

Title: Biomass Electricity and Combined Heat & Power plants – Value for money and affordability IA No: DECC 0120 Lead department or agency: DECC Other departments or agencies: Defra, BIS and HM Treasury	Impact Assessment (IA)
	Date: 06/12/2012
	Stage: Final
	Source of intervention: Domestic
	Type of measure: Secondary Legislation
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Summary: Intervention and Options	RPC Opinion: N/A
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Cost of Preferred Option			
Total Net Present Value	Business Net Present Value	Net cost to business per year (EANCB on 2009 prices)	In scope of One-In, Measure qualifies as One-Out?
£150m	N/A	N/A	No N/A

What is the problem under consideration? Why is government intervention necessary?

The Renewables Obligation (RO) is currently the UK's principal mechanism to incentivise investment in large scale renewable electricity generation, and operates within an overall budgetary limit set by the Levy Control Framework. The Government Response to the RO Banding Review, published in July 2012, set out the tariff levels for each RO technology band for the period 2013-17. DECC is committed to ensuring support provided under the RO demonstrates value for money and affordability, and that biomass support reflects the UK Bioenergy Strategy's principles: including real, cost-effective carbon reductions and consideration of economy-wide impacts, including those on other biomass using industries. Therefore, DECC are introducing measures to limit the total deployment of new dedicated biomass plant, phase out the energy crop uplift for standard co-firing and reduce the support levels for standard co-firing in the first two years of the banding review period. These intentions were set out in the Government Response to the RO Banding Review, and were subject to public consultation, which closed 19th October 2012.

What are the policy objectives and the intended effects?

The objective of the value for money and affordability measures is to ensure RO bands for the period 1st April 2013 to 31st March 2017 support sufficient investment in cost effective renewable energy deployment to meet the UK's 2020 renewable energy targets and deliver longer term cost-effective carbon emission reduction, whilst remaining within the overall RO budget and providing value for money for electricity consumers.

What policy options have been considered, including any alternatives to regulation?

Dedicated Biomass Cap:

- (i) Do nothing, i.e. new dedicated biomass capacity unrestricted
- (ii) Restrict capacity to 1 GW through a supplier cap (**consultation proposal**)
- (iii) Restrict capacity to 400 MW through non-legislative policy measures, including notification process, and enforced through the potential removal of grandfathering rights for additional dedicated biomass power coming forward. (**final proposal**)

Energy Crops Uplift:

- (i) Do nothing, i.e. energy crop uplift continues to be available for standard co-firing
- (ii) Maintain the energy crop uplift in the standard (low-range) co-firing band until April 2019 for existing energy crop contracts only (**consultation and final proposal**)
- (iii) Retain the energy crop uplift in standard (low-range) co-firing only for generators who are already claiming the energy crop uplift until 2019
- (iv) Retain the Energy Crop uplift for use with standard (low-range) co-firing band until 2019

Reduction in support for Standard Co-firing (SCF):

- (i) Do nothing, i.e. SCF support remains at 0.5 for the whole period
- (ii) Reduction from 0.5 to 0.3 in 2013/14 and 2014/15 (0.5 in 2015/16 and 2016/17) (**consultation and final proposal**)

(Note: this proposal also includes co-firing bioliquids and biomass CHP – see paragraph 72 for more details)

Will the policy be reviewed? There is no further scheduled review of RO Bands, although under the Renewables Obligation Order 2009, paragraph (33) (as amended by the Orders 2010 and 2011) an early review of ROC rates can occur subject to certain criteria being met. DECC will continue to monitor costs and deployment in the usual way.

Does implementation go beyond minimum EU requirements?			No		
Are any of these organisations in scope? If Micros not exempted set out reason in Evidence Base.	Micro No	< 20 No	Small Yes	Medium Yes	Large Yes
What is the CO ₂ equivalent change in greenhouse gas emissions? (Million tonnes CO ₂ equivalent)			Traded: n/a	Non-traded: n/a	

I have read the Impact Assessment and I am satisfied that (a) it represents a fair and reasonable view of the expected costs, benefits and impact of the policy, and (b) that the benefits justify the costs.

Signed by the responsible Minister:



Date: 17/12/12

Summary: Analysis & Evidence

Policy Option 1

Description: Restrict dedicated biomass capacity to 400 MW through non-legislative policy measures, enforced through changes to grandfathering policy (including mandatory notification process), maintain the energy crop uplift in the standard (low-range) co-firing band until April 2019 for existing energy crop contracts only, and reduce support for standard co-firing from 0.5 to 0.3 in 2013/14 and 2014/15 (0.5 in 2015/16 and 2016/17) (**Intended policy approach**)

To note: NPV on this summary page covers reduction in support for standard (low-range) co-firing only as the other measures are not expected to have benefits and costs relative the counterfactual baseline.

FULL ECONOMIC ASSESSMENT

Price Base	PV Base	Time Period	Net Benefit (Present Value (PV)) (£m)		
2011/12	2011/12	Years 20	Low:	High:	Best Estimate: 150

COSTS (£m)	Total (Constant Price)	Transition Years	Average (excl. Transition)	Annual (Constant Price)	Total (Present Value)	Cost
Low						
High						
Best Estimate	n/a			n/a	100	

Description and scale of key monetised costs by 'main affected groups'

The key monetised costs associated with a **reduction in support for standard co-firing** are the carbon cost incurred due to a reduction in abatement (compared to a scenario where support was held at 0.5 ROCs in all years) as generators switch from standard co-firing to coal. However, the response from industry to this reduction in support is uncertain. It is possible that levels of enhanced co-firing (ECF) and conversion could increase in this period as generators move towards higher levels of co-firing. This would reduce the cost shown here as the switch to coal (i.e. less abatement) would be to a lesser degree.

The monetised costs on this summary page only relate to the reduction in support for standard co-firing, see evidence base for analysis on impacts to RO spend for specific measures, and the executive summary for explanation of quantified impacts.

Other key non-monetised costs by 'main affected groups'

In addition to the monetised cost quantified above for the reduction in support for standard co-firing, there is also the following risk:

- Reducing SCF support in 2013/14 and 2014/15 could potentially lead to under deployment (compared to central forecasts) of SCF in later years if plants do not pick up deployment at higher support level from 2015/16. This risks losing out on cost effective carbon savings and adversely impacting the ability to meet the 2020 Renewables target.

The key non-monetised cost of introducing a measure to limit dedicated biomass is:

- Potential under deployment due to uncertainty created in the market and/or over registering of deployment by generators - which does not materialise, leading to under deployment. However, the final policy proposed is intended to help deliver deployment at the level centrally forecast in the Impact Assessment accompanying the Government Response to the RO Banding Review, and therefore has no additional impact.

The key non-monetised cost of introducing a measure to remove the energy crop uplift for SCF is:

- Costs incurred by Ofgem in administering the energy crop uplift for SCF for those with existing energy crop contracts until April 2019.

BENEFITS (£m)	Total (Constant Price)	Transition Years	Average (excl. Transition)	Annual (Constant Price)	Total (Present Value)	Benefit
Low						
High						
Best Estimate	n/a			n/a	250	

Description and scale of key monetised benefits by ‘main affected groups’

The key monetised benefits associated with a **reduction in support for standard co-firing** are the lower resource costs due to the switch from standard co-firing to coal. However, the response from industry to this reduction in support is uncertain. It is possible that levels of enhanced co-firing and conversion could increase in this period as generators move towards higher levels of co-firing. This would reduce the benefit shown here as the switch to coal would be to a lesser degree.

The monetised benefits on this summary page only relate to the reduction in support for standard co-firing, see evidence base for analysis on impacts to RO spend for specific measures, and the executive summary for explanation of quantified impacts.

Other key non-monetised benefits by ‘main affected groups’

Introducing value for money and affordability measures incurs the following non-monetised benefits:

- Greater control and certainty over RO budgetary control, delivering value for money for electricity consumers, whilst helping to ensure sufficient growth in cost effective renewable energy deployment to meet the UK’s 2020 renewable energy targets.
- Limiting deployment in less cost effective technologies helps ensure bioresources are deployed in the most carbon cost effective uses, therefore reducing upward pressure on electricity bills and presenting better value for money.
- Designing policy to limit the disruption to industry, for example: continuing support for generators with existing contracts in place for energy crops; and setting the limit for new dedicated biomass at a level which allows for some projects with significant irreversible financial commitments.

Key assumptions/sensitivities/risks**Discount rate (%)**

3.5%

The level of deployment estimated to come through under support rates set out in the Government Response to the RO Banding Review is subject to considerable uncertainty. Similarly, the risk that a higher level of deployment is feasible (leading to budgetary pressures); given other barriers such as biomass supply chains and financing, is also significantly uncertain.

Evidence Base (for summary sheets)

1. The **Biomass Electricity & Combined Heat & Power plants – ensuring sustainability and affordability** consultation¹ was launched on 7th September 2012 and contained two parts: (A) Sustainability criteria (consultation to 30th November); and (B) Value for money and affordability (consultation to 19th October). Section A and B are related in that they both impact on biomass power generation supported through the Renewables Obligation (RO), however they will be implemented separately. This Impact Assessment contains the impact analysis for the final proposals for the value for money and affordability measures (part B), which aim to minimise the risk of breaching the RO budget and ensure that cost-effective carbon reductions are delivered. A separate Impact Assessment will set out the analysis for the final proposals for Biomass Sustainability measures in the new year.
2. The evidence base is set out as follows:
 - 1) Executive summary (including Methodological approach)
 - 2) Strategic Overview / Problem under consideration
 - 3) Rationale for intervention / Policy objective

For each policy:

- 4) Description of options considered
- 5) Analysis of options
- 6) Impacts of each option
- 7) Wider impacts
- 8) Summary and preferred option with description of implementation plan

1. Executive summary

3. This Impact Assessment appraises the Government's proposals for managing the costs and ensuring cost effective carbon savings within the Renewables Obligation (RO) for new build dedicated biomass plants² and standard co-firing in fossil fuel power stations from 1 April 2013. To note, standard co-firing (SCF) (low range) refers to below 50% co-firing, enhanced co-firing (ECF) is split between medium range (50% to below 85% co-firing) and high range (85% to below 100% co-firing). Conversion is when 100% biomass is burned.
4. As set out in the Government Response to the RO Banding Review, the Government's intention is to focus the deployment of biomass electricity over the banding review period (2013-2017) on the cheaper and transitional technologies of conversion and co-firing (i.e. coal replacement). Replacing coal with biomass is lower cost compared to other renewables (since it involves use of existing assets) with significant carbon savings as it replaces high carbon coal. Its shorter operating lifespan compared to new build dedicated biomass also makes it attractive in terms of avoiding significant feedstock lock in beyond the late 2020's.

¹ http://www.decc.gov.uk/en/content/cms/consultations/biomass_ro/biomass_ro.aspx

² New build dedicated biomass power refers to new generating plants designed to use only biomass feedstocks that are built on sites other than on existing coal power plant sites.

5. As highlighted in the Bioenergy Strategy³, new dedicated biomass can be more expensive in terms of cost of carbon abatement compared to other renewables. While a small amount of it is affordable and cost-effective within the framework of the overall RO package, it becomes increasingly less attractive in the longer term and at larger volumes, even taking account the ambition for higher sustainability standards. The latest pipeline data available to DECC suggests higher potential for deployment of dedicated biomass by 2016/17 than centrally forecast at the time of the Government Response to the RO Banding Review. If this higher deployment came forward it could risk breaching the RO budget and reducing the value for money of the scheme. Therefore, the intention is to limit the total deployment of new dedicated biomass plant supported under the RO.
6. The Government Response to the RO Banding Review identified a particular risk to be managed from the RO potentially exceeding its budgetary framework in 2013/14 and 2014/15. Standard co-firing is not grandfathered⁴, reflecting that this technology does not require large sunk investment and can be adjusted rapidly in response to changed market signals. This means it is a technology where support can be reduced without significant unintended impacts on generators. Therefore, DECC intends to reduce its support to March 2015 as a cost saving measure that is in line with the intention to move generators towards enhanced levels of co-firing and conversion.
7. Similarly, as the energy crop uplift was not extended to the new conversion and enhanced co-firing bands, DECC intends to remove the energy crop uplift from standard co-firing in order to present consistent incentives towards enhanced levels of co-firing and conversion. Transitional measures will be introduced to recognise that some generators have existing long-term contracts for the use of energy crops.
8. The intention is that these value for money and affordability measures balance the need to ensure dedicated biomass and standard co-firing RO support levels for the period 2013/14 to 2016/17 support sufficient growth in cost effective renewable energy deployment to help meet the UK's 2020 renewable energy targets, whilst remaining within the overall RO budget and the LCF.

Methodological approach

9. The cost and benefits figures included in the 'Summary: Analysis & Evidence' sheets refer to the monetised impacts of reducing the support for standard co-firing from 0.5 to 0.3 in 2013/14 and 2014/15 only. Table 1 below shows the impact on carbon and resource costs due to the reduction in standard co-firing support. Costs and benefits relate to changes in standard co-firing deployment in 2013/14 and 2014/15 only, it is assumed that forecast deployment before and after this period continues as expected under 0.5 ROCs support level. See Standard Co-firing Support (paragraph **Error! Reference source not found.**) for further information on this policy and impacts on RO spend.

³ http://www.decc.gov.uk/en/content/cms/meeting_energy/bioenergy/strategy/strategy.aspx

⁴ Grandfathering policy aims to strike the right balance between recognising the significant upfront capital costs of converting existing fossil-fuel generating units to biomass, limiting volatility within the RO, and ensuring that consumers are not overpaying for this type of renewable generation in the longer term. Standard Co-firing of biomass (below 50%) is relatively low cost and potentially volatile. Therefore, as in the past, support for standard co-firing is not covered by grandfathering policy. DECC recognises the higher capital cost and longer term commitment represented by enhanced co-firing and full conversion and therefore those support levels are covered by grandfathering policy in some circumstances. See Government Response to the RO Banding Review for further details on grandfathering: <http://www.decc.gov.uk/assets/decc/11/consultation/ro-banding/5936-renewables-obligation-consultation-the-government.pdf>

Table 1: Discounted costs and benefits from a reduction in standard co-firing deployment in 2013/14 and 2014/15

	£m (11/12 prices) Discounted
Cost of carbon	100
Resource cost of renewables	(-) 550
Resource cost of non-renewables	300
NPV	150

Note: Table above relates to NPV figure set out on IA Summary Sheet.

10. The costs and benefits of the measures to limit dedicated biomass deployment and to remove the energy crop uplift from standard co-firing are not included in the ‘Summary: Analysis & Evidence’ monetised costs and benefits. In our central scenario, they are expected to have no additional impact against the counterfactual of the deployment and RO spend set out in the Government Response to the RO Banding Review. However, the risks to the RO budget from not implementing these policies are shown in the sections on ‘Limiting Dedicated Biomass Deployment’ (paragraph 21) and ‘Energy crop Uplift’ (paragraph 43).

2. Strategic overview / Problem under consideration

11. The EU Renewable Energy Directive commits the UK to meeting 15% of its energy needs from renewable sources by 2020 (including interim targets for the two-year periods 2013-2014 and 2015-2016). To achieve this, renewable electricity supply from large-scale generation will need to increase from around 26TWh in 2010 to around 108TWh (under the central renewables deployment scenario) by 2020, and further deployment of renewable electricity will need to come from smaller-scale generation (<5MW). The Renewables Obligation (RO), introduced in 2002, is currently the Government’s main financial policy mechanism for incentivising the deployment of large scale renewable electricity generation in the UK. Since the introduction of the RO in 2002, there has been a significant increase in the UK’s renewable generation, from 1.8% to 9.4% in 2011⁵. The RO has played an important part in securing reductions in carbon dioxide emissions in the UK.

12. The RO is expected to close to new renewables stations from 1st April 2017, whilst maintaining support for existing stations in the scheme out to their respective end dates (of which the latest would be expected in 2037). As part of the Electricity Market Reform, support for large-scale renewable electricity will be available from around 2014 onwards through the new Feed-in Tariff with Contract-for-Difference scheme (FiT with CfD).

13. The RO operates within an overall budgetary limit set by the Levy Control Framework (LCF), which sets an overall limit on support for low carbon generation through levies on customer bills. The Government Response to the Banding Review, published in July 2012, set out the support levels for renewable technologies in each band from 2013/14 to 2016/17, and the intention to consult on further measures to ensure RO spend remains within the overall LCF budgetary limit and presents good value for money for electricity consumers. These included: limiting the deployment of new dedicated biomass plant; removing the uplift for standard co-firing with energy crops; and reducing the support level for standard co-firing in 2013/14 and 2014/15.

⁵ RO-eligible electricity generation as a proportion of UK electricity sales

14. The UK Bioenergy Strategy⁶, published in April 2012, highlights that ensuring bioenergy is genuinely low carbon and cost-effective will be two of the four core principles for future government policy on bioenergy. Biomass is expected to make a significant contribution to the energy mix supported by the RO. It is therefore important to ensure support levels and resulting bioenergy deployment reflect the new UK Bioenergy Strategy's principles within the available RO budget, including real, cost-effective carbon reductions and considering wider impacts, including those on other biomass using industries. The final proposals set out in this Impact Assessment are designed in this context and take into account the feedback received through the consultation process.

3. Rationale for intervention / Policy objective

15. The overarching objective of the RO is to support the delivery of the UK's renewable energy targets, as set under the EU Renewable Energy Directive. Government needs to provide support to large-scale renewable electricity technologies, as current renewables costs are higher than their conventional alternatives, and as such they would not be undertaken at the levels required or in the timescales needed. Intervention is also needed to mitigate a number of market failures and other barriers which would lead to too little investment in renewable technologies without government intervention. These include: the negative externalities relating to greenhouse gas (GHG) emissions (i.e. the damage costs of GHG emissions are not factored into investor decision making, although this is being partially addressed by the EU Emissions Trading System, supported by the Carbon Price Floor); positive externalities relating to investment in innovative and emerging technologies; the homogenous nature of electricity as a product (from a consumers' perspective electricity is electricity⁷ and is difficult for renewable generators to compete on anything other than price); imperfect information; and, limited access to capital.

16. The Government Response to the RO Banding Review sets RO bands for the period 1st April 2013 to 31st March 2017 that should help ensure the RO supports sufficient growth in renewable energy deployment to meet the UK's 2020 renewable energy targets. DECC must ensure overall costs are kept within the RO agreed budget, and that it delivers cost-effective carbon reductions. Therefore, limiting support levels for standard co-firing and encouraging the move towards enhanced levels of co-firing and conversion are considered necessary.

17. The government's intention is to focus the deployment of biomass electricity over the banding review period on the cheaper and transitional technologies of conversion and co-firing (i.e. coal replacement). As set out in the UK Bioenergy Strategy, dedicated biomass is a relatively expensive technology compared to coal to biomass conversion, which also appears cost-effective compared to other renewables (since it involves use of existing assets) with significant carbon savings as it replaces high carbon intensive coal⁸. The shorter operating lifespan of conversion compared to new build dedicated biomass also makes it attractive in terms of avoiding significant feedstock lock-in beyond the late 2020's. In contrast, new dedicated biomass can be less attractive in terms of renewable generation and carbon abatement costs compared to other renewables. While a small amount of it is expected to be affordable and cost-effective at the support level under the RO, it becomes increasingly unaffordable in larger volumes.

⁶ http://www.decc.gov.uk/en/content/cms/meeting_energy/bioenergy/strategy/strategy.aspx

⁷ Although suppliers may label their electricity and tariffs according to its emissions.

⁸ DECC analysis for the RO takes into account the economic lifetime of coal plants and operating restrictions owing to regulatory constraints e.g. LCPD. In this Impact Assessment, DBM plants are compared to a CCGT counterfactual.

18. Although the Governments proposals for tighter sustainability standards⁹ will act to improve the cost effectiveness of dedicated biomass (i.e. by lowering the maximum threshold for emissions per MWh of bioenergy), DECC believes that dedicated biomass cost of carbon abatement will stay relatively high through 2020 and beyond compared to alternative technologies. Given this, it is considered necessary to limit dedicated biomass deployment, providing a safety net to ensure additional RO spend on dedicated biomass post 2017 is minimised.

Value for money and affordability measures

19. This section outlines the final value for money and affordability proposals and expected impacts. The following proposals are included:

- Limiting Dedicated Biomass deployment;
- Removal of the energy crop uplift for standard co-firing; and
- Reduction in support from 0.5 to 0.3 for standard co-firing in 2013/14 and 2014/15 (0.5 in 2015/16 and 2016/17).

20. It is important to note that accurately forecasting deployment under the RO support bands is very challenging and subject to considerable uncertainty. Therefore, the estimated deployment figures quoted in this section should be considered as indicative.

Limiting Dedicated Biomass Deployment

21. Modelling undertaken for the Government Response to the RO Banding Review Consultation Impact Assessment¹⁰ suggested approximately 300 MW¹¹ of new build dedicated biomass plant capacity would be brought forward at the proposed level of subsidy¹² by 2017. It is important to note that this is a central modelled estimate which takes account of financial and other barriers, and the precise technology mix that will come in under the RO is very uncertain. Market assessments at this time indicated that potentially deployment could be significantly higher, and therefore the Government Response to the RO Banding Review included the commitment to consult on a measure to limit dedicated biomass deployment. The *Biomass Electricity & Combined Heat & Power plants – ensuring sustainability and affordability* consultation Impact Assessment noted that potential could be as high as 800 MW by 2017¹³ based on pipeline data available in September, although it was considered unlikely that all of these projects would materialise within the banding review period. The latest available pipeline data for dedicated biomass plants now suggests deployment could be as high as 560 MW capacity by 2017¹⁴.

⁹ See section A: http://www.decc.gov.uk/en/content/cms/consultations/biomass_ro/biomass_ro.aspx

¹⁰ <http://www.decc.gov.uk/assets/decc/11/consultation/ro-banding/5945-renewables-obligation-government-response-impact-a.pdf>

¹¹ 300 MW figure includes approximately 250 MW new capacity assumed in Government Response to the RO Banding Review to come under RO support and approximately 50 MW new capacity to come on in 2016/17 under CfD support.

¹² Government Response support for new dedicated biomass power is set at 1.5 ROCs per MWh until 31 March 2016, reducing to 1.4 ROCs per MWh for new accreditations (and additional capacity added) after 31 March 2016.

¹³ This estimate is based on information provided as part of the RO Banding Review consultation, together with analysis of the DECC Renewable Energy Planning Database (REPD), and is subject to considerable uncertainty.

¹⁴ List of projects excludes potential plants in Scotland and Northern Ireland. Probability of materialising refers to the likelihood of the project being able to claim support under the RO scheme. The following likelihoods are attached: High ~ 70% or higher %, Medium ~ 50%, Low ~ 30% or lower.

22. The consultation set out a proposal to limit energy generated from a maximum 1 GW of annual capacity through a cap on the number of ROCs which suppliers can access for dedicated biomass accredited after March 2013¹⁵. This level was considered to provide sufficient headroom for generators to ensure that advanced (shovel-ready) projects are able to come forward over the banding review period at the support level provided – given the level of uncertainty in estimating future deployment. The intention in setting a cap is to maintain value for money for consumer subsidies while also maintaining investor confidence and to not stop dedicated biomass projects that are shovel ready and can reach financial close by March 2013. The intention is not to deter all dedicated biomass pipeline deployment. The feedback received during the consultation, and the revised options (including the recommended option) are set out below.

Consultation feedback

23. Feedback received through the consultation suggests a supplier cap, as described in the consultation document, would lead to significant under deployment compared to the central forecasts under the RO. The Government Response to the RO Banding Review Impact Assessment set out the estimated cost effective levels of deployment for each technology band (given the support rates). The central forecasts are considered to represent value for money to consumers and ensure that the scheme remains within the budgetary constraints as set through the Levy Control Framework (LCF).

24. The following impacts were highlighted:

- i) Under a supplier cap the total volume of ROCs issued in a year is only known at the end of the year, therefore, the exact volume of dedicated biomass for which ROCs could be submitted would not be known until after the event. The uncertainty this creates is likely to depress the value of the dedicated biomass ROC, making it more difficult for generators to access a Power Purchase Agreements (PPAs)¹⁶ and bank financing.
- ii) Larger projects, with long build times, may face additional difficulty accessing finance as they may risk losing out on ROCs because smaller projects can be built more quickly and take up the capped capacity. This effect is exacerbated with a supplier cap expressed as a percentage of the RO, as it makes predicting the actual utilisation of the cap harder.
- iii) The proposal could potentially favour supplier-generators, given they would have greater certainty over securing a guaranteed market for their dedicated biomass generation. This could result in few suppliers having sufficient demand for dedicated biomass ROCs to offer PPA's to independent generators.

25. Feedback also suggested that biomass feedstock availability in the UK could act as a constraint on higher levels of dedicated biomass capacity being deployed, and potentially this could remove the need for a formal cap on this technology. Estimating future bioresource supply potentially available to the UK is challenging and subject to significant uncertainty. UK access to imported bioresources will depend on a range of factors, including the willingness to pay by different countries, development of supply contracts and the incentives in place to use biomass. The market is likely to respond to increased demand for sustainability resources if an adequate price is available in the market. However, there could be short-term supply constraints due to time lags in the markets ability to

¹⁵ Each year, when the level of the Obligation is set, the level of the dedicated biomass cap would be set as a percent of the total obligation equivalent to the expected generation from 1GW capacity of new build biomass power.

¹⁶ A Power Purchase Agreement (PPA) is a legal contract between an electricity generator (seller) and the electricity buyer. The PPA sets out the commercial terms for the transaction, including details such: when the project will begin operation, when electricity will be delivered, payment terms, etc.

respond to enhanced sustainability standards, infrastructure constraints and government policy (UK and international), and other longer term barriers such as water scarcity. In the context of constrained bioresources, it is also unclear which biomass user would gain access to the limited resources, i.e. dedicated biomass, conversions/co-firers, or non-energy uses. Given the uncertainty surrounding the speed at which the UK supply chain can develop and the lack of evidence available on the future willingness to pay for sustainable woody resources (and the international market response), DECC do not consider the potential supply chain constraint alone as sufficient to provide a robust safety net to limit the deployment of new dedicated biomass.

4. Description of options considered

26. This section sets out the options considered to limit the deployment of dedicated biomass as part of the Government response to the consultation on biomass value for money and affordability measures.

Option 1: Do nothing

27. Continue with support levels as set out in Government Response, no measure put in place to limit dedicated biomass plant deployment. This would not address the risk to the RO budget and potential pressure on electricity bills, and could allow support to be channelled away from more cost effective uses of bioresources. Therefore this option is not recommended.

Option 2: Supplier cap

28. The consultation document proposed a supplier cap on the number of ROCs which suppliers¹⁷ can access for dedicated biomass accredited after March 2013¹⁸ (similar to the working of the existing co-firing cap). The cap would be set on the percentage of their obligation that suppliers can meet with that technology. The only dedicated biomass plants exempted from the cap would have been biomass CHP plants for reasons of greater efficiency. The level of the cap must be fixed in advance in the legislation, whereas the size of each supplier's renewables obligation will vary from year to year. Based on a 90% load factor, and maximum 1 GW annual capacity (this level includes embedded headroom¹⁹, therefore does not represent the capacity forecast to actually come through), the percentages of a suppliers renewables obligation in each year of the banding review period would be: 19/17/14/12%. This implies annual maximum generation at 8 TWh. As noted in paragraph 23 above, evidence gathered during the consultation suggests the uncertainty created by a supplier cap could risk pipeline deployment drying up completely, and not fulfilling the policy intention to support those dedicated biomass projects that are shovel ready and can reach financial close by March 2013. Therefore, this option is no longer recommended.

¹⁷Suppliers is the term used to refer to the utility companies that supply electricity to business and household customers. Suppliers purchase electricity from generating companies in order to supply power to their business and household customers. Suppliers also purchase ROCs from generators to demonstrate that they have met their annual obligation to source a certain amount of their electricity from renewables.

¹⁸ Each year, when the level of the Obligation is set, the level of the dedicated biomass cap would be set as a percent of the total obligation equivalent to the expected generation from 1GW capacity of new build biomass power. This would limit the amount of these ROCs that a supplier could use to demonstrate to Ofgem that they have met their obligation for that year and hence avoid paying the buy-out price for any shortfall in the number of ROCs provided.

¹⁹ Headroom refers to the margin between a cap and the actual level of deployment that is likely to come forward. Imposing a limit on any technology creates uncertainty, project financiers need to be confident that there is sufficient headroom between planned deployment and the cap, so the cap does not bite once the investment has been made.

Option 3: Policy control measure (recommended)

29. A policy control measure would clearly set out the maximum level of new build dedicated biomass capacity that DECC considers acceptable and affordable through largely non-legislative means. The threshold will be set at 400 MW, however the expectation is that around 300 MW capacity would be able to come through given the headroom required for projects to access finance. This option would involve a notification process where generators would register their planned deployment and provide evidence demonstrating that their project had met certain milestones (explained in further detail in Annex A). Ofgem will monitor registration and notify DECC at appropriate intervals as registered capacity approaches the 400MW threshold. Once the threshold capacity is reached DECC will consider issuing a consultation paper setting out proposals to restrict further biomass deployment through the removal of grandfathering rights from additional dedicated biomass power coming forward. The policy control measure would apply to all projects accrediting after 31 March 2013. The potential changes to grandfathering would only apply to those projects coming in over the 400MW threshold. Plants on the notification register before the 400MW trigger is hit will not be affected by a possible consultation on grandfathering rights. These projects will be eligible to proceed to full accreditation and grandfathering at the ROC levels as set out in the Government Response to the RO Banding Review published in July 2012 accreditation.
30. As set out in the Bioenergy Strategy, Combined Heat and Power (CHP) offers good value for money in carbon terms, being a technology that can deliver substantial GHG savings post 2020. Further, the number and capacity of the CHP plants that could come forward is limited by the need for a site with a suitable heat load. Therefore the consultation included the proposal to exclude CHP projects from any measure to limit dedicated biomass. There is a Government CHP Quality Assurance (CHPQA) programme already in place which allows Good Quality CHP to be identified under the RO. This proposal was supported by consultation feedback, although concern was raised that a CHP plant could lose its heat customer through no fault of its own and then become subject to the cap. DECC have taken this risk into account and intend CHP stations to remain outside the cap once certification (that the plant meets CHPQA criteria) has been received.

5. Impact of options

31. **Option 1: Do nothing** – Continuing without any measure in place to limit dedicated biomass plant deployment would not address the risk to the RO budget and potential pressure on electricity bills, this will have a negative impact on the value for money of the RO. Higher levels of deployment of dedicated biomass could allow support to be channelled away from more cost effective uses of bioresources such as conversions and co-firing, which will also reduce the value for money of the scheme.

Option 2: Supplier cap

32. As explained in the 'Consultation feedback' section above (paragraph 23) the key impacts of a supplier cap on the dedicated biomass market include:
- i) Creation of uncertainty in the market (even with generous headroom) that could lead to under deployment relative to the maximum limit imposed by any cap, largely due to projects not being able to access finance due to concerns over the risk of the cap being breached.

- ii) Creation of a constrained market for selling dedicated biomass ROCs depressing their value and affecting the economics of dedicated biomass projects²⁰. As generation starts to reach the level of the cap, the market will become even more of a “buyers’ market”, giving suppliers the power to buy ROCs at a greater than usual discount and limiting the return for generators. The level of discounting will depend on the level of the cap compared to deployment as well as wider market developments.
- iii) The annual supply of dedicated biomass ROCs potentially exceeding the number that generators can use in meeting their Obligations, could lead to a reduced Power Purchase Agreement (PPA) market demand for the ROCs associated with these plants. Setting a cap makes the ROCs less relevant to the overall obligation that a supplier is required to meet, and therefore less of tradable commodity between suppliers. Once a cap has been imposed a dedicated biomass ROC is intrinsically not as valuable as an 'all-purpose' ROC to the supplier community. The cap is not a target and if the suppliers can source ROCs from other technologies to meet their obligation more economically they will do so and (given the limitation on the value of a capped dedicated biomass ROC) they are only likely to seek to contract with dedicated biomass projects if there is an enhanced discount to the general PPA ROC discount.

Option 3: Policy control measure (recommended)

- 33. Given the potential negative impacts identified during the consultation process on the dedicated biomass market from a supplier cap, the aim was to design a limit to dedicated biomass deployment that achieves the policy aim to limit dedicated biomass deployment while mitigating the negative impacts on the industry that could lead to under deployment. The proposed policy control measures will provide an upper limit to guide capacity deployment toward the central forecast level set out in the Impact Assessment accompanying the Government Response to the RO Banding Review – therefore this recommendation should not have an impact on the overall costs set out in the Government Response to the RO Banding Review Impact Assessment. The proposal to implement a policy control measure will include a notification process and the clear statement that any deployment coming on after the 400MW²¹ threshold has been reached will be subject to a review of grandfathering policy for those dedicated biomass projects.
- 34. This proposal provides more certainty for industry compared to a supplier cap as the total maximum capacity that is automatically covered by grandfathered support levels is known at the point of financial close. Whereas under a supplier cap the total volume of ROCs issued in a year is only known at the end of the year, therefore, the exact dedicated biomass capacity for which ROCs could be submitted would not be known until after the event. The latter causes substantial uncertainty for generators in terms of ensuring demand for generation and securing funding of their project.
- 35. The potential for additional plants to come forward after the threshold has been met will be constrained by access to finance given the uncertainty regarding their grandfathering status, which will be subject to review by DECC. Given feedback from industry and financiers, plants are not expected to be able to secure financing without certainty in regards to their grandfathered support rates. Constraining dedicated biomass deployment at this level is considered to meet the policy aims of ensuring the value for money for consumer subsidies is maintained while also maintaining investor confidence and to not stop dedicated biomass projects that are shovel ready from proceeding.

²⁰ As generation starts to reach the level of the cap, the market will become increasingly a “buyers’ market”, giving suppliers the power to buy ROCs at a greater than usual discount and limiting the return for generators.

²¹ The expectation is that up to 300 MW capacity would be able to come through given the headroom required for projects to access finance. Headroom refers to the margin between a cap and the actual level of deployment that is likely to come forward. Imposing a limit on any technology creates uncertainty, project financiers need to be confident that there is sufficient headroom between planned deployment and the cap, so that the cap does not bite once the investment has been made.

36. As mentioned above in paragraph 21, the latest pipeline data for dedicated biomass plants suggests deployment could be as high as 560 MW capacity by 2017. Implementing the Policy control measure is expected to have no impact on the costs and benefits of the central scenario set out in Impact Assessment accompanying the Government Response to the RO Banding Review. However, to illustrate the potential risk to the RO budget if higher levels of dedicated biomass deployment were to become evident, and no policy was in place to limit this expansion, analysis has been carried out to estimate the impact on RO spend.
37. Table 2 below shows forecast RO subsidy cost over the banding review period based on dedicated biomass capacity assumed under the Government Response to the RO Banding Review and under a scenario based on the latest pipeline deployment data (560 MW capacity by 2016/17). The table also shows the annual legacy spend post 2016/17 associated with the capacity deployed through the banding review period, however this should be considered an illustrative figure as legacy spend will be impacted by plants commissioning and decommissioning date.
38. The deployment capacity assumed under the central scenario in the Government Response to the RO Banding Review Impact Assessment (300 MW dedicated biomass by 2016/17) represents the cost effective level of modelled deployment for each technology band (given the support rates). The central forecasts are considered to represent value for money to consumers and ensure that the scheme remains within the budgetary constraints as set through the Levy Control Framework (LCF).
39. This analysis shows that a potential £82m additional RO spend over the RO Banding Review period is avoided by implementing a measure to restrict deployment, and approximately £128m additional annual legacy spend is avoided post 2016/17. To note, the spend implications over the RO Banding Review period are impacted by the profile of capacity deployment in the high scenario, i.e. lower levels of deployment in the first two years but significantly higher levels in the last two years compared to the capacity profile assumed in the Impact Assessment accompanying the Government Response to the RO Banding Review.

Table 2: Dedicated Biomass new build capacity and RO subsidy spend – Illustrating potential savings as a result of limiting dedicated biomass deployment to 300MW

Dedicated Biomass (new build) deployment scenario		2013/14	2014/15	2015/16	2016/17	Cumulative new build capacity to 2016/17	Annual legacy spend associated with new build 2013/14 – 2016/17
Government Response to the RO Banding Review (central scenario)	Annual new capacity MW	65	50	135	50	300	
	Spend (£m 11/12) based on cumulative generation	16	45	92	140		153
Scenario based on latest pipeline data	Annual new capacity MW	20	-	410	130	560	
	Spend (£m 11/12) based on cumulative generation	5	10	113	248		281
Potential saving from limiting deployment to 300 MW	Spend (£m 11/12) based on cumulative generation	(-) 11	(-) 35	20	108		128

Table notes:

(1) The table above assumes all dedicated biomass deployment to 2016/17 comes under RO spend rather than CfD's (i.e. potentially generators could switch to CfD support for 2016/17 new build)

(2) Spend figures above are based on cumulative generation from annual capacity deployed. It is assumed only 50% of generation comes forward from the first year capacity is deployed.

(3) The scenario based on the latest pipeline data shows a different profile of new build deployment compared to the central scenario assumed in the Government Response to the RO Banding Review. Deployment is lower in the first two years (zero in 2014/15) due to delays in forecast project development (leading to savings in RO spend in first two years), but significantly higher in the last two years (leading to potential increased RO spend), resulting in a higher cumulative new build capacity by the end of the Banding review period.

6. Wider impacts

40. Limiting the deployment of dedicated biomass (and therefore use of bioresources) may have wider environmental impacts which are difficult to value. These include benefits to bio-diversity, protection of areas of high carbon stock and/or nature reserves which, as well as safeguarding carbon sinks could have positive recreational or conservation benefits. There are also potential benefits from reduced impact on air quality, land use and feedstock competition. However, these impacts are expected to be relatively small compared to those noted in the IA for the Government Response to the RO Banding Review Consultation.

7. Summary and preferred option

41. The policy intention in limiting dedicated biomass deployment is to maintain value for money for consumer subsidies, by incentivising the most cost and carbon-effective plants which can contribute in the short to medium term to GHG reduction but avoiding lock-in of biomass to uses which are sub-

optimal in the long term, while also maintaining investor confidence and to not stop dedicated biomass projects that are shovel ready from proceeding. Therefore the proposal is to introduce a policy control measure that clearly communicates that 400 MW is the maximum level of dedicated biomass capacity DECC will be willing to subsidise. The notification process will ensure accurate deployment data is known to Ofgem and DECC; on reaching the threshold DECC will consider a review of grandfathering policy. Combined Heat and Power (CHP) plants will be excluded from this measure given the relatively good value for money in carbon terms from this technology.

42. This approach, combined with our intention to improve the GHG performance of dedicated biomass will avoid long-term lock-in of feedstocks into technologies with lesser carbon performance compared to alternative uses of biomass. This will become more critical towards 2030.

Energy crop uplift

43. Currently, under the RO, the government provides an extra 0.5 ROCs/MWh support in addition to prevailing ROC support for use of purpose-grown crops, such as Miscanthus, willow and poplar, in either co-firing or in dedicated biomass (up to a ceiling of 2 ROCs/MWh total support). The extra support for energy crops was provided to help development of the supply chain and to overcome cost hurdles faced during establishment. For example, the market for energy crops is relatively immature and energy crops can take three to five years to establish and require additional infrastructure and development costs compared to established forestry and annual crops used in biofuel production.
44. Under the new RO Bands the Government decided not to extend the energy crops uplift to biomass conversions and enhanced co-firing. Cost evidence reviewed for the Government Response to the RO Banding Review Impact Assessment found insufficient evidence of a significant cost premium for energy crops, and identified a long-term budget risk due to the potential availability of lower cost imported energy crops. Therefore, the provision of the uplift could lead to pressure on the RO budget post 2017.
45. This decision creates an anomaly on the relative rewards for standard co-firing and enhanced co-firing/conversion: SCF with energy crops could be rewarded with up to 1ROC while enhanced co-firing is rewarded with 0.6 – 0.9 ROCs. Although difficult to predict, this anomaly risks potentially skewing generation in favour of SCF above ECF. This would be in conflict with the focus of government policy that is to encourage the move from SCF to ECF and then full conversion.
46. Therefore in order to take a consistent approach to all co-firing bands, and limit the future potential costs to energy consumers, DECC intends to bring the energy crop uplift for the standard (low-range) co-firing band to an end. It is however recognised that energy crops are currently being used by co-firers who will have committed to long-term contracts for feedstock supply. The next section outlines the options DECC consulted on, and the proposed option that allows the removal of the energy crop uplift from standard co-firing while taking into account generators existing contracts.

8. Description of options considered

Option 0: Do nothing

47. This would mean the uplift for energy crops in either standard co-firing or in dedicated biomass would continue, whilst no such uplift would exist for energy crop use in enhanced co-firing and conversions. This option is not recommended as it does not address the inconsistent approach to co-firing bands, and the risk of future potential costs to energy consumers. This option is not recommended.

Option 1: Maintain the energy crop uplift in the standard (low-range) co-firing band until April 2019 for existing energy crop contracts only (recommended)

48. The energy crop uplift would continue until April 2019 only for those standard co-firing generating stations who could demonstrate to Ofgem that they have in place existing contracts for the supply of energy crops for SCF. These contracts would have to be made before 7th September 2012²², and the uplift would only be available for electricity generated using energy crops supplied under those contracts. The Generators would need to show the contract to Ofgem and provide information including the start date, and duration and volume of energy crops that each contract is expected to supply. The generator will need to submit evidence that the energy crops used to generate the electricity by standard co-firing were supplied under the grandfathered contract.

49. This option is preferred as it increases the cost-effectiveness of the RO budget, while grandfathering existing supply contracts and mitigating risks to generators. However it is recognised that this option could have a higher administrative burden for generators and Ofgem than other options. The risk that contracts are entered into specifically to take advantage of the transitional arrangements is mitigated as contracts will need to have been made before 7th September 2012. The cut off date of 31 March 2019 also ensures that these transitional arrangements do not continue indefinitely. This approach is recommended as it provides the greatest certainty that the policy aim is achieved.

Option 2: Retain the energy crop uplift in standard (low-range) co-firing only for generators who are already claiming the energy crop uplift until 2019

50. Generators who have been eligible for the co-firing with energy crops uplift between April 2009 and April 2013 would be able to continue to claim the energy crop uplift for standard co-firing until April 2019; after which all electricity produced from co-firing of energy crops will receive the same rate as co-firing of regular biomass.

51. This option provides a way in which generators already using energy crops and having existing contracts in place can continue to live out these contracts until 2019, but without the administrative burden of the preferred option. This option carries little additional administration burden beyond business as usual. However, this option could have higher RO budget risk compared to the preferred option as it allows new contracts to be put in place by existing or past users of energy crops. It can also be seen as providing a differential advantage across generators operating in the same market, beyond that required to provide transitional grandfathering arrangements for existing supply contracts. This option is not recommended.

²² Launch date of Biomass Electricity and Combined Heat & Power plants – ensuring sustainability and managing costs consultation.

Option 3: Retain the Energy Crop uplift in the standard (low-range) co-firing band until 2019

52. This option is a policy commitment to maintain the energy crop uplift for standard (low-range) co-firing until 31st March 2019. After this date, any energy crops which are burnt by new, or by existing stations, in a low-range co-firing unit will be offered the same rate as regular biomass feedstocks. Some obligated electricity suppliers currently have in place long-term contracts for the supply of energy crops on the basis of receiving the energy crop uplift. However, the evidence available indicates that most contracts currently in place do not extend beyond 2019. By setting a clear end date, the aim is to enable these contracts to continue to the end of their natural life.
53. This option would deliver the least level of certainty to the Government over the future cost of the uplift, and risks an increase in numbers of new long-term contracts and the associated risk to the RO budget. However, it has the advantage of a clear policy intent on which to base investment decisions, with no additional administrative burden for the RO. This option is not recommended.

9. Impacts of removing energy crop uplift for standard co-firing

54. Accurately forecasting deployment under the RO support bands is very challenging and subject to considerable uncertainty. However, it is expected that removing the energy crop uplift for SCF could lead to lower forecast deployment and associated RO spend, as less deployment is incentivised at lower support levels.
55. Table 3 below shows the total forecast deployment and RO spend associated with SCF with the energy crop uplift set out in the RO Banding Review Consultation lead scenario (i.e. without reduced rate of support for SCF in 2013/14 and 2014/15). The maximum impact on modelled deployment and RO spend due to removing the uplift is to reduce deployment and associated spend to zero (this assumes no grandfathering or phasing out and that all planned deployment stops when the uplift is removed). If grandfathering of existing supply contracts or phasing were to occur, positive deployment could be expected up to the amount shown in table 3.

Table 3: SCF with the energy crop uplift - deployment and RO spend (assuming SCF support remains at 0.5 ROCs)

Standard Co-firing (energy crops)	2013/14	2014/15	2015/16	2016/17
Generation (TWh)	0.5	0.5	0.5	0.5
RO spend (£m 2011/12 prices)	23	23	23	21

Note: No deployment modelled for dedicated biomass with energy crops.

Generation figures are approximate and have been rounded.

56. Table 4 below shows the total forecast deployment and RO spend with SCF and the energy crop uplift assuming support for SCF reduces in 2013/14 and 2014/15 to 0.3 ROCs/MWh (increasing to 0.5 ROCs/MWh in 2015/16 and 2016/17) in line with proposals set out below from paragraph 60. As above, the maximum impact of the energy crop uplift removal would be to reduce forecast deployment and spend to zero, however, where SCF support has reduced in 2013/14 and 2014/15 deployment is already forecast at zero (so there would be no additional impact).

Table 4: SCF with the energy crop uplift - deployment and RO spend (assuming SCF reduction in support in 2013/14 and 2014/15 to 0.3 ROCs/MWh)

Standard Co-firing (energy crops)	2013/14	2014/15	2015/16	2016/17
Generation (TWh)	0	0	0.5	0.5
RO spend (£m 2011/12 prices)	0	0	23	21

Note: No deployment modelled for dedicated biomass with energy crops.

Generation figures are approximate and have been rounded.

57. Modelling undertaken for the RO assumes that all deployment of SCF with the energy crop uplift (see tables 3 and 4 above) originates from existing plants rather than new build, i.e. it is not expected that the energy crop uplift would be claimed by any generator that had not already claimed this previously. Under the preferred option the energy crop uplift will remain available until 2019 for existing contracts, therefore allowing for continuous use of energy crops in standard co-firing during the RO period, in line with RO modelling. Therefore this policy proposal is not expected to have material impact on the estimated RO cost set out in the IA for the Government Response to the RO Banding Review Consultation²³.

58. It is important to note that the RO modelling undertaken by Poyry assumes a step supply curve, i.e. the first step on the supply curve is associated with 20% of potential deployment coming forward for that technology at given support levels. Reducing support levels for SCF to 0.3 ROCs/MWh in 2013/14 and 2014/15 does not incentivise deployment sufficiently to get to the first step on the modelled supply curve. However the modelling assumptions and methodology are subject to considerable uncertainty, and in reality at 0.3 ROCs/MWh you may see small levels of SCF deployment which are financially viable.

Summary and preferred option

59. The proposed option is to maintain the energy crop uplift in the standard (low-range) co-firing band until April 2019 for existing energy crop contracts only, as this option increases the cost-effectiveness of the RO budget, while grandfathering existing supply contracts in order to mitigate the risks to generators with existing contracts in place.

Standard Co-firing support

60. The Government Response to the RO Banding Review Consultation set out the new biomass conversion bands and differentiated support for different levels of co-firing²⁴, thus changing the concept of standard co-firing. Standard co-firing is now defined as representing combustion at less than 50% biomass by energy content in a unit. Poyry modelling and in house analysis undertaken for the Impact Assessment for the Government response estimated that there could be approximately 14 TWh potential for conversion and co-firing (standard and enhanced co-firing) in 2013/14, rising to around 17 TWh in 2014/15 and 19 TWh in 2015/16. There is a particular budgetary risk to be managed from the RO potentially exceeding its budgetary framework in 2013/14 and 2014/15, if generation was as high as noted above in these years, it could have serious budgetary implications

²³ <http://www.decc.gov.uk/assets/decc/11/consultation/ro-banding/5945-renewables-obligation-government-response-impact-a.pdf>

²⁴ Low range (standard) (below 50% co-firing), medium range (50% to below 85% co-firing), and high range (85% to below 100% co-firing).

and would risk breaching the Levy Control Framework and the intention to control the impact of the RO on consumers bills.

61. Given the new support bands for conversion and co-firing and the potential budgetary risks noted above (specifically in 2013/14 and 2014/15), the government response announced the limit to support for high-range co-firing in 2013/14 at 0.7 ROCs/MWh, with support increasing from 1 April 2014 to 0.9 ROCs/MWh, and now intends to reduce the standard co-firing support level from its current 0.5 ROCs/MWh to 0.3 ROCs/MWh in 2013/14 and 2014/15 (rising back to 0.5 ROCs/MWh from 1 April 2015). Under the central scenario, SCF support at 0.5 ROCs, and associated levels of deployment, are considered acceptable in budgetary terms in 2015/16 and 2016/17.
62. Cost analysis undertaken for the Government Response to the RO Banding Review Consultation estimates that the costs of standard co-firing are significantly lower than for enhanced co-firing and biomass conversion, as relatively little adaptation is required to enable plant to burn small amounts of biomass alongside coal²⁵. The SCF ROC level is not grandfathered, reflecting that this technology does not require large sunk investment and can be adjusted relatively quickly in response to changing market signals. The ROC provides support primarily for the higher variable operating costs of co-firing relative to coal. Given this, and the objective to find savings within the RO budget in the first two years, it is considered reasonable to lower the support levels in these years.
63. Reducing support to zero (i.e. 0 ROCs per MWh) in these years was discounted due to the potential adverse impact on those generators in transition from standard co-firing to enhanced co-firing. The RO modelling suggested that support above 0.3 ROCs/MWh would risk bringing forward new deployment; therefore 0.3 ROCs/MWh is considered the appropriate support level. However, there is significant uncertainty surrounding deployment figures under the RO given the complexity of the investment decisions and the modelling approach used.

10. Description of options considered

Option 1: Do nothing – retain 0.5 ROCs/MWh for SCF

64. This option involves retaining the 0.5 ROCs/MWh over the whole period. As noted in Section 17 below, this does not address the RO budgetary risks, and therefore is not a recommended option.

Option 2: 0.3 ROCs/MWh in 2013/14 and 2014/15, increasing from 1 April 2015 to 0.5 ROCs/MWh (recommended)

65. This option lowers the support level for co-firing to 0.3 ROCs/MWh in 2013/14 and 2014/15, increasing to 0.5 ROCs/MWh from 2015/16. In response to evidence showing a much greater potential deployment of enhanced co-firing (ECF), the recommended option changes the support level to ensure only the most economic plant comes on, allowing RO spend to remain within the Levy Control Framework of the overall RO scheme. This option is consistent with the approach taken for mid-range co-firing (set at 0.6 ROCs/MWh), and support for high-range co-firing (set at 0.7 ROCs/MWh in 2013/14, rising to 0.9 ROCs/MWh from 2014/15), which were announced in the Government Response to the RO Banding Review Consultation.

²⁵ The ROCs required range for SCF is based on full range of biomass costs, whereas the ROCs required for ECF/conversion uses a best estimate of fuel costs.

11. Impacts of each option

66. The impact of reducing the support rate for SCF from 0.5 ROCs/MWh to 0.3 ROCs/MWh in 2013/14 and 2014/15 can be considered in two parts: (i) impact on resource/generation costs; and (ii) impact on RO spend (subsidy cost).

Impact on resource/generation costs

67. Modelling carried out for the Government Response to the RO Banding Review Consultation estimated the overall impact on costs of generation due to the deployment forecast under each technology band given the level of support provided. To estimate the impact of a reduction in standard co-firing support it is necessary to consider the level of forecast deployment and associated resource costs expected under the higher support level. The key monetised costs associated with a reduction in support for standard co-firing are the additional carbon costs incurred due to a reduction in abatement (compared to a scenario where support was held at 0.5 ROCs in all years). The key monetised benefits associated with a reduction in support for standard co-firing are the lower resource costs due to the switch from standard co-firing to coal.

68. Modelling completed for the Government Response to the RO Banding Review estimated that support set at 0.3 ROCs would result in zero standard co-firing new build coming on in 2013/14 and 2014/15, but deployment would increase from 2015/16 when support rates were returned to 0.5 ROCs. This forecast profile is uncertain and there are a range of responses to the change in support level that could occur. At one extreme generators could respond by moving straight to enhanced co-firing and conversion, although this may be restricted by the time frame. At the other extreme generators could respond by ceasing all standard co-firing given the potential disruption to contracts for feedstock supply.

69. Table 5 below shows the impact on carbon and resource costs due to the reduction in standard co-firing support. Costs and benefits relate to changes in standard co-firing deployment in 2013/14 and 2014/15 only, and it is assumed that forecast deployment before and after this period continues as expected under 0.5 ROCs support level.

Table 5: Discounted costs and benefits from a reduction in standard co-firing deployment in 2013/14 and 2014/15

	£m (11/12 prices) Discounted
Cost of carbon	100
Resource cost of renewables	(-) 550
Resource cost of non-renewables	300
NPV	150

Note: Table above relates to NPV figure set out on IA Summary Sheet.

Impact on RO spend

70. The impact of reducing the support rate for SCF from 0.5 ROCs/MWh to 0.3 ROCs/MWh in 2013/14 and 2014/15 will have an impact of deployment and associated RO spend. This impact has been estimated using the modelling approach set out in the Impact Assessment accompanying the

Government Response to the RO Banding Review Consultation²⁶. Tables 6 and 7 below show the impact in the RO modelling when this change occurs: expected generation in 2013/14 and 2014/15 is reduced from approximately 3.7TWh and 3TWh to zero in each year. This saves approximately £99m and £83m in 2013/14 and 2014/15 respectively.

71. Generation from SCF is estimated at the same level in 2015/16 irrespective of the support level provided in 2013/14 and 2014/15. This is because little investment is required to increase the deployment of SCF, it is just necessary to compensate for the additional fuel operating costs. Assuming generators have foresight of the proposal to lower support in those years, they can switch fuels accordingly without incurring any additional investment or technology costs.

Table 6: Total standard co-firing deployment and RO spend (assuming SCF support remains at 0.5 ROCs)

Standard Co-firing	2013/14	2014/15	2015/16	2016/17
Generation (TWh)	3.7	3.0	3.5	2.8
RO spend (£m 2011/12 prices)	99	83	93	75

Note: Generation figures are approximate and have been rounded.

Table 7: Total standard co-firing deployment and RO spend (assuming SCF reduction in support in 2013/14 and 2014/15 to 0.3 ROCs/MWh)

Standard Co-firing	2013/14	2014/15	2015/16	2016/17
Generation (TWh)	0.0	0.0	3.5	2.8
RO spend (£m 2011/12 prices)	0	0	93	75

Note: Generation figures are approximate and have been rounded.

Standard co-firing with bioliquids and biomass CHP

72. Changes in the level of support for biomass standard co-firing will also affect the levels of support for standard co-firing with bioliquids and biomass CHP. As set out in our Government Response to the RO banding Review consultation, co-firing with bioliquids will receive one level of support, whether standard or enhanced (up to 99% biomass). Therefore, co-firing of bioliquids will also receive the proposed co-firing ROC rate; lowering to 0.3ROCs/MWh in 2013/14 and 2014/15, increasing back to 0.5ROCs/MWh from 2015/16. Standard co-firing with CHP will also receive lower level of support for co-firing with 0.8ROCs/MWh in 2013/14 and 2014/15 or 0.3ROCs/MWh plus the RHI. From 1 April 2015, CHP support will be available at 0.5ROCs/MWh plus RHI. Based on the modelling analysis, no standard co-firing with CHP or bioliquids is expected to come forward during 2013-2017. Therefore, this proposal is not expected to have any impact on the deployment of standard co-firing with CHP or bioliquids, or on the associated cost to the RO budget from these technologies. However, it should be noted that accurately forecasting deployment under the RO support bands is very challenging and estimates are subject to considerable uncertainty.

²⁶ <http://www.decc.gov.uk/assets/decc/11/consultation/ro-banding/5945-renewables-obligation-government-response-impact-a.pdf>

12. Summary and preferred option

73. The preferred option is to reduce the level of support from 0.5 ROCs/MWh to 0.3 ROCs/MWh in 2013/14 and 2014/15, increasing from 1 April 2015 to 0.5 ROCs/MWh. This option meets the policy objective to limit adverse impact on those generators in transition from standard co-firing to enhanced co-firing, whilst minimising the risk to the RO budget.

Specific Impacts Tests

Statutory Equality Duties Impact Assessment

74. This policy has no significant bearing on protected characteristics, including age, disability, gender reassignment, pregnancy and maternity, race, religion or belief, sex and sexual orientation.

Competition Assessment

75. Retaining the energy crop uplift for SCF for those generators with existing contracts in place could result in creating a competitive advantage compared to those generators who do not have existing contracts in place.

Small firms impact test

76. Whilst the total amount of subsidy received depends on the amount of generation, the compliance costs would not be expected to vary with the size of the operator to the same degree. This would represent a potential disadvantage for small firms who could face similar costs in return for less overall support compared to larger operators. The magnitude of costs related to administration and verification, however, do not appear to be unreasonably high when compared to the likely amount of ROC support that even small installations would be entitled to.

Carbon Assessment

77. The value of carbon savings is expected to not significantly differ from those set out in the Government Response to the RO Banding Review Impact Assessment.

Wider Environmental Impacts

78. Combustion of biomass will have implications for local air quality and will need to be addressed through suitable remedial actions, such as the application of filters or scrubbers within the plant design. This and other local environmental impacts of new biomass plants, on local soil, water, air, land, biodiversity and amenities will be considered within the existing planning and permitting process. The RO provides the Government's support scheme for renewables electricity generation. It incentivises investment in renewables projects which help to move the UK away from fossil fuel dependency towards a low carbon economy with consequential carbon savings from displaced fossil fuel generation. Individual projects supported under the RO that are deemed to have the potential to cause significant adverse impacts are required to undertake an Environmental Impact Assessment (Directive 85/337/EEC) as part of the planning process.

Social Impacts

79. As mentioned above, the combustion of biomass will have implications for local air quality, which could impact on **health and well-being**. Detailed determination of such impacts is complex and site

specific. Pollution abatement technologies can be applied to reduce emission if required.

80. On **Human Rights Impacts**, if the value for money and affordability proposals engage article 1 protocol 1 of the ECHR (protection of property) then we consider the proposals are compliant because (a) they will be implemented through legislation (b) they pursue a legitimate aim (that subsidies should represent value for money and stay within agreed budgets) (c) they are necessary (in order to ensure the RO stays within budget) (d) they are proportionate (the proposals do not go further than necessary to achieve the aim). No other convention rights are considered to be potentially engaged by the proposals.
81. In terms of **Justice Impacts**, the proposals may increase the legislative and administrative complexity of the RO. Therefore, the proposal could potentially increase the volume of cases going through the courts.
82. In terms of **rural proofing**, a large proportion of biomass and bioliquid feedstocks are produced by the farming and forestry sectors, and therefore support business and job opportunities in rural areas as part of the UK biomass supply chain. Although there has been no separate or explicit assessment of the needs of rural areas, these proposals are set within this wider policy context and aim to ensure that the impacts on consumers and their bills are reasonable.

Sustainable Development

83. The value for money and affordability measures will help ensure that the bioenergy sector develops sustainably in terms of demand for bioresources and that only the most cost effective deployment comes forward.

Security of Supply

84. Biomass generation is 'dispatchable' so, unlike the majority of renewables, can be used to provide both base load and peak load power. This means that biomass electricity can perform a critical grid balancing role as larger amounts of variable power, such as onshore and offshore wind, comes online. However, growth in biomass electricity cannot take place without public support for new plants being built. Credible affordability measures, including a robust notification process, will help support both an effective, timely planning process, and reduce the associated risks for developers and investors.

Annex A - Notification Process

85. The notification process will provide information to the market, Ofgem and Government on new dedicated biomass projects coming forward. From the date of its introduction, only projects that are on the notification register will be eligible for support under the dedicated biomass band (1.5 ROCs/MWh to 31 March 2016, then 1.4ROCs/MWh) under the Renewables Obligation. The intention is for the notification process for new dedicated biomass generating stations to be introduced through changes to the legislation, coming into force from 1 October 2013.
86. Providing a clear and accurate picture of projects coming forward is essential to enable developers, investors and Government to know what is in the pipeline, and if or when action could be taken. A mandatory notification process should therefore provide necessary transparency to the market. Eligibility to join the register will be based on supplying specified formal documentation to Ofgem as evidence that final investment decision has been reached – such as the grid connection contract signed by both parties, fuel supply contract(s) and major construction contract(s) - together with documentation confirming expected commissioning/full accreditation date and intended generating capacity. Once satisfied, Ofgem will place information on its website similar to that currently published in the Renewable Energy Planning Database together with information on the expected commissioning/approval date and the running total of notified capacity.
87. It will be essential that the documentation required as part of the notification process is sufficient to differentiate between projects that are 'shovel-ready' i.e. well-advanced, and are expected to start construction shortly, and projects that are at an earlier stage of consideration. Otherwise the register risks being filled with projects that have a relatively low chance of being realised under the RO, which could then act as a barrier to the genuine 'shovel-ready' projects progressing to completion. Government will engage with industry and other stakeholders to help ensure that the specified information requirements and registration criteria achieve these aims.