



Department for
Business, Energy
& Industrial Strategy

Carbon Capture, Usage and Storage

An Update on the Dispatchable Power Agreement Business Model

October 2021



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Disclaimer

This update sets out further details on the government's current proposals on the potential business model for power plants with Carbon Capture Usage and Storage (CCUS). The proposals, as set out in this document, and the updated provisional Dispatchable Power Agreement Heads of Terms (DPA HoTs) published simultaneously as Annex A, in whatever form they are expressed, are indicative only and do not constitute an offer by government and do not create a basis for any form of expectation or reliance.

The proposed terms, in this document and the DPA HoTs, are not final and are subject to further development by the government, and approval by Ministers, in consultation with relevant regulators and the devolved administrations, as well as the development and Parliamentary approval of any necessary legislative amendments, and completion of necessary contractual documentation. We reserve the right to review and amend all provisions within the document and its Annexes, for any reason and in particular to ensure that proposals are consistent with any new subsidy control regime.

This update takes into account engagement that has taken place since publication of the Dispatchable Power Agreement (DPA) Business Models update in May 2021. This includes engagement with the Power CCUS Expert Group, project developers, and relevant regulators, stakeholders and the DPA Counterparty. BEIS will continue such engagement as it works to refine its proposals, including engagement with the devolved administrations, to ensure that the proposed policies take account of devolved responsibilities and policies across the UK.

Introduction

In December 2020, we published an update on the DPA model followed by a further update in May 2021. The purpose of this document, which should be read in conjunction with the December and May publications and the updated DPA HoTs published alongside this document (which replace the draft Heads of Terms published in December 2020), is to set out further details and updates regarding the DPA model, reflecting work undertaken since May 2021 and feedback we have received to date.

The key objectives for the DPA were set out in the December 2020 and May 2021 updates and are reiterated below:

Provide sufficient investor confidence

It is important to balance the inherent uncertainty of a dispatchable role with the need for power CCUS to be an investable proposition. The design of the DPA availability payment mechanism forms a basis for a level of revenue certainty, but investors will need to consider the revenues which they can make from the wholesale electricity market and other markets such as those for balancing and ancillary services when building a business case. The DPA is designed to ensure the investment proposition remains without removing the incentives of the CCUS project to participate efficiently in existing markets.

Incentivise the plant to react to the wholesale electricity market

By providing availability payments which are decoupled from dispatch, the plant should be incentivised to react to market prices and provide dispatchable output without incentivising the power CCUS project to generate at all times, which would displace lower-cost and lower-carbon sources of generation such as renewables and nuclear. The flexibility of power CCUS projects should allow them to complement the intermittency of renewables by outputting the level of power needed to meet changes in electricity demand, whilst still capturing emissions from generation.

Displace comparable unabated generation and react to carbon prices

The variable payment is designed to be sufficient to ensure that a power CCUS project dispatches ahead of the unabated equivalent reference plant by accounting for the difference in costs arising from installing and operating carbon capture equipment. Incentivising power CCUS plants to displace higher carbon alternatives will maximise the contribution of these plants to electricity system decarbonisation. The level of the payment should be reactive to carbon prices and power plant costs, meaning that it is only paid when necessary.

Ensure affordability and value for money for consumers

Costs of the DPA will be recovered from consumers. This means that any spend should be efficient and look to deliver value for money for consumers through minimising unit costs, maximising competition and reducing barriers to entry.

We will continue to engage extensively with prospective developers and wider stakeholders in 2021 to test and further develop the business model design outlined in this document. Our

objective is to create frameworks which deliver on our deployment ambitions and create a sustainable market for CCUS infrastructure and capture services.

This document is being published alongside an update to the Industrial Carbon Capture (ICC) business model and the provisional Heads of Terms for the ICC Contract.

Legal and Contractual Framework

We set out below our updated thinking on the key commercial, legal and structural principles for the DPA, a private law, commercial contract between the Generator and the DPA Counterparty which will be the Low Carbon Contracts Company Ltd, to be entered into pursuant to powers provided in section 10 Energy Act 2013. As outlined in the December 2020 update, the DPA will be the key tool used to encourage low carbon electricity generation by bringing forward investment in power CCUS plants initially in GB where there is an existing Contract for Difference (CfD) regime, but potentially across the UK, and to incentivise such facilities to operate in dispatchable mode at the appropriate place in the merit order.

Unless stated otherwise in this section, terms not defined in this section will have the same meaning given to them in the DPA HoTs.

Term length

In the May 2021 update we proposed that the DPA should have a 15 year contract term for new build power CCUS plants, and that we expected a shorter DPA term was likely to be appropriate for retrofit projects. This was to reflect that retrofit projects could have lower capital costs and a shorter remaining asset life.

Following feedback from stakeholders and further consideration, we are now proposing that all projects, regardless of whether they are new build, repowered or retrofit, will have flexibility to choose an appropriate term length that is between 10 and 15 years.

The intention is to provide flexibility across a range of different approaches to implementing power CCUS whilst also facilitating competitive pricing and term lengths that are proportionate to the remaining operational life of each respective project. We consider that individual projects are best placed to determine the length of contract that will help secure investment and offer the best support for their route to market over the lifetime of the Facility, while minimising both the total and annual cost to consumers. We would expect any applicant to be able to justify the rationale for any term length that it proposed as part of the application process.

A term length between 10 and 15 years offers both an investible proposition and value for money for consumers. While longer contracts may help to provide greater investment certainty and may serve to lower annual costs to consumers, shorter contracts are likely to provide a lower overall cost to consumers across the term of the DPA. Longer contracts additionally provide greater certainty of generation capacity for the government. We consider that a term length of between 10 and 15 years strikes an effective balance between these competing considerations and offers flexibility to account for the full range of potential power CCUS projects.

Conditions Precedent

Minimum OCP and Longstop Date Commissioning Requirements

In the May 2021 update we outlined that the proposed durations for the Target Commissioning Window and Longstop Period are each 12 months. A Generator will need to satisfy a set of Operational Conditions Precedent (OCP) by the end of the Target Commissioning Window for payments under the DPA to commence. The Operational Conditions Precedent will include OCP Acceptance Test minimum thresholds for the Facility's Net Dependable Capacity, CO₂ Capture Rate, Plant Net Efficiency and Start Up Time.

If the Operational Conditions Precedent are satisfied after the expiry of the Target Commissioning Window, but before the Longstop Date, payments will still commence, but the DPA contract term will begin to run (and so will be eroded) from the end of the Target Commissioning Window, with payments not commencing until the Operational Conditions Precedent are satisfied. The DPA Counterparty will have the right to terminate the DPA if the Operational Conditions Precedent are not satisfied by the Longstop Date¹.

The Generator will also need to complete Longstop Date Acceptance Tests by the Longstop Date, demonstrating the Facility's Net Dependable Capacity, CO₂ Capture Rate, Plant Net Efficiency, and Start Up Time. These acceptance tests will have minimum thresholds that are equal to or higher than (as applicable) the OCP Acceptance Test thresholds (although they can be carried out at the same time as the OCP Acceptance Tests) and will have termination rights associated with them.

The paragraphs and table below set out the respective thresholds for both the OCP Acceptance Tests and the Longstop Date Acceptance Tests.

NDC

A Facility will be required to achieve:

- **85%** of their Net Dependable Capacity Estimate to satisfy the relevant OCP Acceptance Test; and
- **90%** of their Net Dependable Capacity Estimate to satisfy the relevant Longstop Date Acceptance Test.

CO₂ Capture Rate

A Facility will be required to achieve a CO₂ Capture rate of no less than:

- the 'OCP Required CO₂ Capture Rate', which is the higher of i) **10 percentage points** below their CO₂ Capture Rate Estimate and ii) **80%** to satisfy the relevant OCP Acceptance Test; and
- the 'Required CO₂ Capture Rate', which is the higher of i) **5 percentage points** below their CO₂ Capture Rate Estimate and ii) **85%** to satisfy the relevant Longstop Date Acceptance Test.

¹ **Note to Reader:** Further details are provided in the May 2021 Update in the section 'Target Commissioning Window'.

These floors of 80% and 85% are designed to reflect the fact that projects must have a CO₂ Capture Rate Estimate of at least 90%.

Plant Net Efficiency

A Facility will be required to achieve a Plant Net Efficiency of:

- **90%** of their Plant Net Efficiency Estimate to satisfy the relevant OCP Acceptance Test; and
- **95%** of their Plant Net Efficiency Estimate to satisfy the relevant Longstop Date Acceptance Test.

Start Up Times

A Facility will be required to start up and reach full load within:

- **125%** of their Start Up Time Estimates to satisfy the relevant OCP Acceptance Test; and
- **125%** of their Start Up Time Estimates to satisfy the relevant Longstop Date Acceptance Test.

Start Up Times will be tested during the Start Up/Shutdown Tests for cold, warm and hot starts. During these tests, the Facility must also achieve the OCP Required CO₂ Capture Rate at the OCP stage and the Required CO₂ Capture Rate at the Longstop Date stage.

Correction Curves

CO₂ Capture Rates will be tested concurrently with Net Dependable Capacity and Plant Net Efficiency during both the OCP Acceptance Tests, and Longstop Date Acceptance Tests. This is necessary as both Net Dependable Capacity and Plant Net Efficiency need to be recorded at reference site conditions with the Capture Plant operating simultaneously at the OCP Required CO₂ Capture Rate and Required CO₂ Capture Rate set out above. Correction curves will be used to adjust the Net Dependable Capacity and Plant Net Efficiency test results to the reference site conditions (including any adjustment required to account for differences between the CO₂ Capture Rates achieved during the relevant tests and the OCP Required CO₂ Capture Rate and Required CO₂ Capture Rate set out above).

Criteria	Operational Conditions Precedent Acceptance Test Threshold	Longstop Date Acceptance Test Threshold
Net Dependable Capacity	85% of Net Dependable Capacity Estimate	90% of Net Dependable Capacity Estimate
CO ₂ Capture Rate	-10 percentage points compared to CO ₂ Capture Rate Estimate (with floor of 80%)	-5 percentage points compared to CO ₂ Capture Rate Estimate (with floor of 85%)

Plant Net Efficiency	90% of Plant Net Efficiency Estimate	95% of Plant Net Efficiency Estimate
Start Up Times	125% of Start Up Time Estimates	125% of Start Up Time Estimates

Table 1: Table summarising the minimum commissioning requirements for a power CCUS plant

Milestone Requirement

In line with AR4 CfD requirements, the Generator will be required to demonstrate either i) an actual spend of 10% of Total Project Pre-Commissioning Costs, or ii) the satisfaction of specified ‘Project Commitments’, by the Milestone Delivery Date to satisfy the Milestone Requirement.

The definition of the Total Project Pre-Commissioning Costs is still under development and will be updated in due course.

Project Commitments

In the December 2020 update we set out that the project commitments contained within the DPA would be in line with the AR3 CfD and were to deter speculative or underdeveloped projects from applying for a DPA.

As part of these project commitments, we require projects to provide supporting evidence which shows that they have entered into commercially binding agreements to acquire the necessary ‘Material Equipment’ to deliver the project on time. Valid agreements such as engineering, procurement, and construction (EPC) contracts, direct supply agreements, or frameworks agreements with binding purchase orders would be acceptable supporting evidence.

We propose that to meet the definition of ‘Material Equipment’, an agreed list of equipment must meet the following requirements:

- key items on the construction programme’s critical path must be included;
- any long lead items that should reasonably be expected to be procured by the Milestone Delivery Date so that the Facility can be commissioned by the start of the Target Commissioning Window must be included; and
- such items must be of sufficient value to give confidence to the DPA Counterparty that the developer is financially committed to the project.

For example, it is expected that for a CCGT with post combustion capture, the list of equipment will include at a minimum:

- Gas Turbine and Generator (GTG)
- Heat Recovery Steam Generator (HRSG)
- Steam Turbine and Generator

- Gas Turbine / Steam Turbine Step-up (HV) transformers
- Unit transformers
- Absorber column
- Stripper column
- CO₂ Compressors

The relevant list of Material Equipment for other power CCUS technologies may include different equipment items.

Milestone Delivery Date

The Milestone Delivery Date is the date which falls 18 months after the signature of the DPA. In line with the AR4 CfD, this 18 month period will be capable of a day-for-day extension for Force Majeure (subject to satisfying certain Force Majeure extension conditions which are summarised in the DPA HoTs and subject to the Termination for Prolonged Force Majeure provisions as detailed below) or by failure of the Transmission Network Operator or Distribution Network Operator to provide connections or to reinforce the network.

In addition, given the characteristics of power CCUS plants, under the DPA additional extensions to the Milestone Delivery Date could result from failure of a Gas Licenced Transporter to provide connections to or reinforce the gas network, or failure of a T&S Operator to make the relevant T&S Network available in a timely fashion.

Changes to NDC

Permitted Reductions

We are minded to allow a Generator to make permitted reductions to their agreed Initial Net Dependable Capacity Estimate under the DPA of up to 10% prior to the Milestone Delivery Date (a 'Permitted Reduction'). We consider that this may mitigate early design uncertainty for FOAK projects, striking a balance between providing sufficient flexibility to the Generator to allow project design to be altered, while also providing certainty for government that sufficient low carbon capacity will be delivered. We do not consider it necessary to match the 25% permitted reductions under the renewable CfD as power CCUS plants should not have the same level of construction risk and modularity as an offshore wind project and there is no history of thermal projects requiring permitted reductions of this size in the CfD portfolio.

NDC Cap

The value of the Net Dependable Capacity used to calculate Availability Payments under the DPA will be set by the latest NDC measured during OCP Acceptance Tests, Longstop Date Acceptance Tests, or each year's annual NDC test (the 'Annual NDC Test'), which in any event will be subject to a cap equal to the Net Dependable Capacity Estimate (as such estimate is reduced by any Permitted Reduction made before the Milestone Delivery Date). In addition, the number of MWh of generation to which Variable Payments will be applied will be capped for every half hour period of generation by reference to the Net Dependable Capacity Estimate. This ensures that there is proportionate budgetary control in the allocation and application of DPAs.

Economic Benefits

In the December 2020 update we noted that we considered that eligibility criteria for the DPA would include submission of a supply chain plan. We also included wording in the provisional Heads of Terms published in December, noting that the supply chain OCP was subject to further review by HMG. We are continuing to consider what requirements are appropriate under the DPA for supply chain plans and to facilitate demonstration of economic benefits and will include any such proposals in a future update.

Testing

A combination of Full Load Tests and Start Up/Shut Down Tests that follow established international plant performance testing standards will be required to demonstrate that minimum performance levels have been achieved during OCP Acceptance Tests and Longstop Date Acceptance Tests.

Full Load Tests

Net Dependable Capacity, Plant Net Efficiency and Capture Rate will be measured during the Full Load Test. The Full Load Test shall consist of three test run periods. We are currently minded to set each Full Load Test run period at a minimum of 1 hour duration but are continuing to consider the technical requirements and appropriate durations for these tests. Prior to commencement of the Full Load Test the plant shall achieve the required stabilisation criteria for steady state operation. The test result will be corrected to Reference Site Conditions based upon agreed correction curves in the test procedure which are expected to include correction curves between Net Dependable Capacity / Plant Net Efficiency and:

- Ambient Temperature
- Ambient Pressure
- Relative Humidity
- Seawater Temperature (if applicable)
- Wind Speed (if applicable)
- Generator Frequency
- Generator Power Factor
- Fuel Composition / LHV
- Achieved CO₂ Capture Rate

Start Up/Shutdown Tests

Start Up Times and the CO₂ Capture Rate will be measured under cold, warm, and hot start conditions during the Start Up/Shutdown Tests, which will form part of the OCP Acceptance Tests and Longstop Date Acceptance Tests. A Facility must reach full load within 125% of the Start Up Time Estimate, and a test run period is inclusive of the time taken to fully start-up and shutdown the Facility. The CO₂ Capture Rate over the Start Up/Shutdown Test period must be at least the OCP Required CO₂ Capture Rate or the Required CO₂ Capture Rate as applicable during the relevant OCP Acceptance Tests and Longstop Date Acceptance Tests.

The definition of each start type shall be based upon:

- Cold Start: Where the preceding shutdown of the Facility has taken place more than 64 hours prior to the start.
- Warm Start: Where the preceding shutdown of the Facility has taken place more than 12 hours prior to the start.
- Hot Start: Where the preceding shutdown of the Facility has taken place more than 8 hours prior to the start.

BEIS currently considers that each Start Up/Shutdown Test should last for:

- Cold Start: 12 hours.
- Warm Start: 12 hours.
- Hot Start: 2 test periods lasting 2 hours each.

We are continuing to consider the technical requirements and appropriate durations for the Cold Start, Warm Start and Hot Start test runs.

Audit

The DPA Counterparty shall have the right to conduct an audit of records and information held by or on behalf of the Generator in relation to the DPA reporting requirements if they consider that the Generator has breached its reporting obligations under the DPA. The Generator shall reimburse the DPA Counterparty for all out-of-pocket costs of such an audit in the event this right is exercised. This is to ensure prompt and accurate reporting to the DPA Counterparty under the DPA.

Termination

We summarised certain termination rights for the DPA Counterparty and their corresponding consequences in the December 2020 update. These termination rights included: i) Pre-Start Date termination; ii) termination for Prolonged Force Majeure; iii) termination for T&S Unavailability; and iv) Default termination. In addition, following the AR4 CfD we also included termination arising as a result of a Qualifying Change in Law which gives rise to a QCiL Construction Event or a QCiL Operations Cessation Event.

We also indicated in the December 2020 update that we were considering whether there should be termination and/or contractual consequences for poor performance, and furthermore in the May 2021 update the inclusion of a Minimum CO₂ Capture Rate obligation. Further to the May 2021 update, we have provided an updated position on the Minimum CO₂ Capture Rate obligation which is detailed below in the section 'Updates to the Availability Payment Formula'.

We set out below our updated thinking on the DPA termination provisions.

Pre-Start Date termination

In the December 2020 update we proposed, following the AR3 CfD, that the DPA will contain various rights for the DPA Counterparty to terminate the DPA prior to the occurrence of the Start Date in relation to the commissioning of the Facility. Such rights are included to ensure that DPA funding which has been committed to support the deployment of power CCUS plants is not tied up indefinitely in a project that has no realistic prospect of being commissioned. The DPA will therefore include a right (but not an obligation) for the DPA Counterparty to terminate the DPA where:

- a) Initial Conditions Precedent: The Generator fails to fulfil the Initial Conditions Precedent within 20 business days after the date of the Agreement (subject to any waiver by the DPA Counterparty);
- b) Milestone Requirement: The Generator fails to fulfil a Milestone Requirement before the Milestone Delivery Date; or
- c) Longstop Date: The Generator fails to fulfil the Operational Conditions Precedent, which are set out in more detail above, by the Longstop Date.

Both the Milestone Delivery Date and the Longstop Date will be adjusted day-for-day for any delays which occur due to Force Majeure and/or for any delays that are due to the additional circumstances that are described in the 'Milestone Requirement' section above (e.g. Transmission Network Operator delay). These positions largely mirror those within the AR3 CfD, with certain capture technology-specific adaptations being made for the DPA.

In addition, following the AR4 CfD, if at any time prior to the Start Date, a Default Termination Event (see Default Termination section below) has occurred and is continuing the DPA Counterparty may also terminate the DPA.

As proposed in the December 2020 update, a Pre-Start Date termination will be on a no-liability basis.

Termination for failing Minimum Commissioning Requirements

In addition to the Operational Conditions Precedent, and as discussed above, a Generator will also have to demonstrate that the Facility meets the Longstop Date Acceptance Test Thresholds set out above for CO₂ Capture Rate, Net Dependable Capacity, Plant Net Efficiency and Start Up Times by the Longstop Date.

If a Generator fails to meet these thresholds by the Longstop Date, then the DPA Counterparty will have the right (but not obligation) to terminate the DPA. Such a termination event will be on a no-liability basis.

Termination for Prolonged Force Majeure

In the December 2020 update we indicated that we may include a DPA Counterparty right to terminate the DPA where the Generator is significantly delayed due to a continuing, unresolved Force Majeure. Further to that update, we confirm that this termination event will be included

within the DPA. This is to ensure that committed DPA funding is not tied up indefinitely in a project that has no realistic prospect of being commissioned.

The prolonged Force Majeure termination right will apply where a continuing, unresolved Force Majeure event, that first occurs between the date of signing the DPA and the date the Generator meets a Milestone Requirement, prevents or delays the development, construction, completion, testing or commissioning of the Facility for at least 18 months. Where such an event occurs, the DPA Counterparty will have the right (but not obligation) to terminate the DPA while the Prolonged FM event still ongoing.

We have considered the significant capital expenditure that projects would incur in order to complete commissioning and have therefore shortened the window in which the Prolonged FM Event must first occur so that such window ends on the date the Generator meets a Milestone Requirement, rather than at the end of the Target Commissioning Window (as initially proposed in the December 2020 Update).

As proposed in the December 2020 Update, we confirm that Prolonged FM Event termination will be on a no-liability basis given the non-fault nature of the event.

Termination for T&S Unavailability

In the December 2020 update we noted that where a non-fault event prevents the Facility from accessing the T&S Network for a continuous period (with such period to be determined), BEIS was considering whether to give the DPA Counterparty the right to terminate the DPA. In such circumstances, we said that it may be reasonable for the relevant Generator(s) to be compensated in an amount to be determined.

We are continuing to consider the appropriate contractual triggers that would result in termination for T&S unavailability under the DPA.

We have, however, given further consideration to the compensation that should be paid to a Generator in the event that a DPA is terminated as a result of T&S unavailability, and propose that such compensation should be comprised of:

- development and pre-development costs (e.g. surveys and EIAs);
- decommissioning costs;
- financing and contractual break costs (but excluding any other finance costs); and
- construction costs.

in all cases incurred in relation to the DPA for the Facility, with such compensation reduced to reflect i) any savings made by the Generator in relation to the T&S unavailability event, ii) the residual economic value of the Facility (including any market revenues that can be generated from continued unabated operation) and iii) the repayment or amortisation of the relevant construction costs (where the DPA terminates after the Start Date).

While we continue to develop the T&S unavailability provisions, we are aiming to ensure with these compensation principles that a Generator is not at risk of being unable to pay down its invested capital costs for the project if termination occurs due to prolonged T&S unavailability, provided they have taken all appropriate mitigation action.

Default termination

In the December 2020 update we proposed that the Default termination provisions in the DPA are likely to follow those in the AR3 CfD, by giving the DPA Counterparty the right to terminate the DPA for Generator events of default comprising the following: (i) insolvency; (ii) non-payment which is not rectified within a specific cure period; (iii) breach of key obligations relating to ownership of the Facility (e.g. no assignment and fraud); and (iv) breach of key obligations relating to the fuel, CO₂ and electricity meters. We confirm that these default events will be included in the DPA.

The list of Default termination events in the December 2020 update included an event of Credit Support Default. BEIS now proposes that credit support (and acceptable credit standing) will not be required under the DPA, therefore we have not considered credit support default in this list of default termination events. However, we are continuing to consider the possibility of introducing a credit support and/or acceptable credit standing requirement where a gainshare mechanism is applied to a DPA.

Termination Fees

Further to the December 2020 Update, we confirm that the Generator will be obliged to pay compensation to the DPA Counterparty as a result of a Default termination event which occurs after the Start Date, including termination for a prolonged Minimum CO₂ Capture Rate Breach but excluding termination for a failure to meet the Longstop Date Acceptance Test thresholds (which may occur after the Start Date).

The termination amount payable by the Generator will be calculated as follows:

$$\text{Default Termination Payment} = \text{Net Dependable Capacity Estimate} \times \text{Termination Fee Rate}$$

For each of these termination events, a Termination Fee Rate of £35,000 per megawatt of the Facility's Net Dependable Capacity Estimate (as adjusted by a Permitted Reduction) will apply, as set out in the table below.

Default Termination Event	Termination Fee Rate
Insolvency	£35,000/MW
Non payment	£35,000/MW
Metering breach	£35,000/MW
Breach of Key Obligations	£35,000/MW
Prolonged Minimum CO ₂ Capture Rate Breach	£35,000/MW

Table 2: Table showing the termination events which carry a termination fee

A Generator will not be liable to pay more than one Default Termination Payment. In the event that more than one termination event applies, a single fee of £35,000/MW will apply.

If the DPA Counterparty terminates the DPA for a prolonged Minimum CO₂ Capture Rate Breach, the Default Termination Payment due to the DPA Counterparty will be reduced by any unpaid amounts which the DPA Counterparty has suspended (as detailed further in the Minimum CO₂ Capture Rate section below).

Given the differing payment mechanism to the CfD, we have proposed an alternative Default Termination Payment calculation for the DPA that we consider to be reasonable and proportionate. The approach to the calculation is informed by experience in administering the Capacity Market and has been adapted to the underlying business model for, and payment mechanics of, the DPA. The fee level is designed to reflect the loss of low carbon, dispatchable generation to the consumer and the electricity network, as well as the potential impact on the wider CCUS programme and ecosystem, and out of pocket costs of the DPA Counterparty. In BEIS' view, the proposed termination calculation strikes the right balance between ensuring that Generators fulfil their obligations throughout the term of each DPA, whilst remaining proportionate to the severity of the circumstances leading to a default termination event.

Qualifying Change in Law

In the December 2020 Update, we stated that the DPA would contain change in law provisions, the form and scope of which remained to be determined, but which were anticipated to be similar to those in the renewable CfD. In the May 2021 update we set out our position on Qualifying Change in Law ("QCIL") definitions. We have now developed the compensation offered to Generators for different categories of QCIL events.

Categories

Compensation will be payable to a Generator (or where the savings arising from the QCIL exceed the costs to the DPA Counterparty) for a QCIL that:

- permanently prevents construction of a Facility;
- affect a Facility's Capex;
- affect a Facility's Opex;
- affect a Facility's Availability of Generation, Availability of Capture, Net Dependable Capacity or Plant Net Efficiency;
- affect a Facility's generation of electricity; or
- permanently prevents a Facility from operating.

As discussed below, certain costs will be excluded from the compensation formulations while, generally speaking, any savings will be netted off any costs that arise as a result of the relevant QCIL (and vice versa). Typical no double recovery provisions will apply to ensure that a Generator is not compensated for the same loss (e.g. where a QCIL affects both a Facility's Capex and a Facility's Availability of Capture).

QCIL permanently preventing construction

Where a QCIL permanently prevents the completion of the construction of the Facility by making the Facility illegal, the DPA is automatically terminated, and a 'QCIL Construction Event Payment' will be payable either as a lump sum or staged payments by the DPA Counterparty to the Generator. The Generator will be entitled to recover all irrecoverable and unavoidable out-of-pocket costs (including tax Liabilities) which have been or will be incurred by the Generator in respect of the Facility arising directly from the relevant QCIL Construction Event, if and to the extent that such costs comprise:

- development and pre-development costs in respect of the Facility;
- decommissioning costs in respect of the Facility;
- break costs in respect of the Facility; or
- construction costs in respect of the Facility.

The amount the Generator is entitled to recover will be reduced by savings which have been or will be made by the Generator in respect of the Facility arising directly from the relevant QCIL Construction Event including:

- avoided out-of-pocket costs;
- tax reliefs or reductions;
- insurance proceeds; and
- any other compensation.

QCIL affecting Capex

Where a QCIL results in net Capex costs or savings, the Generator or the DPA Counterparty will receive compensation in order to put the relevant party in the position it would have been in had the QCIL not occurred. Such compensation will be payable at the election of the DPA Counterparty as a lump sum payment, staged payments or daily payments: i) by the DPA Counterparty to the Generator if there are net Capex costs or ii) by the Generator to the DPA Counterparty if there are net Capex savings.

Net Capex costs or savings are defined for the purposes of this calculation as all out-of-pocket costs or all savings which have been, will be or are reasonably likely to be incurred or made in respect of the Facility by the Generator relating to the acquisition, modification, construction or disposal of any asset relating to the Facility and arising directly as a result of or in anticipation of the relevant QCIL (including the costs of site preparation, initial delivery and handling costs, installation and assembly costs, testing costs and professional fees).

QCIL affecting Opex

Where a QCIL results in net Opex costs or savings, the Generator or the DPA Counterparty will receive compensation in order to put the relevant party in the position it would have been in had the QCIL not occurred. Such compensation will be payable as staged payments or daily payments i) by the DPA Counterparty to the Generator if there are net Opex costs or ii) by the Generator to the DPA Counterparty if there are net Opex savings. Net Opex costs or savings

are defined for the purposes of this calculation as all out-of-pocket costs or all savings which have been, will be or are reasonably likely to be incurred or made in respect of the Facility by the Generator, arising directly as a result of or in anticipation of the relevant QCiL, which are not QCiL Capex costs or savings.

QCiL affecting Net Dependable Capacity, Availability of Generation, Availability of Capture or Plant Net Efficiency

Where a QCiL reduces or increases a Facility's Net Dependable Capacity, Availability of Generation, Availability of Capture or Plant Net Efficiency (and therefore reduces or increases the Payments that will be made under the DPA), whether for a set period (e.g. while a Generator is implementing the QCiL) or for the remaining term of the DPA, those respective values will be adjusted (on a backward-looking basis to adjust payments already made to the Generator during a period impacted by the QCiL and on a forward-looking basis for future payment calculations under the DPA affected by the QCiL) based on:

- for Net Dependable Capacity or Availability of Generation, the incremental difference between the actual or forecast value of Net Dependable Capacity or Availability of Generation as impacted by the QCiL, and the forecast value of Net Dependable Capacity or Availability of Generation without the impact of the QCiL;
- for Availability of Capture the incremental difference between the actual/forecast value of Availability of Capture as impacted by the QCiL, and the forecast value of Availability of Capture without impact of the QCiL (which shall not exceed the previous 12 month average ACRph); and
- for Plant Net Efficiency, the impact on GU_{CCUS} (Power Plant Gas Consumption) and CO_{2ECCUS} (Power Plant CO_2 Emissions) attributable to the QCiL.

QCiL affecting generation

A period of reduced or increased generation by the Facility as a direct result of a QCiL will result in a "QCiL Adjusted Revenues Payment" to the Generator or DPA Counterparty. Compensation will be payable at the election of the DPA Counterparty as either a lump sum payment, staged payment or daily payments, where the QCiL leads to increased revenue for the Generator due to an increase in Facility generation (in which case the Generator will pay the DPA Counterparty) or where revenue is decreased due to a decrease in Facility generation (in which case the DPA Counterparty will pay the Generator). This will size of the payment will be determined by calculating the revenue that the Generator would have generated (including wholesale electricity market revenue, balancing system services revenue and ancillary services revenue) from electricity that the Facility would have generated but for the occurrence of the QCiL from the date of the QCiL until the expiry of the Term, with such revenue calculated on a backward-looking basis.

QCIL permanently preventing operations

Compensation will be payable under the DPA if either of the following occurs: i) a QCIL which permanently prevents the Generator from operating the whole of the Facility by virtue of such operation becoming illegal; or ii) a CiL which the Generator can demonstrate imposes a requirement that permanently prevents the whole of the Facility from operating or constitutes the refusal or failure to give approval to a request for consent to re-start the operation of the whole Facility for a period which is likely to exceed twenty four (24) months (following the provisions of the renewable CfD).

In either case, a "QCIL Operations Cessation Event Payment" will be payable to the Generator by the DPA Counterparty as a lump sum payment or staged payments at the election of the DPA Counterparty. Such compensation will comprise an amount equal to: i) all irrecoverable and unavoidable out-of-pocket costs (including tax liabilities and break costs) which have been or will be incurred by the Generator in respect of the Facility arising directly from the relevant QCIL or CiL (but excluding certain costs), plus revenue that the Generator would have received (including wholesale electricity market revenue, balancing system services revenue and ancillary services revenue) from electricity that the Facility would have generated but for the occurrence of the QCIL from the date of the QCIL until the expiry of the Term, with such revenue calculated on a forward-looking basis, minus any savings resulting from the QCIL Operation Cessation Event.

Cap on QCIL compensation

If a QCIL affects a Facility's: Capex; Opex; Availability of Generation, Availability of Capture, Net Dependable Capacity or Plant Net Efficiency; generation of electricity; or any combination thereof, the total QCIL compensation due to the Generator will be capped by reference to:

- the QCIL Construction Event Payment that would have been payable to the Generator had a QCIL Construction Event occurred (pre-Start Date); or
- the QCIL Operations Cessation Event Payment that would have been payable to the Generator had a QCIL Operations Cessation Event occurred (post-Start Date).

As discussed in the Termination section, where the DPA Counterparty is required to pay QCIL compensation to a Generator which is equivalent to either the QCIL Construction Event Payment or QCIL Operations Cessation Event Payment, the DPA Counterparty may elect to terminate the DPA with no liability to pay the Generator any additional compensation.

Payment Mechanism

The proposed DPA consists of two payments: an Availability Payment for low carbon generation capacity and a Variable Payment to adjust the position of the power CCUS plant in the merit order relative to unabated CCGTs.

Updates to the Variable Payment

Definition of a Settlement Unit and Billing Period for the Variable Payment

In the December 2020 update, we set out that Variable Payments could be settled on a daily basis. In line with this, we are currently minded to set both the Settlement Unit and Billing Period for the Variable Payment, at one day, from 00:00 to 00:00. This aligns with the electricity day and is consistent with transfer of ownership rules, supplier levy calculations and the CfD payments schedule. It also represents an appropriate level of granularity given the use of day ahead gas and carbon futures prices.

We anticipate the DPA Counterparty will use the BSC Interim Information Settlement run (produced within 5 working days) to produce a credit note statement within 7 working days with payment being made within 28 working days of the relevant Settlement Unit (day).

As the gas day runs from 06:00 to 06:00, while the Settlement Unit for the Variable Payment, (the 'VP Settlement Unit') will run from 00:00 to 00:00, this will necessitate applying two day-ahead gas prices to each VP Settlement Unit calculation – the first running from 00:00 to 06:00 and the second running from 06:00 to 00:00.

Definition of the Reference Plant

The Variable Payment formula should calculate the difference in costs between a power CCUS plant and an unabated Reference Plant. The Reference Plant should represent the best available unabated CCGT technology. Initially the DPA will define the Reference Plant as an H-Class CCGT with defined thermal efficiency of 62.4% on a lower heat value (LHV) basis, and 56.2% on a higher heat value (HHV) basis².

The Reference Plant will be the same across all DPA recipients, including across both retrofit and newbuild power CCUS projects.

The DPA Counterparty will review and update the Reference Plant definition across all DPA recipients no more frequently than every 5 years, starting in 2027, to ensure that the Reference Plant definition accurately reflects the best available CCGT technology on the system at the time of review. Such review may update both the net thermal efficiency and specific CO₂ emissions (based on the NTS fuel mix) of the Reference Plant.

² The Electricity Generation Costs 2020 report (<https://www.gov.uk/government/publications/beis-electricity-generation-costs-2020>) published in August 2020 sets out the efficiency for a H Class CCGT at both a LHV and a HHV basis.

As proposed in the December 2020 update, the thermal efficiency and specific CO₂ emissions for the Reference Plant can only improve through the Reference Plant review process.

Non-payment and Capture Rate Multipliers

The Variable Payment is intended to ensure that abated generation displaces equivalent unabated generation in the merit order. This is only achieved if CO₂ is captured and exported to the T&S Network. For this reason, the Variable Payment will not be paid for those full half-hour periods in which there is a Capture Plant Outage Event or T&S Outage Event.

In December we said that “BEIS is likely to apply a CO₂ capture rate multiplier to the Variable Payment to avoid creating a perverse incentive for the power CCUS plant to capture less CO₂ and to ensure that subsidies are being paid out only where the power CCUS plant is meeting the objectives of the CCUS Programme.” We are no longer minded to apply any form of multiplier to the Variable Payment formula, to minimise the distortive effects and to avoid perverse incentives in marginal dispatch situations.

Updates to the Availability Payment Formula

Minimum CO₂ Capture Rate

In the December 2020 update we proposed introducing contractual consequences and/or a further termination event, in cases where the Generator's CO₂ Capture Rate performance is poor for a prolonged period of time. Then in the May 2021 update we noted that in the event that a Generator's Achieved CO₂ Capture Rate in successive AP Billing Periods falls below a minimum threshold level for a set number of consecutive AP Billing Periods, the DPA Counterparty may (following notification to the Generator of its intention to exercise such right) suspend or withhold Availability Payments and Variable Payments until such time as the Achieved CO₂ Capture Rate for a subsequent AP Billing Period is greater than or equal to the minimum threshold level.

We are now proposing the following provisions in relation to the 'Minimum CO₂ Capture Rate'.

Prolonged Minimum CO₂ Capture Rate Breach: Termination Notice

From the Start Date, if a Generator's "Achieved and Declared Capture Rate Average" (which shall be the average of their Achieved CO₂ Capture Rate weighted by the number of AP Settlement Units to which the Achieved CO₂ Capture Rate has been applied, and their Declared CO₂ Capture Rates, weighted by the number of AP Settlement Units to which the Deemed CO₂ Capture Rates have been applied) falls below 70% in any 3 whole AP Billing Periods (whether consecutive or not) within a rolling 6 month period, then the DPA Counterparty may issue a notice of termination to the Generator.

Following the notice of termination, the DPA Counterparty may terminate the DPA after 18 months have passed from the date of that notice unless:

- the Generator demonstrates an Achieved and Declared Capture Rate Average of no less than 85% for 3 whole, consecutive AP Billing Periods within such 18 month period; or
- the Generator implements a rectification plan that has been agreed with the DPA Counterparty, and which is expected to enable the Generator to demonstrate an Achieved and Declared Capture Rate Average of no less than 85% for 3 whole, consecutive AP Billing Periods (although this may take longer than 18 months following the notice of termination).

in which case the notice of termination will be removed.

Prolonged Minimum CO₂ Capture Rate Breach: Suspension

If a Generator's Achieved and Declared Capture Rate Average falls below 50% in any 3 whole AP Billing Periods (whether or not consecutive and whether or not the DPA Counterparty has already issued a termination notice to the Generator) within a rolling 6 month period, then all payments under the DPA may be suspended following notice from the DPA Counterparty.

Such suspension may be lifted by the Generator demonstrating an Achieved and Declared Capture Rate Average of no less than 85% for 3 whole, consecutive AP Billing Periods. If the Generator successfully lifts the suspension, then all suspended payments (calculated on the basis of the Availability of Capture during each relevant period of suspension) shall be repaid without interest and payments will resume under the DPA going forward.

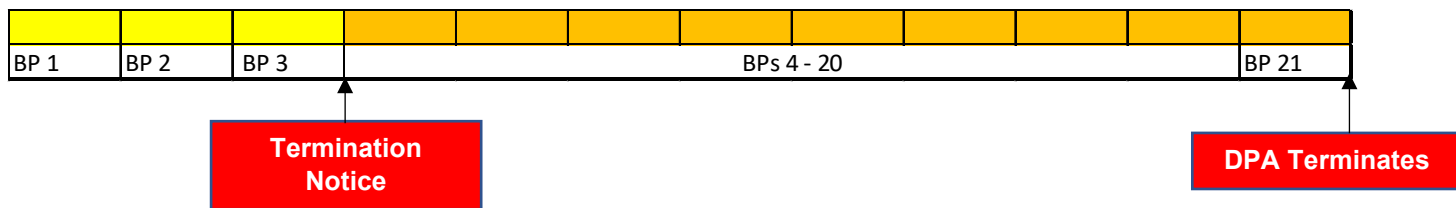
If the Generator is unsuccessful in lifting the suspension and the DPA Counterparty terminates the DPA in the circumstances described above or for any other reason, then all suspended payments will be permanently withheld from the Generator. Where the DPA terminates in the circumstances described above (and not for any other reason), the total amount of the suspended payments will reduce the termination fees that the Generator is required to pay the DPA Counterparty (which are discussed above in further detail).

BEIS will continue to review the use and definition of Achieved and Declared Capture Rate Average for both the termination and suspension thresholds described above as the Deemed Capture Rate and CO₂ Capture Rate declaration systems under the DPA are developed. The intention in each case is to account for CO₂ Capture Rate over the month regardless of whether the Facility is dispatching or not.

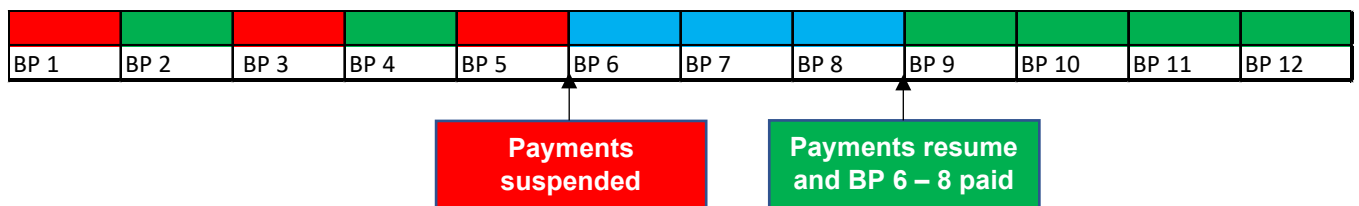
Our aim with these provisions is to strike a balance between protections for the consumer against funding underperforming projects, and the commercial risk faced by first of a kind projects. The initial termination threshold aims to strike that balance by ensuring that DPAs for continually underperforming projects can be terminated, while providing an 18 month window in which the Generator can rectify the issues giving rise to poor performance. We would expect projects to be able to demonstrate an 85% CO₂ Capture Rate in order to achieve cure at a minimum, representing a CO₂ Capture Rate closer to expected normal performance under the DPA and the Required CO₂ Capture Rate that must be demonstrated by the Generator to satisfy the Longstop Date Acceptance Test.

The additional right to suspend payments under the DPA below a 50% CO₂ Capture Rate is intended to ensure that consumers do not pay for uncured generating capacity which would result in the emission of more CO₂ than is captured and stored. This helps to ensure that the DPA mechanisms are proportionate to the policy goals of the DPA business model.

Figure 1: Diagram to show two example situations where the Minimum CO₂ Capture Rate provisions apply



Example 1: a Facility has an Achieved and Declared Capture Rate Average below 70% for three consecutive AP Billing Periods (BP 1, BP 2 and BP 3), and the Generator is issued with a notice of termination. The Facility then has an Achieved and Declared Capture Rate Average below 85% for the following 18 months, and the DPA Counterparty makes the decision to terminate the Generator’s DPA.



Example 2: a Facility has an Achieved and Declared Capture Rate Average below 50% for three out of six consecutive AP Billing Periods (BP 1, BP 3 and BP 5). The Generator is issued with a notice of termination, and its payments are suspended. The Facility then has an Achieved and Declared Capture Rate Average equal to or higher than 85% for the following 3 months (BP 6, BP 7 and BP 8), so the notice of termination is lifted, payments resume and the payments for BP 6, BP 7 and BP 8 are paid.

Key:

	Equal to or higher than 70% Achieved and Declared Capture Rate Average (normal payment period)
	Below 70% Achieved and Declared Capture Rate Average (normal payment period)
	Below 50% Achieved and Declared Capture Rate Average (normal payment period)
	Equal to or higher than 85% Achieved and Declared Capture Rate Average (cure period)
	Below 85% Achieved and Declared Capture Rate Average (cure period)

DPA Payment Mechanism – additional updates

Simultaneous Plant and Capture Outage

In the December 2020 update we said that “where outages of power and capture plant are simultaneous, for that period the lowest of the availability of generation and availability of capture will be used in the formula, whereas the highest of the two will be set to equal 1.” This will no longer apply following updates to the payment formulae under the DPA in the May 2021 update, as we consider that both the Availability of Generation and Availability of Capture terms need to be fully reflected in the Availability Payment formula to ensure proportionality of the payments made under the DPA.

Gas and CO₂ reference prices

The DPA will account for the higher gas costs and lower carbon costs of a power CCUS plant compared to the Reference Plant through the Variable Payment, in the form of the Gas Cost Differential and Carbon Cost Differential. The Gas Cost Differential in the Variable Payment is based on the thermal efficiency of the power CCUS plant under reference conditions and the Reference Plant, plus a Gas Price indicator. The Carbon Cost Differential is similarly based on the thermal efficiency of the power CCUS plant under reference conditions, the specific CO₂ emissions of the fuel used by both the Facility and the Reference Plant, plus a Carbon Price Indicator.

In the December 2020 update we noted that the Gas Price indicator should reflect the granularity of the power CCUS plant’s gas purchasing decisions and that the most liquid market for gas is day-ahead. The DPA will therefore use the settlement price for a day-ahead natural gas contract for delivery at the UK National Balancing Point as the Gas Price indicator.

The Carbon Price indicator should represent the effective carbon price faced by the Power CCUS plant and the Reference Plant. The Carbon Price indicator will therefore be based on a Carbon Reference Price which is equal to the sum of the Carbon Price Support (CPS) (which is set by HM Treasury) and the UK Emissions Trading Scheme Carbon Price (UKETS CP), defined as the December Futures Contract Price within the Secondary Markets as reported by ICE Futures Europe. This is historically the most common trading platform for the EU Emissions Trading Scheme, and so we currently consider this to be the best indicator for the December Futures Contract Price.

In the December 2020 update we noted that the DPA will not take account of any hedging arrangements, therefore there will be an incentive for the Generator to trade commodities to achieve the most efficient outcomes. This continues to be the adopted position.

The Gas Price Indicator and the Carbon Price Indicator may be reviewed at any time where a trigger event occurs and will be assessed according to a set of key principles which are generally aligned with the existing CfD review procedure principles. The principles review triggers will include, but are not limited to:

- market events such as splitting of GB Gas Market,
- low volumes of data,
- following a dispute,
- on request from portfolio holders, or
- where relevant laws and schemes are amended/repealed.

Indexation

In the December 2020 update we noted that it was likely that the Availability Payment Rate would be fully indexed to inflation to protect investors from inflationary pressure. This continues to be the case and we consider that the Consumer Price Index is the appropriate measure of inflation to which the Availability Payment Rate should be indexed. This is consistent with both existing electricity market support mechanisms and wider support mechanisms for utilities such as water.

In addition, we consider that the 'Other Extra Variable Costs' term in the Variable Payment should be indexed to Consumer Price Index to reflect inflationary pressure on the initial value agreed for this term in the DPA.

Gainshare

In order to ensure that the commercial terms of each DPA reflect value for money for the consumer and comply with subsidy control principles, BEIS is continuing to consider whether it will be necessary to introduce DPA gainshare provisions during the evaluation/negotiation stages of Phase 2, in relation to areas of a project's finances which may be more difficult to model as part of the initial assumptions made during DPA negotiations. While this is not an exhaustive list, BEIS has identified the following four key areas which may be included as part of any gainshare discussions in which the DPA Counterparty may seek to share a limited portion of any project gains:

1. Actual project Capex is lower than initial assumptions
2. Actual operational revenues are higher than initial assumptions
3. Divestments lead to higher shareholder returns than initially assumed
4. Refinancing leads to higher shareholder returns than initially assumed

As prospective DPA applicants may be aware, an important function of gainshare mechanisms is to prevent overcompensation arising by reason of the implementation of subsidy support mechanisms. This fact has been recognised in recent years by the UK Government and will be a key consideration when BEIS decides whether such mechanisms will be required for the DPA.

Other Extra Variable Costs

The Variable Payment will include a term representing the additional variable costs, other than gas, carbon emissions and T&S fees, of operating the power CCUS plant compared to the Reference Plant. The Generator will need to demonstrate that the costs it proposes are included in this term would not have been incurred by the Reference Plant. For reference, the following items could be considered, by way of example only, to be applicable to the Other Extra Variable Costs term in the Variable Payment, although the precise scope will vary between projects:

- Consumables, e.g.

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- Nitrogen gas for system and equipment layup
- Cooling water for carbon capture plant
- CO₂ compressor / centrifugal pump bearing lubricant
- Miscellaneous lubricants/grease for carbon capture plant

Next Steps

This document reflects the work we have done to date to progress the DPA design following publication of the December 2020 and May 2021 update documents. We will continue to develop further the detailed structures and mechanisms of the DPA with the objective of finalising the model early in 2022. This work will be undertaken in close coordination with the development of the business models for T&S, industrial carbon capture, hydrogen and CIF.

In relation to the DPA business model further updates planned for the next year include:

Update	Indicative date
Phase-2 CCUS Cluster Sequencing Launch including publication of the full eligibility criteria, evaluation criteria and assessment process.	Q4 2021 The launch of Phase-2 is planned to be in parallel with, or soon after, the Track-1 cluster announcement from w/c 25 th October ³ .
DPA Update and publication of draft full contract	Q1 2022

CCUS is integral to the UK’s Green Industrial Revolution. ‘CCUS Supply Chains: a roadmap to maximise the UK’s potential⁴ published in May 2021 stated that “as we deliver on our ambitions, it is vital that our economy and, in particular, our UK CCUS supply chain companies realise the economic benefits of this large-scale infrastructure programme.” It also noted government’s intention “to provide a further update on our approach to UK CCUS supply chains by the end of 2021”. We expect that any further business model supply chain updates may be developed with such future publications, as well as learnings from other sectors, in mind.

³ Further information is available here: <https://www.gov.uk/government/publications/cluster-sequencing-for-carbon-capture-usage-and-storage-ccus-deployment-phase-1-expressions-of-interest/update-on-phase-1-eligible-clusters-and-phase-2-timeline>

⁴ The CCUS Supply Chain roadmap can be found at: <https://www.gov.uk/government/publications/carbon-capture-usage-and-storage-ccus-supply-chains-a-roadmap-to-maximise-the-uks-potential>

Worked Example

NDC Cap

The following worked example demonstrates the application of the proposed NDC cap to the Availability Payment and Variable Payment.

The value of the Net Dependable Capacity used to calculate Availability Payments under the DPA will be set by the latest NDC measured during OCP Acceptance Tests, Longstop Date Acceptance Tests, or each year's annual NDC test (the 'Annual NDC Test'), which in any event will be subject to a cap equal to the Net Dependable Capacity Estimate (as such estimate is reduced by or any Permitted Reduction made before the Milestone Delivery Date). In addition, the number of MWh of generation to which Variable Payments will be applied will be capped for every half hour period of generation by reference to the Net Dependable Capacity Estimate. This ensures that there is proportionate budgetary control in the allocation and application of DPAs.

The worked example considers a CCGT with post combustion capture plant with Net Dependable Capacity of 1100 MW (at reference site conditions) and design capture rate of 90% for operation during an AP Billing Period from 1st February 2021 to 28th February 2021 (total number of Settlement Units in AP Billing Period = 1344).

Availability Payment

The Availability Payment Rate is assumed to be £5.708/MW/Settlement Unit (based on £100/kW/year and 17520 Settlement Units in a year). For simplification, the T&S Capacity Fee (TSCF) is assumed to be zero.

- Net Dependable Capacity Estimate = 1100 MW
- The plant declares a Net Available Capacity = 1200 MW for all Settlement Units in AP Billing Period
- There are no outages/derating events during the AP Billing Period
- The Achieved Capture Rate during the AP Billing Period = 90%

$$AP = \sum (AG_i \times AC_i \times NDC \times APR_i) + TSCF$$

$AG_i = 1$ for all Settlement Units

$AC_i = 90\%$ for all Settlement Units

$NDC = 1100$ MW for all Settlement Units

$APR_i = £5.708$ /MW/Settlement Unit

$TSCF = £0$ (simplification)

Therefore,

$$AP = 1344 \times (1 \times 90\% \times 1100\text{MW} \times £5.708/\text{MW}/\text{SU}) + £0 = £7,594,836$$

Variable Payment

This example shows the NDC cap operating over a single VP Settlement Unit and VP Billing period, which is 1 day.

The Variable Payment Rate is assumed to be £1/MWh for this Settlement Unit. This is an example indicative figure for simplification.

- The plant operates at constant output = 1200 MW throughout the VP Billing Period.
- However, the NDC Estimate = 1100 MW.

$$VP = VPR \times MWh$$

$$VPR = GC + CC + OC + TSVPR$$

VPR = £1/MWh for the Settlement Unit

MWh = 1100MW x 24h = 26400 MWh for the Settlement Unit

Therefore,

VP = £1/MWh x 26400 MWh = £26,400

Glossary

Term	Description
AR3	Allocation Round Three (referring to the third contract for difference allocation round for renewable technologies).
AR4	Allocation Round Four (referring to the upcoming fourth contract for difference allocation round for renewable technologies).
AP	Availability Payment
BEIS	Department for Business, Energy and Industrial Strategy
BMRS	Balancing Mechanism Reporting Services
Capex	Capital expenditure
CCGT	Combined Cycle Gas Turbine
CCUS	Carbon Capture, Usage and Storage
CCS	Carbon Capture and Storage
Cluster	Transportation and storage network (incorporating the onshore and offshore network and offshore storage facility) and an associated first phase of carbon capture projects.
CfD	Contract for Difference
CIF	CCS Infrastructure Fund
CM	Capacity Market
CO ₂	Carbon Dioxide
DPA	Dispatchable Power Agreement
December 2020 update	The Carbon Capture, Usage and Storage Business Models update published in December 2020: https://www.gov.uk/government/publications/carbon-capture-usage-and-storage-ccus-business-models
FEED	Front End Engineering Design
FID	Final Investment Decision

FOAK	First-Of-A-Kind
GB	Great Britain
HHV	Higher Heating Value
HMG	Her Majesty's Government
HoTs	Heads of Terms (for the Dispatchable Power Agreement)
ICC	Industrial Carbon Capture
JEP	Joint Environmental Programme
LHV	Lower Heating Value
May 2021 update	The Carbon capture, usage and storage (CCUS): business models update published in May 2021: https://www.gov.uk/government/publications/carbon-capture-usage-and-storage-ccus-business-models
MW	Megawatt
MWh	Megawatt hours
NDC	Net Dependable Capacity
NTS fuel mix	The fuel mix used in the National Transmission System.
OCP	Operational Conditions Precedent
Opex	Operating expenditure
QCIL	Qualifying Change in Law
REMIT	Regulation on Wholesale Energy Market Integrity and Transparency
Storage	Geological store for the captured CO ₂ from the end of the injection well.
TCW	Target Commissioning Window
T&S	Transport and Storage
T&SCo	A company licensed to provide transport and storage services

An Update on the Dispatchable Power Agreement Business Model

UK	United Kingdom of Great Britain and Northern Ireland
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