ICC/Waste ICC Contract, the rectification period and Capture Rate Breach Deadline remains, however the right for the Contract Counterparty to terminate the ICC/Waste ICC Contract will instead be linked to any breach of the new Termination Threshold Capture Rate.

If following the Capture Rate Breach Deadline, the Minimum CO₂ Capture Rate Breach has not yet been rectified, but the Termination Threshold Capture Rate has not been breached, a financial remedy will apply which reduces the Capex Payment Rate until the Minimum CO₂ Capture Rate Breach has been rectified. This financial remedy will involve the calculation of the Capex Payment using a “CRBC Reduced Total Return Component” (replacing the Total Return Component in the calculation), where CRBC stands for Capture Rate Breach Continuation, and which will be calculated as follows:

$$CRBCRr = r \times AACR$$

Where:

$CRBCRr$ = CRBC Reduced Total Return Component (£);

r = Total Return Component (£);

$AACR$ = Average Achieved CO₂ Capture Rate (*expressed as a decimal fraction*)

In any given month that the financial remedy applies, the return component will therefore be reduced in line with the actual Average Achieved CO₂ Capture Rate in that month.

Where an Emitter has failed to satisfy the CO₂ Capture Rate Condition Subsequent (see above section) *and* triggers the financial remedy for an operational Minimum CO₂ Capture Rate Breach, the Capex Payment Rate shall be calculated on the basis of the lower of the CRBC Reduced Total Return Component and the CS Reduced Total Return Component.

Termination Threshold Capture Rate Breach

A Termination Threshold Capture Rate Breach will be deemed to have occurred if the Average Achieved CO₂ Capture Rate is below the Termination Threshold Capture Rate for three consecutive months, or three non-consecutive months within a six-month period. Once a breach of the termination threshold has occurred, the Contract Counterparty will have the right, but not the obligation, to terminate the ICC/Waste ICC Contract if the breach has not been rectified by the later of the Capture Rate Breach Deadline (see section above); and 6 months after the date of a Termination Threshold Capture Rate Breach Notice (i.e. a notice sent by the Contract Counterparty to the Emitter confirming that a Termination Threshold Capture Rate Breach has occurred). The Termination Threshold Capture Rate Breach will be considered to have been rectified if the project achieves an Average Achieved CO₂ Capture Rate above the Termination Threshold Capture Rate for three consecutive months.

Extension Required CO₂ Capture Rate

If an Emitter wishes to apply for an extension beyond the initial 10-year term of their contract, they must meet a number of extension conditions, one of which is demonstration of an Average Achieved CO₂ Capture Rate over the five immediately preceding Contract Payment Term Years which is equal to or greater than the Extension Required CO₂ Capture Rate. In the ICC and Waste ICC Contracts published in October 2023, the Extension Required CO₂ Capture Rate was defined as an Achieved CO₂ Capture Rate which is the higher of:

- (i) five (5) percentage points lower than the OCP Achieved CO₂ Capture Rate; and
- (ii) eighty five per cent. (85%);

We have now amended this definition such that Extension Required CO₂ Capture Rate means an Achieved CO₂ Capture Rate which is the higher of:

- (i) five (5) percentage points less than the lower of: (a) the OCP Achieved CO₂ Capture Rate; and (b) the CO₂ Capture Rate Estimate; and
- (ii) eighty-five per cent. (85%);

As with the change that has been made to the Minimum CO₂ Capture Rate, this change ensures that projects are not placed in a worse position for overachieving during their OCP Performance Test.

Special Purpose Vehicles (SPVs)

As detailed within our April 2024 publication, the department was minded to accommodate the use of a separate SPV (if relevant) as the owner of the Capture Plant (the "Alternative Ownership Structure") and as party to the ICC/Waste ICC Contract (as distinguished from the previous approach, which had assumed that the Capture Plant and the underlying Industrial/Waste Installation would be owned and operated by the same legal entity). This approach has been pursued following discussions with industry on the challenges posed by the original requirement for the Industrial/Waste Installation and Capture Plant to be owned and operated by the same entity and to better accommodate third party financing arrangements.

The department has conducted a full review of the Waste ICC Contract to confirm the contractual amendments that the department requires to be included in the Waste ICC Contract for projects using the Alternative Ownership Structure. This was a necessary step to:

- ensure that generally both the Waste ICC Contract Counterparty and the project are in no better/ no worse position as a result of a project using the Alternative Ownership Structure;
- reflect that the Waste Installation and the Capture Plant will be owned by different entities and is intended to ensure the Emitter (as owner of the Capture Plant, but not the Waste Installation) can fulfil its obligations under the Waste ICC Contract; and
- identify any consequential impacts on the wider programme.

This exercise was undertaken first for the Waste ICC Contract due to the anticipated earlier take-up of the Alternative Ownership Structure for Waste ICC projects. The first Waste ICC Contract to utilise these terms will be published on the LCCC website. We plan to implement similar amendments to enable the Alternative Ownership Structure for ICC projects, if there is a need for prospective projects.

Cross-chain risks

The draft ICC and Waste ICC Contracts published in October 2023 include provisions to afford projects protection from T&S cross-chain risks, which projects have limited ability to manage. In light of feedback received during the negotiations process, we have reviewed the provisions and updated certain provisions to provide increased protection to the Emitter and address the concerns raised.

T&S Connection Delay Compensation

Should a T&S Commissioning Delay Event occur, DESNZ's revised policy position allows for the Emitter to be compensated for all out-of-pocket costs which are irrecoverable and unavoidable by the Emitter and arise directly from such T&S Commissioning Delay Event (subject to specified exclusions). The compensation includes payments the Emitter would have received under the ICC/Waste ICC Contract in relation to Capex and return, had the Emitter been able to access the T&S network, based on an estimated amount of CO₂ (a "TCDE Relief Amount"). The Emitter must meet certain conditions, including having satisfied all Operational Conditions Precedent (save for connection to the T&S network) and having completed its own connection works, to qualify for compensation arising from the T&S Commissioning Delay Event.

T&S Termination Payment, QCiL Construction Event Payment and QCiL Operations Cessation Event Payment

If the ICC/Waste ICC Contract is terminated as a result of a T&S Prolonged Unavailability Event, the Emitter is entitled to a T&S Termination Payment. Following a review of the drafting for this category of compensation, we now include financing break costs (uncapped) within the scope of eligible T&S Termination Costs. Similarly, the ICC/Waste ICC Contract can be terminated due to a Qualifying Change in Law (QCiL) Construction Event or QCiL Operations Cessation Event; if such an event occurs, financing break costs may also be included in the relevant compensation.

Network Code Modification

Our policy intention has always been that formal modifications to the CCS Network Code made following the Agreement Date will constitute a Change in Law (by means of the express inclusion of the CCS Network Code within the definition of "Industry Documents" in the ICC/Waste ICC Contracts). Following clarification questions received during the negotiations process, we have amended the drafting in the ICC/Waste ICC Contracts to include a specific limb within the Change of Law definition to cover amendments made to the CCS Network Code by means of the formal Modification Procedure set out in Section B of the CCS Network Code.

Post-capture measurement requirements

Since the draft ICC and Waste ICC Contract published in October 2023, we have finalised and added an additional annex (Outlet CO₂ Meter Operational Framework and Technical Specification) setting out the requirements for installation, operation and maintenance of equipment used for the measurement of the mass flow and concentration of CO₂ in the stream(s) routed to the T&S Network and (if applicable) to CO₂ Utilisation. Accurate measurement of CO₂ output is essential under the ICC and Waste ICC Contract to enable contractual payments, which are calculated based on the mass quantity of metered CO₂ output

that is captured and stored, as well as to enable the CO₂ Capture Rate and (for the ICC Contract only) Capture Factor to be determined.

Measurement Equipment

Each Emitter must install a “T&S Meter Measurement System” to measure the mass flow and concentration of CO₂. The T&S Meter Measurement System must include:

- A T&S Flow Meter(s) to measure the CO₂ Rich Stream flow rate (the “CO₂ Rich Stream” describes the gas stream that exits the Capture Plant and which primarily consists of CO₂).
- T&S Composition Analysis Equipment to measure CO₂ concentration and determine CO₂ mass fraction in the CO₂ Rich Stream.
- Any other measurement device(s) necessary to enable the calculation of the Metered CO₂ Output to T&S and the Metered CO₂ Rich Stream Output to T&S, for example fluid stream temperature and pressure devices.
- A Data Acquisition and Handling System (DAHS).

For flow metering, the preference is for a mass flow meter to be used, however a volumetric flow meter in conjunction with a densitometer is also acceptable if the system is compliant with the requirements of the Outlet CO₂ Meter Operational Framework and Technical Specification. Each T&S Flow Meter must be installed on the CO₂ Rich Stream routed from the Capture Plant to the T&S Network and, where there are multiple sub-streams, each sub-stream must be metered with a T&S Flow Meter, at agreed locations.

For the T&S Composition Analysis Equipment, the preference is for an online gas chromatograph optimised for high-purity CO₂, however suitable alternatives will be accepted if they meet the other requirements of the measurement specification and are agreed between the Emitter and the Contract Counterparty. For the purposes of the ICC/Waste ICC Contract, the CO₂ concentration of the CO₂ Rich Stream must be measured by the T&S Composition Analysis Equipment at least once every ten minutes.

Measurement data and uncertainty

An Emitter’s proposed measurement approach must meet minimum requirements regarding measurement uncertainty and data granularity.

Following the data collection and reporting requirements of Annex 11, the Emitter must calculate and report the following values to the Contract Counterparty:

- Metered CO₂ Rich Stream Output to T&S. This is the mass quantity of CO₂ Rich Stream (i.e. the total mass quantity through the flow meter, which consists primarily of CO₂ but contains small quantities of other components) entering the T&S Network from the Installation during the relevant Settlement Unit. The Metered CO₂ Rich Stream Output to T&S is used to determine the T&S Flow Charge.

- Metered CO₂ Output to T&S. This is the mass quantity of CO₂ (i.e., the mass quantity of CO₂ in the CO₂ fraction of the Rich Stream) entering the T&S Network from the Installation during the relevant Settlement Unit. The Metered CO₂ Output to T&S is used to determine the Opex and Capex payments under the contract, as well as to calculate the Capture Rate and, for the ICC Contract only, the Capture Factor.

In each case, a Settlement Unit is a period of one day.

There are different measurement uncertainty requirements for the Metered CO₂ Rich Stream Output to T&S and the Metered CO₂ Output to T&S. These differences reflect the increased uncertainty associated with measurement of CO₂ concentration. The uncertainty requirement is also relaxed at particularly low flow rates, where measurement uncertainty is higher. The following measurement uncertainty requirements apply:

- Metered CO₂ Rich Stream Output to T&S requires overall uncertainty $\leq \pm 1\%$ at flow rates $\geq 10\%$ of maximum flow rate; and $\leq \pm 2\%$ at flow rates $< 10\%$ of maximum flow rate.
- Metered CO₂ Output to T&S requires overall uncertainty $\leq \pm 1.5\%$ at flow rates $\geq 10\%$ of maximum flow rate; and $\leq \pm 3\%$ at flow rates $< 10\%$ of maximum flow rate.

For any measurement approach, the Emitter must generate a comprehensive measurement uncertainty budget which is reviewed at regular intervals and shared with the Contract Counterparty on request. These uncertainty requirements ensure that data reported to the Contract Counterparty is as accurate as possible within the limits of technical feasibility.

CO₂ Utilisation

Any Emitter which is directing a proportion of the CO₂ output from the Capture Plant towards CO₂ Utilisation will need to separately measure the mass flow and concentration of CO₂ directed towards CO₂ Utilisation. The technical specifications for the “CCU Meter Measurement System” are analogous to those for the T&S Meter Measurement System.

Downstream CO₂ Venting

In some cases, the Emitter may require the ability to vent CO₂ from the pipeline downstream of the T&S Flow Meter and upstream of the CO₂ T&S Delivery Point. This may be required to enable removal of Off-Specification CO₂ during an Off-specification CO₂ Event, or to depressurise the pipeline to enable safe working during routine maintenance operations. Projects which require this arrangement will need to agree this with DESNZ during negotiations, and Downstream CO₂ Venting will only be allowed in these specific circumstances.

In these cases, the quantity of CO₂ which is vented must be determined, via a calculation based on the internal pipe volume and gas pressure and temperature, and deducted from the Metered CO₂ Output to T&S and Metered CO₂ Rich Stream Output to T&S during the relevant Settlement Unit(s). It is expected this will be a rare event and details are provided in Annex 14 (Downstream CO₂ Vent Operational Framework and Technical Specification) of the ICC Contract and Waste ICC Contract.

Capex payment period (Waste ICC Contract only)

In the draft Waste ICC Contract published in October 2023, the Total Capex Payment and the Total Return Component are expected to be paid to the Emitter over the course of the initial 10-year term of the Waste ICC Contract. Following feedback received in the negotiations process, this position has been revised so that the Emitter can recover Capex in the first 8 years of the Waste ICC Contract and can recover any Capex shortfall (which could occur if less CO₂ is captured than expected) in the final 2 years of the Initial Term of the Waste ICC Contract, providing more flexibility to account for Capture Plant or Waste Installation operational variability.

As previously published, the annual cap on Capex payments will be set by reference to an estimated maximum quantity of CO₂ delivered by the Capture Plant to the CO₂ T&S Network Delivery Point(s) during the relevant year. This cap may vary each year, depending on expected changes in production over the Capex Payment Period, and the cap for each year is intended to be agreed during negotiations. The cap is applied through the application of a Yearly Capex Cap Multiplier, which represents the estimated maximum quantity of CO₂ delivered by the Capture Plant for each year as a proportion of the CO₂ capture quantity estimate over target Capex Payment Period, which is now 8 years. The sum of the Yearly Capex Cap Multipliers for the initial 8 years of the Contract Payment Term will sum to 1. For avoidance of doubt, a Yearly Capex Cap Multiplier will also apply to years 9 and 10 of the Capex Payment Period, and it is anticipated that these will be the same as the multiplier for year 8 of the Capex Payment Period.

Determining monthly fossil / biogenic CO₂ percentages (Waste ICC only)

The draft Waste ICC Contract published in October 2023 set out requirements for determining the monthly fossil / biogenic CO₂ percentages, which are required to calculate the applicable carbon reference price⁶. This is necessary because certain biogenic CO₂ emissions are zero-rated under the UK ETS. The Emitter must comply with the requirements for determining the fossil / biogenic CO₂ percentages set out in Annex 13 of the Waste ICC Contract.

The published draft October 2023 Waste ICC Contract set out that, once the UK ETS is expanded to apply to the waste sector, if the Emitter does not comply with the requirements for determining fossil / biogenic CO₂ percentages, this would result in the relevant Biogenic Long

⁶ The applicable carbon reference price is the Average Monthly Carbon Reference Price that applies to the relevant Settlement unit, multiplied by the Applicable Emissions Percentage for each Settlement Unit (i.e. the fossil %).

Term Sampling System (LTSS)⁷ fossil CO₂ percentage (i.e. the LTSS Fossil Emission (FE) Multiplier) being deemed as 100% for the relevant Biogenic LTSS. This has the effect of increasing the applicable carbon reference price, which then reduces the Opex Payment due to the Emitter. This would occur during each month until (and including) the month in which the breach is remedied (thereby reducing the subsidy paid to the Emitter).

Following feedback received in the negotiations process, this position has been revised. If a non-compliance(s) (a "Deemed LTSS FE Multiplier Trigger") has only occurred in relation to a Biogenic LTSS in respect of one month within the 12-month period ending on the last day of the relevant calculation month, the fossil CO₂ percentage that will apply to that Biogenic LTSS in that calculation month will, subject to certain exceptions, be the highest historical fossil CO₂ percentage (i.e. the highest LTSS FE Multiplier) calculated in relation to the relevant Biogenic LTSS in the 12-month period preceding the end of the relevant calculation month, plus an increment of 5%.

For example, if in respect of the month of December the Emitter has been determined not to have complied with the requirements in respect of one Biogenic LTSS, for the purposes of calculating the Opex payment to the Emitter for December, the Waste ICC Contract Counterparty will apply the highest LTSS FE Multiplier in the preceding 12-month period (e.g. December-November). If, for example, that was 55%, then the additional Biogenic LTSS FE Increment of 5% would be added to give a Deemed LTSS FE Multiplier of 60%. The 60% will only be applied in relation to the non-compliant Biogenic LTSS.

An exception to the method of calculating the highest historical fossil CO₂ percentage for a given Biogenic LTSS (as described above) is if: (i) the Start Date coincides with the expansion of the UK ETS to the waste sector; and (ii) a Deemed LTSS FE Multiplier Trigger occurs before an Initial Recalculation or a Final Recalculation has been conducted in relation to that Biogenic LTSS. In such case, the fossil CO₂ percentage that will apply to that Biogenic LTSS in that calculation month will be the fossil CO₂ percentage determined prior to the Start Date when carrying out the OCP Biogenic LTSS Proving Test.

If, in relation to a Biogenic LTSS, a Deemed LTSS FE Multiplier Trigger has occurred in respect of *more than one month* within the 12-month lookback period ending on the last day of the calculation month with respect to which the Deemed LTSS FE Multiplier applies, additional increments will be added to the highest historical fossil CO₂ percentage to calculate the Deemed LTSS FE Multiplier for that calculation month. For each additional month of non-compliance(s) that occurs in relation to a single Biogenic LTSS in the same 12-month lookback period, an additional 2.5% increment will be added.

Where in relation to the same Biogenic LTSS, a Deemed LTSS FE Multiplier Trigger has occurred in respect of two months, this will result in an increment of 7.5% (calculated by 5% + 2.5%). For example, if for the same example above in December, one Deemed LTSS FE

⁷ The Biogenic LTSS is a long term sampling system which measures biogenic CO₂ emissions. This measurement point must be located upstream of the Capture Plant. More than one Biogenic LTSS may need to be installed if there are multiple streams of CO₂ or if the Biogenic LTSS is located downstream of the Capture Plant Bypass Line.

Multiplier Trigger has occurred in relation to one Biogenic LTSS then the Deemed LTSS FE Multiplier will 60% (55% + 5%). For the next month, January, if the Emitter has not complied with the relevant requirements in respect of the same Biogenic LTSS in January (of the relevant Contract Payment Term Year), a Deemed LTSS FE Multiplier Trigger would be deemed to have occurred in relation to that Biogenic LTSS in respect of two months during the 12-month lookback period (e.g. January-December). Therefore, in relation to the month of January, the Waste ICC Contract Counterparty will apply the highest LTSS FE Multiplier in the preceding 12-month period plus an increment of 7.5%. For example, if the highest LTSS FE Multiplier in the preceding 12-month period was 55%, the overall Deemed LTSS FE Multiplier in January would be 62.5% (55% + 7.5%). The Deemed LTSS FE Multiplier of 60% in December and 62.5% in January will only be applied in relation to the non-compliant Biogenic LTSS.

The maximum fossil CO₂ percentage, in relation to a Biogenic LTSS, cannot exceed 100%. The increment amount to be applied will be calculated by identifying the number of non-compliances that have occurred in relation to the relevant Biogenic LTSS, within the 12-month period ending on the last day of the relevant calculation month (i.e. a rolling calculation). Due to the timings of when non-compliances can be identified, the Biogenic LTSS FE Increment will be fixed at 5% until the date on which the Waste ICC Contract Counterparty carries out an Annual Recalculation, regardless of the number of non-compliances identified as having occurred during the 12-month lookback period in advance of the Annual Reconciliation. After the end of each Contract Payment Term Year, the Biogenic LTSS Data Auditing & Verification Statement will include information on any breaches of failures to comply with the Biogenic LTSS Technical Specification, and the relevant period in which these occurred. The Waste ICC Contract Counterparty will take these findings into account and calculate whether any additional increments are required (on top of the 5% initially applied), as well as if the LTSS FE Multiplier and/or highest historical fossil CO₂ percentage applied remains correct in respect of the relevant calculation month.

In the example described above, for the purposes of calculating the Opex payment to the Emitter for January, the Waste ICC Contract Counterparty will apply the highest LTSS FE Multiplier (e.g. 55%) in the preceding 12-month period (e.g. January-December) plus a fixed increment of 5% (e.g. an overall FE Multiplier of 60%). Following the acceptance of the Biogenic LTSS Data Auditing & Verification Statement the Waste ICC Contract Counterparty would apply the highest LTSS FE Multiplier calculated in the preceding 12-month period (e.g. January-December), which may still be 55% and add 7.5% (i.e. 5% + 2.5%). An LTSS FE Multiplier of 62.5% in relation to the non-compliance Biogenic LTSS would therefore be used to recalculate the month payment in relation to the relevant calculation month.

This revised position retains the primary aim of ensuring that government does not over subsidise projects and that taxpayer money is spent appropriately. For an Emitter, the deemed value is also likely to be closer to the respective project's 'actual' historical fossil emission values, compared to the previously assumed 100%.

We will continue to keep the percentage increments under review to ensure they remain appropriate for the range of projects eligible for Waste ICC business model support.

UK Emissions Trading Scheme (ETS) Alignment (Waste ICC only)

The Waste ICC Contract, Annex 6, includes a mechanism for determining the Carbon Reference Price (“UK ETS Initial CRP Principles Review⁸”), which is required for the calculation of the Opex Payment once the UK ETS has expanded to the waste sector. Following feedback received in the negotiations process, additional provisions have been included to seek to ensure that, when carbon pricing is expanded to the waste sector, the applicable carbon reference price that applies to an abated Waste ICC Contract holder is aligned (as closely as possible) to the carbon price exposure of an unabated waste installation. Consequently, this seeks to ensure that unabated and abated waste installations are on a level playing field and that the Waste ICC Contract does not create any distortions within the waste sector.

In summary, the protections provide that the Waste ICC Contract Counterparty shall conduct a UK ETS Alignment Review in certain circumstances to ensure that:

- a) there is no direct conflict between (i) the requirements set out in the Waste ICC Contract and (ii) UK ETS requirements, which would prevent the Emitter from complying with each set of requirements (“UK ETS Conflict Review”); and
- b) the Waste ICC Contract methodology for determining biogenic / fossil CO₂ emissions aligns with the methodology that is used by the majority of the waste sector under the UK ETS (“UK ETS Alternative MRV Review”).

The UK ETS Initial CRP Principles Review, UK ETS Conflict Review and UK ETS Alternative MRV Review can be conducted concurrently or separately, and only on one occasion.

A. UK ETS Conflict Review and Further UK ETS Conflict Review

If the occurrence of a UK ETS Alignment Review Trigger results in a conflict between the requirements set out in the Waste ICC Contract and the UK ETS requirements following the expansion of the UK ETS to the waste sector, which means that it is not possible for the Emitter to comply with each set of requirements (“UK ETS Conflict Change in Law”), the Waste ICC Contract Counterparty shall conduct a UK ETS Conflict Review. A UK ETS Conflict Review can only occur up to six months prior to the commencement of carbon pricing. This back-stop has been included to allow sufficient time, before the expansion of carbon pricing to the waste sector, for the Waste ICC Contract Counterparty to implement any required changes, as well as for the Emitter to have clarity on the requirements and understanding of how the applicable carbon reference price will be calculated.

Additionally, the Waste ICC Contract includes a follow-up review of the UK ETS Conflict Review (“Further UK ETS Conflict Review”), which can be triggered if there remains a UK ETS

⁸ Previously termed as “Initial CRP Principles Review” in the October 2023 Waste ICC Contract.

Conflict Change in Law following the implementation of a UK ETS Conflict Review. The Further UK ETS Conflict Review can only be conducted up to four months prior to the start of carbon pricing for the waste sector.

B. UK ETS Alternative MRV Review and UK ETS Reversion Review

To determine the biogenic / fossil CO₂ emissions percentages, the Waste ICC Contract (Annex 13) requires the Emitter to use the Biogenic LTSS and carbon-14 (C-14) analysis methodology. In 2024, the UK ETS Authority consulted⁹ on the implementation of the expansion of the UK ETS to energy from waste and waste incineration, including MRV requirements for operators to participate in the scheme. A government response is expected in due course. Due to the current lack of certainty on the methodology/(ies) that the waste sector will be permitted to use under the UK ETS (once the waste sector is included in the UK ETS) and given that the Waste ICC Contract has been developed prior to waste integration into UK ETS being finalised, a UK ETS Alternative MRV Review has been included in the Waste ICC Contract. If the Waste ICC Counterparty determines, or the Emitter can demonstrate to the satisfaction of the Waste ICC Counterparty, that 75% or more of “Relevant Emitters” are using the same methodology as each other which is different to the Biogenic LTSS and C-14 (Annex 13 of the Waste ICC Contract) methodology, the Emitter will be permitted to use the alternative methodology. “Relevant Emitters” are defined as the Emitter, as well as other emitters which are operating an Eligible Waste Technology¹⁰ within a radius of 80 miles (excluding Hospital and Ultra Small Emitters). This position will therefore allow the Emitter to move away from the Biogenic LTSS and C-14 (Annex 13 of the Waste ICC Contract) methodology if a substantial majority of their competitors are using an alternative methodology that is permitted by the UK ETS.

The UK ETS Alternative MRV Review can only be triggered up to 12 months after the start of carbon pricing. After this date, in the scenario that there are any changes to UK ETS as a result of a Change in Applicable Law¹¹ that means the methodology permitted under the Waste ICC Contract is inoperable (such as a direct conflict between the methodology allowed under the UK ETS and Annex 13), then this may mean that a Change in Applicable Law Review may be triggered by either the Emitter or the Waste ICC Contract Counterparty (subject to the relevant threshold being met).

A “UK ETS Reversion Review” has also been included in the Waste ICC Contract to enable a return to C-14, which is the preferred methodology for the Waste ICC Contract. If, subsequent to such other methodology being permitted, 35% of “Relevant Emitters” are using C-14, the Waste ICC Contract will be brought back to the previous position of requiring the Emitter to use the C-14 methodology, and Annex 13 will be reinstated (subject to certain specified amendments). The Emitter will be able to provide supporting information in relation to changes they view as required to Annex 13. Any changes made to the Waste ICC Contract will be in the sole discretion of the Waste ICC Contract Counterparty, as they will need to consider aspects

⁹ <https://www.gov.uk/government/consultations/uk-emissions-trading-scheme-scope-expansion-waste>

¹⁰ “Eligible Waste Technologies” means any waste management facility which (A) recovers energy from the thermal treatment of residual waste; or (B) incinerates hazardous waste.

¹¹ “Change in Applicable Law” means the coming into effect, amendment, supplement, termination, repeal, replacement or withdrawal of or to: (i) any Law or Directive; or (ii) any Industry Document; or a change in the interpretation or application of any Law, Directive or Industry Document by any Competent Authority.

such as the financial and administrative burden associated with effecting further changes to Annex 13 and the remaining length of the contract.

Greenhouse Gas Removals (GGRs) (Waste ICC only)¹²

The draft Waste ICC Contract published in October 2023 included in Annex 12 the “restrict and review” policy regarding the sale of GGR Credits. As set out in the December 2022 business model update¹³, given the ongoing development of the wider policy landscape on negative emissions in the UK and the need to ensure a coherent approach to how any negative emissions sales would be claimed/accounted for, the sale of GGR Credits under the Waste ICC Contract are initially restricted. This restriction may be lifted following a review conducted by the Waste ICC Counterparty, where the Counterparty would determine whether and how the restriction should be lifted. Annex 12 includes separate review processes for Voluntary Schemes (the Voluntary Scheme Review, VSR) and Compliance Schemes (the Compliance Scheme Review, CSR). If the Waste ICC Contract Counterparty determines that there are acceptable scheme(s) in which the Emitter can participate, GGR Credits would be allowed to be sold in certain circumstances (subject to any conditions determined by the Waste ICC Contract Counterparty). Following any permitted sales of GGR Credits, payment of 90% of the gross achieved sales revenues (pre-tax) will be made by the Emitter to the Waste ICC Counterparty on a monthly basis (or, if credits are surrendered in the compliance market or Compliance GGR Credits transferred internally to a linked entity, payment of 90% of a “fallback” price).

Following feedback received in the negotiations process, we have amended the VSR to include a requirement for the Waste ICC Contract Counterparty to conduct and complete a VSR no later than the date which is 3 months prior to the final day of the Emitter’s Target Commissioning Window. This makes clear that a VSR will have been conducted prior to the Emitter becoming operational. Should the VSR conclude that the restriction can be lifted (which would remain in the discretion of the Waste ICC Contract Counterparty), the restriction would be lifted (with any conditions specified) and the sale of GGR Credits in any Acceptable Voluntary Scheme(s) permitted.

We are making this amendment to provide further clarity on the timeframe in which the sale of GGR Credits may be permitted, which may facilitate discussions between Emitters and potential offtakers regarding future sales of GGR Credits. Due to the gainshare mechanism with the sale of GGR Credits, where 90% of gross revenues are paid to government, the lifting of the restriction on GGR Credit sales represents an opportunity for the overall cost to government to be significantly reduced. It is therefore desirable for GGR sales by the Emitter to occur as soon as possible once the Emitter becomes operational, after the restriction is lifted (subject to the VSR), to ensure overall cost reductions can be realised promptly.

¹² The “restrict and review” policy in relation to GGR Credit sales is also in place for the ICC Contract. However, the amendment included in this section is only relevant to the Waste ICC Contract.

¹³ <https://assets.publishing.service.gov.uk/media/639c59bbd3bf7f7f95e05734/industrial-carbon-capture-business-model-summary-december-2022.pdf>

Next Steps

Whilst the ICC and Waste ICC Contracts have been finalised for initial projects, we are continuing to further develop the design of the business models for future projects. We have engaged with stakeholders on proposals for changes to the business models and expect to share updated positions in a future publication in due course.

This publication is available from: <https://www.gov.uk/government/publications/carbon-capture-usage-and-storage-ccus-business-models>

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