



Department for
Business, Energy
& Industrial Strategy

CONTRACTS FOR DIFFERENCE FOR RENEWABLE ELECTRICITY GENERATION

Consultation on proposed
amendments to the scheme

December 2017

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An electronic version of this consultation can also be found at <https://www.gov.uk/government/consultations/contracts-for-difference-cfd-proposed-amendments-to-the-scheme>.

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Introduction

Scope of this consultation

This consultation concerns changes the government is considering making to the Contracts for Difference (CfD) scheme, which provides support for new low carbon electricity generation projects.

The government welcomes responses from anyone with an interest in the policy area. It is envisaged that this consultation will be of particularly strong interest to those considering developing new renewable energy projects in Great Britain, to electricity traders and suppliers, to businesses operating in the bioenergy and waste sectors, and to consumer and environmental groups with an interest in the electricity sector.

The CfD scheme applies to the United Kingdom, but does not currently operate in Northern Ireland. The changes proposed in this consultation will apply to contracts awarded as a result of future allocation rounds. They will **not** affect existing contracts.

Context of these proposals

The changes proposed in this document form part of the government's overall strategy to cut emissions, increase efficiency, and help lower the amount consumers and businesses spend on energy across the country, in conjunction with supporting economic growth. The United Kingdom has a proud record in emissions reductions and was one of the first countries to recognise the challenge posed by climate change. Our investment in green energy has seen Britain produce record amounts of renewable electricity. The CfD scheme is a cornerstone of the government's strategy to cut emissions and ensure investment in low carbon technologies in the electricity sector over the coming years.

In the 2017 allocation round, the government published a Call for Evidence on fuelled technologies in the CfD scheme, and introduced a temporary 150MW maximum for fuelled technologies pending a more detailed consideration of what further steps, if any, should be taken to address issues that had been identified in the sector. The responses received have now been analysed and have informed development of a number of the policy changes proposed in this consultation document.

The outcome of the second CfD allocation round in September, which saw the price of new offshore wind fall significantly relative to previous allocation rounds, demonstrates the effectiveness of a competitive approach in delivering cost reductions in renewable energy generation, and in driving down costs to the consumer. It also reinforces the UK's position as one of the world leaders in renewable technologies.

In October 2017 the Clean Growth Strategy¹ noted that the government will work with industry as they develop an ambitious Sector Deal for offshore wind, provided costs continue to fall. This could result in 10 gigawatts of new capacity built in the 2020s, with the potential to support high value jobs and a sustainable UK industry exporting goods and services around the world. We will also consider whether there could be opportunities for additional offshore wind deployment in the 2020s, if this is cost-effective and deliverable. In November, the Crown Estate and Crown Estate Scotland announced they will work with the offshore wind sector and stakeholders to consider making new seabed rights available to offshore wind developers.

Up to £557 million will be made available for further for further Contracts for Difference for renewable electricity projects, with the next competitive allocation round for less

¹ "The Clean Growth Strategy - Leading the way to a low carbon future", published in October 2017 and available on the gov.uk website

established technologies currently planned for spring 2019. It is our current intention that wind projects on the remote islands of Scotland that directly benefit local communities will be eligible for the next auction, subject to obtaining State aid approval.

Aim of this consultation

The government is now considering various changes to the CfD scheme to enable it to continue to support new generation and provide best value for bill payers in coming years. This consultation seeks views on these proposed policy changes.

The government aims to support the development of onshore wind projects on remote islands, where they benefit local communities. This consultation sets out a proposed **definition of remote islands wind**, as a new technology that can compete in future auctions for 'less established' technologies (also known as 'Pot 2'). Views are sought on this definition and on how island communities can benefit from these projects.

Refinements in relation to **Advanced Conversion Technologies (ACT) are also being proposed**, to ensure that only more innovative and efficient plants are awarded subsidy, achieving best value for money and ensuring supported projects can continue to develop in this sector.

Changes to the overall **efficiency requirements for Combined Heat and Power (CHP) are being put forward**, to ensure that CfD supported CHP plants have a suitably high overall efficiency. The government also proposes that applicants must confirm in their application that they intend to comply with those CHP requirements. A related amendment to the Contracts for Difference (Definition of Eligible Generator) Regulations 2014 regulations is also proposed.

The government also proposes several possible **methods of determining an updated greenhouse gas emissions standard** that new fuelled technology projects will have to comply with.

The government proposes to **use new load factor assumptions** that are at the high end of government forecasts in allocating budget, in order to reduce the risk of uncertain load factors for new projects leading to unexpectedly high subsidy costs being paid by consumers.

Additionally, in order to facilitate more accurate forecasting of budget spend the government proposes to require generators to provide the Low Carbon Contracts Company with their best estimates of their expected generation output during the CfD contract term.

Views are also invited on various potential changes to the detailed terms of new CfD contracts in order to ensure the scheme continues to operate effectively, with further detail expected to be discussed in a subsequent consultation.

Next steps

The government aims, where possible, to incorporate any changes Ministers decide to make following this consultation into the scheme before the next allocation round. Some of the changes being proposed are likely to require State aid approval, and some will require the approval of Parliament.

Some of the changes being proposed could be implemented in several ways, and if necessary the government may consult further on the detail of these changes if it is decided to take them forward. The government may also consult in further detail on consequential and other changes to the terms of the CfD contract that would be necessary to implement some of these proposals.

How to respond

Date this consultation was issued: 15th December 2017
Date by when we welcome responses: 9th March 2018

The government welcomes responses on all questions, or on specific parts of this consultation. Responses will be most useful if they are framed in direct response to questions posed, though further comments and evidence are also welcome.

Electronic responses (in PDF, Word, Rich Text or ODF formats) are preferred however we aim to consider responses in any accessible format. Responses should be sent to BEISContractsForDifference@beis.gov.uk, or to *CfD Consultation, c/o David Curran, Clean Electricity Directorate (Level 3 Spur), BEIS, 1 Victoria Street, London SW1H 0ET*.

Engagement & enquiries during the consultation process

Subject to the level of interest, we expect to run a small number of meetings (and potentially telephone discussions) on specific areas of this consultation, as an opportunity for informal engagement during the consultation process. Those with an interest in such meetings and discussions, or with questions or clarification requests on specific points in this document are encouraged, in the first instance, to contact BEISContractsForDifference@beis.gov.uk. To aid grouping of similar discussion topics please indicate any sections of the consultation that you have a particular interest in.

Confidentiality and data protection

Information provided in response to this consultation, including personal information, may be subject to publication or disclosure in accordance with the access to information legislation (primarily the Freedom of Information Act 2000, the Data Protection Act 1998 and the Environmental Information Regulations 2004).

If you want some or all of the information that you provide to be treated as confidential please say so clearly in writing when you send your response to the consultation. It would be helpful if you could explain to us why you regard the information you have provided as confidential, including explanation if you consider the confidential nature of the information is such that it would not be appropriate for us to share such information with LCCC on a confidential basis in order to support and inform our policy development. If we receive a request for disclosure of the information we will take full account of your explanation, but we cannot give an assurance that confidentiality can be maintained in all circumstances. An automatic confidentiality disclaimer generated by your IT system will not, of itself, be regarded by us as a confidentiality request.

All responses will be summarised and this summary will be placed on the GOV.uk website. This summary may include a list of the types of responses received, or of organisations that responded - but not people's personal names, addresses or other contact details.

Quality assurance

This consultation has been carried out in accordance with the **Government's Consultation Principles**. If you have any complaints about the consultation process (as opposed to comments about the issues which are the subject of the consultation) please address them to enquiries@beis.gov.uk.

Wind on remote islands

The government intends to support the development of wind projects on remote islands, including off the coast of Scotland, where they will directly benefit local communities. This consultation seeks views on a proposed legal definition for remote island wind, and on how the government can ensure that remote island wind projects awarded a Contract for Difference (CfD) will benefit local communities.

1. Wind projects on remote islands have characteristics, including high transmission costs and high load factors, which set them apart from projects elsewhere in the UK. The government intends, subject to State aid approval, to define remote island wind (RIW) as a separate technology from mainland onshore wind, to set a separate administrative strike price for RIW, and to allow it to compete in future Pot 2 allocation rounds.
2. Whilst currently these projects can compete alongside Pot 1 technologies they have distinct characteristics from typical mainland projects and face correspondingly higher costs. We intend to allow these projects to compete against other technologies currently in Pot 2: offshore wind, dedicated biomass with combined heat and power, wave, tidal stream, advanced conversion technologies, anaerobic digestion and geothermal.
3. If RIW projects are successful in an allocation round, it should, in turn, facilitate the construction of new transmission links, which could deliver a range of wider and longer term benefits and cost savings to the renewables industry and to the island economies.

Previous consultation

2. In November 2016 the government consulted on whether to classify non-mainland GB onshore wind projects as a separate technology and make them eligible to compete in future allocation rounds for less established technologies². The responses received have informed our thinking on the proposed policy changes outlined here.
3. A majority of the responses received said that non-mainland GB onshore wind should be considered a separate technology from onshore wind, citing the higher transmission costs as the main justification, while some also pointed to the benefit to the UK of utilising the high wind resource found on the islands, as well as the supply chain benefits to the UK and the economic and employment benefits to local communities. A majority of responses suggested the CfD was the most appropriate mechanism for supporting these projects. A more detailed summary of the responses received is included as an Annex to this consultation document.

Proposed definition of remote island wind

4. The government proposes to amend the Contracts for Difference (Allocation) Regulations 2014³ “the Allocation Regulations” to define what a remote island is and describe the necessary characteristics required by a RIW CfD unit to qualify as an eligible technology. The government proposes the following definition:

² “Consultation on treatment of non-mainland GB onshore wind projects”, published November 2016 and available on the GOV.uk website

³ “The Contracts for Difference (Allocation) Regulations 2014 No.2011”, a UK Statutory Instrument available on the legislation.gov.uk website.

A **remote island** is an island:

- (i) Located in the territorial sea of the United Kingdom, other than the part adjacent to Northern Ireland; and
- (ii) Where all parts of its coastline are situated at least 10 kilometres from mainland Great Britain.

To qualify as a **remote island wind CfD unit** a project would have to meet all of the following criteria:

- (i) The project is located on a remote island.
- (ii) The connection between the unit's generation circuit and the Main Interconnected Transmission System (MITS) will require at least 50 km of cabling, of which 20 kilometres must be subsea cabling.
- (iii) Upon completion, the project must be connected to the national transmission system for Great Britain or the distribution system.

5. The following map provides an indicative illustration of the areas that satisfy the first part of this definition, of being a 'remote island'. To be eligible to compete in a future allocation round, RIW projects will also need to meet the additional characteristics set out above.



6. In addition, existing eligibility criteria applicable to onshore wind will apply to RIW CfD units, including that a unit must have a generating capacity of over 5MW. Other requirements, such as the need for projects larger than 300MW to have an approved Supply Chain Plan, would also apply where relevant.
7. Allowing RIW projects to compete in Pot 2 allocation rounds requires State aid approval, and the government has submitted a notification to the European Commission setting out this intended approach.

Ensuring communities on remote islands benefit

8. Communities on remote islands hosting renewable energy projects play an important role in helping to meet a national need for secure, clean energy, and these communities should benefit from the contribution such installations make towards renewable energy and decarbonisation goals.
9. Responses to the previous consultation in 2016 suggest that onshore wind projects on the remote islands of Scotland have developed a wide and diverse range of benefits, such as annual payments into community benefit funds that can be used to meet a variety of community needs, and offers of shared ownership giving communities a financial stake in the projects themselves.
10. Further discussions with project developers, representatives from community groups, representatives of local councils and the Members of Parliament for Na h-Eileanan an Iar, and Orkney and Shetland, have explored how communities on the remote islands of Scotland could directly benefit from hosting these projects. The government recognises the need for benefits to be delivered flexibly, taking into account the unique needs of local communities, and that local people want benefits to be of lasting value and a driver for economic growth on the islands.
11. Developers and operators of RIW projects must continue working in partnership with communities to develop a sustainable community benefit package tailored to local circumstances. The government expects them to deliver on the commitments they make to the local communities. Mechanisms already exist to aid transparency; for example, registers have been established to record the benefits operational windfarms are providing to local communities. Industry has also established protocols requiring developers to pay an annual sum into community benefit funds. These mechanisms provide us with reassurance that commitments will be honoured.

Consultation Questions	
1	The government welcomes views on whether the proposed approach is an effective means of supporting onshore wind on remote islands.
2	The government welcomes views on whether the proposed definition is a suitable definition of those wind generation projects located on islands which should be distinguished from onshore wind, and in particular on what evidence prospective generators should be asked to supply in order to demonstrate that they have the required characteristics.
3	The government welcomes views on how local communities, developers and other stakeholders can work together to ensure that these remote island wind projects will deliver lasting benefits to the islands.

Mitigating load factor risk

A load factor (also known as a capacity factor) is the ratio of how much electricity a generating unit actually produces over a given period of time divided by its theoretical maximum output. The costs of CfDs are funded by electricity suppliers, and so if load factors are higher than expected, the subsidy paid by suppliers and passed onto consumers will be larger than initially forecast.

To mitigate this risk, the government is proposing two changes. Firstly, to use higher forecasts of generation (load factors), set centrally by the government, when valuing Contract for Difference (CfD) applications at the time of allocating contracts. Secondly, to require successful generators to provide the Low Carbon Contracts Company (LCCC) with their best estimates of their expected electricity production during the contract term. These changes should reduce the risk of overspending in future allocation rounds and enable more accurate forecasting.

Previous consultation

12. In 2016 the government issued a call for evidence on future options for CfDs, which noted a concern that there is a risk of overspend, borne by the consumer, due to inherent uncertainty on the load factor of new projects⁴. The government asked how the risk of underestimating load factors and overspending could be reduced, and how the introduction of any measures could impact on strike prices and the investability of the CfD.
13. Many responses to the call for evidence commented that the government's current assumptions are more accurate than those that had been used previously, and that the risk of overspend is therefore much lower for future auctions. Some respondents stated that additional reporting requirements of load factors could be introduced that could be fed back into improving the assumptions used in the valuation process.
14. Many respondents expressed concerns regarding the introduction of a hard cap on generation output. The main arguments made were that a cap was unnecessary (because of improved load factor assumptions); that wholesale price fluctuations were the main reason for the difference between forecast and actual costs, rather than load factor uncertainty; that a cap would increase regulatory risk, leading to higher strike prices and reduced competition; that restricting output could reduce performance improvements, innovation, and budgetary efficiency; and that a cap could complicate auctions or distort competition.
15. Respondents noted that if a cap were to be implemented, an annual cap would make pricing difficult and so flexibility between years or a lifetime cap would be necessary. Some commented that this approach was similar to what had been done in other countries.

Proposal to reduce load factor risk in CfD allocation rounds

16. When allocating CfDs in an allocation round, the Delivery Body values all eligible applications in order to establish whether the applications fit within the available budget. The valuation formula that must be used is set out in the Allocation Framework for each round.

⁴ The call for evidence was part of the "Consultation on changes to the CfD contract and CfD regulations", published in May 2016 and available on the GOV.uk website

17. Currently, the load factors published in the Allocation Framework are based on the government's view of the expected central load factors for each technology in the delivery years for that allocation round. In the recent 2017 allocation round this drew from an independent report on generation costs, published by Arup in 2016, which includes low, central and high ranges for expected load factors for each technology⁵. The 'central' load factors, in addition to other evidence held by the government, were used to set the assumptions for the second CfD allocation round.
18. There is inevitably a risk that the projects that are successful in competing for contracts in an allocation round could have higher load factors than the government's central estimate, which would mean that the allocated budget could be exceeded and consumers are exposed to higher costs than budgeted for.
19. In order to protect consumers from this risk, the government intends to use load factors that represent the best performing plants, rather than central plants, in the valuation formula. For example, if this approach had been applied to the 2017 allocation round the government could have used an equivalent of the 'high' range from the Arup report instead of the central range that was used for the second round.
20. The government would use the most up to date evidence that it holds at the time of administrative strike price setting to set the load factor assumptions that would be published in the Allocation Framework.
21. The higher load factors would only be used for the purpose of valuing applications in CfD allocation rounds and not for other purposes (for example this proposal does not affect the "Assumed Load Factor" within the CfD standard terms or other support schemes such as the Renewables Obligation). This is because the load factors used in the Allocation Framework are being used to protect consumers from additional, unexpected spending in light of the range of load factors that can be expected at different sites. They do not represent the government's view of the expected, central load factor for each technology, which remains the most appropriate assumption to use for other purposes.
22. The government may also publish different load factor assumptions for subsets of a technology if there is scope for significant variation, for example if some geographical regions are expected to experience significantly higher wind speeds than others.

Proposal to improve estimates for successful CfD projects

23. The government proposes to amend the contract terms so that generators must provide their best estimate of their expected load factor over the contract term or generation output (which could be used to calculate the expected load factor) to the LCCC at various milestones, alongside an explanation of the underlying assumptions and reason(s) for any changes in this estimate. This information would be used to increase confidence levels around forecasts of CfD cost, for example by the LCCC when setting the supplier obligation and by the government in its publication of the forecast cost of renewable subsidy schemes, and when setting the parameters for future CfD and capacity market auctions.
24. There are currently several provisions in the contract that require generators to provide information to the LCCC, and further provisions dealing with the treatment of generator confidential information. However, to provide further clarity, it is intended to

⁵ "Review of Renewable Electricity Generation Cost and Technical Assumptions", a report by Arup, published in November 2016 and available on the GOV.uk website

amend the contract terms to explicitly confirm the position on load factor and generation output information.

25. Generators would be required to submit this information at regular milestones within the contract, including (a) 10 business days after the agreement date, as part of their initial conditions precedent, (b) alongside the submission of the milestone requirement notice by the generator (which must be within 12 months of the agreement date), (c) as part of the operational conditions precedent, (d) alongside submission of the final installed capacity notice, and (e) as and when requested by the LCCC (within 5 business days of the request). We also propose that generators would provide an update on an annual basis between the submissions of the milestone requirement notice and the final installed capacity notice, and after the start date (i.e. the first date of generation for which CfD payments are made).
26. This is not intended to be a burdensome process for generators or the LCCC. There will not be a requirement for generators to provide additional evidence to support their submission or for the LCCC to review this evidence. However, the government notes that Condition 32.3 of the CfD Standard Terms and Conditions requires that the generator provides forecast data that is prepared with due care and attention, and that the information is true, complete and accurate and not misleading, and it is intended for generators to submit estimates of load factors on a similar basis.
27. The submitted data for individual plants would be subject to the existing confidentiality provisions of the CfD, under which it is envisaged that the information would be shared by the LCCC with BEIS for the purposes of administering the scheme, and it may be published in an aggregate form (for example, in publications of the forecast cost of renewable subsidy schemes).

Monitoring the effectiveness of these measures

28. The government considers these proposals are light-touch option to address the issue of load factor uncertainty, compared to alternatives such as implementing a form of generation cap. If this proposal is taken forward for the next allocation round, the government will continue to monitor the effectiveness of these measures and consider whether any other measures need to be introduced to ensure that consumers are protected from unbudgeted costs arising from the CfD scheme.

Consultation Questions

4	The government welcomes views on the proposal to use higher load factors in the valuation formula, rather than central estimates – including on whether this approach is sufficient to mitigate the risk of overspend and protect consumers from unexpected costs.
5	The government welcomes views on the proposal to potentially use different load factors for subsets of the same technology in the valuation formula, and welcome thoughts on how subsets might best be defined.
6	The government welcomes views on whether the proposed approach of generators submitting their expected load factors/generation output to the LCCC is the best way to obtain accurate estimates of load factors for successful CfD projects.
7	The proposal does not require generators to provide evidence to the LCCC alongside their load factor estimate. The government welcomes views on whether a requirement for supporting evidence and/or a Director's Certificate would be a suitable means of ensuring that generators submit estimates of their load factors that are, to the best of their knowledge, accurate, and on whether there are alternative approaches that might be more effective.

Advanced Conversion Technologies

Advanced Conversion Technologies (ACTs) are grouped with the 'less established technologies' in the CfD scheme, with support aimed at relatively innovative projects. However the current CfD scheme requirements for ACTs may not be effective in focussing support on the most innovative forms of ACTs.

This consultation proposes refinements to what is considered ACT in the CfD scheme so that support is directed to the more efficient, innovative forms of the technology. The government seeks to make a clear distinction between ACTs and projects based on conventional combustion such as energy from waste and dedicated biomass, with or without CHP.

Responses to the Call for Evidence

29. In November 2016 the government published a Call for Evidence on fuelled technologies, including ACTs, in the CfD scheme⁶. This received a broad range of views, with mixed opinions on whether the CfD should continue to support ACT in some form, and some views that ACT should be supported through heat and transport schemes on the grounds that this would be a better use of the technology and feedstock resources.
30. Some respondents highlighted opportunities to support more advanced and innovative forms of the technology, claiming that some projects that could currently qualify as ACT could equally be characterised as energy from waste or dedicated biomass projects. These respondents proposed various ways of supporting more advanced forms of ACT, including setting requirements on the syngas or synliquid, which are the outputs of the gasification or liquefaction of the feedstock, respectively. These included raising the minimum syngas calorific value; requiring that syngas meets criteria so that it can be used in the gas grid; using a "syngas offtake ready" assessment; and focusing support on projects which use the syngas in reciprocating engines or gas turbines. A more detailed summary of responses is included as an Annex to this consultation document.

Rationale for focussing support for ACTs

31. Some ACT projects are a form of the technology referred to as 'close-coupled' gasification - where the conditions necessary to generate syngas are present, but the syngas is generated and combusted in the same chamber, or one which is closely and substantially linked, in order to produce heat for steam production. The government has concerns that this type of plant could blur the distinction between ACT and conventional combustion technologies such as dedicated biomass and energy from waste. These latter technologies, without combined heat and power, are ineligible for the CfD scheme. Even where they do have CHP they are eligible for the scheme but with different administrative strike prices. This potential for overlap needs to be addressed to ensure clarity as to the eligibility for CFD support of different technologies and, where a technology is eligible, what technology type it qualifies as and therefore which administrative strike price should apply.

⁶ "Call for evidence on fuelled and geothermal technologies in the Contracts for Difference scheme", published in November 2016 and available on the GOV.uk website

32. The government also wishes to ensure that biomass resources are used efficiently. More advanced gasification technologies in general are expected to convert higher proportions of the chemical energy in the feedstock to chemical energy in the syngas⁷. Driving efficiency improvements in this technology will also result in reduced emissions and cost savings for consumers over time.

Wider benefits of the proposed refinements

33. Although the CfD scheme only directly supports the production of electricity, we consider that this support can be targeted towards affordable and innovative technologies that can, in the future, be used to decarbonise other sectors. ACTs have the potential to produce syngas or synliquid that can be used in other sectors including in heat, the gas grid and transport. These outputs could be a valuable contribution to the circular economy⁸ and have potential for a beneficial impact in sectors which are more challenging to decarbonise.

Proposed criteria for ACTs in the CfD scheme

34. Although the majority of existing ACT plants produce a gaseous product (such as mixture of methane, hydrogen and carbon monoxide), there are some processes in development that either produce combustible liquids or mixtures of combustible liquids and gases. The proposal below aims to allow access to the CfD scheme for generation using both liquid and gaseous fuel.
35. The government has considered three criteria that could be used to more clearly demarcate the kinds of ACT technology the CfD scheme should support:

1: Efficiency of the process	2: Quality of the syngas or synliquid	3: Separation of the gasification or liquefaction process and the production of electricity
The process efficiently converts the biogenic energy content of the feedstock into syngas or synliquid or liquid.	The process generates a clean, high quality syngas or synliquid, that has the potential to be used in electricity production and a range of applications	Option A: require physical separation of the gasification or liquefaction process and the combustion process. Option B: require the syngas or synliquid be used in an internal combustion engine, turbine or a fuel cell.

It is proposed that these three criteria take the form of requirements which ACT generators in future allocation rounds will need to meet to ensure payment under the contract.

Criterion 1: Efficiency of the gasification or liquefaction process

36. This proposed criterion would measure the efficiency of the conversion of the biogenic energy content of the feedstock into syngas or synliquid. Efficiency would be determined by dividing the calorific value per unit mass of the biogenic syngas (under standard conditions) or synliquid produced by the calorific value per unit mass

⁷ "Targeting new and cleaner uses for wastes and biomass using gasification", an Insights Paper published by the Energy Technologies Institute in June 2017 and available at www.eti.co.uk

⁸ In a circular economy the value of products and materials is maintained for as long as possible and waste and resource use are minimised.

of the biogenic component of the feedstock consumed. The intent of setting an efficiency criterion on the gasification or liquefaction process is that support is directed to the most innovative forms of these technologies and so that as much of the biogenic and combustible material in the feedstock as possible is utilised.

How the “Efficiency of the process” criterion would be measured

The government proposes that the calorific value of the feedstock and of the syngas or synliquid be determined through a chemical composition analysis to determine the molecular formula of the constituent parts. This can then be converted to a net calorific value, knowing the internal chemical bond energy (the ‘heat of formation’) of each constituent part. The government believes that this method will provide an accurate calculation. It can also be used to calculate the level of incombustible material in the gas, relevant to the second criterion.

Proposed threshold for the “Efficiency of the process” criterion

The government proposes to set the efficiency threshold at 60%⁹, and believes this to be an achievable target.

A minimum of 60% conversion efficiency of biogenic content at the gasification or liquefaction stage is currently necessary to deliver an overall plant efficiency of 35%. 35% overall efficiency is a level generally reached by less innovative, cheaper, conventional combustion based electricity generating technologies using biomass feedstock. Therefore, the proposed threshold of 60% is currently the minimum necessary to offer comparable efficiency with lower-cost conventional combustion technologies. This is the case for ACT plant using solely biomass as feedstock. In the case of mixed feedstock ACT plants, 60% conversion efficiency of biogenic content at gasification or liquefaction stage may or may not correspond to an overall plant efficiency of 35% or higher, however the government considers 60% an appropriate benchmark to apply to all types of ACT project.

As innovation in gasification or liquefaction allows greater efficiencies to be achieved, the efficiency threshold could potentially be increased over time.

37. The ACT provisions in the CfD scheme are intended to only support the generation of electricity from the liquid or gas derived from the biogenic component of feedstock. However, in certain mixed-waste processes, there is evidence suggesting that a higher proportion of the syngas or synliquid is derived from the non-biogenic components, whereas the biogenic component is converted primarily to non-combustible gases such as carbon dioxide.
38. In order to ensure that generators are only incentivised to produce genuine low-carbon generation from the combustible element of the biogenic component of the feedstock, plants using waste or a proportion of non-biogenic content will have to implement a further test in order to establish the proportion of syngas or synliquid which is derived from the biogenic fraction.

⁹ Measured in Gross Calorific Value

Additional measure for plants with mixed (renewable and non-renewable) feedstocks

The government has established that plants using mixed waste or contaminated biomass could measure the carbon isotope (C12:C14) ratio in the carbon containing combustible fraction of the syngas or synliquid to ensure an accurate measurement of the biogenic fraction of the output. This is possible as fossil fuels contain only C12, whereas biomass contains both C12 and C14. By comparing the levels of C12 and C14 in the feedstock and syngas, the efficiency of conversion of the biogenic content of the feedstock into syngas or synliquid can be determined.

There are a number of ways in which the syngas can be tested for C14, including via scintillation or mass spectrometry. Our research has shown that there are laboratories in the UK which carry out this testing, but feedback is welcomed from respondents on the availability and costs of

these types of test, or any other tests which would be capable of establishing the biogenic content of the syngas or synliquid to a reasonable degree of accuracy

The established alternative to this measurement is to assume that fossil-derived feedstock and biogenic feedstocks are converted at the same efficiency, and therefore assume that the proportions of biogenic and fossil content in the feedstock will be reflected in the composition of the syngas, once by-products have been accounted for. This is the most commonly used method under the Renewables Obligation scheme for establishing the biogenic content of the syngas. However, as noted above, there is a risk that biogenic and fossil content may not be converted at the same efficiency. Given the importance of having accurate figures for establishing efficiency, more accurate testing may therefore be necessary.

39. The government is not proposing to set an efficiency criterion for the conversion of the syngas or synliquid to electricity. This is because CfD generators are already sufficiently incentivised to optimise the generation process as they receive payment for the electricity that they generate and export to the grid. This is a different approach to the one set out in this consultation on CHP, where there are different drivers and incentives at play. Similarly, the government believes that developers are incentivised to produce syngas with low contaminants that can be used efficiently in an engine to generate electricity as this will maximise their CfD payments - and no further controls are required for (for example) particulates or tars.

Consultation Questions

8	The government welcomes views on the proposed efficiency criterion, the proposed means of measuring it, whether there are other ways of measuring conversion efficiency that could be more effective, and whether it could be circumvented. Government also welcomes views and evidence on whether setting the conversion efficiency threshold at 60% is appropriate, or whether a different figure should be used.
9	The government welcomes views on the additional measure for plants with mixed feedstocks, including whether C12:C14 testing is an appropriate and reliable way to establish the biogenic fraction of the syngas or synliquid for plants using waste, and on whether there are better approaches establish the biogenic fraction of the syngas to a reasonable level of accuracy.
10	The government welcomes views on whether there are sufficient incentives on the efficient generation of electricity for ACT for an efficiency threshold not to be required at this stage of the production process

Criterion 2: Quality of syngas or synliquid

40. This proposed criterion would place a limit on the level of incombustible material (carbon dioxide, nitrogen, water) in the syngas or synliquid, used for CfD supported electricity generation, to ensure that the product can be used for efficient electrical generation whilst encouraging the use of fuel suitable for decarbonisation of other areas of the economy.

How the “Quality of syngas or synliquid” criterion would be measured

As for Criterion 1, the government proposes that this would be measured by carrying out a composition analysis of the syngas to establish the levels of incombustible gases present, including carbon dioxide and nitrogen.

Proposed level for the “Quality of syngas or synliquid” criterion

The government proposes to set a maximum level of 20%¹⁰, on the grounds that this is likely to be the maximum amount of non-combustibles that would be allowed for injection to the gas grid. For the natural gas (methane) gas network, the Health and Safety Executive set minimum standards for the gas¹¹ and we do not believe these could be met where syngas with non-combustibles higher than 20% are injected into the grid in any appreciable amounts. The government considers this a good benchmark for good quality syngas. For scenarios where sections of the gas grid are completely converted to syngas, it would be reasonable to expect gas quality to be similar to that of town (coal) gas which typically has less than 20% non-combustible fraction.

Synliquid-producing technologies have only one potential non-combustible liquid by-product; namely water. We are proposing that these would need to meet the same maximum threshold of 20%. It is important that they contain a minimal amount of water as other potential uses of the liquids (such as transport) cannot tolerate high water content.

As with Criterion 1, this threshold could potentially be lowered over time in line with technological improvements.

41. For clarity, a post-production purification process is not an excluded method of achieving the target of non-combustible material. This could be most easily done with synliquids where the most common non-combustible material is likely to be water. Where the gasification or liquefaction process happens at the plant, any energy required to purify the material in a subsequent stage would be deducted from the final metered output and therefore would not be eligible for CfD payments.

Consultation Questions

11	The government welcomes views on the proposal to set a maximum level of incombustibles in syngas or synliquid
12	The government welcomes views on the proposed level of 20% and whether this a suitably ambitious but achievable threshold
13	For processes that produce liquids or mixtures of liquids and gases, the government welcomes evidence on the proposed maximum allowable amount of non-combustible material in the liquid (such as water) and on whether it is worth testing liquids for non-combustible material.
14	The government welcomes information on the availability of laboratories that would be capable of carrying out these tests, and the likely cost of testing

¹⁰ To be measured in molar percentage

¹¹ “Gas Safety (Management) Regulations 1996”, Schedule 3 - Content and other characteristics of gas

Criterion 3: Separation of Gasification and Combustion Processes

42. This third criterion aims to ensure separation of gasification process from combustion process. In practice we consider that it would achieve a clearer distinction between the type of ACTs that the CfD scheme supports and those which are ineligible or have different administrative strike prices.
43. We consider there are two options for how this this requirement could be realised:

Option A Require physical separation of the gasification or liquefaction process and combustion processes.	Option B Require the syngas or synliquid to be used in an internal combustion engine, turbine or a fuel cell.
An ACT plant must be composed of a minimum of two distinct and physically separated units, one to convert the feedstock into gas or liquid and one to convert the gas or liquid into electricity.	An ACT plant must use apparatus that produces mechanical or electrical power by expanding the combustion products following internal combustion of eligible gaseous or liquid fuel; or, using a fuel cell that produces electrical power from the reformation and conversion of eligible gaseous or liquid fuel.

44. The government believes Option A is preferable, on the grounds that it will be easier to verify a physical separation between the gasification or liquefaction chamber and the combustion chamber. Option B would rely on a precise definition of a gas engine, turbine and fuel cell, which may more challenging to implement and offer more scope for gaming.
45. In either case this places a requirement on the way the plant must be designed to be eligible for the CfD. It is proposed that Generators will self-declare that they meet these requirements at eligibility stage, at which point they would be required to submit a site plan. The government is also proposing to give the CfD counterparty a right to access and inspect the site, in order to verify the consistency of the plant with guidance on this criterion issued by BEIS. It is envisaged this would happen before the contract Start Date.

Consultation Questions

15	The government welcomes views on Criterion 3, including on the relative merits of Option A, Option B and any other potential approaches, on the ease of implementing these measures, and the extent to which compliance could be circumvented.
16	The government welcomes views on the likely impact of this criterion on what types of project would be eligible to receive CfD support, and whether this change would encourage generators to carry out further clean-up or processing of the syngas
17	The government welcomes information on any known close-coupled combustion ACTs that could be clearly differentiated from direct combustion technologies, and capable of delivering affordable and efficient low-carbon electricity.

Reporting and independent testing for Criteria 1 and 2

46. In order to demonstrate compliance with the Criteria 1 and 2, the government proposes to require generators to submit information to the CfD Counterparty on a regular basis in addition to normal measurement and sampling procedures required under the CFD. Government has established that means of testing both C12:14 in the syngas and level of incombustible gases exist in the UK, but is aware that these types of testing will add costs to developers. These costs will depend on how frequently this test by an independent entity is required.
47. The government has identified suppliers which could charge from £400 per test for determining C12:C14 and upwards of £1000 for determining levels of incombustible gases. The government expects reporting against these criteria to use similar mechanisms to those currently in place for fuel measurement and sampling. The generator would be required to sample and have the gas or liquid independently tested¹². The data would then be sent to the CfD Counterparty who would determine whether the criteria have been met.
48. It is important to ensure that generators are complying with these criteria, and ultimately this is something which can only be established through sampling and reporting. However, the government recognises that the need to ensure compliance must be balanced against the cost to the generator and to electricity suppliers, and ultimately consumers, who fund the costs of the scheme. The following options with regard to reporting frequency are proposed:

Option (i) monthly testing: Generators to have independent test carried out on syngas or synliquid sample on a monthly basis, with report sent to CfD Counterparty on the same frequency. This option is less onerous on the generator than others, but risks that payments could be either made or withdrawn for a month based on a sample which is not representative of plant performance across the month. There is risk of considerable variation outside of the sampling period which could amount to non-compliance with the criteria.

Option (ii) weekly testing: Generators to have independent test carried out on syngas or synliquid sample on a weekly basis, with report sent to CfD Counterparty on the same frequency. This would be preferable in terms of ensuring compliance with the criteria, and will limit periods of non-payment. However, it is recognised that this option may incur significant or potentially prohibitive costs on generators.

Option (iii) combination of frequency for testing: For criteria 1 – efficiency – generators to have independent test carried out on syngas or synliquid sample on a weekly basis. For criteria 2 – quality – generators to have independent test carried out on monthly basis. Reports to be sent to CfD Counterparty on the same frequency respectively. This option is effectively a mid-way option, which focuses compliance with the proposed definition on the efficiency criteria.

49. In each of these cases the government proposes a right of inspection given to the CfD Counterparty. This would mean they could visit and inspect a site (or appoint a third party to do so) with a minimum notice of one business day. It is envisaged that these inspections would be carried out at least once a year.

¹² Independent testers would need to be accredited by a body recognised by Ofgem or the CfD Counterparty

Consultation Question

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Views are welcomed on the relative merits of the three options for frequency of sampling, whether they provide a suitably robust measure at a reasonable cost, and whether there are any other means of sampling or demonstrating compliance that may be preferable. The government is also seeking views on the possibility of monitoring processes on a continuous basis (for example, whether this is already undertaken for quality assurance processes).

Penalties for non-compliance with the Criteria

50. We consider that the initial consequence of a CfD-supported generator failing to meet the thresholds set out in criteria 1 and 2 should be that generator's payments are suspended for the duration of the non-compliance. This would in practice mean that payments are suspended for the duration of that reporting period. Under the third reporting option (weekly reporting on conversion efficiency and monthly syngas analysis), this would allow payments to be withheld on a weekly or a monthly basis depending on which criteria are met.
51. Government is also considering whether a contract should be terminated after a significant period of non-compliance, e.g. 6 months.
52. The system of self-sampling for criteria 1 and 2 presents scope for gaming or fraud – either through manipulation or even substitution of samples before independent testing. It is proposed that sampling would be verified by giving the CFD counterparty the right to carry out a site visit at short notice (1 business day) and take an observed sample which would be tested independently. Government is considering an approach whereby in cases where there is significant or consistent discrepancy between results reported via self-sampling and verified sampling, that the CFD counterparty would terminate the contract. Government considers a relatively significant penalty in this case is necessary to disincentivise gaming or fraud.
53. It is proposed that non-compliance with the third criterion would result in termination which is likely to occur pre-start date.

Consultation Question

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Views are welcomed on the proposed penalties for non-compliance with these criteria

Combined Heat and Power

In order to be eligible for a CfD, Dedicated Biomass and Energy from Waste schemes must deploy with combined heat and power (CHP). In order to receive high levels of CfD support, these schemes must show they are good quality CHP against criteria set out in Guidance Note 44 (GN44) of the Combined Heat and Power Quality Assurance Programme (CHPQA)¹³. However the current efficiency requirements in GN44 mean that it is possible for CHP schemes to qualify for substantial levels of CfD support whilst producing a low level of useful heat, and consequently achieving low levels of overall efficiency.

This consultation proposes three ways of addressing this issue with the preferred option being to amend GN44 in order to increase the overall efficiency requirements applying to CHP schemes of all sizes awarded a CfD in future allocation rounds. These changes are intended to encourage best available technology and application of CHP, deliver high levels of overall efficiency and make the best use of biomass resources. The government considers these changes are necessary to manage the risk of supporting projects which share characteristics with technologies which are ineligible for the CfD. The government also proposes to make a clarificatory amendment to CfD regulations to facilitate this change.

The government also intends to clarify how CHP projects are treated under the CfD scheme. In particular, the government proposes that, in respect of future rounds, the requirements relating to CHP efficiency in the CfD standard terms and conditions should not apply to those technologies that have the option to deploy without CHP.

The government is also proposing that applicants in respect of those technologies which must deploy with CHP (currently Dedicated Biomass with CHP and Energy from Waste with CHP) confirm at the point of application that they are aware that the CHPQA related requirements set out in CfD standard terms and conditions will apply to them.

Responses to the Call for Evidence

54. In November 2016 the government launched a Call for Evidence on fuelled technologies, which included questions on CHP technologies eligible for a CfD. Respondents raised a number of issues. Some alluded to the difficulty of identifying a heat off-taker. Other respondents suggested that the requirements for CHP schemes are insufficient. Further detail is included as an Annex to this document.

Current requirements

55. The government has been supporting renewable CHP schemes through the Renewables Obligation (RO) since 2002. During that time there have been improvements in dedicated biomass¹⁴ technology resulting in an increase in efficiency. Dedicated Biomass and Energy from Waste technologies are only eligible for a CfD *with* CHP. This is based on the higher efficiencies possible for these technologies as CHP schemes¹⁵. The rationale for supporting renewable CHP above

¹³ "Quality Assurance for Combined Heat and Power, Guidance Note 44 – Use of CHPQA in respect of Renewables Obligation and Contracts for Difference, Issue 6", published in October 2016. This is one of a series of CHPQA guidance notes available on the GOV.uk website

¹⁴ Annex 1 of "Commission Delegated Regulation (EU) 2015/2402", reviewing harmonised efficiency reference values for separate production of electricity and heat in application of Directive 2012/27/EU of the European Parliament and of the Council and repealing Commission Implementing Decision 2011/877/EU, published in December 2015 and available at the Europa.eu website

¹⁵ "Electricity Market Reform Delivery Plan", published in May, 2013 and available on the GOV.uk website

single output biomass technologies, where possible, was established in 2012¹⁶, as it offers potential for most efficient use of available biomass resources and greater decarbonisation.

56. CHP supported technologies within the CfD scheme are required to provide the Low Carbon Contracts Company (LCCC) with a certificate issued under Guidance Note 44 of the CHPQA (GN44). This certificate confirms the extent to which the scheme's output satisfies the criteria set out in GN44 and, as a result of the CHP Qualifying Multiplier set out in CfD contract terms (the CHPQM), the proportion of the scheme's output which will be eligible for support. This process is aimed at making sure that the CfD subsidy is only provided to the extent that relevant schemes deliver good quality CHP.
57. This consultation sets out the Government's proposals to:
- Apply the CHPQM only to those technologies which must deploy with CHP in order to be eligible to take part in the CfD scheme (currently biomass with CHP and energy from waste with CHP projects);
 - Increase the efficiency requirements provided for in GN44 (against which those two technologies will be assessed); and
 - Make amendments to how the eligibility requirements for dedicated biomass with CHP and energy from waste with CHP projects are set out in CfD regulations.

The proposed changes will apply only to schemes qualifying in future allocation rounds, and therefore will not be retrospective.

Rationale for changes to GN44

58. Having reviewed responses to the Call for Evidence, undertaken its own analysis, and reviewed performance across Europe, the Government is concerned that the current efficiency requirements set out in GN44 are no longer sufficient to ensure that only good quality CHP receives CfD support. Currently, renewable CHP schemes can qualify for high levels of CfD support whilst producing a low level of useful heat and consequently achieving low levels of overall efficiency. This consultation sets out the Government's intention to increase the efficiency requirements in GN44, to ensure that CfD subsidy is directed towards:
- Best available technology and application of renewable CHP; and
 - Schemes which deliver high levels of overall efficiency and make the best use of biomass resources.
59. The current requirements provided for in the most recently published GN44 are set out in the table below.

Current criteria in CHPQA Guidance Note 44¹⁷

For CHP schemes under 25MWe (megawatts of electrical capacity) to have a minimum:

- primary energy saving of 10%, and
- heat efficiency of 10% Gross Calorific Value (GCV)

For schemes equal to and over 25MWe to have a minimum:

- primary energy saving of 10%,

¹⁶ "UK Bioenergy Strategy", published in April 2012 and available on the GOV.uk website

¹⁷ "Quality Assurance for Combined Heat and Power, Guidance Note 44 – Use of CHPQA in respect of Renewables Obligation and Contracts for Difference, Issue 6", published in October 2016. This is one of a series of CHPQA guidance notes available on the GOV.uk website

- heat efficiency of 10% GCV, and
- overall efficiency of at least 35% GCV

These requirements do not ensure any specific level of overall efficiency for schemes below 25MWe. Performance of current projects shows that the requirement for 35% GCV for schemes of 25MWe or more is in many cases achievable with electrical efficiency alone (in other words, with no production of heat).

Preferred approach

60. For the purposes of future CfD Allocation Rounds the Government intends to apply the CHPQM only to those technologies that must deploy with CHP in order to be eligible for CfD support (currently Dedicated Biomass with CHP and Energy from Waste with CHP), and not in respect of those technologies have the option to deploy without CHP (these currently include advanced conversion technologies, anaerobic digestion and geothermal). That is consistent with the basis on which the scheme was originally intended to operate.
61. The government also proposes increasing the efficiency requirements provided for in GN44 (against which the output from those technologies will be assessed). The government proposes increasing those requirements as follows:

For CHP schemes under 25MWe to have a minimum:

- overall efficiency of 70% (or, should consultees provide sufficient evidence that a lower requirement is appropriate, 60% or 50%) (net calorific value)
- primary energy saving of 10% (gross calorific value)
- 10% heat efficiency (gross calorific value)

For schemes equal to and over 25MWe to have a minimum:

- overall efficiency threshold of 70% (net calorific value)
- PES of 10% (gross calorific value)
- 10% heat efficiency (gross calorific value)

62. This approach would more effectively direct support towards best available technology and application of CHP, and ensure efficient use of available CHP resources, while retaining flexibility for schemes to balance their output between heat and power.
63. The government considers that renewable CHP schemes of all sizes are capable of achieving a 70% Net Calorific Value (NCV) of overall efficiency, provided an appropriate heat off-taker is in place. Therefore the preferred option is for all CHP schemes qualifying for a CfD to meet 70% overall efficiency. A range of options is being tested for schemes below 25MWe in size as the government has evidence to show that smaller schemes can achieve higher efficiencies, but is interested in views on this.
64. A potential impact of this approach is that schemes would need to be located at a site where there is an economic demand for heat produced, and be sized in proportion to that demand.

Alternative approaches also being considered

Alternative 1

For CHP schemes under 25MWe to have a minimum:

- primary energy saving of 10%
- 10% heat efficiency

For schemes equal to and over 25MWe to have a minimum:

- overall efficiency of 70%
- primary energy saving of 10%
- 10% heat efficiency

65. This is the minimum action the government considers necessary. *Alternative 1* increases the overall efficiency threshold in GN44 to the level provided for in the CHPQA standard (which is used to determine entitlement to fiscal or other benefits other than CfD or RO subsidy to CHP schemes).
66. However, it is considered that this option does not encourage higher overall efficiency from schemes below 25MWe, and could provide a perverse incentive for new schemes to size themselves below 25MWe.

Alternative 2

For CHP schemes under 25MWe to have a minimum:

- primary energy saving of 10%
- and one of the following combination of thresholds:
 - (a) 70% overall efficiency and 25% heat efficiency
 - (b) 60% overall efficiency and 20% heat efficiency
 - (c) 50% overall efficiency and 15% heat efficiency

For schemes equal to and over 25MWe to have a minimum:

- primary energy saving of 10%
- overall efficiency threshold of 70% and heat efficiency threshold of 25%

67. *Alternative 2* is similar to the preferred approach, in that the overall efficiency of all schemes is increased, but it goes further by also increasing the minimum heat efficiency above the current 10% requirement for all schemes, with a view to ensuring that plants make best use of available biomass resources.
68. *Alternative 2* could support the best available technology and use of biomass resources, but appears to have a limited additional benefit beyond the preferred approach provided the overall efficiency levels are at the highest level for all sizes of plant. Increasing the minimum heat efficiency may place an additional burden on developers and limit their ability to balance heat and power outcomes effectively.

Consultation Questions

20	The government welcomes views on the <i>preferred approach</i> , <i>Alternative 1</i> , and <i>Alternative 2</i> , including on their relative merits.
21	The government welcomes views on the proposals to introduce an overall efficiency threshold for schemes below 25MWe, and the options presented. In particular, Government welcomes views on the extent to which those schemes are capable of delivering 70% overall efficiency (as per the preferred approach).
22	The government welcomes views on the extent to which <i>Alternative 1</i> might incentivise schemes to be sized to just under 25MWe, or place insufficient requirements on smaller schemes.
23	The government welcomes views on the merits of increasing the minimum heat efficiency (in addition to a higher overall efficiency threshold) for all schemes proposed under <i>Alternative 2</i> , including whether the combination of thresholds proposed are the most appropriate.

Eligibility requirements

69. The Contracts for Difference (Definition of Eligible Generator) Regulations 2014¹⁸ (the Regulations) set out certain eligibility requirements for applicants. Those applying in respect of a dedicated biomass with CHP scheme or energy from waste with CHP scheme are currently required to intend to accredit the relevant station under the CHPQA Standard, Issue 6¹⁹.
70. To implement one or more of the proposals set out above, a revised CHPQA Standard would need to be published leaving this reference outdated.
71. We consider that the requirement to update the reference to the CHPQA Standard in the Regulations each time that a revised standard is published has the potential to delay our ability to deliver Allocation Rounds. Therefore we propose removing the reference to the CHPQA Standard from the Regulations altogether.
72. We do not consider that this will have any practical impact on the way in which the CfD scheme currently operates. That is because the Delivery Body does not currently test this requirement at the eligibility stage (as made clear in previous publications on electricity market reform).²⁰
73. However, in order to ensure that generators who do intend to establish dedicated biomass with CHP schemes or energy from waste with CHP schemes are aware of the requirement to accredit under the CHPQA regime set out in CfD contract terms, we propose including a requirement for those generators to confirm that they do in fact intend to accredit under the relevant CHPQA standard in the Allocation Framework. We envisage that applicants would be required to confirm this as part of the Delivery Body's online application process.

Consultation Questions

24	The government welcomes views on this proposal to amend the Regulations to remove the reference to the CHPQA Standard.
25	The government welcomes views on whether this proposal provides sufficient clarity for applicants of Dedicated Biomass with CHP and Energy from Waste with CHP projects.

¹⁸ "The Contracts for Difference (Definition of Eligible Generator) Regulations 2014", available on the legislation.gov.uk website

¹⁹ "The CHPQA Standard – Issue 6", October 2016", prepared by CHPQA on behalf of the Department for Business, Energy and Industrial Strategy and available on the GOV.uk website.

²⁰ "Implementing Electricity Market Reform (EMR): Finalised policy positions for implementation of EMR", published in June 2014 and available on the GOV.uk website

Greenhouse gas criterion for solid and gaseous biomass

Technologies using solid and gaseous biomass feedstocks are required to meet sustainability standards to be eligible for support under the Contracts for Difference (CfD) scheme. These include a greenhouse gas (GHG) emissions criterion.

The government is consulting on approaches to developing a new criterion appropriate to the decarbonisation trajectory expected in the power sector over the coming decades.

74. The current greenhouse gas criteria were set out in a government consultation response, published in 2013. At that time the criteria were established for projects which were offered contracts within the current Electricity Market Reform Delivery Plan period, which ends in March 2019.
75. In view of changes to emissions levels, and continued development of low carbon technologies, the government is mindful of the need to ensure that plants supported by new CfD contracts can continue to deliver a significant carbon saving. The government is therefore considering what criterion should apply to contracts entered into in future allocation rounds.
76. As part of work on the second Renewable Energy Directive (RED2), the European Union is considering biomass sustainability criteria applying to generation from 2021 to 2030. It is possible that new proposals could therefore be adopted in the new Directive, and depending on the UK's approach to exiting the European Union, that they could be transposed into UK law. It is however not clear if negotiations on RED2 will have concluded before the government holds a third CfD allocation round.
77. The government has therefore decided to develop and consult on an approach to setting new GHG criteria suitable for the UK, mindful of the possibility that whatever is determined at the end of this consultation process could potentially be superseded by RED2 provisions.

Existing GHG criteria

78. The current GHG criteria, applicable to biomass generators under the Renewables Obligation and the CfD which was published in 2013, is reproduced below.²¹

Generation affected	Emission limits for plants bound by the criteria
New-build dedicated biomass power (with or without CHP) ²²	240 kg CO ₂ eq per MWh (from 1 April 2014 to 31 March 2020)
	200 kg CO ₂ eq per MWh (from 1 April 2020 to 31 March 2025)
	180 kg CO ₂ eq per MWh (from 1 April 2025 to 31 March 2030)

Methodology for ensuring compliance with the GHG criterion

79. Compliance with the GHG criterion is established using the 2009 EU Renewable Energy Directive lifecycle methodology. This considers the emissions from the

²¹ "Government Response to the consultation on proposals to enhance the sustainability criteria for the use of biomass feedstocks under the Renewables Obligation", published in August 2013 and available on the GOV.uk website

²² Dedicated biomass without CHP was eligible under the RO, but is not under the CfD. These criteria are also applied to ACT technologies.

cultivation, harvesting, processing and transport of the biomass feedstocks. It also considers direct land use change where the land use has changed category since 2008. It does not consider impacts such as carbon stock change or displacement effects (what would have happened to the wood in the absence of subsidy).

80. The government recognises limitations in the current methodology in terms of quantification of carbon stock change (whilst carbon stocks are addressed through the wider sustainability requirements) but considers that the methodology remains the best available for ensuring that technologies supported with new CfD contracts deliver low carbon electricity²³. The methodology is therefore not considered in detail in this consultation, but is under review as part of the RED2 negotiations and the UK position will be re-examined once those negotiations are complete.

Considerations in setting a new criterion

81. In setting a new criterion, the government is mindful of the following factors:

Newly supported projects need to deliver a significant greenhouse gas saving	The impact on the sector
Ensuring that new projects constitute “low carbon electricity”. The government considers a significant saving must be demonstrable – compared with the expected outcome in the absence of a subsidy - in order to justify new subsidy.	Ensuring that the criterion does not exclude projects or technologies which could provide low carbon electricity in a cost-effective way through the scheme. Ideally the criterion should be set at a level which drives efficiencies and improvements in those technologies and their fuels.

Proposed new GHG criterion

82. The proposed new criterion will apply to new projects that are offered a contract from the third allocation round onwards. The Government is not proposing any changes to the types of technology or fuel type to which the criterion applies. This criterion would initially be set for commissioning years between 2021/22 and 2025/26, and it would apply throughout the duration of the 15-year CfD contract.
83. The government proposes to use the range of performance of existing plants using solid and gaseous biomass feedstocks which are reporting under the current GHG criteria as a basis for setting the new criterion using data from 2011/12 onwards. In doing this, the government is considering two options:

Approach to setting new criterion	Emissions limit
Option 1: Set new criterion at the (mean) emissions intensity of plants reporting since 2011/12.	40 kg CO ₂ e per MWh
Option 2: Set new criterion based on the lowest 30% of emissions intensities reported by existing plants since 2011/12. ²⁴	25 kg CO ₂ e per MWh

²³ Current and previous Governments have also published significant work looking at the full scope of emissions particularly from North American solid biomass feedstocks, which have provided reassurance that the worst case scenarios associated with this feedstock are unlikely or unlikely to be widespread – see in particular “Life Cycle Impacts of Biomass Electricity in 2020”, published in July 2014 and available on the GOV.uk website, and “Use of high carbon North American woody biomass in UK electricity generation”, published in March 2017 and also available on the GOV.uk website

²⁴ The government has ranked the emissions intensities reported by existing plants from 2011/12 onwards, from low to high, and selected the level that represents the 30th percentile.

84. The government is minded to adopt **Option 1**, which offers a low emissions limit (while still being demonstrably deliverable by a significant proportion of existing plants). The government considers this to be an appropriate option given the criterion will cover contracts lasting up to the year 2041, when the economy as a whole should be approaching the 2050 targets set out in the Climate Change Act. The government will consider other evidence that arises during the consultation and how this could affect the approach taken.
85. The emissions limits above will result in projects supported by new CfD contracts having lower emission levels than were allowed under the existing GHG criterion. The government believes there remains potential for significant reduction of emissions in the sectors within the scope of the methodology including harvesting, processing and transport of fuels.

Additional limits on individual consignments of biomass

86. The current GHG criterion is based on annual average performance, but also applies a ceiling level of emissions for individual consignments of biomass. The government is not proposing to update the ceiling level of emissions for individual consignments of biomass, as with a proposed significantly lower annual average limit the government is less concerned about individual consignments, and also anticipates plants may require the option of flexibility within the year to meet this.

Ensuring that this new criterion delivers a significant carbon saving

87. The government has considered what electricity generation is being 'displaced' in order to be confident that newly supported projects deliver a significant greenhouse gas saving.
88. When the current greenhouse gas criteria were established in 2013, the EU fossil fuel comparator was used as a benchmark; and the criterion was set at a level which demonstrated that new projects represented a significant reduction in emissions relative to that comparator. However that comparator will have decreasing relevance when applied to new CfD projects as it includes the generation of electricity from unabated coal, which the recently published Clean Growth Strategy confirms is set to be phased out of the GB electricity mix from 2025²⁵. This comparator was also used when support was largely delivered through a demand-led scheme (the Renewables Obligation) rather than a fixed budget scheme (the CfD).
89. In setting the criterion for new contracts the government has therefore considered several possible alternative ways of demonstrating the level of savings offered under a new criteria:
 - *Approach 1: average emissions of fossil fuel generation on the GB network (excluding coal) in the past three years.* This is a suitable comparison if it is assumed that subsidised solid and gaseous biomass solely displace fossil fuels from the electricity mix.
 - *Approach 2: average emissions of all generation on the GB network (excluding coal, but including renewables) in the past three years.* This is a suitable comparison if it is assumed that the CfD scheme has a finite budget, meaning that subsidised solid and gaseous biomass can displace both fossil fuels and other renewable technologies from the electricity mix.

²⁵ The Clean Growth Strategy – Leading the way to a low carbon future”, published in October 2017 and available at the gov.uk website.

- *Approach 3: an average of a forward projection of emissions of all generation on the GB network over the 15 years life of the new contract.* This is a suitable comparison if it is assumed that solid and gaseous biomass receiving support are displacing fossil fuels and renewables over the life time of a new 15 year contract, and that the criterion should reflect a saving against decarbonisation of the grid that occurs over the period of subsidy. This comparison is based on a future projection.

90. The table below shows that the emissions limit under the preferred option for the new GHG criterion (Option 1) will offer a good saving relative to all of these alternatives.

GHG savings under a new criterion ²⁶		
	Option 1 Criterion of 40 kgCO ₂ e/MWh	Option 2 Criterion of 25 kgCO ₂ e/MWh
Approach 1	90%	94%
Approach 2	76%	85%
Approach 3	13%	45%

Consultation Questions

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The government welcomes views on all aspects of the proposed approach, including:

- setting a new (and lower) criterion than the one used up to now
- using recent performance under the existing criteria as a basis for defining a new criterion
- defining a single criterion applying across five commissioning years
- setting a criterion that will remain constant for the duration of a 15 year CfD contract
- which of Option 1 and 2 appears most appropriate
- the proposal to not to change the emissions limit for single consignments
- scope for unintended consequences

²⁶ Consistent with the UK Greenhouse Gas Inventory methodology. Nuclear and renewables (including bioenergy) are assumed to have zero carbon dioxide emissions.

Changes to improve the operation and clarity of the CfD

The Contracts for Difference (CfD) contract is kept under ongoing review to ensure that it is operating as intended and benefits from the experience gained since the conclusion of the first allocation round in 2015.

Without limitation to that ongoing process, the government is proposing changes to the standard terms and conditions, specifically relating to Force Majeure, to the handling of Grid Connection delays, to the definition of Installed Capacity, and to the definition of a Facility.

These changes could improve the operation and clarity of the CfD contract, and, in certain respects, ensure the contract is giving effect to the intended balance of risks between generators and consumers.

In addition, we are proposing to amend the definition of 'waste' in CfD regulations to bring our national legislation into line with the new definition of 'waste' in the EU Renewable Energy Directive.

Force majeure

91. The CfD contract provides relief to Generators for any failure or delay in the performance of any of their obligations under the contract, for example, in achieving the Longstop Date (LD), Milestone Delivery Date (MDD) and Target Commissioning Window (TCW), where this is caused by a Force Majeure²⁷. Condition 69 of the Standard Terms states that Force Majeure relief will only be granted where certain conditions are met, including a requirement to use reasonable endeavours to mitigate the effect of the Force Majeure.

Clarifications

92. However, operational experience suggests that some Generators have sought to interpret the current drafting in different ways, for example in seeking to claim Force Majeure relief. To put the intention of the contract beyond doubt, the government proposes to amend the contract drafting to make it clear that relief can only be claimed:
- (a) where a Generator can demonstrate that the delivery of a contractual milestone has, or will be, affected, i.e. the relief does not extend to milestones which are not contractual milestones;
 - (b) where any failure or delay in performing a contractual obligation (including achieving a LD, MDD and TCW) is caused by and directly attributable to a Force Majeure event;
 - (c) where Condition 69 of the contract has been complied with; and
 - (d) where the Force Majeure event or circumstance is a continuing one, is an event or circumstance which remains beyond the reasonable control of the FM Affected Party or their Representatives and remains one which they could not reasonably have avoided or overcome.

²⁷ Longstop Date, Milestone Delivery Date, Target Commissioning Window and Force Majeure are defined in the CFD contract.

Consultation Question

27

The government proposes to make these proposed clarifications but is consulting to allow respondents to highlight if they consider that they could lead to any unintended adverse consequences which the government should properly take into account before making any such changes and/or which may impact the way the proposals are drafted.

Amendments

93. In addition, the government is minded to amend the contract to stipulate that a force majeure event must not be the result of pre-existing factors of which the Generator was aware, or could reasonably be expected to be aware, on or prior to the Agreement Date. This is because it considers that the Generator is in the best position to manage the risk of any event or circumstance which arises prior to the Agreement Date. That is, if the Generator identifies an event or circumstance prior to entering into the CfD contract which may impact their ability to meet their contractual obligations or contractual milestones, they may either choose not to enter into the contract or to enter into the contract having put in place appropriate mitigations. This proposal is analogous to drafting on Foreseeable Change in Law where relief is not provided in relation to new legislative proposals which are available in draft before the Agreement Date.
94. Condition 69.3(A) of the contract requires an FM Affected Party²⁸ to notify the LCCC as soon as reasonably practicable of the nature and extent of the Force Majeure causing its failure or delay in performance. The current drafting requires notice of the Force Majeure to be submitted after the Force Majeure has occurred. However, the government is keen that any event or circumstance which may result in a failure or delay in performance is identified early, so that appropriate mitigations can be put in place at the earliest opportunity. Therefore, we are minded to clarify the contract to require that an FM Affected Party should also provide notice of any Force Majeure as soon as that FM Affected Party is or could reasonably be expected to be aware that a Force Majeure is likely to cause it to fail to perform its obligations under the CfD.

Consultation Question

28

The government welcomes views on these proposed amendments including, but not limited to, whether they could lead to any unintended consequences.

Grid connection delay

95. In a similar way to Force Majeure, the CfD contract provides protection to Generators against delays to grid connection works being undertaken by third parties, including the Transmission System Operator and Licensed Distributor, which are beyond the Generator's control. This protection is built into the definitions of LD, MDD and TCW and is intended to allow for extensions to these milestones if a grid delay affects the Generator's ability to meet them.

²⁸ 'FM Affected Party' is defined in the CFD contract.

96. This protection was provided because it was recognised that certain grid delays may be outside of the control of the Generators. However, operational experience suggests that the policy intent with respect to relief from grid connection delays is not fully understood and would benefit from clarification through minor amendments to the CfD contract. In particular, the government wishes to clarify that this relief was never intended to apply to situations where third party delays have occurred because a Generator has failed to enter into a connection works agreement in a timely way, i.e. the delay is partly due to the Generator's own actions and therefore not entirely outside of their control. The government also wishes, for the avoidance of doubt, to clarify that grid delay relief was never intended to apply to delays that have no actual impact on contractual milestones.
97. The government therefore proposes to amend the LD, MDD and TCW definitions to place an obligation on the Generator to use reasonable endeavours (a) to avoid delays to milestones occurring by ensuring that the grid connection and grid works agreements are agreed in a timely manner, and (b) where delays occur, to use reasonable endeavours to mitigate the effects of delay on the Generator's performance of its obligations under the CfD.
98. The government also proposes to amend the definitions of LD, MDD and TCW to clarify that any grid delay must actually cause a delay to a relevant contractual milestone (rather than another milestone) in order to qualify for grid delay relief.

Consultation Question

29

The government proposes to make these proposed clarifications but is consulting to allow respondents to highlight if they consider that they could lead to any unintended adverse consequences which the government should properly take into account before making any such changes and/or which may impact the way the way the proposals are drafted.

Installed capacity

99. The government proposes to clarify the drafting of the definition of "Installed Capacity" to reflect government policy intentions that CfD difference payments should be paid on electrical output net of parasitic loads and electrical losses, as measured at the boundary point meter.
100. The Installed Capacity of a Facility is first introduced as part of the application process for a CfD when applicants must indicate the Initial Installed Capacity Estimate prior to submitting their bid. The definition of Installed Capacity in the CfD is used to calculate the Installed Capacity Estimate, the Final Installed Capacity and the Maximum Contract Capacity. The Maximum Contract Capacity effectively caps the level of metered output on which a Generator can receive difference payments until the end of the contract term, and cannot exceed the Initial Installed Capacity Estimate submitted during the application process.
101. CfD payments are based on the output as measured at the boundary point meter i.e. payments are based on output which is net of the electricity used by the Facility (parasitic loads) and losses within the Facility. It follows that the cap on payments is set as the maximum *net* output that could be generated on a continual basis without causing damage to the Facility.
102. Operational experience indicates, however, that some CfD Generators have sought to interpret Installed Capacity as a gross figure (being the cumulative nameplate capacity of all the generating units) while others took it to be net (i.e. net of parasitic

loads and electrical losses). Similarly, some thermal Generators have sought to interpret Installed Capacity as the maximum operating capacity corresponding to the output produced (taking into account lost load due to export of heat through CHP operation), while others have interpreted Installed Capacity as the maximum operating capacity corresponding to the maximum electrical output that can be achieved in normal operating conditions when no heat is exported outside the Facility. These examples are illustrative only and not intended to reflect all possible interpretations that Generators have been put forward.

103. To help mitigate the risk of Generators entering into a CfD and progressing towards CfD milestones with different interpretations of Installed Capacity, LCCC published "*Guidance: installed capacity & final installed capacity*"²⁹ in January 2017 clarifying Installed Capacity as maximum capacity net of the parasitic loads and electrical losses within the CfD Facility necessary for the continuous generation of electricity without causing damage to the Facility. The LCCC have also published Q&A for CfD Generators on their website setting out the same position³⁰.
104. For the avoidance of doubt, and to reduce the risks of potential uncertainty for generators and disagreement between the counterparties on this matter, the government proposes to amend the definition of "Installed Capacity" to clarify that the Installed Capacity is the capacity of the Facility were it to be operated on a continual basis at the maximum capacity possible without causing damage to it (assuming any source of power used by it to generate electricity was available to it without interruption), net of parasitic electrical load and operating losses to the boundary meter point.
105. Further, in relation to combined Heat and Power schemes, we intend to clarify that the Installed Capacity is the capacity of the Facility when the turbine or engine is in power only mode (operating at the maximum capacity possible without causing damage to it without any external heat offtake) minus parasitic loads and electrical losses up to the export meter (and assuming any source of power used by it to generate electricity was available to it without interruption). This is because heat offtake may be intermittent and it is our intention that Installed Capacity should be a measurement of the capacity of the Facility without losses caused by any heat offtake.
106. Drafting this amendment is likely to require new definitions for 'parasitic load' and 'electrical losses'. The government's current view is that if such definitions are inserted into the contract, the drafting should be consistent with the way this term is described in LCCC's "*Guidance: installed capacity & final installed capacity*". That is, the parasitic loads and electrical losses that should be deducted when determining the Installed Capacity are:
 - any parasitic electrical load generated by auxiliary equipment required to operate the Facility for a sustained period of time safely and efficiently at the maximum capacity possible and without causing damage to the Facility (expressed as a percentage of the Installed Capacity); and
 - any electrical losses within the Facility from the generating units to the export metering point when generating at the maximum capacity possible and without causing damage to the Facility (expressed a percentage of the Installed Capacity).

29 "Guidance: installed capacity & final installed capacity, Version 2", published by the Low Carbon Contracts Company in January 2017 and available on the lowcarboncontracts.uk website

30 "Frequently Asked Questions – Installed capacity", available on the lowcarboncontracts.uk website

Consultation Question

30

The government welcomes views on our proposal to clarify the definition of “Installed Capacity” and introduce new defined terms for ‘parasitic electrical load’ and ‘electrical losses’ as suggested above, including whether these changes could lead to any unintended consequences. Given the variable nature of parasitic loads and electrical losses, we would also welcome views on any practical issues that we should consider in relation to determining the level of parasitic loads and electrical losses for the purposes of determining net capacity, e.g. whether these should be calculated on an average basis.

Facility description

107. The “Facility” definition has important contractual implications for the Generator throughout all phases of the contract. For example, it is referred to in the definition of Installed Capacity (the use of the term “Installed Capacity” has been discussed in more detail on previous pages), informs whether Project Commitments have been met and may be relevant when determining the extent of a Qualifying Change in Law or Force Majeure relief.
108. It is essential for the effective operation of the contract that there is a clear understanding between the Generator and the LCCC as to which assets fall within the definition of ‘Facility’. A description of the assets which comprise the Facility is already required to be provided by the Generator in a form which is satisfactory to the CfD Counterparty pursuant to the Conditions Precedent (see Schedule 1 (C)(i)) of the CfD standard terms and conditions). For clarity, we propose to make a small adjustment to the definition of “Facility” in the generic CfD agreement to clarify that the assets that fall within the generating facility are those identified in the description of the Facility provided pursuant to Schedule 1.
109. In addition, to ensure ongoing clarity, the government is considering consequential amendments to allow that definition to incorporate any updated description of the assets which is provided by Generators pursuant to condition 5, 6 or 7 (i.e. where there is a reduction in the Installed Capacity Estimate, adjustment to the Installed Capacity Estimate or agreement of the Final Installed Capacity) provided that description has been agreed by the CfD Counterparty.

Consultation Question

31

The government welcomes views on the proposal to clarify the definition of Facility, including whether it could lead to any unintended consequences.

110. Should the government decide to proceed with any of the proposed changes set out above, it is our current intention that we would, subject to the views that we receive in response to this consultation, consult again on specific draft amending text for the CfD contract prior to implementation.

Additional contract changes

Implications of leaving the European Union

111. On 23 June 2016, the EU referendum took place and the people of the United Kingdom voted to leave the European Union. Until exit negotiations are concluded, the UK remains a full member of the EU and all the rights and obligations of EU membership remain in force. During this period the government will continue to negotiate, implement and apply EU legislation. The outcome of the exit negotiations will determine what arrangements apply in relation to EU legislation in future once the UK has left the EU. The government intends to review the CfD Standard Terms and Conditions and various front-end CfD contract agreements to identify any changes that may be necessary to ensure that the CfD contract continues to operate effectively on the UK's departure from the EU. We will consult in due course setting out our analysis and proposed drafting changes.

Indirect Land Use Change amendments

112. EU Directive 2015/1513³¹ was adopted in 2015 and addresses concerns about the impact of indirect land-use change caused by the growing of crops for use as transport biofuels, or bioliquids used for the generation of electricity and/or heat. In relation to bioliquids, it amends Directive 2009/28/EC on the promotion of the use of energy from renewable sources (commonly called the Renewable Energy Directive or RED)³².
113. In October this year the government consulted on proposals on how to transpose into the Renewables Obligation (RO) new EU legislation concerning the sustainability of bioliquids used for electricity generation.³³ The consultation responses are being analysed and the government will publish its response to the consultation in due course.
114. The requirements of Directive 2015/1513 must also be transposed into the CfD to ensure that where bioliquids are used in CfD generating stations, they comply with the new sustainability requirements. The CfD Counterparty has already transposed the necessary amendments where appropriate into existing CfD contracts, including those awarded during the second CfD allocation round. The CfD Counterparty has published an open letter³⁴ to CfD Generators on their website outlining the changes required to ensure that contracts comply with the requirements of the Directive. It is our intention to implement the same changes into the CfD standard terms and conditions, and we will consult on this matter in due course.

Amending the definition of 'waste'

115. One of these changes, on which we are consulting now, concerns amending the definition of 'waste' in The Contract for Difference (Definition of Eligible Generator) Regulations 2014 – referred to here as the Eligible Generator Regulations - to take account of the new definition of 'waste' introduced by Directive 2015/1513.

³¹ "Directive (EU) 2015/1513 of the European Parliament and of the Council of 9 September 2015 amending Directive 98/70/EC relating to the quality of petrol and diesel fuels and amending Directive 2009/28/EC on the promotion of the use of energy from renewable sources", is available at the europa.eu website

³²The Renewable Energy Directive, "Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC (Text with EEA relevance)", and available at the Europa.eu website.

³³ "Consultation - New rules for bioliquids, wastes and residues under the Renewables Obligation", published in October 2017 and available on the gov.uk website

³⁴ Open letter to current CFD Generators and applicants to the Second CFD Allocation Round (9 August 2017), available in the Publications section of the CfD Counterparty's website

116. Waste is defined in the Eligible Generator Regulations and the CfD Agreement³⁵ by reference to Article 3(1) of the Waste Framework Directive (Directive 2008/98/EC)³⁶ which states that “‘waste’ means any substance or object which the holder discards or intends or is required to discard”. Directive 2015/1513 amends Article 2 of the RED by introducing a new definition of ‘waste’ which refers to the definition of waste in Article 3(1) of the Waste Framework Directive but adds to that definition that “substances that have been intentionally modified or contaminated to meet that definition are not covered by this definition”. This amendment is a clarification of EU policy intent that substances which have been intentionally modified to count as waste, thereby being subject to less stringent sustainability criteria, should not be included in the definition of waste.
117. The government proposes to amend the definition of waste in the Eligible Generator Regulations to bring it into line with the new definition of ‘waste’ in the RED. This will make it clear that the term ‘waste’ excludes any substance that has been intentionally modified or contaminated to fall within the definition of waste in Article 3(1) of the Waste Framework Directive.
118. While the ILUC Directive is particularly concerned with biofuels and bioliquids, applying a consistent definition of waste for all purposes in the CfD legislation avoids creating unnecessary confusion and burdens on generators and avoids creating distortions in the waste feedstock market. The government therefore proposes that the new definition of ‘waste’ will apply in the CfD scheme for all purposes where the term ‘waste’ is used in the contract and/or by reference to the Eligible Generator Regulations.
119. We have no evidence to suggest that future participants in the CfD intend to use modified waste, and it is our expectation that any developer wishing to participate in future CfD rounds as a fuelled generator would want to ensure that the feedstocks that they use meet the appropriate sustainability standards required under the contract. We therefore do not believe that amending the definition of ‘waste’ as described above would have any impact on the fuelled technology sector.
120. Subject to this consultation, the government intends to amend the Eligible Generator Regulations in advance of the next CfD allocation round. The government will consult on specific drafting changes to the CfD Agreement to give effect to this amendment in due course.

Consultation Questions

32	The government welcomes views on the proposal to amend the definition of ‘waste’ in the Eligible Generator Regulations and the CfD Agreement to bring it into line with the new ‘waste’ definition in the Renewable Energy Directive. The new definition would apply for all purposes where the word ‘waste’ is used in the CfD scheme.
33	The government welcomes comment on the view that participants in future CfD rounds do not intend to use modified waste and that they would want to ensure that the fuels they use meet the appropriate sustainability standards, and that consequently this amendment is likely to have no impact on the fuelled technology sector?

³⁵ CfD Agreement (Annex 4, Fuelling Criteria, paragraph 1.1)

³⁶ The Waste Framework Directive ‘Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives’ is at: <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32008L0098>

Additional minor and technical changes

121. The government is considering a number of additional minor and technical changes to improve the operation of the CfD, and will consult on these in due course. By way of example, we anticipate that this will include changes to the Transmission Loss Multiplier (TLM) definition in the Strike Price Adjustment process which is being implemented through the *Elexon* P350 Modification under the Balancing and Settlement Code in compliance with The Energy Market Investigation (Electricity Transmission Losses) Order 2016 published by the Competition & Markets Authority³⁷. The CfD Counterparty's intention to make this change to existing and second allocation round CfD contracts was also signalled in its letter of 9 August 2017 to CfD Generators.

³⁷ The Energy Market Investigation (Electricity Transmission Losses) Order 2016 and Explanatory Note, available on the Competition and Markets Authority website

Annex Responses to the Consultation on non-mainland GB onshore wind projects

In November 2016, the government launched a consultation seeking views on the future treatment of non-mainland GB onshore wind projects³⁸. It sought views on whether they should be classified as a separate technology or allowed access to allocation rounds for less established technologies (Pot 2).

The consultation suggested that non-mainland GB onshore wind projects should continue to be treated as onshore wind and not moved to compete in Pot 2, but noted that should the consultation result in new evidence or strong justification being provided, the government was open to considering the possibility of distinct treatment for them.

129 responses to the consultation were received from individuals, independent renewables generators, trade associations and large integrated energy suppliers, environmental groups and companies located on Shetland, Orkney and the Outer Hebrides.

Treating non-mainland projects as a separate technology category

122. The consultation asked whether non-mainland GB onshore wind should be considered a separate technology from onshore wind. Around two thirds of those who responded were in favour of treating it separately. Most cited the additional transmission costs associated with projects to be developed on the islands as the main justification, while some of those also pointed to the benefit to the UK of utilising the high wind resource found on the islands, as well as the supply chain benefits to the UK and the economic and employment benefits to local communities.
123. Of those who did not favour treating it separately, most argued that the projects were onshore wind and did not require additional support. A smaller number were concerned that it might lead to gaming with developers choosing unsuitable sites for new projects due to the increased support that they might stand to receive.

Specific barriers to projects & wider potential support measures

124. The consultation sought views on what the specific barriers to the development of these projects might be. Most respondents identified transmission costs associated with subsea cables to deliver electricity to mainland GB and the associated grid capacity constraints as the principal barriers.
125. A few respondents were concerned that allowing projects to go ahead on the islands might have a negative impact upon tourism potential in future, as well as potential to damage peat reserves releasing stored carbon during the building process. Concerns were expressed that the small land area of the islands would make wind farms and associated infrastructure more dominant than on the GB mainland.
126. Asked what measures, outside the CfD, might be put in place to counteract the challenges already identified by respondents, most respondents suggested the CfD was the most appropriate mechanism, some noting it was well established and was a known mechanism for the purpose of supporting investment. Other suggestions included directly funding transmission assets, developing a new form of support for remote islands and supporting tidal rather than wind technologies on the islands.

³⁸ "Consultation on treatment of non-mainland GB onshore wind projects", published on 9 November 2016 and available on the gov.uk website

Annex Responses to the Call for Evidence on fuelled technologies

The call for evidence³⁹ ran from 9 November to 20 December 2016. It received approximately 3,000 similar responses, as well as a further 49 unique responses (28 from developers, 6 from NGOs, 5 from trade associations, 8 from interested bodies and 2 from members of the public). A separate response on Geothermal technologies, which were covered in the same call for evidence, was previously published in March

Cost reduction potential for fuelled technologies

127. Almost a third of the unique responses to this question argued that fuelled technologies were now a mature technology with little or no scope for further cost reduction. Factors that could affect future cost levels included government support for, and investment in, supply chain infrastructure. Particular obstacles to cost reductions that were mentioned included the difficulties associated with connecting to a district heating network, planning concerns, and the difficulties of securing and maintaining a heat offtaker.
128. Some respondents noted that long term stable and predictable policy support from government plays an important role in promoting investor confidence and an environment conducive to investment and innovation.
129. Potential increases in the cost of woody biomass due to increasing world demand was cited by some respondents as a factor which could hinder future cost reduction. Approaches suggested to offset any such cost increases included offering long term price guarantees or encouraging the development of UK indigenous resources.
130. While some respondents felt that the competition generated by the CfD mechanism would lead to reduced costs across technologies, others felt the CfD mechanism is not well tailored to fuelled technologies and hinders further cost reduction. Some argued that if the 'project delivery' milestone was extended to two years it could increase investor confidence and lead to a reduction in financing costs.

Potential changes to the CfD scheme to drive cost effective decarbonisation of electricity generation

131. Several respondents argued that decarbonisation could be achieved most cost effectively by focusing on wind and solar power, with some noting that biomass resource could be put to better use to decarbonise heat and the wider economy. Several respondents argued that the criteria for CHP plants needed to be tightened to deliver a more material decarbonisation impact. A number of respondents argued that emissions from biomass are incorrectly accounted for, and that action was necessary to avoid giving a misleading picture of the carbon saved from technologies which use biomass as a fuel source.
132. A few respondents argued that the CfD should better reflect the reduction in emissions of using waste as a fuel, compared with the landfill counterfactual.
133. Advanced conversion technologies were suggested as an effective back up for intermittent renewables by a few respondents, while others noted that the more

³⁹ "Call for evidence on fuelled and geothermal technologies in the Contracts for Difference scheme", published in November 2016 and available on the gov.uk website

advanced forms of the technologies were capable of producing significantly more electricity per unit of fuel than other technologies, but had higher costs that made it difficult to secure CfD contracts in competitive allocation rounds. It was also noted that battery technology may be an alternative means of addressing an increase in intermittent sources of generation.

Interaction between the CfD scheme and support for decarbonisation of heat

134. Several respondents noted that a key issue to address was the difficulty of securing and maintaining a reliable and long term heat offtaker for CHP schemes. Suggested solutions included a government guarantee for the heat element; stricter criteria in selecting heat off takers to provide long term security and removing the requirement to find an alternative heat of taker. More broadly, several respondents argued the government should support the development of heat networks, either directly or through the planning regime.
135. Several respondents suggested CHP should be supported through the CfD as much for heat, as for power, although arguments were also raised that supporting heat production through the CfD distorts the market. A few respondents requested greater stability in government policy, particularly on timing of future CfD allocation rounds.
136. The relationship between the CfD and the Renewable Heat Incentive (RHI) scheme was an issue raised by several respondents. Some suggested an RHI contract should be ring fenced for those successful in the CfD auction process, while others argued that telling us there should be no overlap between the CfD and RHI schemes.
137. Several respondents argued that the efficiency rate for CHP to qualify for CfD should be raised to 70%, and a few argued that the definition of the economic use of heat under the scheme should be tightened.

Innovative ACT projects & the circular economy using waste as fuel

138. Around half of the responses to this question stated that the CfD should continue to support ACT in some form. Reasons cited included the contribution the technology offers in terms of developing the circular economy with regards to waste; the fact that it secures base load energy supply; and that it delivers low carbon and cost effective electricity generation, and that its potential for carbon savings extends to transport and manufacturing.
139. Some respondents suggested that continuation of the current approach to support under the CfD is important for deployment of ACT projects, to limit risk for the ACT industry and help the sector become more established.
140. Some respondents suggested that support for ACT under the CfD should be amended. Proposals included splitting ACT on the basis of whether or not it provides CHP and to incentivise projects which deliver steps up the waste hierarchy. These respondents broadly felt that support should either be limited to more advanced forms of ACT which deliver a high quality syngas, or that the CfD should differentiate between standard and more advanced forms of ACT.
141. Some respondents thought that the CfD should not continue to support ACT, in some cases arguing that waste and biomass should be directed to areas that are harder to decarbonise such as heat, transport and chemicals. A few respondents suggested that, if the government decides to continue to support ACT, definitions should be altered to ensure that plants receiving new CfD contracts deliver a high quality syngas.