Title: Impact Assessment for the Government Response to the Consultation on the Grandfathering Policy of Support for Dedicated Biomass, Anaerobic Digestion and Energy from Waste Under the Renewables Obligation	Impact Assessment (IA)
	URN: 10D/752
	Date: 14/7/2010
Lead department or agency: DECC	**Stage:** Final
	Source of intervention: Domestic
Other departments or agencies:	**Type of measure:**
	Contact for enquiries: Jackie Honey

Summary: Intervention and Options

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

The UK will need to radically increase its use of renewable electricity if it is to meet its EU target for renewable energy in 2020. The RO provides a financial incentive to correct various market failures and barriers to renewable electricity deployment. The Renewable Obligation (RO) supports a range of technologies. Grandfathering is a policy intent, that once accredited, a generator should receive a set level of support under the RO over its eligibility period. This grandfathering policy applies to most technologies but it does not apply to dedicated biomass, AD, EfW and ACT. The uncertain nature of support for these technologies, has led to difficulty in raising finance, restricting the deployment of biomass projects.

What are the policy objectives and the intended effects?

To ensure the deployment of renewable electricity capacity in order to meet the 2020 renewable energy target in a cost-effective manner. Biomass technologies are an important part of a cost-effective mix to reach the renewable energy target. The policy will allow deployment of biomass through increasing investor confidence in the ongoing level of support for accredited biomass technologies.

What policy options have been considered? Please justify preferred option (further details in Evidence Base)

Three options have been considered against a baseline of no grandfathering (no change): grandfather at current bands; grandfather at current bands with uplift; grandfather minimum level. The preferred option is to adopt a policy to grandfather support for biomass, AD, EFW and ACT, and not to grandfather support for technologies using bioliquids.

When will the policy be reviewed to establish its impact and the extent to which the policy objectives have been achieved?	It will be reviewed on an ongoing basis – and impact assessed for the banding review in 2013.
Are there arrangements in place that will allow a systematic collection of monitoring information for future policy review?	Yes

SELECT SIGNATORY Sign-off For consultation stage Impact Assessments:

I have read the Impact Assessment and I am satisfied that, given the available evidence, it represents a reasonable view of the likely costs, benefits and impact of the leading options.

Signed by the responsible SELECT SIGNATORY:..... Date:.....

Summary: Analysis and Evidence

Policy Option 1

Grandfather RO support at current levels for dedicated biomass AD and EFW

Price Base Year	PV Base Year	Time Period Years	Net Benefit (Present Value (PV)) (£m)		
			Low:	High:	Best Estimate:
2009	2010	20	-850	450	-200

COSTS (£m)	Total Transition (Constant Price)	Years	Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low	N/A		-20	**-850**
High	N/A		40	**550**
Best Estimate	N/A		10	**200**

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

Key costs included are resource costs of renewable generation, resulting from increased deployment of biomass as a result of grandfathering. Range reflects assumptions as to the type of renewable generation displaced by the additional biomass. If biomass displaces a more expensive renewable technology there could be net benefits resulting from the measure, if it displaces a cheaper technology then there will be net costs – in practice we would expect there to be a mixed impact which will determined by a number of factors, including supply side barriers, fuel prices, and the outcome of the banding review.

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

Costs considered are generation costs, and do not include the subsidy costs needed to bring forward generation (which are given in the main text below). Costs do not include any costs of removing barriers to renewables deployment. Costs do not include the benefit from increased certainty of support levels, which could lead to lower cost of capital.

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

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

Key benefits of renewable generation are the monetised value of carbon saved in the traded sector. Under this option we have assumed that any increase in biomass deployment displaces another form of renewable generation – so there are no net benefits from this measure.

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

Non monetised benefits include the benefits from supporting innovation in new renewable technologies, and from encouraging diversity of renewable generation. Biomass plant is dispatchable, and has a relatively high capacity credit compared to other forms of renewable generation, leading to security of supply impacts compared to other forms of renewable generation.

Key assumptions/sensitivities/risks **Discount rate (%)** 3.5

The range of estimates reflects uncertainty as to the form of renewable generation displaced by additional biomass. Also important and uncertain is the assumption of the impact of grandfathering on the level of biomass deployment, detailed below. Estimates above are based on an assumption of flat future fuel prices. The section on risks/ sensitivities below considers the impact on costs if biomass prices vary.

Impact on admin burden (AB) (£m):			Impact on policy cost savings (£m):	In scope
New AB: neg	**AB savings:** neg	**Net:** neg	**Policy cost savings:**	Yes/No

Enforcement, Implementation and Wider Impacts

What is the geographic coverage of the policy/option?			England and Wales		
From what date will the policy be implemented?			2010		
Which organisation(s) will enforce the policy?			DECC		
What is the annual change in enforcement cost (£m)?			No change		
Does enforcement comply with Hampton principles?			YES		
Does implementation go beyond minimum EU requirements?			NO		
What is the CO_2 equivalent change in greenhouse gas emissions? (Million tonnes CO_2 equivalent)			**Traded:** n/a	**Non-traded:** n/a	
Does the proposal have an impact on competition?			Yes/No		
What proportion (%) of Total PV costs/benefits is directly attributable to primary legislation, if applicable?			**Costs:**	**Benefits:**	
Annual cost (£m) per organisation (excl. Transition) (Constant Price)	**Micro**	**< 20**	**Small**	**Medium**	**Large**
Are any of these organisations exempt?	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No

Specific Impact Tests: Checklist

Set out in the table below where information on any SITs undertaken as part of the analysis of the policy options can be found in the evidence base. For guidance on how to complete each test, double-click on the link for the guidance provided by the relevant department.

Please note this checklist is not intended to list each and every statutory consideration that departments should take into account when deciding which policy option to follow. It is the responsibility of departments to make sure that their duties are complied with.

Does your policy option/proposal have an impact on…?	**Impact**	**Page ref within IA**
Statutory equality duties[1] Statutory Equality Duties Impact Test guidance	No	
Economic impacts		
Competition Competition Assessment Impact Test guidance	yes	16
Small firms Small Firms Impact Test guidance	No	
Environmental impacts		
Greenhouse gas assessment Greenhouse Gas Assessment Impact Test guidance	no	
Wider environmental issues Wider Environmental Issues Impact Test guidance	yes	17
Social impacts		
Health and well-being Health and Well-being Impact Test guidance	no	
Human rights Human Rights Impact Test guidance	no	
Justice system Justice Impact Test guidance	no	
Rural proofing Rural Proofing Impact Test guidance	yes	17
Sustainable development Sustainable Development Impact Test guidance	yes	

[1] Race, disability and gender Impact assessments are statutory requirements for relevant policies. Equality statutory requirements will be expanded 2011, once the Equality Bill comes into force. Statutory equality duties part of the Equality Bill apply to GB only. The Toolkit provides advice on statutory equality duties for public authorities with a remit in Northern Ireland.

Summary: Analysis and Evidence

Policy Option 2

Part Grandfather RO support for biomass, fully grandfather AD and EFW

PRICE BASE YEAR	PV BASE YEAR	TIME PERIOD YEARS	NET BENEFIT (PRESENT VALUE (PV)) (£M)		
			LOW	HIGH:	BEST ESTIMATE:
2009	2010	20	**-550**	**250**	**-150**

COSTS (£m)	Total Transition (Constant Price)	Years	Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low	N/A		-10	**-250**
High	N/A		30	**550**
Best Estimate	N/A		10	**150**

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

Key costs included are resource costs of renewable generation, resulting from increased deployment of biomass as a result of grandfathering. Range reflects assumptions as to the type of renewable generation displaced by the additional biomass. If biomass displaces a more expensive renewable technology there could be net benefits resulting from the measure, if it displaces a cheaper technology then there will be net costs – in practice we would expect there to be a mixed impact which will be determined a number of factors, including supply side barriers, fuel prices and the outcome of the banding review.

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

Costs considered are generation costs, and do not include the subsidy costs needed to bring forward generation (which are given in the main text below). Costs do not include any costs of removing barriers to renewables deployment. Costs do not include the benefit from increased certainty of support levels, which could lead to lower cost of capital

BENEFITS (£m)	BENEFITS (£m)		BENEFITS (£m)	BENEFITS (£m)
Low	N/A		N/A	N/A
High	N/A		N/A	N/A
Best Estimate	N/A		N/A	N/A

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

Key benefits of renewable generation are the monetised value of carbon saved in the traded sector. Under this option we have assumed that any increase in biomass deployment displaces another form of renewable generation – so there are no net benefits from this measure.

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

Non monetised benefits include the benefits from supporting innovation in new renewable technologies, and from encouraging diversity of renewable generation. Biomass plant is dispatchable, and has a relatively high capacity credit compared to other forms of renewable generation .

Key assumptions/sensitivities/risks **Discount rate (%)** **3.5**

The range of estimates reflects uncertainty as to the form of renewable generation displaced by additional biomass. Also important and uncertain is the assumption of the impact of grandfathering on the level of biomass deployment, detailed below. Estimates above are based on an assumption of flat future fuel prices. The section on risks/ sensitivities below considers the impact on costs if biomass prices vary.

IMPACT ON ADMIN BURDEN (AB) (£M):			IMPACT ON POLICY COST SAVINGS	IN SCOPE
NEW AB:	AB SAVINGS:	NET:	POLICY COST SAVINGS:	Yes/No

Enforcement, Implementation and Wider Impacts

What is the geographic coverage of the policy/option?			England and Wales		
From what date will the policy be implemented?			2010		
Which organisation(s) will enforce the policy?			DECC		
What is the annual change in enforcement cost (£m)?			No change		
Does enforcement comply with Hampton principles?			YES		
Does implementation go beyond minimum EU requirements?			NO		
What is the CO_2 equivalent change in greenhouse gas emissions? (Million tonnes CO_2 equivalent)			**Traded:** n/a	**Traded:** n/a	
Does the proposal have an impact on competition?			Yes/No		
What proportion (%) of Total PV costs/benefits is directly attributable to primary legislation, if applicable?			**Costs:**	**Costs:**	
Annual cost (£m) per organisation (excl. Transition) (Constant Price)	**Micro**	**< 20**	**Small**	**Medium**	**Large**
Are any of these organisations exempt?	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No

Specific Impact Tests: Checklist

Set out in the table below where information on any SITs undertaken as part of the analysis of the policy options can be found in the evidence base. For guidance on how to complete each test, double-click on the link for the guidance provided by the relevant department.

Please note this checklist is not intended to list each and every statutory consideration that departments should take into account when deciding which policy option to follow. It is the responsibility of departments to make sure that their duties are complied with.

Does your policy option/proposal have an impact on…?	**Impact**	**Page ref within IA**
Statutory equality duties[2] Statutory Equality Duties Impact Test guidance	No	
Economic impacts		
Competition Competition Assessment Impact Test guidance	yes	16
Small firms Small Firms Impact Test guidance	No	
Environmental impacts		
Greenhouse gas assessment Greenhouse Gas Assessment Impact Test guidance	no	
Wider environmental issues Wider Environmental Issues Impact Test guidance	yes	17
Social impacts		
Health and well-being Health and Well-being Impact Test guidance	no	
Human rights Human Rights Impact Test guidance	no	
Justice system Justice Impact Test guidance	no	
Rural proofing Rural Proofing Impact Test guidance	yes	17
Sustainable development Sustainable Development Impact Test guidance	yes	

[2] Race, disability and gender Impact assessments are statutory requirements for relevant policies. Equality statutory requirements will be expanded 2011, once the Equality Bill comes into force. Statutory equality duties part of the Equality Bill apply to GB only. The Toolkit provides advice on statutory equality duties for public authorities with a remit in Northern Ireland.

Summary: Analysis and Evidence

Policy Option 3

Grandfather RO support for biomass, AD and EFW with potential to uplift if costs rise

PRICE BASE YEAR	PV BASE YEAR	TIME PERIOD YEARS	NET BENEFIT (PRESENT VALUE (PV)) (£M)		
			LOW:	HIGH:	BEST ESTIMATE:
2009	2010	20	**-850**	**450**	**-200**

COSTS (£m)	Total Transition (Constant Price)	Years	Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low	N/A		-20	**-450**
High	N/A		40	**850**
Best Estimate	N/A		10	**200**

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

Key costs included are resource costs of renewable generation, resulting from increased deployment of biomass as a result of grandfathering. Range reflects assumptions as to the type of renewable generation displaced by the additional biomass. If biomass displaces a more expensive renewable technology there could be net benefits resulting from the measure, if it displaces a cheaper technology then there will be net costs – in practice we would expect there to be a mixed impact which will be determined a number of factors, including supply side barriers, fuel prices and by the outcome of the banding review.

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

Costs considered are generation costs, and do not include the subsidy costs needed to bring forward generation (which are given in the main text below). Costs do not include any costs of removing barriers to renewables deployment. Costs do not include the benefit from increased certainty of support levels, which could lead to lower cost of capital

BENEFITS (£m)	BENEFITS (£m)		BENEFITS (£m)	BENEFITS (£m)
Low	N/A		N/A	N/A
High	N/A		N/A	N/A
Best Estimate	N/A		N/A	N/A

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

Key benefits of renewable generation are the monetised value of carbon saved in the traded sector. Under this option we have assumed that any increase in biomass deployment displaces another form of renewable generation – so there are no net benefits from this measure.

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

Non monetised benefits include the benefits from supporting innovation in new renewable technologies, and from encouraging diversity of renewable generation. Biomass plant is dispatchable, and has a relatively high capacity credit compared to other forms of renewable generation .

Key assumptions/sensitivities/risks **Discount rate (%)** **3.5**

The range of estimates reflects uncertainty as to the form of renewable generation displaced by additional biomass. Also important and uncertain is the assumption of the impact of grandfathering on the level of biomass deployment, detailed below. Estimates above are based on an assumption of flat future fuel prices. The section on risks/ sensitivities below considers the impact on costs if biomass prices vary. Under rising fuel prices this option will be more costly than option 1, as it leads to greater risk of subsidy rents than other options.

IMPACT ON ADMIN BURDEN (AB) (£M):			IMPACT ON POLICY COST SAVINGS	IN SCOPE
NEW AB: NEG	**AB SAVINGS:** NEG	**NET:** NEG	**POLICY COST SAVINGS:**	Yes/No

Enforcement, Implementation and Wider Impacts

What is the geographic coverage of the policy/option?			England and Wales		
From what date will the policy be implemented?			2010		
Which organisation(s) will enforce the policy?			DECC		
What is the annual change in enforcement cost (£m)?			No change		
Does enforcement comply with Hampton principles?			YES		
Does implementation go beyond minimum EU requirements?			NO		
What is the CO_2 equivalent change in greenhouse gas emissions? (Million tonnes CO_2 equivalent)			**Traded:** n/a	**Traded:** n/a	
Does the proposal have an impact on competition?			Yes/No		
What proportion (%) of Total PV costs/benefits is directly attributable to primary legislation, if applicable?			**Costs:**	**Costs:**	
Annual cost (£m) per organisation (excl. Transition) (Constant Price)	**Micro**	**< 20**	**Small**	**Medium**	**Large**
Are any of these organisations exempt?	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No

Specific Impact Tests: Checklist

Set out in the table below where information on any SITs undertaken as part of the analysis of the policy options can be found in the evidence base. For guidance on how to complete each test, double-click on the link for the guidance provided by the relevant department.

Please note this checklist is not intended to list each and every statutory consideration that departments should take into account when deciding which policy option to follow. It is the responsibility of departments to make sure that their duties are complied with.

Does your policy option/proposal have an impact on…?	**Impact**	**Page ref within IA**
Statutory equality duties[3] Statutory Equality Duties Impact Test guidance	No	
Economic impacts		
Competition Competition Assessment Impact Test guidance	yes	16
Small firms Small Firms Impact Test guidance	No	
Environmental impacts		
Greenhouse gas assessment Greenhouse Gas Assessment Impact Test guidance	no	
Wider environmental issues Wider Environmental Issues Impact Test guidance	yes	17
Social impacts		
Health and well-being Health and Well-being Impact Test guidance	no	
Human rights Human Rights Impact Test guidance	no	
Justice system Justice Impact Test guidance	no	
Rural proofing Rural Proofing Impact Test guidance	yes	17
Sustainable development Sustainable Development Impact Test guidance	yes	

[3] Race, disability and gender Impact assessments are statutory requirements for relevant policies. Equality statutory requirements will be expanded 2011, once the Equality Bill comes into force. Statutory equality duties part of the Equality Bill apply to GB only. The Toolkit provides advice on statutory equality duties for public authorities with a remit in Northern Ireland.

Evidence Base (for summary sheets) – Notes

Use this space to set out the relevant references, evidence, analysis and detailed narrative from which you have generated your policy options or proposal. Please fill in **References** section.

References

Include the links to relevant legislation and publications, such as public impact assessment of earlier stages (e.g. Consultation, Final, Enactment).

No.	Legislation or publication
1	http://www.decc.gov.uk/en/content/cms/consultations/grandfathering/grandfathering.aspx
2	
3	
4	

+ Add another row

Evidence Base

Ensure that the information in this section provides clear evidence of the information provided in the summary pages of this form (recommended maximum of 30 pages). Complete the **Annual profile of monetised costs and benefits** (transition and recurring) below over the life of the preferred policy (use the spreadsheet attached if the period is longer than 10 years).

The spreadsheet also contains an emission changes table that you will need to fill in if your measure has an impact on greenhouse gas emissions.

Annual profile of monetised costs and benefits* - (£m) constant prices

	Y_0	Y_1	Y_2	Y_3	Y_4	Y_5	Y_6	Y_7	Y_8	Y_9
Transition costs										
Annual recurring cost										
Total annual costs										
Transition benefits										
Annual recurring benefits										
Total annual benefits										

* For non-monetised benefits please see summary pages and main evidence base section

Microsoft Office
Excel Worksheet

Evidence Base

Problem under consideration

The UK has a stretching target to source 15% of energy from renewable sources by 2020. A large proportion of this will be met through technologies deployed in the large scale electricity sector. The key instrument to support these technologies is the renewable obligation (RO). Investors in some bio-energy technologies, have claimed that there is a real danger these technologies could not go ahead as planned due to uncertainty over future support levels. This IA considers options for amendment of the current RO arrangements, and considers the costs and benefits of different options, and their impact on renewable deployment.

Rationale for intervention

The overarching objective of this policy is to tackle climate change. Tackling the barriers that prevent the UK moving towards a low carbon economy requires addressing the market failures that prevent the optimal allocation of resources to maximise welfare to society over future generations. Technology support is part of the Stern review's three pronged approach to addressing climate change, without which the private sector is not expected to invest sufficiently, or in the timescales needed, in innovative low carbon technologies (such as anaerobic digestion) or in the deployment of renewable technologies that are currently more expensive than their fossil fuel counterparts. If these failures are not addressed, they could prevent the UK from meeting its legally binding renewables target.

The Renewable Energy Strategy published last year, suggested that renewable electricity would need to provide around 30% of all electricity by 2020 to meet its renewable energy target – from 6.6% currently. A large part of this (around 20% renewable generation) is expected to be met through bio-energy technologies. Biomass is one of the key renewable electricity technologies that is not intermittent, and therefore provides a valuable, dispatchable part of our energy mix. The objectives of the policy recommendation is to provide support to incentivise deployment of biomass technologies, while obtaining value for money for the consumer.

The market on its own will not deliver the required development and deployment of renewable technologies to achieve the UK's renewable energy target. This is because the carbon price is not yet high enough or certain enough to support these higher cost technologies, and there are market failures such as positive externalities from innovation, asymmetric information and uncertainty, and increasing returns to scale in the power sector. The Renewables Obligation is in place to support development and deployment of large scale renewable electricity.

Following the consultation on banding and Grandfathering in 2008, the Government made a decision not to grandfather support for biomass technologies as, in contrast to other renewable technologies, a large proportion of generator's costs are fuel costs, which can vary over time. Grandfathering these technologies could lead to risk of rents for these technologies if fuel prices fall, and conversely too little support if prices rise. It could also lead to a market distortion in the ability of plant to compete for biomass feedstocks if support levels are fixed over time.

Since then, evidence from investors in biomass industry (and evidence of recent deployment levels) has suggested that the uncertainty due to lack of grandfathering ROC support for biomass technologies means that there will be little investment in these technologies, which has led Government to revisit its grandfathering decision.

As a result of responses and evidence obtained, the Government has made the decision to adopt a policy to fully grandfather support for biomass, AD, Energy from Waste and ACT, and not adopt a policy to grandfather support for technologies using bioliquids. It was considered that grandfathering, with no uplift would be the most cost-effective way to bring forward deployment of large scale biomass and energy from waste. It was decided not to adopt a policy to grandfather technologies using bioliquids at this stage, in order to give the Government the flexibility to change its approach to bioliquids as more information emerges on the costs and best use of this resource, and to allow further work to be carried out.

Policy Objectives

Objectives of this measure are:

(i) Support deployment of biomass electricity, to provide a framework where it is possible for investors to invest in biomass with a predictable support scheme.

(ii) To minimise the cost of deployment – ensure that deployment comes forward in a cost-effective manner

(iii) Not distort the biomass market. Not to create conditions where there is pressure to increase biomass prices.

Options considered

Options considered are:

(i) Grandfather at current levels biomass AD and EFW;
(ii) Part Grandfather biomass, fully grandfather AD and EFW;
(iii) Grandfather all with potential to uplift if costs increase.

Costs and Benefits

The Renewable Energy Strategy (RES) and accompanying IAs, published summer 2009, set out the measures needed, and the costs and benefits, to meet the 2020 renewable energy target. Since then, there have been further amendments to the RO, including changes to banding for certain offshore wind projects. The impact assessment for this work can be found at : http://www.decc.gov.uk/en/content/cms/consultations/elec_financial/elec_financial.aspx. These reports contain assumptions of deployment levels and technology costs that underpin the Renewable Energy Strategy to date.

Under RES assumptions, by 2020 electricity generation from biomass (including biogas and wastes) will comprise around 20% of all renewable generation needed to meet the renewable energy target. This proportion is indicative, as it is not possible to predict with certainty the mix of renewable generation that will be incentivised over time, which will be determined by changing fuel prices, technology costs, and response to overcoming barriers. By 2013, the time of the banding review it is estimated that there will be around 4TWh of renewable electricity generated from biomass, AD and wastes (excluding cofiring, sewage sludge and landfill gas – which are not under consideration here). This modelling was based on assumption that ROC levels were not adjusted at review for changes in biomass prices.

Latest statistics published in June 2009 show that there is currently around 3.2 TWh electricity generated from biomass and wastes (excluding cofiring, sewage sludge and landfill gas), which is close to the 2013 prediction. There is around 100MW biomass under construction, 1.8GW awaiting a planning decision and 1.2 GW approved awaiting construction. Current generation

plus expected generation from that under construction brings us close to the 4TWh assumed in the RES.

It is likely therefore that a change to grandfather biomass could increase deployment of biomass above that assumed in the RES above. Cost estimates below employ assumptions as to the additional deployment that could arise before 2013 based on proportions of approved plant. The cost estimates do not make any assumptions about impact on deployment post 2013, as this will be dependent on decisions made at the next banding review. Any increase in deployment due to grandfathering pre 2013 is limited by the length of construction times, and the need to be generating by 2013 in order to gain from grandfathering current levels. More detail is given below.

Estimates below are presented in a range, which reflects the renewable technology that is displaced by additional deployment of biomass or AD. Biomass generation receives subsidy of 1.5 ROCs, AD receives subsidy of 2 ROCs - determined at the time of the banding review, and based on underlying technology cost assumptions. If additional biomass generation displaces more expensive renewable generation (say offshore wind), then grandfathering biomass could reduce the cost of the RO overall. If it displaces a cheaper technology (say cofiring) then grandfathering is likely to increase resource and subsidy costs.

Costs and Benefits are set out by technology type – costs and benefits of dedicated biomass generation are considered separately from AD / EFW.

Dedicated Biomass

We consulted on four options for dedicated biomass

- No grandfathering
- Grandfather only the non fuel element (proposed in consultation)
- Grandfather at current levels (now our recommended option)
- Grandfather with uplift

Estimates of the costs and benefits of grandfathering options are determined by assumptions as to:

- the response of investor behaviour to the policy change;
- which form of renewable generation is displaced by additional biomass generation, and
- support levels in the event of changing prices.

Any assumptions as to the response of investors to changes to the grandfathering regime is uncertain, as are future fuel prices and how subsidy rates would need to adjust to accommodate them. Table 1 below gives an indication of the impact of different options on costs and benefits, based on the following assumptions:

- Without grandfathering, that new build for biomass would be restricted to 100MW - which is the amount of biomass currently under construction. In total there would be around 400MW dedicated biomass built by 2013.
- Part grandfathering could restrict new build to around 100 to 200MW in addition to that already in construction, which is up to 15% of plant currently consented but awaiting construction.
- Grandfathering could lead to additional biomass build before 2013 of around an estimated 200 to 400MW in addition to that already in construction. This is based on an estimate of up to 30% of plant consented and awaiting construction. Higher growth than this is unlikely, given construction times to build biomass plant.
- The table below assumes flat fuel prices over time – the impact of rising and falling prices on the cost of grandfathering options is considered in the Risks and Assumptions section below.

Table 1: CBA Grandfathering options (£m)

Costs and Benefits from plant deployed pre 2013 under grandfathering options (£m 2009 prices lifetime 2010 to 2030)	Grandfather fully Deploys	Part Grandfather Deploys	Grandfather with uplift only Deploys
Resource cost	-400 to 550	-200 to 300	-400 to 550
Subsidy costs	-400 to 850	-200 to 400	-400 to 850

The costs and benefits are presented against a do nothing scenario. Costs and benefits are given in a range which reflects the range of uncertainty surrounding one of the cost drivers - the impact of increased biomass deployment on deployment of other technologies. The top of the range represents the highest cost scenario - that increased biomass generation due to grandfathering displaces biomass co-firing (a lower cost technology than dedicated biomass). The lower cost end of the range assumes that additional biomass displaces a higher cost renewable technology, (offshore wind). Under this latter assumption increased deployment of biomass through grandfathering would lead to a lower resource cost of renewable electricity.

Given these caveats, the results suggest that:

Under the current policy position **not to grandfather any support**, it is assumed that there will be limited additional deployment of biomass plant, limited to around 100MW that is currently under construction. In total therefore it is estimated that under this option there could be 400MW deployed by 2013. Under the assumption that biomass does not displace other higher cost renewable generation, this option has the lowest cost as it is assumed to restrict additional biomass growth. If additional biomass displaces higher cost renewables, then options that increase biomass deployment could reduce the overall cost of renewable electricity.

Based on evidence from the consultation response, we have assumed that **Grandfathering the non fuel costs** could provide sufficient guaranteed support to enable some utilities financing on balance sheet to invest in biomass. This could restrict the market to large scale utilities, and it is likely that some, but relatively little, additional biomass would be deployed. We estimate that this could be up to an additional 200MW above the 100MW in construction.

This option is likely to increase biomass costs relative to not grandfathering, as it could bring on more investment. If the additional deployment displaces higher cost renewable generation, this would lead to a reduction in costs relative to the do nothing scenario.

This option was recommended in the consultation, as it has the advantage that we could protect the consumer by reducing subsidy levels if prices fall, and respond if prices rise. But, in response to the consultation, while a number of respondents to the consultation agreed with the logic of part grandfathering support - which puts biomass technologies on the same footing as other non biomass technologies - they also highlighted the practical difficulties. The number of feedstocks used in biomass would mean that a system that matched price increases to costs of individual plant would be very complex. Moreover DECC received evidence to demonstrate that the proportion of fuel to non fuel costs varied considerably between biomass plant.

In order to prevent collusion between suppliers of biomass and developers leading to inflated prices at the time of ROC review, the variable element of ROCs would need to be fixed to a

globally traded biomass price index. There are many different biomass technologies, and many different feedstocks, which would mean that any index would not necessarily match plant in operation. This would give developers a clear index against which they could hedge their fuel costs, but would not necessarily reflect movements in prices of indigenous biomass sources. For these reasons this option has not been adopted for the purpose of this decision.

Grandfathering at current levels ensures that ROC support is set at 1.5 ROCs for biomass plant built and generating by 1 April 2013. It is assumed that the level of certainty offered by fixed ROC levels could incentivise up to an additional 400MW biomass plant. Compared to the current situation with no grandfathering – this additional biomass plant could cost more if it does not displace more expensive renewable generation.

Under flat fuel price assumptions the impact of **Grandfathering with uplift** has the same impact as grandfathering at current levels (above). The subsidy costs of this option under different fuel price scenarios is given in the risks and assumptions section below.

Anaerobic Digestion / Energy From Waste / ACT

Options considered are:

(i) Do nothing
(ii) Grandfather at current levels AD and EFW
(iii) Grandfather all with uplift

The option to part grandfather support for AD was not considered to be practical. AD plant use a wide range of feedstocks, which means that it would be difficult to find an index that would reflect the changing costs in the market (between actual costs of EC, to avoided gate fees) . A fixed / floating ROC option would therefore need to differentiate between feedstocks for AD, which would make it extremely complex, and most likely, unworkable. This option was not recommended in the consultation.

The table below give illustrative costs based on stylised assumptions, which show the relative costs and benefits of grandfathering options for AD. It is assumed that:

- Not grandfathering will lead to no new AD growth under the RO. (AD is also supported under the Feed in Tariff system, and it is assumed that take up of AD under the FIT system is not affected by the grandfathering options).
- It is assumed that full grandfathering leads to an additional 0.1 GW – around 0.6TWh by 2013. This is very uncertain, as we don't have estimates of AD plant in planning, nor which are likely to claim ROCs.
- EFW additional costs are very small, and are not included here, as they are not anticipated to significantly affect the costs estimates below. There are only 24MW municipal waste under construction, and it is not clear whether these are CHP plant that could qualify for ROCs. Similarly we expect the any costs of grandfathered support for ACT to be extremely small, which will not significantly impact on cost estimates.

Table 2: Cost of new AD plant under grandfathering options (£m)

Costs and Benefits from plant deployed pre 2013 under grandfathering options (£m)	Grandfather fully	Grandfather with uplift only
Resource cost	-100 to 300	-100 to 300
Costs of Carbon	0	0
NPV	-300 to 100	-300 to 100
Subsidy costs	0 to 500	0 to 500

The costs and benefits are presented against a do nothing scenario. Costs and benefits are given in a range which reflects the range of uncertainty surrounding one of the cost drivers - the impact of increased AD deployment on deployment of other renewable technologies. The top of the range represents the highest cost scenario - that increased AD generation due to grandfathering displaces biomass co-firing (a lower cost technology than dedicated biomass). The lower cost end of the range assumes that additional AD displaces a higher cost renewable technology, (offshore wind). Under this latter assumption increased deployment of AD through grandfathering would lead to a lower resource cost of renewable electricity.

Table 2 shows that under these assumptions grandfathering RO support for AD costs more than not grandfathering. These costs are very uncertain both because deployment assumptions are uncertain, and it is unclear how much deployment would occur under FITs.

Bioliquids

Although some bio-liquids have been co-fired in the RO since its inception, there is now a small but growing pool of electricity and/or CHP plants in planning or consented that are looking to use bio-liquids (approximately 200MW). There are also 1185MW currently installed capacity of oil-fired plant which could convert to bioliquid.

Because liquid feedstocks are potentially a constrained resource, with often a range of uses, we wish to consider what the optimal use for liquids should be to best deliver government objectives. In addition, support levels under the RO are based on solid biomass. This needs to be revisited to ensure it is at the right level for bio-liquids technologies. However, further work is planned on the position of bioliquids derived from wastes and advanced conversion technologies.

While there are sustainability concerns for bioliquids which use virgin oils such as palm oil, it will be important to see how companies respond to the RED sustainability criteria, in which key sustainability features such as land use change must be taken into account. If these criteria provide an effective barrier to unsustainable liquid feedstocks, it will provide a clear framework for companies to demonstrate their sustainability. The RED sustainability criteria will be incorporated into the RO. In the meantime, by not changing its policy towards grandfathering of bioliquids at this stage, it allows Government the flexibility to change its approach to bioliquids as further evidence comes to light.

There is limited information on the amount of generation from bio-liquids likely to come forward, but the low level of generation from bio-liquids currently, and the small number with planning approved (around 50MW) suggests that there is likely to be only a small amount deployed pre 2013, with or without grandfathering. It is therefore anticipated that grandfathering decisions for bioliquids will not have a significant impact on overall cost estimates.

Summary – combined cost estimates

Table 3 below presents the range of costs for the options under consideration. The cost estimates of grandfathering options are presented here compared to the do nothing option of not grandfathering. Options considered are:

(i) Grandfather at current levels biomass AD and EFW
(ii) Part Grandfather biomass, fully grandfather AD and EFW
(iii) Grandfather biomass, AD and EFW with uplift

Table 3: Range of costs and benefits of Grandfathering options – against a do nothing scenario of no grandfathering

(£m 2009 prices lifetime 2010 to 2030)	Grandfather biomass, AD and EFW	Part Grandfather biomass + fully grandfather AD	Grandfather AD, EFW and biomass fully with uplift
Resource cost	-450 to 850	-250 to 550	-450 to 850
Cost of Carbon	0	0	0
NPV	-850 to 450	-550 to 250	-850 to 450
Subsidy costs	-400 to 1300	-200 to 900	-400 to 1300

The analysis in Table 3 is based on a range of assumptions as to the impact on deployment of grandfathering options that are outlined above, and the range reflects the counterfactual technology that additional biomass displaces. Comparison of options is on the basis of fuel prices that remain flat over time. This latter assumption is considered in the section below.

Estimates here differ from those in the impact assessment for the March consultation http://www.decc.gov.uk/en/content/cms/consultations/grandfathering/grandfathering.aspx . In that consultation, we provided estimates for the cost of grandfathering biomass only relative to a counterfactual of additional co-firing. Here the inclusion of AD cost increases the maximum resource cost from around £550m (biomass only) to £850m. The inclusion of an alternative counterfactual that reflects the uncertainty about the renewable technology displaced by additional biomass, leads to a positive NPV (negative cost) at the other end of the range. It is not possible to state with certainty which form of renewable generation will be displaced by additional biomass, since the RO does not set targets for individual technologies, and the response to the incentive will depend on a number of factors, including supply side barriers, fuel prices, and levels of incentive set in future banding reviews. In practice we would expect biomass to displace a mix of technologies.

Changes to the Renewables Obligation have an impact on consumer costs and bills, through changes to the subsidy costs, which are assumed to be passed through. The costs impose vary according to assumption of counterfactual technology, and price assumptions. Table 4 below gives estimates of the increase in renewables subsidy per unit of renewable generation under the RO under the different grandfathering options.

Table 4 – Impact on Renewables Subsidy Costs per unit of Renewable Generation

	Grandfather biomass, AD and EFW	Part Grandfather biomass + fully grandfather AD	Grandfather AD, EFW and biomass fully with uplift
£/mwh increase in RO subsidy costs	-£0.2 to £0.6	-£0.1 to £0.4	-£0.2 to £0.6

Risks and Assumptions

The objective of grandfathering policy increase investor confidence in ongoing RO support levels for accredited generating stations. Under grandfathering, the fuel price risk is borne by investors, as, under a scenario of rising prices, the policy is that RO support would remain the same. Future fuel prices are uncertain, but it is important to assess the impact on relative costs of grandfathering options under different fuel price assumptions. Table 5 below illustrates RO subsidy costs for biomass and AD under the following assumptions as to price and subsidy levels:

- rising fuel prices (falling gate fees) leads to an increase by in RO subsidy of ½ a ROC;
- falling fuel prices, which lead to a reduction in subsidy of ½ a ROC.

These are very stylised assumptions, but they allow relative comparison of grandfathering options against the do nothing scenario of no grandfathering. As above, the range reflects assumptions as to whether or not biomass displaces more expensive renewable generation. If increased deployment of biomass displaces more expensive renewable generation, there will be a saving in renewable subsidy costs.

The analysis assumes that grandfathered support will provide a stable environment where developers can find long term contracts for fuel, or will have sufficient support in order that additional biomass / AD is incentivised even under rising prices. The analysis does not take account of any increased benefit to developers from more certain support levels, and therefore lower risk, which could feed into lower cost of capital.

Table 5: Impact of rising / falling price scenarios on RO costs of grandfathering options

(£m 2009 prices lifetime 2010 to 2030)	Grandfather biomass, AD and EFW	Part Grandfather biomass + fully grandfather AD	Grandfather AD, EFW and biomass fully with uplift
Flat Fuel Prices	-400 to 1300	-200 to 900	-400 to 1300
Rising FP	-800 to 900	0 to 1100	150 to 1900
Falling FP	0 to 1700	-400 to 700	0 to 1700

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- Under rising fuel prices, full grandfathering of biomass and AD is likely to cost less than other options which are assumed to result in increased subsidy levels as fuel prices rise.
- Conversely, when prices fall, subsidy costs of part and full grandfathering options rise compared to current policy which should see falling subsidy levels under falling prices.
- Part grandfathering increases costs relative to do nothing under rising prices, but could reduce costs under falling prices, on the assumption that increased biomass displaces more expensive renewable alternatives. It is cheaper than other grandfathering options that increase biomass deployment.
- Grandfathering with uplift is the most expensive option under all scenarios.

Admin Burden

This measure is not expected to have a significant impact on administration costs, as it is not expected to change significantly levels of overall renewable deployment under the RO, as biomass generation is expected to displace other renewable generation.

Wider Impacts

Competition Assessment

The RO is a market-based instrument that operates in a competitive market for electricity. It is open to all participants in renewable generation. The way in which the RO recycles money from the buy-out fund should act as a positive incentive to competition between suppliers, and reduce barriers to entry for renewable electricity generators.

There could be some impact on competition between new and existing generators if there is a significant change in biomass prices over time, and later entrants receive a different level of support . Fixing ROC support for biomass means that fuel price risk is borne by developers.

Small firms impact test

The major impact of the RO on the large majority of small business is likely to come from increased costs of electricity which, while affecting all electricity consumers are likely to represent a larger proportion of income for smaller companies, as they are less likely to have their own generation compared to – particularly - larger industrial users with heavy electricity requirements.

Sustainable Development

The RO is aimed at increasing the deployment of renewable electricity generation in order to move the UK away from fossil fuel dependency towards a low carbon economy in preparation for a future when supplies of gas and oil will become tighter and more expensive.

The RO includes sustainability reporting requirements for the use of biomass in electricity generation. This will be reported annually and will help inform Government policy on sustainable use of biomass for electricity generation.

Carbon Assessment

The UK is committed to a Renewable Energy Target of 15% by 2020, with the UK expecting to deliver around 30% renewable electricity by 2020. It assumed that additional biomass generation that could be incentivised through grandfathering will displace other forms of renewable generation. It is therefore assumed that there is no net change in carbon saved from this measure.

Security of Supply

Dedicated biomass has a higher capacity credit than other renewable technologies, therefore options which increases the proportion of biomass generation compared to the do nothing option are likely to result in a slightly higher overall capacity margin within the electricity market. Levels of unserved energy are similar across all options, assuming central build rates.

Environmental Impacts

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.

Rural Proofing

A large proportion of renewable energy is produced in rural areas and affects businesses involved in the generation of renewable energy and rural communities living in the vicinity of new developments. Increasing the proportion of energy from renewable sources will mean more renewable energy developments in rural areas.

Certain forms of renewable development impact disproportionately on rural areas and there can be resistance to new developments. However, any resistance needs to be viewed in the light of Government's commitment to increasing renewable energy to meet its longer term goals and in order to tackle climate change. In addition, a high proportion of the new renewable generation needed between now and 2020 will take the form of offshore wind generation, some of which will be built some distance from shore.

Although there has been no separate or explicit assessment of the needs of rural areas, the proposals are set within this wider policy context and aim to ensure that the impacts on consumers and their bills are reasonable.

Separate legislation exists with a focus on ensuring that the environmental and social impacts of development are fully taken into account, outside the scope of the RO.

Development of RO policy has been subject to extensive consultation. This has previously included business interests within the renewables sector and consumer interests. It has also included relevant rural business groups (including NFU and CLA as well as wind sector) but has not sought to engage rural community groups in particular.

RO policy has also been informed by advisory boards including the Renewables Advisory Board and Biomass Implementation Advisory Group (BIAG). These are primarily industry groups and include rural business interests as appropriate (e.g. the NFU and CLA are represented on BIAG).

Summary and Preferred option , with description of implementation plan-

The preferred option is to grandfather at current levels biomass AD and EFW, costs and benefits of which are given in the Table 5 below:

Table 6: Costs and benefits of Option 1: Fully Grandfather RO support for biomass, AD and Energy from Waste

(£m 2009 prices lifetime 2010 to 2030)	Grandfather biomass, AD and EFW
Resource cost	-450 to 850
Cost of Carbon	0
NPV	-850 to 450
Subsidy costs	-400 to 1300

The RO is administered and enforced by Ofgem, who report annually on their administration of the RO and conduct regular audits in relation to compliance with the RO.

DECC is responsible for monitoring the impact of the RO on the development of renewable energy and collects detailed information on growth in renewable energy generation and projects under development.

Annexes

Annex 1 should be used to set out the Post Implementation Review Plan as detailed below. Further annexes may be added to provide further information about non-monetary costs and benefits from Specific Impact Tests, if relevant to an overall understanding of policy options.

Annex 1: Post Implementation Review (PIR) Plan

A PIR should be undertaken, usually three to five years after implementation of the policy, but exceptionally a longer period may be more appropriate. A PIR should examine the extent to which the implemented regulations have achieved their objectives, assess their costs and benefits and identify whether they are having any unintended consequences. Please set out the PIR Plan as detailed below. If there is no plan to do a PIR please provide reasons below.

Basis of the review: The measure will be reviewed in order to inform the re-banding of the RO in 2013.
Review objective: The review will consider whether the policy has achieved its objectives, and consider the impact on biomass deployment and costs of renewable energy.
Review approach and rationale: The review will involve monitoring of outturn data on capacity and generation of renewable energy. This will be supported by gathering qualitative data through engagement with stakeholders.
Baseline: The baseline is the assumption that not grandfathering will bring about limited biomass deployment.
Success criteria: Success will be determined by the level of biomass deployment, and the cost-effectiveness of the RO in delivering renewable electricity.
Monitoring information arrangements: Data is collected on renewable capacity and generation.
Reasons for not planning a PIR: [If there is no plan to do a PIR please provide reasons here]

Add annexes here.