Department of Energy & Climate Change

Government Response to the consultation on proposals to enhance the sustainability criteria for the use of biomass feedstocks under the Renewables Obligation (RO)

22 August 2013

Contents

Executive Summary

Introduction

1. The Renewables Obligation (RO) is currently the main financial mechanism by which the Government incentivises deployment of large-scale renewable electricity generation.

2. On 7 September 2012, the Government published a consultation paper setting out proposals addressing biomass affordability and sustainability for the RO[1]. Part A of the consultation, covering improvements to the sustainability criteria that apply to the use of biomass for electricity generation under the RO, closed 30 November 2012. The consultation proposals mainly addressed the use of solid biomass and biogas feedstocks.

3. Mandatory sustainability criteria for bioliquids have already been introduced as required and set under the EU Renewable Energy Directive (RED). Therefore the consultation proposals were intended to apply to bioliquids only where this was specifically stated.

4. This document is the Government Response to this consultation on biomass sustainability criteria and sets out the Government's decisions on these matters.

Responses to the consultation

5. In total 73 responses were received that provided evidence and feedback in response to the 14 specific questions asked. These were drawn from across the biomass industry including trade associations, power station developers, manufacturers, supply-chains and financiers. Responses were also received from certification bodies, non-government organisations (NGOs), a local authority and two individuals.

6. Some of the responses provided general evidence and feedback regarding bioenergy rather than specific answers to the questions. In addition, some responses addressed some of the questions but not all. Therefore the total numbers of responses received to each question varies between 9 and 46 in total. The list of respondents is available at Annex A.

7. We also received a large number of responses, around 2,000, as part of the Friends of the Earth (FoE) campaign that highlighted concerns regarding biomass power and carbon emissions. A copy of the letter text is available at Annex B. 540 responses were received in response to the Renewable Energy Association's 'Back Biomass campaign' that highlighted benefits from bioenergy. A copy of this letter text is available at Annex C.

8. In addition there were a large number of meetings with stakeholders and a significant amount of evidence has been provided and considered. This Government Response is the formal response to all of your feedback, data and the two campaign letters.

---

[1] DECC (2012) Biomass Electricity & CHP generating stations – ensuring sustainability and affordability www.decc.gov.uk/en/content/cms/consultations/biomass_ro/biomass_ro.aspx

9. We would like to thank all of those who responded to the consultation, and provided Government with their views and evidence. Your contribution and active engagement has helped inform the Government's final decisions set out in this document; we appreciate your significant time and effort.

Feedback and decisions

10. **The UK Government has decided to bring in robust sustainability controls for solid biomass and biogas that go beyond those currently recommended or required in the EU and internationally.** The policy decisions presented in this Government Response reflect the principles of the UK Bioenergy Strategy and aim to support the development of sustainable biomass supply-chains. Many of the power generators operating in the UK are already recognised as industry leaders on biomass sustainability, so are well-placed to work with their supply-chains, certification bodies and others to meet these ambitious and stretching criteria.

11. **The changes to the RO sustainability criteria set out in this document will be brought in as a requirement to report against performance from April 2014.** This will give generators and their supply-chains a period of transition to familiarise themselves with the new controls and related guidance, ahead of the UK's intent to mandate the requirements (i.e. require demonstrating meeting the criteria to receive support) for generators of 1MWe capacity and above.

12. The European Commission aims to publish an updated report on the requirements for sustainability criteria for solid biomass and biogas used for electricity, heat and cooling by the end of the year. **Following the publication of the EC report, the UK intends to notify its RO sustainability criteria to the EU under the Technical Standards Directive (TSD) with the intention that the sustainability criteria for the use of solid biomass and biogas feedstocks under the Renewables Obligation will become mandatory from April 2015.** This would mean generating stations of 1MWe capacity and above would be required from this date to demonstrate that solid biomass and biogas feedstocks meet the sustainability criteria in order to be eligible for support under the RO.

Greenhouse Gas Trajectories

13. **The UK Government has decided that biomass power using solid biomass and/or biogas, whether new or existing, with or without combined heat and power (CHP), dedicated, standard co-firing, enhanced co-firing, coal to biomass conversion, advanced conversion technologies or anaerobic digestion, will be placed on the same greenhouse gas (GHG) emissions trajectory from 1 April 2020.** Before this date existing biomass power generation will remain on the current target of a 60% GHG emissions saving compared to the EU fossil electricity average to reflect that long-term contracts will be in place and these plants will need time to transition to the tighter target, while new dedicated biomass power generation will be subject to a tougher target to 2020 reflecting the relatively higher cost of carbon savings compared to the replacement of coal with biomass in existing stations.

14. The GHG trajectories for generators using solid biomass and/or biogas will be:

    (i) *New-build dedicated biomass power (with or without CHP*) that receives full accreditation on or after 1 April 2013 –

    - **240 kg CO2eq per MWh from 1 April 2014 to 31 March 2020**
    - **200 kg CO2eq per MWh from 1 April 2020 to 31 March 2025**
    - **180 kg CO2eq per MWh from 1 April 2025 to 31 March 2030**

    (ii) *All other biomass power* (includes existing dedicated biomass power, with or without CHP that received full accreditation no later than 31 March 2013, co-firing coal stations, coal stations converting to standard/enhanced co-firing or to 100% biomass conversion, anaerobic digestion and advanced conversion technologies that accredit under the RO before its close in 2017):

    - **285 kg CO2eq per MWh from 1 April 2014 to 31 March 2020**
    - **200 kg CO2eq per MWh from 1 April 2020 to 31 March 2025**
    - **180 kg CO2eq per MWh from 1 April 2025 to 31 March 2030**

15. In order to set an ambitious but achievable trajectory which recognises that consignments could through no fault of the generator exceed the target (e.g. ship diversion due to inclement weather conditions) and to allow generators greater flexibility in sourcing suitable feedstocks, **the target will represent an annual average**. **This is subject to the provision that any one consignment of solid biomass or biogas feedstocks must not exceed the ceiling of:**

- **285 kg CO2eq per MWh from 1 April 2014 to 31 March 2020**
- **270 kg CO2eq per MWh from 1 April 2020 to 31 March 2025**
- **260 kg CO2eq per MWh from 1 April 2025 to 31 March 2030**

16. Averaging will be available to new-build dedicated biomass (with and without CHP) from April 2015 when we intend the criteria will become mandatory. It will also be available to all other biomass generating stations using solid biomass and biogas from April 2020 when these stations become subject to the 200 kg CO2eq per MWh target. Details of how averaging will be applied in practice is set out in section 3.25 - 3.28.

17. The greenhouse gas lifecycle methodology is as set out under the 2009 EU Renewable Energy Directive, reflecting the recommendations made in the European Commission's 2010 report on requirements for sustainability criteria for solid biomass and biogas used for heat, electricity and cooling. This methodology considers the emissions from the cultivation, harvesting, processing and transport of the biomass feedstocks. It also includes direct land use change where the land use has changed category since 2008. It does not include indirect impacts such as displacement effects.

18. **The UK Government has decided that only biomass generating stations below 1MWe will be allowed to use the high level default values set out in the ROO for specified whole feedstock GHG lifecycles. All stations of 1MWe and above will be required to use a GHG tool, when reporting on their GHG lifecycle emissions from different feedstocks, such as the tool available from the Ofgem website or suitable alternatives.**

Land Use and Sustainable Forest Management Criteria

19. **The Government has decided that biomass power plant, using solid biomass and/or biogas feedstocks, whether a new or existing generating station or unit, with or without CHP, dedicated, co-firing or coal to biomass conversion will be subject to land criteria. The land criteria will be different for (i) virgin wood and (ii) all other non-waste biomass including energy crops.** Land criteria will not apply to biomass waste or to feedstocks wholly derived from waste

20. **Sustainable forest management criteria will be brought in for the use of feedstocks that are virgin wood or made from virgin wood from April 2014.** The sustainable forest management criteria will be based on the UK Timber Procurement Policy (UK-TPP) principles for central Government. **The use of mass balance will be allowed for the processing, storage and sale of wood that is sourced from forests where bespoke evidence is used (for public procurement of timber this is referred to as Category B evidence)** in addition to wood sourced from forests that has been certified under an approved scheme. Reflecting that the UK TPP principles considers a range of social, economic and environmental issues relevant to forests, including biodiversity, productivity and protection of habitats, **for these feedstocks the land criteria will correspond to the sustainable forest management criteria.**

21. The proposed RO sustainability criteria do not currently directly address the preservation of land carbon stocks except where the reported use of the land changes. We will seek to bring this issue specifically into the criteria for bioenergy in the coming years, with a review of the effectiveness of our approach in 2016/17 as part of the planned UK Bioenergy Strategy Review. The Review will include consideration of the sustainability criteria that should apply to new biomass generation coming forward from April 2019. This would support wider UK Government work to improve international carbon accounting and management practices. It would also offer important public awareness benefits of the value from sustainable forest management in addressing climate change.

22. **The land criteria for all other solid biomass and biogas, including perennial energy crops, such as miscanthus grass and short rotation coppice willow, and agricultural residues, such as straw, will correspond to the land criteria set out in the EU Renewable Energy Directive for transport biofuels and bioliquids.** In addition, RO energy crops which (i) meet the narrower definition of energy crops as set out in the Renewables Obligation Order 2009, as amended by the Renewables Obligation Order 2013, and (ii) have been assessed as meeting the requirements of the Energy Crops Scheme or equivalent that applied at the time of the assessment, will be deemed to meet the Land Criteria.

23. **Use of feedstocks that are biomass waste, made wholly from waste, animal manure or slurry will be exempt from the scope of land criteria, as well as the GHG criteria** reflecting the lower sustainability risks and that energy from waste is identified as a priority pathway in the UK Bioenergy Strategy. Users of waste feedstocks will, however, be required to provide profiling information to enable Government to monitor the role of these feedstocks in biomass power generation.

Certainty for investment

24. **The tightening GHG trajectories will be put in legislation to give industry sight of the toughening GHG targets to apply out to 31 March 2030.** We will also set out how the sustainable forest management criteria, based on the UK Timber Procurement Policy, will apply with respect to the Renewables Obligation. This will be a separate document to current guidance for government procurement, so as to be in a format suitable to be referenced in future RO legislation. We intend to publish this document before the end of the year.

25. **We have also decided to adopt a policy that the UK will not make further unilateral changes in the methodology underpinning the GHG targets or to other aspects of the RO sustainability criteria before 1 April 2027.** This is the date when support for existing coal to biomass conversions under the Renewables Obligation is due to end. Converting existing coal generation is identified as a priority low-risk transitional pathway by the UK Bioenergy Strategy. However, we retain the option of making changes in the light of any recommendations of the European Commission concerning solid biomass, biogas or bioliquids, or requirements of EU or international law. Any such changes would take place following consultation.

26. **We intend that Contracts for Difference (CfD) awarded under the first Delivery Plan period for bioenergy will follow the same approach as the sustainability standards set under the Renewables Obligation.** This would mean that solid biomass and biogas generation that comes forward under either the RO or CfD before April 2019 will benefit from the policy of no further unilateral changes before April 2027. We will retain the option to make changes to the criteria that apply to new biomass generation coming forward from April 2019.

Independent Assessment/Audit

27. **Biomass power and CHP generating stations of 1MWe and above electricity generating capacity, using solid biomass and/or biogas feedstocks will be required to provide an independent assessment/audit report for feedstocks used from 1 April 2014.** For those using wastes or feedstocks made wholly from waste the independent assessment/audit report will cover the assessment of these feedstocks as waste, and hence excluded from GHG and Land Criteria.

28. **The sustainability report and (or integrated with) the independent audit/assessment will be required to be submitted to Ofgem by 30 June of the following reporting year.** This will allow Ofgem a month to check that the ROCs for the previous reporting year have been issued correctly, before suppliers potentially present these ROCs to demonstrate compliance against their Obligation in August. We note that Ofgem intends to develop a single integrated template covering the expected content for the report and the audit/assessment, and warmly welcome this initiative.

Profiling data

29. The Government has decided that the proposals to rationalise the profiling data for solid biomass and biogas feedstocks, as well as bioliquids where appropriate, will be introduced broadly as proposed. **The changes include improvements to reporting on anaerobic digestion to support the increased use of waste and improved monitoring of crop usage, and requiring additional information on land use and wood types for virgin wood feedstocks. We will also ask for the available information on forest management practices and region as well as country of origin.**

30. If the reported data reveals significant use of high quality wood the Government will consider measures to mitigate adverse impacts, e.g. a voluntary code of practice for generators.

EU and International requirements

31. The decisions set out in this document reflects the European Commission's report on the requirement for sustainability criteria for solid biomass and biogas used for electricity, heat and cooling published in February 2010. This report did not mandate criteria; instead it recommended that if members states chose to bring in criteria that these should be similar to those mandated for transport biofuels and bioliquids under the EU Renewable Energy Directive (RED).

32. The European Commission hopes to publish an updated report on the requirements for sustainability criteria for solid biomass and biogas later this year. The UK supports harmonised criteria across the EU for larger producers and users of solid biomass and biogas. As we set out in this document, we believe this should draw both on the existing criteria for biofuels and bioliquids and well-established national and global controls to promote sustainable forestry. This would create a simpler, coherent market, benefiting both buyers and sellers. Care is needed, however, to ensure that new EU controls do not impact community or household users using locally grown supplies, where sustainability risks are very low. This may be best achieved by setting a threshold at the appropriate level that reflects the reduced risk. We will work with the Commission and other member states to help achieve this. Decisions set out in this document are subject to meeting EU and international regulation.

Implementation and next steps

33. A consolidated Renewables Obligation Order is to be laid in Parliament in early 2014, and the changes made by that Order are intended to come into force (subject to Parliamentary approval and, if necessary, State aid clearance) on 1 April 2014. These legislative changes will cover changes to the reporting requirements, including the GHG target trajectory, the sustainable forest management criteria and the requirement to provide an independent audit/assessment report.

34. The legislative changes to make the criteria mandatory will be included in a further RO Order to be laid next year following notification of the UK Government's sustainability criteria scheme as required under the EU Technical Standards Directive (TSD).

35. The decisions set out in this document apply to the RO in relation to England and Wales. Decisions regarding the operation of the RO in Scotland and Northern Ireland are for the Scottish Government and Department of Enterprise, Trade and Investment in Northern Ireland respectively. However, the UK Government and the Devolved Administrations understand the benefits of a consistent approach and the importance of this to many within the industry and will seek to provide such consistency across the UK.

Contact details

36. If you have any questions regarding this response, please contact:

Renewables Obligation Team
Office for Renewable Energy Deployment
Department of Energy and Climate Change
Area 4A, 3 Whitehall Place
London
SW1A 2AW

Email: biomass@decc.gsi.gov.uk

1. Biomass overview

Introduction

1.1 Biomass is expected to make a significant contribution to delivering the UK's 15% renewable energy target in 2020, with roles across transport, heat and electricity. DECC's online 2050 pathways analysis which allows users to create pathways for the UK to meet both its carbon reduction goals and provide the energy we all rely on - electricity, heat and transport - confirms that bioenergy from sustainable feedstocks will play a key role in a low carbon UK.

1.2 As we set out in the 2012 UK Bioenergy Strategy[2], it is essential that our policies reflect four core principles; that bioenergy should deliver real greenhouse gas savings; be cost-effective; take account of wider impacts across the economy; and manage possible risks such as to food security and biodiversity. We should also, when developing bioenergy policy, look to place us on a pathway that takes account of our long-term climate and energy goals to 2030 and 2050.

1.3 The UK Bioenergy Strategy considered the availability of sustainable biomass supplies and its analysis concluded that up to 11% of the UK's total energy needs could be met with biomass by 2020, without impacting biodiversity or food security. It also identified the use of sustainable biomass to replace coal in existing generation as a priority transitional pathway, together with a longer-term role for industrial biomass heat, for combined heat and power (CHP) and the use of biomass wastes for energy in general. These provide cost and carbon effective energy which increase our energy security and control impacts on UK bill payers.

1.4 The recently concluded Renewables Obligation (RO) Banding Review[3] reflected the Strategy's principles and priority pathways in its decisions. New support levels were added for coal to biomass conversions and for enhanced (50% plus) co-firing to encourage these cost-effective technologies to come forward, together with a non-legislative 400MW cap to limit the new dedicated biomass power without heat capture that would be supported under the RO to shovel-ready projects.

1.5 One of the benefits of bioenergy is that it can replace fossil fuels with limited disruption or impact on customers and can often integrate with existing infrastructure. These benefits accrue from biomass being a physical fuel that can be stored and used when required, in the same way as coal, oil or gas. However the Strategy concluded that this on-going need for biomass feedstocks presents sustainability risks that must be actively managed.

---

[2] DECC (2012) UK Bioenergy Strategy https://www.gov.uk/government/publications/uk-bioenergy-strategy

[3] DECC (2013) Government Response to the consultation on proposals for the levels of banded support under the Renewables Obligation https://www.gov.uk/government/consultations/supporting-large-scale-renewable-electricity-generation

1.6 As an example, for woodfuel to be renewable the forest from which it is sourced must regenerate at the same or greater rate than wood is removed. This means harvesting rates set at a sustainable level in combination with suitable restocking. The results of such an approach is a sustainably managed forest that continues to take up net carbon dioxide and produces wood for a mix of timber and renewable fuel, decade after decade. However, even in this case, there could be carbon impacts, positive or negative, from significant changes in management practices; such as a large increase or decrease in the rotation length before mature trees are harvested or in growing densities.

1.7 In addition, for the resulting bioenergy to be low carbon, the greenhouse gas (GHG) emissions savings from the substitution of wood for fossil fuel and fossil materials must exceed the emissions associated with the cultivation, harvesting, production and transport of the biomass feedstock. The Strategy also emphasised that optimal GHG emissions savings are achieved when the high quality wood is used in construction and manufacturing, and residues are used for energy. So it is important to ensure that this traditional mixed-use of harvested wood continues.

1.8 Therefore the follow-on RO Banding Review Consultation that covered biomass sustainability (as well as affordability) set out proposals to deliver robust long-term sustainability controls while providing the longevity and certainty that the bioenergy industry needs to invest. Key elements included bringing in greenhouse gas emissions trajectories so that the target tightens over time, adding sustainable forest management criteria that build on established international forest certification schemes, and a requirement for an independent audit. The consultation proposals, and the Government decisions in this document, primarily address the use of solid biomass and biogas feedstocks; these apply only to bioliquids where this is specifically stated.

1.9 Seventy three (73) responses were received addressing the consultation questions, together with 2 letter campaigns organised by Friends of the Earth and by the Back Biomass campaign. This document sets out the UK Government's decisions informed by the evidence and data received during the consultation. The document is split into sections each covering a key aspect of the sustainability criteria, with a summary of the responses received and an explanation of how the final decision was reached. The document sections cover:

2. Mandatory linkage with support
3. Grandfathering, stability of system and long-term GHG trajectories
4. Land Criteria and Sustainable Forest Management
5. Reporting to Ofgem - independent verification and use of mass balance
6. Carbon calculator tool and default values
7. Anaerobic digestion
8. Definitions and Clarifications

1.10 The changes to the RO sustainability criteria set out in this document will be brought in as a requirement to report against performance from April 2014. This will give biomass electricity and biomass combined heat and power (CHP) generators and their supply-chains a period of transition to familiarise themselves with the new controls and related guidance, ahead of the UK's intent to mandate the requirements (i.e. require demonstrating meeting the criteria to receive support) for generators of 1 MWe capacity and above from April 2015.

2. Mandatory linkage with support

Requiring sustainability criteria to be met to receive RO support

Q1. *Do you agree power and CHP generating stations using solid biomass or biogas feedstocks, of 1MWe or above, should be required to meet the sustainability criteria from October 2013 in order to receive ROC support?*

Original consultation proposal

2.1 We proposed that power or CHP generating stations of 1 MWe generating capacity and above using solid biomass and/or biogas would be required from October 2013 to meet the sustainability criteria to be eligible for support under the RO. This would apply to the claiming of ROCs under any of the biomass bands, so would include anaerobic digestion, gasification and pyrolysis generating stations, as well as dedicated biomass, conversions and co-firing, where the generating station is 1MWe capacity or above.

2.2 By setting the threshold at the 1MWe total installed capacity level we capture the large majority of biomass generating station capacity, but avoid placing an undue burden on community-sized generating stations where sustainability risks are lower. We proposed to introduce the change from October 2013 to allow time for industry to familiarise themselves with the new scheme, and adjust their procurement practices where necessary.

Main messages from responses to Q1

2.3 Of the 43 responses that addressed this question, 74% supported the proposal. 32 agreed and 11 disagreed. Though the 43 responses differed in their focus, there was broad support across different stakeholders for requiring generators of 1MWe capacity and above to demonstrate meeting the criteria to receive support under the RO. Views diverged, however, on the timing of this change.

- A significant majority across the different groups of stakeholder supported the introduction of mandatory controls within a reasonable timeframe, and considered 1MWe a sensible threshold. There was collective agreement that the growth in bioenergy should demonstrate genuine carbon benefits while protecting biodiversity and preventing deforestation.

- However, bioenergy industry respondents were concerned that October 2013 was too soon for mandatory controls.

- Several criticised the introduction of changes to the RO that start in the middle rather than the beginning of an RO reporting year.

- Some also mentioned that though the UK was attractive for renewables investment, the rapid introduction of tough sustainable controls linked to eligibility for support, could send investors' money (and available biomass supplies) elsewhere in the EU where support schemes had low or no sustainability controls or to meet China's expanding need for fibre.

- Biomass feedstock suppliers were keen to stress that their industry, unlike paper manufacturing, was embryonic, and though they were confident their biomass was sustainable, demonstrating this would involve some learning and additional data gathering. The new sustainable forest management criteria were a particular concern.

- In contrast other wood using industries were keen to see a rapid introduction of mandatory standards for energy use.

- NGOs, some private individuals and academics wanted changes to the GHG methodology to include carbon debt and indirect effects before the criteria were made mandatory, as they considered the current criteria would be too easy to meet.

Post consultation decisions

2.4 Given the need for robust criteria that drive changes in the supply chain we have decided to proceed with the establishment of mandatory criteria for RO supported generation. At the same time, taking into account consultation feedback and being conscious that the proposed changes will impose what is expected to be the most stringent controls on the use of solid and gaseous biomass for energy not only in the EU, but also internationally, we have decided to allow more time for the implementation of these criteria.

2.5 Fuel costs constitute one of the most significant components of biomass project costs (approximately 75% of total costs for conversions and 50% of total costs for new dedicated biomass). Our announced intention to link biomass sustainability criteria with eligibility for ROC support is already driving the desired changes in the biomass market; generators need to ensure that their biomass supplies meet the long-term RO requirements in order to secure investment. Due to the nascent nature of the biomass market this means generators are securing the large majority of their supply through 7-15 year contracts, with small amounts of spot-buying to take advantage of power/biomass market developments. The length of the contracts therefore leaves limited room for short term deviations from the expected longer term sustainability requirements.

2.6 In addition, the current sustainability data – which include GHG lifecycle assessments, country of origin and whether an environmental standard or scheme has been met – are published on the Ofgem website for each generator. So we consider that reputational issues, both for large generators and for the smaller community CHP projects, should prevent the intentional use of even small quantities of 'unsustainable' biomass between now and April 2015 when we intend demonstrating meeting the criteria will be linked to ROC support for generators of 1MWe and above.

2.7 Reflecting these considerations and the need for generators to develop their reporting and procurement policies and systems to meet the new criteria, **we have decided to bring in the changes to the sustainability criteria from April 2014 on a reporting basis.** Our intention is, following the publication of the EC updated report on requirements for sustainability criteria for solid biomass and biogas expected this year, that we will look to **make the criteria 'mandatory' for generation stations of 1MWe capacity and above, i.e. link demonstrating meeting the criteria to ROC issue, from April 2015**.

3. Grandfathering, stability of system and long-term GHG trajectories

Grandfathering

Q2. *Do you agree that subject to EU or international requirements the sustainability criteria for solid biomass and biogas should be: (i) Fixed to 1 April 2020?*

Original consultation proposal

3.1 We proposed that once the changes arising from this consultation are made to the RO sustainability criteria for solid biomass and biogas, the criteria will not change again before April 2020. This is with the proviso that the UK would need to meet any new EU or international legislation should that come forward.

3.2 The only two proposed exceptions to this grandfathering principle besides the need to meet EU or international requirements, would be if the EU is able to define the term 'highly biodiverse grassland' as used within the land criteria for transport biofuels and bioliquids, or makes specific recommendations to member states regarding indirect land use criteria (ILUC) with respect to solid biomass and biogas, If so we would, for consistency, wish to update the land criteria as it applies to solid biomass and biogas following a statutory consultation.

Main messages from responses to Q2(i)

3.3 Of the 34 responses that addressed this question views, 47% supported the proposal and 53% opposed. 16 agreed and 18 disagreed.

- Many in industry were opposed to the proposals as an April 2020 date would not give the length of certainty their investors required. The majority of their responses considered it essential for installations to be 'grandfathered' for sustainability criteria, in the same way as ROC levels are fixed for 20 years or to 31 March 2037 from the point of full accreditation, whichever is earlier.

- Those industry responses that did support the proposal saw fixing the criteria to April 2020 as the barest minimum and urged Government to extend this.

- Several generators and feedstock suppliers also cautioned against Government setting levels for GHG emissions that disadvantage the UK's ability to attract investment in renewables as compared to Europe and the rest of the World.

- Some other stakeholders, including NGOs, were opposed to any fixing of the criteria until issues of carbon debt and ILUC were included in the controls. They highlighted how much is still unknown about bioenergy, and called on Government to retain the flexibility to respond quickly.

Post consultation decisions

3.4 Our view is that both sides of the argument raise important and valid concerns. We accept industry needs greater long-term certainty to secure investment in new renewable generating capacity and recognise the nascent nature of the bioenergy sector. We are also aware of the on-going evidence being developed on bioenergy's benefits and limitations.

3.5 Government's decisions on the Renewables Obligation Banding review sought to provide a balanced and pragmatic policy response to these arguments by focusing on low-risk bioenergy deployment pathways that are in line with the UK Bioenergy Strategy, and will contribute towards our longer term decarbonisation targets as well as to 2020 renewable objectives. The stringent nature of the sustainability controls, proposed in the September 2012 consultation and confirmed in this document, can place the UK in the forefront of developing sustainable supply chains.

3.6 In order to allow investments in these low risk, priority pathways to materialise **we have decided to set out, and put into legislation a fixed GHG trajectory with a methodology and criteria that will not change unilaterally to 31st March 2027.** These criteria will remain fixed unless the EU mandates or recommends specific changes to the sustainability criteria for solid biomass, biogas or bioliquids used for electricity, heat and cooling, or if changes are required to meet other EU or international regulation. If so the criteria as it applies to solid biomass and biogas could be changed following a statutory consultation.

3.7 **We will also set out how the sustainable forest management criteria, based on the UK Timber Procurement Policy (UK-TPP) principles, will apply with respect to the RO.** This will be set out in a separate document to the guidance currently available from the Central Point of Expertise on Timber (CPET)[4]. It will be in a format suitable to be referenced in the RO legislation. As a separate document it will not automatically change with changes to the UK Timber Procurement Policy itself.

3.8 As we set out in section 4 on Land Criteria and Sustainable Forest Management we see global schemes, implemented locally, will play an important role in ensuring forests are managed sustainably in the medium and the very long-term. For example, the UK Forestry Standard was developed using the Forest Stewardship Council (FSC) principles. The nature of sustainable forestry is extremely complex, and such an approach can draw on international expertise, better reflect local environmental and socioeconomic conditions, build on - or be built in to - regional/national legislation, with regular planned updates to reflect new evidence and good practice.

3.9 We recognise that some projects designed for support under the RO may seek support under Contracts for Difference (CfD) instead, or in the case of conversions have a unit on the same site supported under CfD, and another unit supported under RO. Therefore for practical consistency we intend that the **CfD contracts awarded under the First Delivery Plan period for Electricity Market Reform (i.e. 2014/15-2018/19) will follow the same approach as the sustainability standards set under the RO**.

[4] CPET Website: http://www.cpet.org.uk/

3.10 This would mean that the biomass generation that comes forward under either the RO or CfD before April 2019 will benefit from the policy of no further unilateral changes before April 2027. We retain the option to make changes to the criteria that apply to new biomass generation coming forward from April 2019.

GHG trajectories and evidence gathering

Q2. *Do you agree that subject to EU or international requirements the sustainability criteria for solid biomass and biogas should: (ii) Follow the planned GHG emissions trajectories set out for (a) new dedicated biomass (b) existing dedicated biomass and (c) other biomass generating stations?*

Original consultation proposal

3.11 We expected that new dedicated biomass power, including biomass CHP, would substitute for the marginal technology, natural gas, and would generate into the 2030s and beyond. In contrast conversion and co-firing were considered to be substituting for coal, therefore offer higher carbon savings with lower levelised costs, with significantly shorter lifetimes unless they are able to meet tightening efficiency and emission standards going forward.

3.12 For these reasons, we proposed that new build dedicated biomass generating stations, with or without CHP, should be tasked with delivering better carbon savings and hence tougher standards than conversion or co-firing. Therefore the consultation set out the following trajectories:

- dedicated biomass power - including with CHP - accredited on or after 1 April 2013 is placed on an 'accelerated trajectory' of 240 kg CO2eq/MWh, to apply from October 2013 until April 2020; then 200 kg CO2eq/MWh from April 2020 to April 2025;

- dedicated biomass power - including with CHP - accredited before 1 April 2013 remains on the standard trajectory of 285 kg CO2eq/MWh to April 2020, then 200 kg CO2eq/MWh from April 2020 to April 2025;

- all other generating stations using biomass, including coal to biomass conversion/co-firing generating station remains on the standard trajectory of 285 kg CO2eq/MWh to April; then 240 kg CO2eq/MWh from April 2020 to April 2025;

3.13 We also proposed that we would set a target to apply from 2025 subject to suitable evidence being available to underpin this decision. So Q3 invited respondents to contribute data to support Government with this decision.

Main messages from responses to Q2 (ii)

3.14 Of the 30 responses that addressed this question views were similarly split as to the grandfathering proposal, 47% supported the proposal and 53% opposed. 14 agreed and 16 disagreed.

- Regarding the proposed GHG trajectories, existing generators stressed that long-term contracts had been signed based on the current 285 kg CO2eq per MWh target, so time was needed to adjust.

- However, some industry responses were confident that a 200 kg CO2eq per MWh target could be achievable longer-term, providing flexibility was permitted for the GHG performance of a single individual consignment to allow for possible events beyond the generator's control. Many of the industry responses asked for the target to be set as an average across all consignments.

- Without some flexibility even a 240 kg CO2eq per MWh was considered challenging to guarantee for every single shipment; while a flat 200 kg CO2eq per MWh target was considered impossible for all generators to confidently meet at the current time, except those using only EU/UK sources.

- Larger generators also wanted a further target to be set in 2025, to provide the certainty needed to make costly upfront investment in biomass supply-chain.

- Several industry respondents highlighted that new dedicated biomass would have similar efficiencies to coal conversions. These pointed out that the bulk of coal conversions are of 500MW+ units with gross sent out efficiencies in the range 35-39%, which is as good as any new build project and probably better than many smaller projects.

- Many highlighted that the Energy Bill intends to set a statutory limit for Emissions Performance Standards allowable for new fossil fuel generating stations at 450 kg CO2eq per MWh to 2045 and encouraged Government to provide similar targets for solid biomass and biogas generation to ensure that RO eligibility is preserved for the life of the generating station.

- The Committee on Climate Change (CCC) and non-government organisations emphasised that all biomass power should become subject to the same tough targets from 2020. Though coal to biomass conversion and enhanced co-firing was recognised as a lower-cost transitional technology, it is now expected for the period up to 2027 to provide significantly higher levels of biomass electricity generation than dedicated biomass.

- Several calling for tougher targets highlighted the Government's ambition to have a Grid Intensity of 100 kg CO2eq per MWh by 2030, and that targets should be set better reflecting this.

NNFCC report of greenhouse gas trajectories

3.15 In addition to the responses to the consultation DECC commissioned a study from the NNFCC on potential GHG trajectories for biomass power, using the EU RED GHG methodology, with industry and other data sources. A summary is published with the Government Response[5].

NNFCC (2013) RO Sustainability Standards https://www.gov.uk/government/consultations/ensuring-biomass-affordability-and-value-for-money-under-the-renewables-obligation

3.16 This showed very similar GHG lifecycle assessments (in kg CO2eq per MWh) for the dedicated biomass generating station compared to the coal conversion station for all of the scenarios – 2012-baseline, 2020, 2025 and 2030. Whether the generating station was dedicated or a conversion the analysis showed that those using wood pellets made from forestry or sawmill residues, that is, the expected feedstock, should be able to make some further savings from reducing the carbon intensity by 2020 and looking out further to 2030.

3.17 The most significant reductions in the GHG lifecycle assessments are expected to result from improvements in the shipping industry due to greater efficiencies and the use of lower carbon shipping fuels. The other key area will be reducing the use of fossil electricity in the processing and drying stage, either by investing in biomass CHP locally, or by decarbonisation of the grid at national level.

3.18 But the analysis concluded that these will be modest, and the further the target reduces below 200 kg CO2eq per MWh, the larger the volumes of potential supplies that could be excluded, and the higher the risk to the generator. Its conclusions were clear that a basic pass/fail threshold of 200 kg CO2eq per MWh or less would be challenging and costly to meet for dedicated biomass power or coal to biomass conversion stations. Such a target could only be credibly applied from 2020 onwards if combined with an averaging approach that would allow the mixing of different supplies to achieve such a target overall, and reducing the need for the generator to build in a large comfort margin for each consignment.

Post consultation decisions

3.19 When making our decisions on the GHG trajectories required to deliver cost effective carbon abatement from bioenergy, we took care to compare like with like. For example, the UK's 'Grid Intensity' is assessed according to international carbon accounting agreements, which means that smokestack emissions are the only emissions considered, i.e. the carbon that is emitted when coal, oil or gas is combusted**.** Grid intensity is not a GHG lifecycle assessment and does not include harvesting/extraction, processing or transport emissions associated with the fuel. Renewables - including wind, solar, tidal and biomass - are zero-rated with respect to smokestack, and hence zero-rated when the UK calculates its grid intensity. Therefore, there is no direct relationship between reducing the greenhouse gas target set for biomass electricity (lifecycle) and reducing the UK's Grid Intensity (smokestack only) under the current assessment methodology.

3.20 We also accepted many of the arguments that dedicated biomass power should be treated similarly to coal to biomass conversions in terms of GHG trajectories, creating a single target across the supply chains. However, in line with the consultation proposals, we continued to recognise that existing installations - whether dedicated biomass or co-firing - have long-term supply contracts in place, so we will allow time for these plants to move to a tighter target than the current 285kg CO2eq per MWh.

3.21 Therefore, taking into account consultation evidence (including evidence that expected plant efficiencies for new conversions are similar to those expected for best performing new dedicated plant), the UK Government has decided that biomass power, whether new or existing, with or without CHP, dedicated, co-firing or a coal to biomass conversion will be on the same GHG trajectory from 1 April 2020. We also considered the evidence provided, and considered this was sufficient to set a further target from 2025.

3.22 Therefore, the GHG trajectories will be:

New dedicated biomass power (with or without CHP) that receives full accreditation on or after 1 April 2013:

- **240 kg CO2eq per MWh from 1 April 2014 to 31 March 2020**
- **200 kg CO2eq per MWh from 1 April 2020 to 31 March 2025**
- **180 kg CO2eq per MWh from 1 April 2025 to 31 March 2030**

All other biomass power (includes existing co-firing coal stations converting to biomass and dedicated biomass power that receives full accreditation no later than 31 March 2013, advanced conversion technologies and anaerobic digestion):

- **285 kg CO2eq per MWh from 1 April 2014 to 31 March 2020**
- **200 kg CO2q per MWh from 1 April 2020 to 31 March 2025**
- **180 kg CO2eq per MWh from 1 April 2025 to 31 March 2030**

3.23 In setting these trajectories we recognised that as the target tightens the risk of unintended consequences increases. Generators asked for a GHG target to be based on the average of all consignments to provide some flexibility, with the addition of a ceiling to ensure each individual consignment delivers a good level of savings. They highlighted the difficulties that could arise, particularly at 200kg or below, as events outside their control - a ship diverted to another port, or a biomass CHP powering a pellet generating station being out of commission temporarily, could lead to consignments failing the target possibly by just 1 or 2kg.

3.24 Therefore the Government has decided **that the target will represent an annual average, with the provision that any one consignment of solid or gaseous biomass feedstocks must not exceed the ceiling of:**

- **285 kg CO2eq per MWh from 1 April 2014 to 31 March 2020**
- **270 kg CO2eq per MWh from 1 April 2020 to 31 March 2025**
- **260 kg CO2eq per MWh from 1 April 2025 to 31 March 2030**

3.25 The requirement will be for biomass power and CHP generators using solid biomass and/or biogas feedstocks other than wastes or feedstocks made wholly from waste, manure, slurry, landfill gas or sewage gas to report on performance against the new GHG target trajectories from April 2014. We intend that following a transitional period that those generating stations of 1MWe and above will be required to demonstrate that the applicable GHG target is met from 1 April 2015.

3.26 From the start of the criteria being mandatory, Ofgem will issue ROCs, on a monthly basis as currently, where the average of the month is reported as being within the annual target and where each individual consignment is reported as within the appropriate ceiling. For any month where the average is not reported as being within annual target, Ofgem will only issue ROCs against the use of those consignments that were reported as individually meeting the annual target.

3.27 At the end of the year, the generator can report the annual average for all biomass consignments used within the reporting year as part of its sustainability report and audit to Ofgem. This will enable the generator to submit an assessment of the average carbon intensity for the renewable electricity produced across the whole reporting year, in order to demonstrate that the target has been met. The calculation will involve a simple calculation of carbon intensity by dividing (i) the carbon associated with the total biomass (other than waste) feedstocks used in the reporting year with (ii) the total renewable electricity generation over the same period. If Ofgem is satisfied that the target has been met, the remaining ROCs may be issued to the generator.

Call for evidence to underpin decisions set out above

3.28 Nine organisations provided data to support the development of the GHG trajectories. We are very grateful for these contributions, which formed part of the evidence NNFCC drew on when developing their report for Government and which informed the development of the final GHG trajectories listed above.

4. Land Criteria and Sustainable Forest Management

Land criteria for woodfuel

Q4. *Do you agree that wood, when used for a solid and gaseous fuel, should be required to meet the UK's Government's public procurement policy for wood, and that this should replace the land criteria for solid biomass and biogas in the particular case of wood?*

Q7. *Do you agree that the introduction of sustainable forest management criteria based on the UK Government's public procurement policy for wood will help address the key land use change issues of: (i) sustainable harvest rates and carbon stocks, (ii) deforestation, (iii) biodiversity, and (iv) social concerns?*

Original consultation proposal

4.1 We proposed that the RO sustainable forest management criteria for woodfuel should be based on the UK's Government's timber procurement policy principles (UK-TPP). We also proposed that as the UK-TPP principles cover a broad range of social and environmental issues, including biodiversity and sustainable harvesting, this should replace the existing land criteria that apply to woodfuel. The current land criteria used for woodfuel and other solid biomass and biogas were considered appropriate to sustainable agriculture, but less relevant and costly to report against for forests.

4.2 The UK-TPP principles set out good practice for government department and public bodies when purchasing wood and wood products including woodfuel. It requires that suppliers and contractors to Government should have available documentary evidence demonstrating the wood supplied is from legal and sustainable sources. This evidence should include chain of custody from the forest source(s) to the end user. The evidence that will be accepted is either that it meets an approved Forest Certification Scheme such as Forest Stewardship Council (FSC) and PEFC (Programme for the Endorsement of Forest Certification (PEFC) – this is known as Category A for the public procurement of timber; or that other suitable evidence that demonstrates compliance is provided – this is known as Category B the for public procurement of timber.

Main messages from responses to Q4 and Q7

4.3 Of the 40 responses that addressed the question as to whether the UK-TPP principles should form the basis for the land criteria for woodfuel, responses were split, 47.5% supported the proposal, 52.5% opposed. 19 agreed and 21 disagreed.

4.4 However the 45 responses were more positive as to whether land criteria based on the UK-TPP principles would address sustainable harvest rates, carbon stocks, deforestation, biodiversity and social concerns. 76% supported the proposal. 34 agreed, 11 disagreed.

- Many in the forestry industry welcomed the approach set under the UK-TPP principles. It was considered a more appropriate and relevant approach for timber feedstocks than the EU RED land criteria which seemed more suited to agricultural crops and farming.

- Advantages of the UK-TPP principles included that it is built on well-established sustainable forestry schemes, draws on an existing UK Government definition of sustainable wood and applied the same controls irrespective of the end-use of the wood.

- However, even those generators supporting the UK-TPP principles, suggested it would need some amendments to make it suitable for the RO and woodfuel. Specifically it was noted that its application would need to better reflect that woodfuel is low-value, high volume commodity, and the UK-TPP was designed for higher value wood such as construction and furniture.

- Many generators were concerned that the industrial wood pellet supply is embryonic. Large volumes of FSC or PEFC stamped pellets do not yet exist. Therefore, much of the large and disperse supply-chain will need to use extensive bespoke evidence covering the same areas as FSC and PEFC to meet the UK-TPP principles. This was seen as very difficult and costly.

- Some foresters highlighted that making use of feedstock produced from the management of currently under-managed smaller woods will bring the best economic and biodiversity benefits. Yet owners of these woods will not have the resources to engage with a complex scheme.

- In a similar vein, several responses emphasised that the part of the wood harvest - tops, branches, thinnings - that will be used for energy is low value. It would be only a modest part of a forest owner's income, and a very small part of a farmer's income. Therefore bioenergy by itself will not pay the additional costs of certification.

- NGOs' concerns focused in two main areas. Firstly PEFC was not seen to be as robust as FSC, so the recommendation was that only FSC wood should be considered as meeting the sustainable forest management criteria. In addition neither scheme dealt directly with the issue of forest carbon stocks. These were seen as major issues.

- Both generators and the supply-chain agreed more time would be needed to introduce sustainable forest management criteria successfully.

Post-consultation decisions

4.5 Forests have a large and pivotal role in addressing climate change. Reflecting this, the UK is already taking a co-ordinated package of actions at a national, EU and global level to support sustainable forest management and prevent deforestation or environmental degradation.

4.6 The introduction of sustainable forest management criteria for woodfuel should be seen as part of a much broader package of UK on-going actions to support sustainable forest management and prevent deforestation or environmental degradation. At the global level the UK is working towards improved international carbon accounting and management practices and greater support for forest protection in developing countries. The UK Government has been a strong early supporter of the UN REDD+ (Reducing Emissions from Deforestation and forest Degradation, and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries) mechanism.

4.7 We have also introduced new domestic legislation to implement our part of the EU Forest Law Enforcement Governance and Trade (FLEGT) plan. FLEGT aims to tackle illegal logging by ensuring that imports of timber into the EU are from legal sources. FLEGT is the foundation of the EU's efforts to support improvements to forest governance around the world, in particular in developing nations. We also work closely with the EU to improve the consideration of indirect land use change within the sustainability criteria applied under the Renewable Energy Directive for transport biofuels and bioliquids.

4.8 The UK Government's established policy regarding sustainable wood procurement for the public sector is a further key part of the UK's approach. The UK Timber Procurement Policy (UK-TPP) looks across a wide range of socioeconomic and environmental factors that are part of managing a forest sustainably. Importantly, it draws on certification schemes that have been assessed as meeting the UK-TPP principles, so is an approach that can address the significant variations in forests across the world using existing controls. Building on an established UK policy would provide consistency and help avoid unnecessary cost or complexity for wood producers and users. It would also reflect the need for criteria that takes account of the controls that are already in place within a country or region, and respects World Trade Organisation (WTO) agreements to place the same requirements on imports as on domestic sources.

4.9 We also wanted an approach that reflects where the UK is likely to source its woodfuel in practice, for heat as well as for electricity. The Renewable Heat Incentive intends to use the same sustainable forest management criteria as the RO. North America with its large forest resource is expected to provide the majority of woodfuel used for electricity generation in the UK in the medium term. However, biomass heat boilers or community-scale combined heat and power (CHP) are likely to use UK woodfuel. So our approach to sustainable forest management criteria needs to work for domestic and for imported supplies.

4.10 In the UK, we have a system of regulation, monitoring and incentives that has underpinned the increase in the percentage of forested land in the UK from 5% to 12% in the past 60 years. At the heart of our approach is the UK Forestry Standard[6] (UKFS), which is the Government's reference standard for sustainable forest management in the UK. The UK Government has developed and implemented a well-researched policy on carbon stocks primarily through the UK Forestry Standard (UKFS) and its specific Climate Change Guidelines[7] and the Woodland Carbon Code[8] . The carbon stored in UK forests was assessed at 803 million tonnes in 1990, increasing to 893 million tonnes in its most recent FAO assessment for 2010.[9]

---

[6] Forestry Commission (2011) *UK Forestry Standard – 3rd edition* http://www.forestry.gov.uk/theukforestrystandard

[7] Forestry Commission (2011) Forests and Climate Change – UK Forestry Standard Guidelines http://www.forestry.gov.uk/pdf/fcgl002.pdf/$FILE/fcgl002.pdf

[8] Forestry Commission (2012) *UK Woodland Carbon Code* http://www.forestry.gov.uk/carboncode

[9] FAO (2010) Global Forest Resource assessments – Country Reports – United Kingdom http://www.fao.org/docrep/013/al656E/al656E.pdf

4.11 Canada and the US each have around 8% of the world's forests; the carbon stocks in their forests were shown as stable or increasing between 1990 and 2010[10]. This has been achieved despite major outbreaks of mountain pine beetle infestations and increased wildfires affecting both countries during this period. But the two differ significantly in other aspects. The large majority (93%) of Canadian forests are in public ownership. Certification is used widely, with around a third of Canadian forest certified under FSC or PEFC. In the US, around 75% of forests are in private ownership, and certification is at a relatively low level. However, US Federal and State environmental laws protect wildlife and endangered species in forests on all public and private lands, and support forest practices regulation or best management practices. The details of these laws vary depending on the State.

4.12 **Reflecting all of these considerations, we have decided to bring in new sustainable forest management criteria for woodfuel, broadly as consulted upon. These criteria will be based on the UK TPP principles.** The criteria can be met either through the use of wood from a forest that has been certified under an approved scheme (Forest Stewardship Council (FSC) or the Programme for the Endorsement of Forest Certification (PEFC) scheme. For public procurement of timber this is called Category A. Or it can be met through providing equivalent bespoke evidence (for public procurement of timber products this is called Category B).

4.13 **The initial requirement will be to report on performance from April 2014 with the intention to make the criteria mandatory for generators of 1MWe and above from April 2015. This will replace the use of the Renewable Energy Directive land criteria for these feedstocks.** Reflecting that the use of bespoke evidence (such as local or regional legislation and business-led initiatives) will be important, we intend to improve the support and guidance available. We will also set out how the sustainable forest management criteria, based on the UK Timber Procurement Policy, will apply with respect to the Renewables Obligation. This will be a separate document to current guidance for government procurement, so as to be in a format suitable to be referenced in future RO legislation. We intend to publish this document before the end of the year.

4.14 We recognise the importance to sustainable forest management of timely restocking and regeneration and the management of forest carbon stocks, to ensure that bioenergy is renewable and low-carbon. Most sustainable forest management controls and schemes include the consideration of sustainable harvesting rates and managed regrowth, but do not cover the formal quantification of forest carbon stocks. Average carbon stocks can change when management practices or species change. For example, moving to a shorter rotation length (i.e. reducing the age at which mature trees are typically harvested) could over time reduce average carbon stocks, while planting more densely could over time increase it. The industry view is that the formal quantification of carbon stocks is complex and costly, so this should be applied at a regional (e.g. state or county) level, as it is the overall average rather than individual performance that matters. Others considered that applying such an approach at the forest manager level would drive good practice and understanding.

[10] FAO (2010) Global Forest Resource Assessment – Main report http://www.fao.org/docrep/013/i1757e/i1757e.pdf

4.15 The market premium placed on large, high quality wood means most productive forests in the UK, the wider-EU and North America are likely to continue under their current management practices including rotation length. However, when looking to the future, some uncertainty remains; the potential impact due to the growth in demand for renewable fibre and fuel in a decarbonised economy is an important issue. Furthermore, looking longer-term it is likely that some of the woodfuel used in the UK will be sourced from outside North America and Europe, potentially from regions where forest area is currently declining. At a global level, the world's forest carbon stocks were assessed as reducing from 672 billion tonnes in 1990 to 652 billion tonnes in 2010. This decline was very largely due to reduced carbon stocks in Africa, Asia and Central & South America. Therefore our approach to sustainable forest management needs to seek to prevent contributing to such reductions.

4.16 The proposed RO sustainability criteria do not currently directly address the preservation of land carbon stocks except where the reported use of the land changes. **We will seek to bring this issue specifically into the criteria for bioenergy in the coming years, with a review of the effectiveness of our approach in 2016/17 as part of the planned UK Bioenergy Strategy Review. This will include consideration of the criteria that would apply to new biomass generation coming forward from April 2019.** We intend to commission new research to increase our understanding and address any evidence gaps.

4.17 There is already progress in this area; the UK Government welcomes initiatives by the Forest Stewardship Council (FSC) and the Programme for the Endorsement of Forest Certification (PEFC) to promote the benefits from sustainable forest management to protect carbon stocks and address climate change. Through its research and development project 'ForCES - Forest Certification for Ecosystem Services', FSC plans to pilot test over the coming years opportunities to cover, amongst other ecosystem services, carbon storage and sequestration more explicitly in its certification system. Similarly, PEFC is developing a voluntary module for greenhouse gas emissions.

4.18 The UK Government looks forward to continuing to work closely with the bioenergy, forestry and wood-using industries, voluntary certification schemes, the European Commission and our global partners, to support such developments. These actions would support and build-on wider UK Government work to improve international carbon accounting and management practices. It would also offer important public awareness benefits of the value from sustainable forest management in addressing climate change.

4.19 **We have decided that other solid biomass and biogas feedstocks, with the exception of wastes and feedstocks made wholly from waste, manure and sewage will continue to be subject to the existing RO Land Criteria, as set under the EU RED for transport biofuels and bioliquids**. We also intend that following a transitional period that those generating stations of 1MWe and above will be required from April 2015 to demonstrate that the applicable land criteria have been met to receive support.

Land criteria for energy crops and data on previous land use

Q5. *Do you agree that energy crops which have been assessed as meeting the Energy Crops scheme for England, or its equivalent, should be deemed to meet the land criteria for solid biomass and biogas?*

Q6. *Do you agree that: (i) Generators using energy crops for solid or gaseous fuel should be required to provide detail on the previous use of the land.*

Original consultation proposal

4.20 The Energy Crops Scheme (for England) sets out the Government's view for responsible and sustainable farming practices when growing perennial energy crops such as miscanthus grass or short rotation coppice (SRC) willow. Applications are subject to an environmental appraisal including a site visit, and the scheme sets out what types of land cannot be used such as protected areas.

4.21 We proposed that under the RO that energy crops which (i) meet the narrower definition of energy crops as set out in the Government Response to the RO Banding Review, when used as a solid and gaseous fuel, and (ii) have been assessed as meeting the requirements of the Energy Crops Scheme that applied at the time of the assessment, should be deemed to meet the Land Criteria.

4.22 We also proposed that generators using energy crops for solid or gaseous fuel should be require to provided detail on the previous use of the land.

Main messages from responses to Q5 and Q6(i)

4.23 Of the 34 responses that addressed the question on whether energy crops meeting the Energy Crops should be deemed as meeting the land criteria, the majority of responses - 82% - supported the proposal. 28 agreed and 6 disagreed. Of the 34 responses that addressed the question on whether there should be a requirement to report on the previous use of the land, the majority of responses - 78% - supported the proposal. 25 agreed and 7 disagreed.

- Most saw this as a logical, low risk approach which would reduce the burden on small land owners in the UK.

- Several stressed the increasing role perennial energy crops could play in the future energy mix, and emphasised Government should support this through removing unnecessary burdens and red tape.

- Others suggested that responsible farming schemes such as 'Red Tractor' could also be assessed as meeting the land criteria.

- However there was concern that the Energy Crops Scheme for England does not address or monitor the impact of displacing food crops, and the potential for indirect land use change (ILUC) with its associated environmental and social impacts. Therefore the additional requirement to report on previous land use (which would apply for both UK and imports) was considered important information that should be gathered.

Post consultation decisions

4.24 We consider that the risks associated with indirect land use change impacts from energy crops are limited by the low expected uptake under the RO. Food crops are higher value than perennial energy crops meaning that perennial energy crops can make economic sense on lower quality land but the risk of displacement with food production is very low. Despite Defra providing 50% of the establishment costs in England for perennial energy crops, and the energy crop uplift provided under the RO, uptake to date has been low. This is not expected to change as the RO uplift is due to be removed. In addition, direct land use change will continue to be addressed through the GHG lifecycle assessment element of the sustainability criteria.

4.25 Government is keen to draw on existing voluntary schemes where suitable, however we note that currently the Red Tractor Scheme does not cover perennial energy crops. Therefore, Government has decided to introduce the policy as proposed in the consultation, while noting the existence of other schemes for the development of future sustainability policy, such as in the planned 2017 UK Bioenergy Strategy review.

4.26 Therefore in line with the agreed RO policy, we have decided **that energy crops which (i) meet the narrower definition of energy crops as set out in the Renewables Obligation Order 2013[11], when** used as a solid and gaseous fuel**, and (ii) have been assessed as meeting the requirements of the Energy Crops Scheme that applied at the time of the assessment, or its equivalent, will be deemed to meet the Land Criteria**.

4.27 **Generators using energy crops for solid biomass or biogas feedstocks will be required to provide detail on the previous use of the land as part of the profiling data requirement**.

Virgin wood and land use change

Q6. *Do you agree that: (ii) Generators using virgin wood for solid and gaseous fuel should be required to provide detail on quality and species?*

Original consultation proposal

4.28 The UK Bioenergy Strategy sets out that carbon benefits are typically highest when the good quality wood is used for products and low quality wood is used for energy. In most cases the price premium placed on quality wood means market pricing is currently delivering this desired outcome. However, Government wants to be able to monitor the situation, so that we can take action if needed

[11] HMG (2013) Renewables Obligation Order amendment 2013
[11] http://www.legislation.gov.uk/ukdsi/2013/9780111534137/pdfs/ukdsi_9780111534137_en.pdf

4.29 Therefore, we proposed that where a generator uses solid biomass or biogas containing or produced from a virgin wood feedstock the generator will be asked, as part of the profiling report, **to provide additional information on wood quality, such as whether the wood is whole trees or includes saw-logs, and its species.** Virgin wood includes wood supplies from the management of forests and woodlands, from arboriculture (managing trees in parks and urban areas) and from timber processing (sawmill residues including off-cuts and sawdust).

Main messages from responses to Q6(ii)

4.30 Of the 41 responses to this question, responses were split, 54% positive, 46% opposed. 22 agreed, 19 disagreed.

- Generators were concerned this would be difficult data to gather. Whilst it may be possible to identify species and component parts of the tree for some monocultures and large generating stations it could place undue restrictions on certain fuel sources (mixed virgin forest products for example).

- Responses from the forestry industry confirmed that it would be difficult to determine the precise quality and species for sawmill and/or forest residues. An overview of the general composition of the forest from which the biomass has been extracted could be provided but any further detail would be extremely challenging. A typical pellet producer could source fibre from multiple sawmills, each with multiple suppliers.

- Both generators and the forestry considered the risk of high quality wood being used for energy as being very low, and questioned the need for data gathered. Foresters confirmed that the pellet manufacturers and generators would not pay the market price for good quality saw-logs, and would be restricted to the thinnings and residues.

- Several welcomed the new energy market for forestry residues, seeing this as a benefit for the sawmill industry by providing a ready market and a better price for their residues (sawdust and offcuts). This would help keep them in business during a tough economic climate for construction and manufacturing.

- Others mentioned that the term 'whole tree' was being confused with ‘whole forest', and that the use of whole trees for energy was being incorrectly criticised. These pointed out that ‘whole trees' covers the harvest of young/small thinnings or diseased trees, which sawmills would not take for processing, but could be beneficially used for energy.

- However the respondents from the traditional wood using industries and NGOs were concerned that additional reporting would be ineffective at monitoring the impacts of bioenergy on other wood markets. A ban on the use of whole trees (and possibly all virgin wood) for energy was recommended as the best way to ensure mixed use continues.

Post consultation decisions

4.31 Government wants to ensure, both at home and abroad, that the harvested wood from a forest is used for construction as well as energy. The traditional mixed-use where the forest is managed to maximise the production of high value saw logs and veneer logs and the lower quality residues used for woodfuel, will typically deliver the best GHG savings. It also offers further reassurance to those concerned regarding foregone carbon sequestration, as some of the carbon in the harvested wood is locked up for longer and where the wood is substituting for concrete or steel in construction, the net emissions savings will typically be very high.

4.32 However this focus on mixed use does not mean that any whole tree should not be used for energy. As some respondents highlighted, any single tree could be small, diseased or of insufficient quality to be processed for timber. For example, it is common UK practice to plant trees at relatively high densities. Over time some of these small, young trees will die due to competition or may be thinned out to allow the best trees to thrive. These whole trees, particularly the earlier thinnings, can be beneficially used for energy generation and this may be their only practical use. Similarly, diseased trees will typically be unsuitable for non-energy uses due to discolouration or structural damage. Perennial energy crops, such as short rotation coppice (SRC) willow, are fast-growing 'whole trees' grown as a dense crop which are only suitable as fuel use.

4.33 Our analysis shows that current market prices are delivering the desired outcome of mixed use in most cases, in the UK and other countries. High quality wood suitable for timber and construction commands a significant price premium, making its use for energy currently uneconomic. This should limit generating stations to using low quality, low value forestry residues, such as tree tops and thinnings or to the pulpwood that no longer has a local market due to paper mill closures. Therefore, we understand that current market forces are already preventing the use of whole forests for energy in the large majority of cases. Nevertheless we recognise that uncertainty remains as to how the market will act in the long-term.

4.34 Monitoring will be essential so that we can confident that this is and remains the case. Therefore we have decided to introduce the policy as planned, in **that where a generator uses solid biomass or biogas containing or produced from a virgin wood feedstock will be required to provide available information on the region and forests it has been sourced from.** This should include the different types of wood used for feedstock, such as residues and small round-wood, and the general forestry management practices used in the region.

4.35 We recognise that this requirement may provide incomplete data or impose significant cost on generators which would be passed through their supply-chains. Therefore the Biomass and Biogas Stakeholder Implementation Group (BABSIG) sub- group is providing advice to Government as to how data can be best gathered to ensure that mixed use of harvested wood continues. In addition, **the UK Government will also seek to work with others at a regional and national/international level, such as state-wide reporting and satellite imagery, to better monitor the health of the forestry sector, including sawmills and use of wood in construction timber, overall.**

4.36 If the data reveals significant use of high quality wood the Government will consider measures to mitigate the adverse impacts, e.g. a code of practice for generators. We will also work with the European Commission to promote the mixed use of wood.

Indirect land use change and other impacts

4.37 The Lifecycle Analysis (LCA) used to inform the decisions set out in this Government Response used the 'cradle to grave' or 'forest to furnace' GHG approach as set out in the EU Renewable Energy Directive and in the EC 2010 report on the requirements for sustainability criteria for solid biomass and biogas used for electricity, heat and cooling. This EU approach considers the direct emissions impact of each stage in the generation of useful energy from biomass feedstocks, from cultivation through to harvesting, processing, transport and finally combustion for energy purposes. However, this methodology does not include indirect impacts, such as indirect land use change or possible impacts on other biomass using industries. The assumption is that the biomass will be residues or wastes from other processes or that where it is a dedicated perennial energy crop it will be grown on low quality or degraded land unsuitable for food production.

4.38 We recognise that this is a key area of great complexity and uncertainty, as it requires making assumptions of what would have taken place if the biomass were not used for energy. For example if the forestry residues would have otherwise been left to decay in the forest in wet conditions, then avoided methane emissions can be modelled as an additional benefit. Alternatively, if the forest would have been otherwise been left unmanaged the additional carbon sequestration from further growth could be modelled. If the assumption is that the forestry residues would have otherwise been used for local particleboard manufacture then there is a further assumption to be made as to what the result would be from it not being used for local particleboard. Cost, availability, suitability/performance and general aesthetic preferences will all influence which substitute is used in practice.

4.39 DECC is currently developing a bioenergy calculator that is in a format similar to DECC's existing 2050 pathways calculator. This is the BEaC (Biomass Emissions and Counterfactual) Model. Users can choose various scenarios for bioenergy and the calculator then models global lifecycle GHG emissions resulting from those scenarios. The plan is to eventually incorporate BEAC in the DECC's main 2050 pathways calculator. This tool will be used to inform the UK's future negotiations at an EU and international level with respect to global accounting and future energy and decarbonisation targets. It will also be used to inform the development of bioenergy policies post 2020. **BEaC is not a regulatory tool, and it will not replace the Biomass & Biogas Carbon Calculator (B2C2) available from the Ofgem website.**

5. Reporting to Ofgem - independent verification and use of mass balance

General profiling data, GHG & Land Criteria

Q8. *Do you agree with our proposed changes to the Article 54 profiling report, and the circumstances in which it must be provided?*

Original consultation proposal

5.1 The data set out in Article 54 of the RO Order 2009 were designed to gather information to help inform the development of sustainability standards. This data includes biomass type/format, mass/volume used and country of origin together with other attributes. Some of the data required by article 54 is no longer useful, so we propose that the information requested was streamlined in some areas, and expanded in others where policy interest has increased.

Main messages from responses to Q8

5.2 Of the 37 responses that addressed this question, 73% supported the proposal. 27 agreed and 10 disagreed.

- Majority agreed with the proposed rationalised report, including that profiling data on waste should be added to give a more complete picture across biomass power and CHP generation.
- However, several reiterated concerns regarding their ability to gather data on virgin wood species and quality, and addressed changes that were specifically dealt with elsewhere in the consultation.
- Others pointed out that as bioliquids were already providing this data to meet their mandatory requirements, there would be benefits to standardise information across all biomass whether solid, gaseous or liquid.

Post consultation decisions

5.3 Reflecting the broad support for the changes Government has decided that all stations over 50kW which use solid biomass and/or biogas, except landfill gas, sewage gas and municipal solid waste, will, as proposed in the consultation, be required to provide the basic profiling information set out below on a per consignment basis:

- material from which the biomass was composed (e.g. wood);
- the form of the biomass where it is solid; (e.g. powder, pellet, chip, briquette, log)
- its mass/volume (in standard units);

- whether the biomass was waste or wholly derived from waste;
- whether the biomass is an energy crop (including short rotation coppicing), and if so the previous land use prior to the first cultivation of an energy crop;
- where the biomass is virgin wood information on its quality and species;
- where the biomass was plant matter or derived from plant matter, the country where the plant matter was grown and its region, and
- where the information specified in the above bullet is not known or where the biomass was not plant matter or derived from plant matter, the country from which the operator obtained the biomass.

5.4 In addition, all stations over 50kW and under 1MW which use solid biomass or biogs, except for landfill gas, sewage gas, waste or biomass wholly derived from waste will provide the following information on a per consignment basis:

- the greenhouse gas lifecycle emissions from the use of the biomass to generate one mega joule of electricity and whether it meets the GHG target;
- if the GHG target has not been met or is unknown the reasons why biomass that did meet the GHG criteria was not used;
- whether it meets the land criteria, and
- if the land criteria are not met or are unknown, the reasons why biomass that did meet the land criteria was not used.

5.5 We will not extend these formal requirements to bioliquids to avoid imposing new legislative burdens. However, we will seek to standardise the units and terms used in the reports, across solid biomass, biogas and bioliquids, to enable easier comparison of different generators' performance.

Mass Balance Approach

Q9. *Do you agree with our approach to: (i) Allow the use of a mass balance approach for the purpose of demonstrating compliance with the sustainability criteria for solid biomass and biogas, except where that biomass is woodfuel using category B evidence to demonstrate meeting the UK Government public procurement policy for wood?*

Original consultation proposal

5.6 We proposed allowing generators of all sizes to use the mass balance 'chain of custody' system as set out in the UK Timber Procurement (UK-TPP) principles. A mass balance system enables different consignments of biomass to be physically mixed at any point in the chain, which keeps costs down, yet allows reporting to remain straightforward.

5.7 In a nutshell, it requires that, at each step in the chain, parties can only use/sell biomass with the same sustainability characteristics and in the same volume as the biomass they took in originally, less any biomass they have recorded as being used or sold previously. Generators using approved certification as evidence of sustainability for a woodfuel consignment (known as Category A evidence for the public procurement of timber) would be able to use the mass balance approach across the feedstock supply-chain as well as within the fuel storage bunkers at the power generating station.

5.8 However, the UK Timber Procurement Policy principles do not permit the use of a mass balance approach for wood using other equivalent evidence of sustainability (known as Category B for public procurement of timber). This approach when applied to the RO would means that up to the point that such a woodfuel consignment is delivered to the power generating station, mixing with other different biomass would not be permitted.

Main messages from responses to Q9i

5.9 Of the 44 responses that addressed this question, 32% supported the proposal and 68% were opposed. 14 agreed and 30 disagreed.

- Majority agreed that allowing mass balance benefits the generator and supply chains by ensuring accurate tracking of feedstock but also supporting the cost and logistics efficiency of blended storage.

- However the majority also agreed that mass balance must be allowed for woodfuel using for bespoke evidence as well as for certified materials. Not being able to combine the two sources of biomass was seen as impractical and costly. Woodfuel is a low cost and high volume commodity, so storage facilities, ports operations and shipping will, inevitably, involve mixing in bulk containers.

- One respondent highlighted that a typical pellet producer may source fibre from many hundreds of different forest owners. Different forms of biomass will also be held in stock for different periods of time and it is not possible to accurately track back a pellet to its constituent components. Moreover, it is common to mix different feedstocks at the mill to produce the desired pellet properties.

Post consultation decisions

5.10 The Government's goal is ensuring that the biomass used for energy in the UK is sustainable, through efficient and effective controls. The use of mass balance avoids imposing unnecessary costs through the supply-chain, while still allowing that quantity of biomass that meets the sustainability criteria to receive a price premium and encourage the market to further increase supply accordingly.

5.11 Therefore, reflecting the evidence on how supply-chains operate in practice, the Government has decided that mass balance will be allowed for the use of all solid biomass and biogas feedstocks. **This will include woodfuel using bespoke evidence (this is known as the Category B evidence route for public procurement of timber) to demonstrate sustainable forest management criteria are met.**

Independent verification/assessment

Q9. *Do you agree with our approach to: (ii) Require biomass power generating stations of 1MWe and above to provide a sustainability audit report from an independent verifier, operating to ISAE 3000 standard or equivalent?*

Original consultation proposal

5.12 In the case of stations of 1MWe and above which use solid biomass or biogas (except for landfill gas or sewage gas), we proposed to require an independent assessment/audit report from an independent verifier. To ensure verification is carried out to a good standard we considered that the report should meet an ISAE 3000 standard or its equivalent. This would align our policy for solid biomass and biogas to that of bioliquids and transport biofuels where a corresponding requirement for independent verification to ISAE 3000 standard already exists.

5.13 Although we proposed to exempt wastes and biomass wholly derived from waste from the GHG criteria and land criteria for solid biomass and biogas, we did not propose to exempt them from the requirement to submit an independent assessment/audit report. This was to ensure that their claim to be waste or wholly derived from waste is covered by the independent verification.

Main messages from responses to Q9ii

5.14 Of the 44 responses that addressed this question, 73% supported the proposal. 30 agreed and 14 disagreed.

- A large cross-section of stakeholders welcomed the requirement for an independent assessment/audit.
- A majority of generators highlighted that more time would be needed to produce the independent assessment/audit report, several suggested a September deadline.
- However, several generators emphasised the importance of being provided with clear guidance, detailing the methodology to be followed and the criteria against which generators are assessed if this requirement is to be introduced.
- Ofgem's intention to develop a simple integrated voluntary reporting template covering the key requirements of the profiling report and the sustainability audit report was singled out and welcomed by several respondents.

Post consultation decisions

5.15 An independent verification/assessment of the sustainability report will be key to securing public support and confidence in biomass power. Therefore, the Government has decided to implement the proposal as set out in the consultation, that **all stations of 1MWe and above which use solid biomass or biogas, except landfill gas or sewage gas, will provide an independent assessment/audit report, from an assessor operating to ISAE 3000 standard or equivalent.**

- For **stations of 1MWe and above that use solid biomass or biogas, except landfill gas, sewage gas, wastes and biomass wholly derived from waste, the independent assessment/audit report will cover the GHG and the land criteria.**

- For stations of 1MWe and above that **use wastes and biomass wholly derived from waste the independent assessment/audit report will only need to cover their categorisation of these consignments as waste and the exemption from the GHG and land criteria** hence applies, and the reporting on the profiling information such as volume, country of origin and use of mass balance.

5.16 The end of July is just one month before the deadline for electricity suppliers (i.e. the utility companies who provide electricity to households and businesses) to provide ROCs to Ofgem as evidence that they have met their Obligation to supply a certain amount of renewable electricity to their customers in a particular reporting year. Typically it is in the month of August that the electricity suppliers submit to Ofgem the ROCs they wish to use for compliance and therefore there is a risk that suppliers could be redeeming ROCs that once the generator's audit report is finalised is considered to be unsustainable

5.17 Recognising the complexity of producing the audit/assessment report in addition to the main sustainability report, but also the risk to the regulator of issuing ROCs which may need to be revoked, the Government has decided to allow 3 months for the completion of both reports. We considered that setting this deadline will encourage generators to start work on the report early, and continue refining their report during the reporting year.

5.18 **Therefore the sustainability report and (or integrated with) the independent audit/assessment will be required to be submitted to Ofgem by 30 June following the end of the April-March reporting year.**

5.19 This will allow Ofgem a month to check that the ROCs for the previous reporting year have been issued correctly, before suppliers potentially present these ROCs to demonstrate compliance against their Obligation in August. We note that Ofgem intends to develop a single integrated template covering the expected content for the report and the audit/assessment, and greatly welcome this initiative.

5.20 To avoid unnecessary cost and complexity, this report and audit can cover the use of bioliquids as well as solid biomass and biogas, but in this case these should be submitted by 31 May, reflecting the bioliquid deadline. For combined heat and power generating stations the report and audit can also cover Renewable Heat Incentive requirements where this support is being claimed in addition to the RO. In this case the reporting year for the RHI will align itself with the RO, so will run April - March, and the CHP generating station should submit the sustainability report and audit for its solid biomass and biogas use to the RO team and the RHI Team by 30 June.

6. Carbon calculator tool and default values

UK Biomass & Biogas Carbon calculator

Q10. *Do you agree that power generating stations of 1MWe or above should use: (i) the greenhouse gas lifecycle tool provided by the UK Government and available from the Ofgem website or an alternative lifecycle tool that an independent verifier operating to ISAE 3000 standard, or equivalent, has confirmed is compliant with the recommendations made by European Commission?*

Original consultation proposal

6.1 A further goal of the sustainability scheme is for its results and impact to be transparent and accessible to those outside of technical experts within the biomass and energy sector. One of the key elements for this will be ensuring that reported data are being produced on a comparable basis. Therefore we proposed that generators of 1MWe or above should use a GHG tool when reporting on their GHG lifecycle emissions from different feedstocks. The use of high level defaults covering a particular feedstock (e.g. wood pellets from EU country) would not be permitted. Generators would be encouraged to use the tool available for free download and use from the Ofgem website, or one of similar verified quality.

6.2 The greenhouse gas lifecycle methodology used by the UK Government is as set out under the 2009 EU Renewable Energy Directive, reflecting the recommendations made in the European Commission's 2010 report on requirements for sustainability criteria for solid biomass and biogas used for heat, electricity and cooling. This methodology considers the emissions from cultivation, harvesting, processing and transport of the biomass feedstock. It also includes direct land use change where the land use has changed category since 2008. It does not include indirect impacts such as possible substitution effects from displaced wood products or changes in carbon stocks due to changes in forest management practices.

6.3 The Government has supported the development of a Biomass and Biogas Carbon Calculator that uses this methodology and draws on a large number of standard input values covering different elements within the lifecycle that draw upon robust, credible data sources. This tool and an accompanying user-guide is available from the Ofgem website.

Main messages from responses to Q10(i)

6.4 Of the 38 responses that addressed this question, 82% supported the proposal. 31 agreed and 7 disagreed.

- Majority agreed that it was sensible to promote the use the greenhouse lifecycle tool provided by the UK Government but also accept alternative tools that have been suitably assessed. Some stakeholders mentioned the Biograce tool being developed by other EU

member states, as an alternative which has been designed using the same EU methodology.

- However, some industry responses considered that all generators should be required to use the same calculator tool. This would allow the industry to be confident of its relative reporting on emissions data, to ensure suppliers are all subject to the same measurement approach and to improve the ability to trade feedstock between generating stations, confident that standards will be met.

- Other stakeholders raised the issue of the EU GHG lifecycle methodology not including indirect effects or carbon debt, so questioned the use of any tool built to comply with this approach.

- Several respondents put forward suggestions to further improve the UK Government's GHG tool, which would help discourage the use of alternatives.

Post consultation decisions

6.5 We agree that ready comparability of results is very important, and will continue to strongly encourage the use of the tool provided on the Ofgem website. However, we recognise that significant investments have already been made in other calculators, notably the Biograce initiative elsewhere in the EU, and as many generators operate in several member states, some flexibility here seems sensible.

6.6 **Therefore Government has decided that generators of 1MWe or above will be required to use a GHG tool when reporting on their GHG lifecycle emissions from different feedstocks, such as the tool available from the Ofgem website or suitable alternatives.** Alternatives may be used providing an independent verifier operating to ISAE 3000 standard, or equivalent, has confirmed the tool is compliant with the recommendations made by European Commission in their 2010 report on biomass sustainability which builds on the mandatory criteria for transport biofuels and bioliquids set within the EU Renewable Energy Directive.

6.7 We acknowledge that the current EU methodology used for the RO does not account for all possible greenhouse gas emissions in different scenarios for biomass production and use. These include displacement effects, possible changes in carbon stocks due to changes in forest management practices and forgone carbon sequestration (additional forest growth that would have occurred without harvesting). However, we consider it essential we use the approach recommended by the EU to provide consistency and to support a single market across the 27 member states. Our approach to addressing these issues in the longer-term is set out in section 4.2

Use of actual data or standard inputs

Q10. *Do you agree that power generating stations of 1MWe or above should use: (ii) actual rather than standard inputs for those elements that the GHG lifecycle result is most sensitive to. Namely: (a) fertiliser use, (b) type and amount of energy used in processing and (c) transport distances?*

Original consultation proposal

6.8 Our analysis showed that the results from the modelling can change significantly according the (i) amount of fertiliser used, if any, (ii) the amount of energy used in processing and (iii) the transport distance. We wish to encourage and reward good practice and innovation in these areas - which would mean reduced fertiliser used with perennial energy crops, a preference for shipping, water and rail above road transport and an increased use of renewable energy, ideally CHP, when chipping or pelleting.

6.9 Therefore, we proposed that this data should be entered as 'real' figures, rather than using the high-level default values set out in Schedule 3B Part 2 of the RO Order 2009 (as amended by the 2010 and 2011 Amendment Orders).

Main messages from responses to Q10(ii)

6.10 Of the 37 responses that addressed this question, results were balanced, with 54% positive, 46% opposed. 20 agreed and 17 disagreed.

- Many generators were concerned whether it would be possible to gather actual data. Use of fertiliser was seen as particularly challenging, as foresters are unlikely to keep accurate records dating back decades.

- Others were worried by the large numbers involved in a typical biomass supply-chain, and needing to gather data specific to each.

- Those intending to use biomass residues sourced from woodlands or farms in the UK, considered the collection and use of actual values an unnecessary administrative burden. Several highlighted that the 'worst case' GHG lifecycle would in such cases be well below even a 200 kg CO2eq per MWh target.

- Other stakeholders welcomed the required use of 'real' data, as this was seen as preventing generators picking the optimal mix of actual and default data to deliver the lowest GHG result.

Post consultation decisions

6.11 We recognise that there is a need to balance the burden of additional data collection with the expected benefits. **Therefore, reflecting what data should be readily available and which are the key variables, the Government has decided that generators of 1MWe or above will be required to use actual data regarding (i) the type of energy and amount used in pelleting and (ii) transport distances.**

6.12 However, we do not want to introduce unnecessary cost where sustainability risks are low. Where a consignment of biomass is sourced from one region, the use of averages for transport distances will be acceptable, providing that the worst case example demonstrates that the GHG target would be met even in this case. In addition, in the case of purpose grown energy crops, where the whole harvest is used for energy, actual data on the type and amount of fertiliser is to be used.

6.13 **Default inputs may be used in all other cases.** This includes any use of fertiliser in traditional - long rotation or short rotation - forestry. We would expect over time, this data will be readily available.

High level default values

Q11. Do you agree that only power generating stations below 1MWe, will be able to choose to use high-level default values covering whole feedstock lifecycles as specified within the RO, and are therefore not required to use a GHG modelling tool?

Original consultation proposal

6.14 Smaller biomass schemes are likely to be managed and operated by a non-energy professional who may find using the tool difficult. Therefore we proposed that for power and CHP generating stations below 1MWe that the GHG lifecycle can be evaluated using the method based on a combination of a high level default value set out in the ROO for the whole feedstock lifecycle in combination with the generating station's actual energy conversion efficiency.

Main messages from responses to Q11

6.15 Of the 37 responses that addressed this question, 87% supported the proposal. 26 agreed and just 4 disagreed.

- Most agreed this was sensible, and that the cost of imposing the use of the GHG tool and collecting actual values would outweigh the likely benefit.

- Several highlighted this would encourage smaller suppliers and biomass users to come forward.

- Others thought that non-energy professionals would be able to use the GHG tool and gather the necessary data. However, given that it is proposed that ROC support for generating stations below 1MWe is not dependent upon meeting the sustainability criteria, the use of default values was still seen as acceptable.

- Those that disagreed were concerned that smaller generators could still be using a large amount of biomass collectively, so this should be monitored. Another respondent considered that the use of high level defaults should be available to generators of all sizes.

Post consultation decisions

6.16 We wish to encourage community scale generating stations which typically have lower sustainability risks and higher energy security benefits. Such generating stations would still be required to provide profiling data, so Government will be able to monitor that exempting these generating stations from being required to use a GHG tool is not resulting in the use of large volumes of higher risk imported biomass.

6.17 Therefore, the policy will be introduced as proposed. The Government has decided that **only biomass generating stations below 1MWe can use the high level default values set out in the ROO for the whole feedstock lifec**ycle in combination with the generating station's actual energy conversion efficiency. All stations of 1MWe and above will be required to use a GHG tool.

7. Anaerobic digestion

Promoting and monitoring the use of waste in AD

Q12. *Do you agree that the use of animal manure and animal slurry should be exempt from the GHG emissions and land criteria for solid biomass and biogas and exempt from the requirement to report on the mass/volume used?* If you consider other specific types of non-waste biomass also offer low risks and high benefits and should be considered exempt, please provide reasons for your answer.

Original consultation proposal

7.1 The proposals aimed to remove barriers to the use of animal manure and slurry, and to allow easier monitoring of the relative proportion of waste and non-waste feedstocks that each AD Generating station uses.

7.2 We proposed that the use of animal slurry and animal manure would be excluded from the scope of the GHG emissions, land criteria for solid biomass and biogas and the requirement to provide mass or volume consumed as part of the profiling report. Removing these materials from fields and buildings for weighing can be awkward and costly for a farmer

7.3 The use of other non-waste biomass by AD generating stations, such as whole crops or crop residues, would continue to be subject to the GHG emissions, land criteria and the general profiling data requirements.

7.4 A simple spread-sheet would provide standard conversion data for use of whole crops or crop residues. So the use of the profiling data for the non-waste biomass feedstocks, together with the total electricity reported over the same period, would allow the assessment of the relevant percentage split between (i) energy generated from waste and (ii) non-waste biomass.

Main messages from responses to Q12

7.5 Of the 23 responses that addressed this question, 87% supported the proposal. 20 agreed and 3 disagreed.

- Majority considered that the use of animal manure and slurry for AD should be encouraged, and that the proposed light touch to reporting was sensible. The difficulty of measuring was agreed to be disproportionate to the sustainability risks posed.

- Several stakeholders were concerned that this approach could lead to a larger volume of waste being classified as this category and allowing the potential for fraud. One highlighted that for consistency purposes, AD should be treated in the same way as all other biomass users.

- One respondent recommended that ecological restoration biomass streams should be categorized as waste. The removal of such brush can have ecological, water recharge, fire management, economic, food production and GHG benefits

Post consultation decisions

7.6 The Government seeks to promote the expanding use of waste, animal manure and slurry in anaerobic digestion (AD). We want to see UK AD generating stations being primarily fuelled by these feedstocks which deliver optimal sustainability benefits, with the use of whole crops kept to the level needed to maintain the operational performance and efficiency of the generating station.

7.7 **Therefore, Government has decided that the use of solid/gaseous biomass feedstocks for anaerobic digestion that are wastes or wholly derived from waste, animal manure or slurry, will be exempt from the scope of the GHG and land criteria, and from the requirement to report on mass or volumes used. The requirement will be limited to biomass type, its country of origin, form (if appropriate) and confirmation that the biomass is a waste.** This exemption will apply only to use of such feedstocks for anaerobic digestion, not for their use in combustion technologies.

7.8 The use of non-waste biomass feedstocks for anaerobic digestion (other than animal manure or slurry) will be subject to the GHG criteria, land criteria and the general profiling information including mass/volume. AD stations at or above 1MWe would also need to provide a sustainability audit report for the use of solid biomass or biogas.

7.9 A factual overview of the use of wastes and non-wastes for anaerobic digestion for anaerobic digestion is expected to be included in Ofgem's annual sustainability report on biomass use in the RO.

7.10 The Government also intends to consider further whether certain biomass removed for ecological or disease control purposes (such as pine beetle infestation and ash dieback) can be considered waste, for the purpose of combustion (if dry) as well as for anaerobic digestion (if wet), in line with the usual definition.

8. Definitions and Clarifications

Clarity and consistency across renewables incentives

Q8. *Do you agree with our proposed changes to the Article 54 profiling report, and the circumstances in which it must be provided?*

Original consultation proposal

8.1 The Government set out proposed detailed clarifications to support better understanding of wastes and residues, and what an independent assessment audit entails. We also proposed that where possible the sustainability criteria being introduced to the RO and Renewable Heat Incentive would be complementary, and apply across solid biomass, biogas and bioliquids.

Main messages from responses to Q8

8.2 Of the 37 responses that addressed this question, 73% supported the proposal. 27 agreed and 10 disagreed.

- There was widespread support for consistency where possible across bioliquids, solid biomass and biogas, heat, electricity and transport. This would avoid industry confusion as much as possible, and support a common understanding of sustainability standards.

- There was a similar call for simplicity and the need to avoid the proliferation of new sustainability controls, where schemes already exist these should be used.

- Consistency at an EU and global level was similarly considered to be essential by many respondents, calling for the same sustainability standards to be applied to biomass when used for non-energy uses - such as for human or animal food and in construction - as we are now introducing for energy.

- The majority welcomed the proposed clarifications on wastes, residues and emphasised the importance of ensuring the definitions of wastes and residues are clear and consistent across the UK incentives. Others asked for more guidance on what might constitute a 'consignment' for the purpose of reporting.

- Those in the bioenergy industry specifically welcomed confirmation that residues from forestry and sawmills are not co-products, so are therefore treated in the same way as agricultural and processing residues when assessing greenhouse gas emissions. Existing users disagreed as they already provide a market for these.

- Those that disagreed were concerned that these changes would not tackle the underlying problems with the profiling report, in particular the lack of meaningful monitoring and enforcement.

- Several in industry highlighted that consistency should also mean consistency in the application of grandfathering to the sustainability criteria in the same way as it is applied to ROC levels at point of full accreditation.

- Others disagreed due to specific issues which were dealt with in more detail in other parts of the consultation, such as concerns with their ability to provide more detail on virgin wood quality, species and region.

Post consultation decisions

8.3 Regarding the call for a level playing field, the UK will continue to press for harmonised, robust sustainability controls within our negotiations at an EU and Global level. We want a fair and level playing field for business which ensures sustainability at home and abroad, without damaging UK competitiveness.

8.4 In the shorter-term the Government will seek to provide consistency across the different UK Government renewables incentives. **Therefore, the UK Government has decided to introduce complementary sustainability criteria to the Renewable Heat Incentive as to the RO.** On 27 February the Government Response to the consultation on the Non-Domestic Renewable Heat Incentive was published. This confirmed that a mandatory greenhouse gas lifecycle target and land criteria would be brought into the Renewable Heat Incentive. The land criteria would be the same as those which would be brought in for the RO and with respect to woodfuel will draw on established sustainable forestry schemes.

8.5 In addition we will seek to give greater clarity, by confirming that the following clarifications, as proposed in the consultation, are to be applied:

- The RO Order 2009 sets out that "waste" has the meaning given to it in section 75(2) of the Environmental Protection Act 1990 (EPA)[12], which is now embedded in the 2008 Waste Framework Directive (WFD) 2008/98/EC[13]). Article 3(1) of the WFD defines "waste" as "…any substance or object which the holder discards or intends or is required to discard…" In August 2012, Defra published 'Guidance on the legal definition of waste and its application'[14]. **This is the primary definition of waste to be used.**

- In addition, the broad intentions in the Renewable Energy Directive as to how different types of wastes are treated should also be factored into deliberations with respect to sustainability criteria. **For consistency a particular type of biomass should be treated the same with respect to bioliquids and transport biofuels as it is treated for solid biomass and biogas, wherever it is practical.**

[12] UK Government (1990) Environmental Protection Act http://www.legislation.gov.uk/ukpga/1990/43/contents

[13] EU (2008) Waste Framework Directive http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:312:0003:0030:en:PDF

[14] Defra (2012) Guidance on the legal definition of waste and its application https://www.gov.uk/government/publications/legal-definition-of-waste-guidance

- The RO Order 2009 does not define **"residues".** The European Commission Communication 2010/C 160/02[15] defines a "processing residue" as "a substance that is not the end product(s) that a production process directly seeks to produce. It is not a primary aim of the production process and the process has not been deliberately modified to produce it." Although EC Communications are not binding on Member States, and this definition will not be transposed into the ROO, we consider this as a suitable definition for the purpose of applying the sustainability criteria for solid biomass and biogas.

- **Residues from forestry and arboriculture, aquaculture and fisheries should be considered as zero-rated at the point of their collection** for solid biomass, biogas and bioliquids. This would mean these residues would be treated in the same way as residues from agriculture and processing. Therefore emissions associated with their cultivation or harvesting would be considered zero up to their collection.

8.6 **The sustainability audit report for solid biomass, biogas or bioliquids is to be done to ISAE 3000 limited assurance standard.** This involves:

- replacing the requirement to identify systems and confirm that measures have been taken to protect those systems against fraud and to ensure information is accurate and reliable, with a requirement to consider whether the systems used to produce the relevant sustainability information are likely to produce information which is reasonably accurate and reliable and whether there are controls in place to help protect against material misstatements due to fraud or error;

- replacing the requirement to evaluate the adequacy of the frequency and methodology of the sampling, with a requirement to consider the frequency and methodology of the sampling;

- replacing the requirement to evaluate the robustness of the data, with a requirement to consider the robustness of the data, and

- imposing a new requirement for the report to state whether anything has come to the attention of the person preparing the report to indicate that the relevant sustainability information is not accurate.

8.7 Following discussion with Ofgem, we would also seek to give practical guidance as to what is likely to be considered as a single consignment of solid biomass and biogas for RO sustainability reporting purposes. Where solid biomass or biogas is from multiple sources, providing the material from each source has the same sustainability characteristics it can be considered as a single consignment. Where the sustainability characteristics differ, these should be considered as separate consignments, and reported separately.

[15] EU (2010) Communication from the Commission on the practical implementation of the EU biofuels and bioliquids sustainability scheme and on counting rules for biofuels http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2010:160:0008:0016:EN:PD

8.8 In a single consignment we would expect that the following characteristics should be the same:

- Feedstock type - i.e. the final fuel is the same material, or where it is different materials that these have similar sustainability characteristics (e.g. pellets sourced from 80% forest management residues and 20% sawmill residues)
- Country of origin - i.e. same country of origin (e.g. UK, France, Canada)
- Fuel classification - i.e. waste, product, co-product, processing residue, etc
- Whether or not it meets the land criteria
- Whether or not it meets the greenhouse gas (GHG) criteria

8.9 Where feedstock type includes different materials or different sources, the land criteria and GHG criteria should still be met (or be exempt) on an individual basis. If any of the source materials/locations did not individually meet the relevant target when all emissions was taken into account then it would need to be considered a separate consignment.

Use of binding agents

Q14. *Do you agree that solid biomass pellets may contain up to 2% by weight of another solid biomass material for the purpose of binding, without needing to report separately on the sustainability of the binding additive in order to be eligible for ROCs on 100% of the resulting biomass generation from the pellet?*

Original consultation proposal

8.10 The Government recognised that some biomass can be difficult to process into robust pellets. Dust and breakage leads to transport and combustion inefficiencies. The use of a small quantity of additives can improve compactness, stability and performance, with corresponding benefits to the GHG lifecycle emissions. Use of 2% or lower additives is in line with the CEN/TS 14961-2 Grade A1 standard for wood pellets. Therefore we proposed that up to 2% by weight of solid biomass material for binding purposes would be considered sustainable, and would not require a separate sustainability report in order to be eligible for ROC support

Main messages from responses to Q14

8.11 Of the 42 responses that addressed this question, 88% of responses supported the proposal. 37 agreed and 5 disagreed.

- Industry welcomed this proposal as sensible and practical. However some were concerned that 2% was too low.

- Several responses highlighted that many pellets are produced to the I2 industrial wood pellets specifications which has a 3% by weight content allowance for the binding additive under CEN/TS 14961-1. Therefore 3%-4% should be the appropriate permitted level.

- Other stakeholders considered allowing even a small percentage of an additive would risk non-sustainably sourced material being routinely used. Therefore recommended that any additive use would be ineligible for ROC support.

Post consultation decisions

8.12 On balance, considering the large volumes that will be involved, the Grade A1 standard rather than the I2 industrial standard is considered appropriate. **Therefore, the Government has decided that up to 2% by weight of solid biomass material for binding or other performance purposes will be deemed sustainable without requiring a separate sustainability report for the additive.**

8.13 Where the additive is a bioliquid, or the total additives (whether solid or liquid or a mixture) exceed 2% by weight generators will need to report separately on the additive/s to receive ROCs on the generation from the whole pellet. Otherwise ROCs can only be claimed for the use of that proportion of the pellet that is both biomass and is sustainable. Under the terms of the EU Renewable Energy Directive (RED), the UK or any other member state cannot provide support for the use of bioliquid content, such as vegetable oil that does not meet the sustainability criteria in the RED.

Annex A: List of respondents

350 Strategy
AB Sugar
Action Aid UK
American Forest Foundation
Back-up Power Europe Ltd
Biofuelwatch
BSW Energy
BSW Timber
Centrica Energy
Combined Heat and Power Association (CHPA)
Confederation of Paper Industries
Confederation of UK Coal Producers (CoalPro)
Confor: Promoting forestry and wood
CSA SFM User Group
Dalkia plc
DEAC (Dorset Energy Advice Centre)
Drax Power Ltd
E.On
Eco2
ecoFUELS LLC
EDF Energy
EDF Trading Limited
Eggborough Power
Energy Power Resources Limited
Energy Technologies Institute ("ETI")
Energy UK
Enviva LP
Forest Products Association of Canada
Forest2Market Inc
Forth Energy
Fram Renewable Fuels L.L.C.
Friends of the Earth
Futurebiogas
GB Renewables Investments Ltd
GDF SUEZ Energy International
Government of Canada
GP Strategies Future Perfect
Green Circle Bio Energy
Hampshire Woodfuel Cooperative Ltd
Helius Energy
LABORELEC GDF SUEZ
MGT Power
National Farmers Union (NFU)
New Energy Farms
Peel Energy Limited
PEFC Nederland
PEFC UK

Plum Creek Timber Company
Princeton University (Woodrow Wilson School)
Protocol Biomass Corp
PWC
Renewable Energy Association (REA)
RES
Roundtable on Sustainable Biofuels
Royal Society for the Protection of Birds RSPB
RWE
Scottish Natural Heritage
Scottish Power
SembCorp Utilities
SmartestEnergy
SSE
Sustainable Forestry Initiative, Inc. (SFI Inc.)
The Anaerobic Digestion and Biogas Association (ADBA)
The Earth Partners
UK Biochar Research Centre
UPM
US Industrial Pellet Association (USIPA)
Westervelt Renewable Energy
Weyerhaeuser Company
Wood Panel Industries Federation
Woodsure Ltd
and 2 responses from individuals.

Annex B: FoE letter

Dear Minister,

I am writing to ask you to stop spending public money on supporting power stations that burn trees. The subsidies were intended to reduce greenhouse emissions, and yet they are having the opposite effect.

Research commissioned by your own department has found that burning whole trees results in even more greenhouse emissions than burning coal. If the practice continues, UK power stations will soon be burning 6 times as much wood as all our forests currently produce each year. The shortfall will create the need to import more trees from overseas. This increased demand for wood will put even more pressure on the world's forests and lead to further deforestation.

Public subsidies under the Renewables Obligation should only be spent on technologies that lead to real climate benefits. These include clean energy such as solar, wind, and wave power. Please make sure that, in the current review of the sustainability and carbon standards of the Renewables Obligation, support for the burning of wood from tree trunks is scrapped and refocused on the use of biomass from wastes and residues only.

You can contact me by email (preferably - to save resources) or at the following address:

Yours sincerely,

Annex C: Back biomass letter

Dear Minister,

The UK urgently needs jobs, growth, and energy security. Upgraded energy infrastructure can keep the lights on and lower ghg emissions; but it's also one of the strongest foundations for growth, competitiveness and a rebalanced economy.

The green economy made up 1/3 of all UK growth since 2008. Already contributing over a billion pounds and supporting tens of thousands of UK jobs, bioenergy could be a cornerstone industry in Britain's economic and energy future.

Bioenergy could potentially supply 11% of UK energy demand by 2020. Government currently advocates all forms of biomass: from brand new dedicated projects; to conversion and co-firing of coal stations; and highly efficient biomass combined heat and power. Biomass power and CHP provides predictable, on-demand generation to complement the growth of other renewable. It's cost-effective, rapidly deployable and, with Ofgem predicting a capacity crunch of 4% as early as 2015, it could make a vital contribution to UK energy security.

The biomass sector is geared up and shovel ready to deliver new investment, infrastructure and energy security. But current policy and political uncertainty is damaging investor confidence and jeopardising projects. Ambitious action is required. Government must act now and take the long-term decisions needed to get these projects up and running.

I am writing to show my support for UK biomass and to call on Government to be bold, end the delays, and give investors the certainty they need.

Yours faithfully

Department of Energy & Climate Change
3 Whitehall Place
London SW1A 2AW
www.gov.uk/decc

URN 13D/027