Title:	Impact Assessment (IA)
Amendments to the Renewable Transport Fuel Obligation for compliance with the Renewable Energy Directive - (1) Minimum Sustainability Criteria	**IA No:** DFT00049
Lead department or agency: Department for Transport (DfT)	**Date:** 01/08/2011
Other departments or agencies:	**Stage:** Final
	Source of intervention: EU
	Type of measure: Secondary legislation
	Contact for enquiries: Craig Mills - 020 7944 4895 craig.mills@dft.gsi.gov.uk

Summary: Intervention and Options

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

Greenhouse gas (GHG) emissions from transport are significant and impose costs on others through their contribution to climate change; those costs are not taken into account by those that emit them. Using renewable energy can reduce GHG emissions and there are therefore EU and UK renewable energy targets. However, these are not likely to be met by the market alone, because of the extra cost of renewable energy compared to fossil fuels in the near term at least. The UK intends to meet its Renewable Energy Directive (RED) target through the Renewable Transport Fuel Obligation (RTFO). Sustainability criteria are required to ensure that the UK biofuel supply is sustainably sourced and is compliant with the requirements of the RED.

What are the policy objectives and the intended effects?

The RTFO aims to increase the use of renewable energy in the transport sector, in a cost effective way. The amendments to the RTFO considered in this Impact Assessment aim to ensure that only biofuels meeting carbon stock and biodiversity land based criteria and minimum greenhouse gas (GHG) saving criteria, count towards meeting UK biofuels targets as prescribed by the RED.

These amendments are intended to improve the GHG savings and sustainability of biofuel supplied under the RTFO, in order to comply with the RED requirements. We do not intend to implement this directive beyond the minimum requirements.

What policy options have been considered, including any alternatives to regulation? Please justify preferred option (further details in Evidence Base)

This impact assessment is the first in a set of five impact assessments considering amendments to the RTFO.

The only policy option considered is to implement the criteria. This has been considered against a "do nothing" baseline where the criteria are not implemented.

The preferred option is to implement mandatory sustainability criteria, as it would be expected to:

- Ensure minimum levels of sustainability of biofuels supplied in the UK.
- Ensure compliance with the RED and avoid the risk of infraction.
- However, this may impact on pump prices, which are estimated to increase by around 0 to 0.4ppl (including VAT) over the period 2012 to 2020 in the central scenario.

Will the policy be reviewed? It will be reviewed. **If applicable, set review date:** 4/2014	
What is the basis for this review? Not applicable. **If applicable, set sunset clause date:** Month/Year	
Are there arrangements in place that will allow a systematic collection of monitoring information for future policy review?	Yes

Ministerial Sign-off For final proposal stage Impact Assessments:

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) the benefits justify the costs.

Signed by the responsible Minister: ..... Date: .....

Summary: Analysis and Evidence

Policy Option 1

Description:

1a) Implement mandatory sustainability criteria as prescribed in the RED

Price Base Year 2011	PV Base Year 2010	Time Period Years 18	Net Benefit (Present Value (PV)) (£m)		
			Low: 1739	**High:** -621	**Best Estimate: 402**

COSTS (£m)	Total Transition (Constant Price)	Years	Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low			7	**106**
High			52	**809**
Best Estimate			21	**318**

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

The main cost impact is expected to be the higher costs associated with sourcing and supplying more sustainable biofuels. This would be a net cost to business in the first instance, but the competitive nature of the fuel market means that these costs would be expected to be fully passed through to the consumer in the form of pump prices.

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

There may be possible indirect impacts on food prices depending on the types of fuels supplied; and possible welfare impacts of reduced driving. As there are significant uncertainties around indirect land use impacts, it is possible that greenhouse gas emissions could be higher where such effects are inadvertently caused. In addition, suppliers may face additional familiarisation costs due to the revised regulatory regime and implementing internal processes to ensure compliance.

BENEFITS (£m)	Total Transition (Constant Price)	Years	Average Annual (excl. Transition) (Constant Price)	Total Benefit (Present Value)
Low			142	**1580**
High			16	**188**
Best Estimate			59	**720**

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

The key monetised benefit is the greenhouse gas savings that the sustainability criteria are intended to secure, relative to the baseline.

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

Provisions to exclude biofuels sourced from areas of high biodiversity and/or carbon stocks may yield benefits not monetised in this impact assessment. Other non-monetised benefits include possible increased security of national fuel supply, potential small ancillary benefits arising from a possible reduction in driving, including congestion, air pollution, noise, road infrastructure and accidents, market / employment opportunities in UK agriculture and production of more sustainable biofuels.

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

The scale of increases to biofuel prices is the main uncertainty in estimating the costs of mandatory sustainability criteria. As such, these have been tested for high, low and central scenarios, generating the range of estimates above. See "Risks and assumptions" section of the Evidence Base for further details. Another key uncertainty remains the indirect land use effects of biofuels for which there is currently little available evidence, hence these effects have not been possible to capture in the analysis.

Direct impact on business (Equivalent Annual) £m):			In scope of OIOO?	Measure qualifies as
Costs: NA	**Benefits:** NA	**Net:** NA	No	NA

Enforcement, Implementation and Wider Impacts

What is the geographic coverage of the policy/option?			United Kingdom		
From what date will the policy be implemented?			15/12/2011		
Which organisation(s) will enforce the policy?			DfT		
What is the annual change in enforcement cost (£m)?			0		
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:** 2.5	**Non-traded:** 15.7	
Does the proposal have an impact on competition?			No		
What proportion (%) of Total PV costs/benefits is directly attributable to primary legislation, if applicable?			**Costs:** n/a	**Benefits:** n/a	
Distribution of annual cost (%) by organisation size (excl. Transition) (Constant Price)	**Micro**	**< 20**	**Small**	**Medium**	**Large**
Are any of these organisations exempt?	No	No	No	No	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	22
Small firms Small Firms Impact Test guidance	Yes	23
Environmental impacts		
Greenhouse gas assessment Greenhouse Gas Assessment Impact Test guidance	No	
Wider environmental issues Wider Environmental Issues Impact Test guidance	No	
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	23
Sustainable development Sustainable Development Impact Test guidance	Yes	24

[1] Public bodies including Whitehall departments are required to consider the impact of their policies and measures on race, disability and gender. It is intended to extend this consideration requirement under the Equality Act 2010 to cover age, sexual orientation, religion or belief and gender reassignment from April 2011 (to Great Britain 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 assessments of earlier stages (e.g. Consultation, Final, Enactment) and those of the matching IN or OUTs measures.

No.	Legislation or publication
1	EU Renewable Energy Directive – Promotion of the use of energy from renewable sources: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:140:0016:0062:en:PDF
2	Renewable Fuels Agency carbon and sustainability data (archived) http://webarchive.nationalarchives.gov.uk/20110410141814/http://renewablefuelsagency.gov.uk/carbon-and-sustainability/rtfo-reports
3	DfT biofuels statistics webpage http://www2.dft.gov.uk/pgr/statistics/datatablespublications/biofuels/
4	Renewable Transport Fuel Obligations Order 2007 (as amended) (the "RTFO Order"): http://www.legislation.gov.uk/uksi/2009/843/contents/made
5	Department of Energy & Climate Change Energy Projections http://www.decc.gov.uk/en/content/cms/about/ec_social_res/analytic_projs/en_emis_projs/en_emis_projs.aspx

+ 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 (for summary sheets)

Introduction

1. Transposition of the EU Renewable Energy Directive (RED) into UK law means that changes are required to the Renewable Transport Fuel Obligation (RTFO) in order for the UK to be compliant.

2. This Impact Assessment is one of five final stage impact assessments covering transposition of transport elements of the RED which will accompany the government response to the RED consultation which was published in March 2011. The focus of this impact assessment is the biofuel sustainability criteria requirements of the RED.

3. The suite of 5 final stage impact assessments includes:
   i) Sustainability Criteria
   ii) Verification of the Sustainability Criteria
   iii) Double-Certification of Waste-Derived Biofuels
   iv) Buyout Recycling
   v) Partially Renewable Fuels

4. Two further impact assessments (relating to inclusion of Non Road Mobile Machinery fuel in the RTFO and the RTFO minimum threshold) were published during the consultation. Final stage impact assessments on these issues will be published at a later date alongside a further government response.

5. This impact assessment examines the costs and benefits of implementing minimum sustainability criteria for biofuels under the RTFO. These form part of the requirements of the RED, and are expected to improve the GHG savings of biofuels, contributing to tackling climate change and sustainable development policy goals.

6. There are significant uncertainties in the analysis presented, not only because of the long timeframe considered (to 2030) but also the underlying costs, benefits, fuel prices etc. The analysis is presented to 2030 to capture the potential long-run effects of the policy options. In addition, such uncertainties mean that the analysis is intended to illustrate the order of magnitude of expected effect.

7. The structure of this IA is as follows: it will set out the problem under consideration and the rationale for government intervention, before then explicitly stating the policy objectives of this intervention. The policy option is described and the methodology for analysing the costs and benefits of the policy option is explained, including the key assumptions and areas of uncertainty. Wider impacts and relevant specific impact tests are described in the annex. The impact assessment concludes by describing the preferred option.

Consultation Exercise

8. This final stage impact assessment follows a public consultation exercise carried out by the Department for Transport. Interested parties were invited to comment on the policy options and underlying analysis either at public meetings (2 of which were held) or through written responses.

9. Stakeholders noted that sustainability criteria compliant biofuel does currently trade on international biofuel markets. The department has since obtained market data which has been used to test/validate estimated biodiesel price impacts. The market data showed that RED compliant biodiesel trading at a price premium of a similar magnitude[1] to the illustrative central estimate presented in the consultation stage impact assessment. Therefore the analysis of price impacts presented in the consultation stage impact assessment remains unchanged. No other suggestions or improvements were received in relation to the price assumptions, so in the absence of additional evidence the basic assumptions from the consultation stage impact assessment remain unchanged. However, in response to concerns raised by the Regulatory Policy Committee, sensitivities for the price adjustment phase (used in the modelling of costs) have now been added.

10. Stakeholders remarked that without action being taken to incentivise sustainability, other EU member states will become the favoured destination for sustainable biofuel, leaving the UK with the unsustainable remainder. This point of view has been reflected in revised baseline greenhouse gas (GHG) saving assumptions.

11. Stakeholders also raised concerns that the most recent RTFO data (the first 9 months of obligation year 3) had not been used in the analysis. RTFO year 3 data has now been taken into account in the analysis.

Problem under consideration

12. In 2008, transport accounted for around a quarter of UK greenhouse gas emissions (132 MtCO2e) and the majority (around 90%) of those emissions come from road transport (Committee on Climate Change, 2010). The UK has legally binding climate change targets both for the long term to reduce emissions by at least 80% below 1990 levels by 2050; and, in the short term to reduce emissions by 34% below 1990 levels by 2020 (Climate Change Act, 2008). The UK also has a renewable energy target for 15% of UK energy to be supplied from renewable sources by 2020, with a transport-specific target of 10% (RED).

13. Biofuels are currently the only significant option for increasing renewable energy usage in transport, particularly in the period up to 2020 when other options are limited due to the lead in times for technological developments.

14. The RTFO currently requires fuel suppliers in the UK to provide a target volume of biofuel each year. This is currently the main mechanism through which the UK supports the supply of biofuels. The RED has implications for this mechanism because for compliance, several

[1] The market data is subject to copyright, so cannot be referenced.

amendments would need to be made. As this IA focuses on the sustainability criteria of the RED, the changes to the RTFO to account for this are explained.

Rationale for intervention

15. A market failure occurs when market outcomes do not maximise society's welfare. One example of this is climate change resulting from greenhouse gas emissions, which are formally known as a negative externality i.e. emissions are generated but those responsible for them do not take into account the impact they are having on others. Where the market is not likely to rectify this, it may be appropriate for public policy to do so through government intervention.

16. Biofuels have the potential to deliver GHG savings relative to fossil fuels. However, the GHG saving benefits of biofuels are not automatically captured in their market prices without public policy intervention, therefore there is no incentive to consider sustainability when meeting targets.

17. Currently, the RTFO does not directly price biofuels on the basis of % GHG savings or sustainability of the fuel, as it is a volume-based mandate. There is therefore no incentive for more sustainable or lower GHG fuels to be supplied. Government intervention to ensure sustainability is therefore justified.

Policy objective

18. The transposition of the RED is intended to ensure all biofuels supplied in the UK meet the sustainability criteria, delivering a sufficient level of GHG savings to meet UK and EU renewable energy targets and demonstrate compliance with GHG saving targets.

19. The RTFO will need to be amended in order to be compliant with the RED. The particular amendment considered here is a verification system implemented to enforce sustainability criteria with a view to ensuring biofuels supplied in the UK are sustainable.

20. Implementing sustainability criteria in the RTFO will meet the requirements of the RED and will increase the overall level of GHG savings in the UK transport fuels sector, thus contributing to the UK meeting its commitments to the Fuel Quality Directive (FQD) and climate change targets.

21. The specific changes to the RTFO considered here are therefore that biofuels counted towards the RTFO targets:

- Meet a minimum greenhouse gas saving (compared to a fossil fuel reference value).
- Are not sourced from areas of high biodiversity.
- Are not sourced from areas of high carbon stocks.

Description of options considered (including baseline)

Baseline

22. The baseline, or 'do nothing' option, would be to not implement the sustainability criteria as prescribed in the RED and to retain the RTFO in its current form.

23. This option carries the risk of infraction proceedings by the European Commission. This represents the counterfactual against which the policy option is assessed.

Option 1A - Implement sustainability criteria as prescribed in the RED

GHG Savings Criteria

24. The biofuel GHG saving (relative to fossil fuel) required increases over time and varies by the point in time at which a refinery commenced operation (i.e. older refineries do not have to comply with the criteria before 2013 and refineries commencing operation post-2017 are subject to a higher GHG saving threshold). From 2011, refineries which commenced operation post 2012 are required to deliver GHG savings of at least 35%. From 2013, all refineries are required to deliver at least 35% GHG savings. From 2017, all refineries are required to deliver at least 50% GHG savings. From 2018, refineries which commence operation post 2017 are required to deliver at least 60% GHG savings.

Figure 1: Minimum GHG & grandfathering periods for biofuel installations (RED)

Period	**Date production started at an installation**		
	Pre 24/01/08	**Post 24/01/08**	**Post 01/01/17**
05/12/2010 – 31/03/2013	No criteria	35%	-
01/04/2013- 31/12/2016	35%	35%	-
01/01/2017- 31/12/2017	50%	50%	50%
01/01/2018- 31/12/2020	50%	50%	60%

25. Figures 2 and 3 show the levels of GHG savings being obtained by biofuels supplied under the RTFO up to Jan 2011.

Figure 2: Profile of reported biodiesel GHG savings (RTFO data Apr 2008 – Jan 2011)

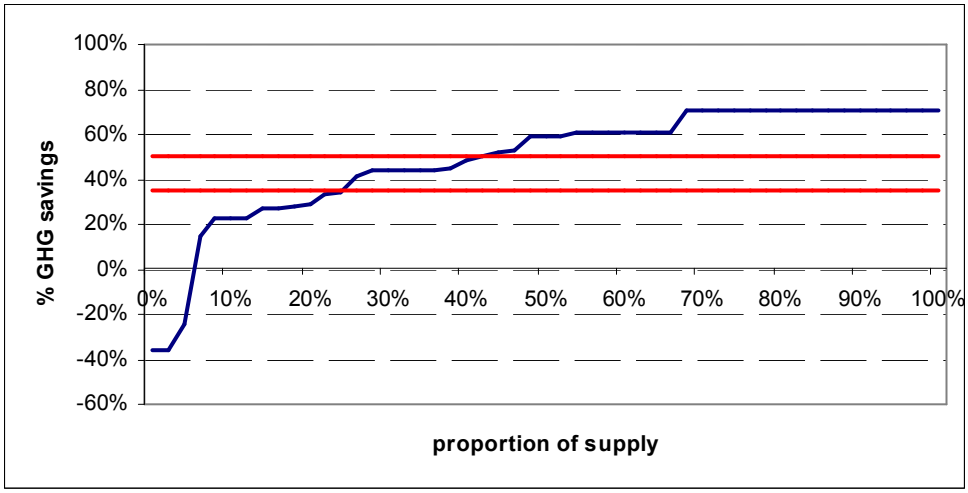
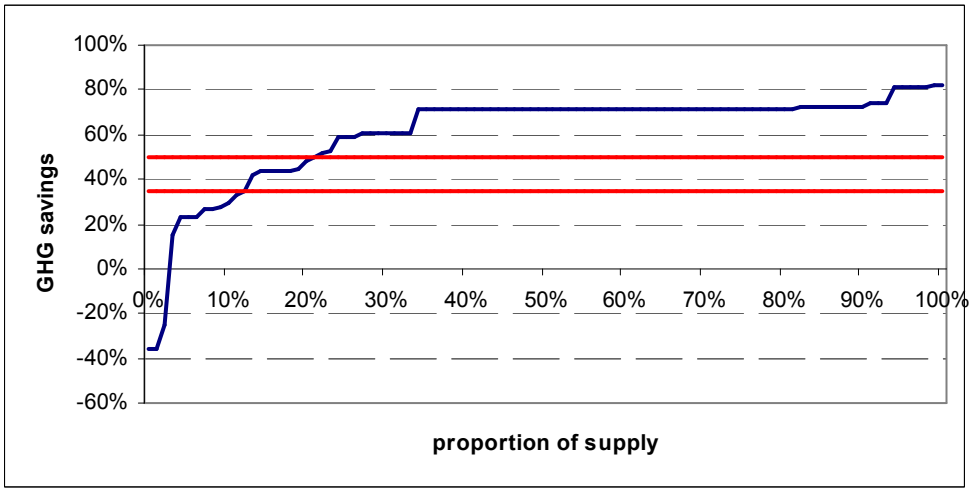


Figure 3: Profile of reported bioethanol GHG savings (RTFO data Apr 2008 – Jan 2011)



26. The horizontal lines above represent the sustainability criteria proposed, namely that biofuels supplied achieve a 35% GHG saving in 2012 and 50% saving in 2017. On the basis of fuels supplied under the RTFO up to Jan 2011, 71% of biodiesel would have been exceeded the 35% GHG savings threshold and 26% would have exceeded the 50% GHG savings threshold. 87% of bioethanol would have been exceeded the 35% GHG savings threshold and 79% would have exceeded the 50% GHG savings threshold. The sustainability criteria would be expected to raise the minimum and average levels of GHG savings delivered by biofuels supplied in the UK. In order to achieve higher GHG savings, there may be some increase in the cost of biofuels.

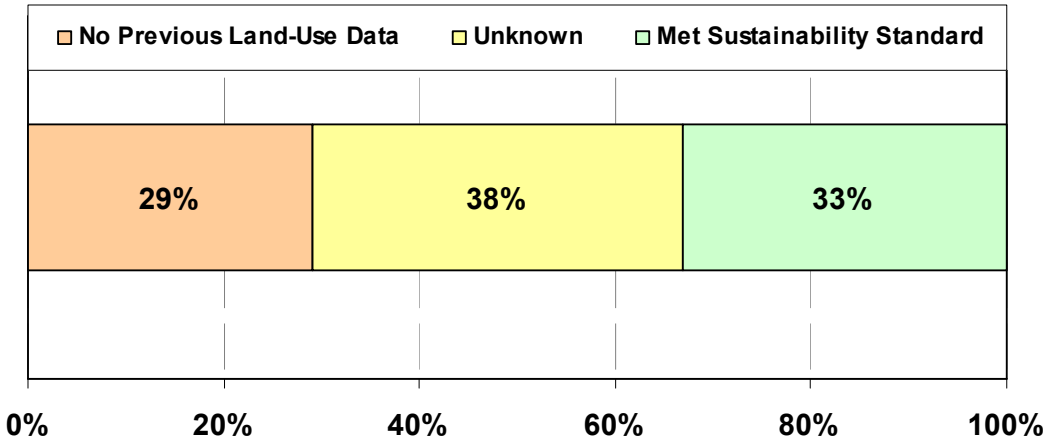
27. Biofuel producers are expected to increase average GHG savings following the implementation of the sustainability criteria. This can be achieved in a number of ways including increasing crop yields, reducing fertiliser use and improving energy efficiency / GHG intensity of refining processes.

Land Based Criteria

28. The implications of the requirement that biofuels are not sourced from areas of high carbon stock or high biodiversity areas are particularly uncertain and difficult to evaluate.

29. Figure 4 gives an indication of the proportions of the current UK biofuel supply that could be affected by the land-based criteria. Those with no previous land-use data could be considered more likely to not satisfy the land-based criteria. Those which have supplied land-use data but not demonstrated compliance with current RFA sustainability standards may or may not satisfy the land-based criteria. Those which have demonstrated compliance with current RFA sustainability standards could be considered more likely to satisfy the land-based criteria.

Figure 4: UK biofuel supply by land-use sustainability data (RFA provisional 2009/10 data)



30. Given that there is significant global agricultural production occurring in areas which do not have high carbon stocks or biodiversity, it is anticipated that the market will adapt and obligated suppliers will be able to obtain increased volumes of compliant biofuel following the introduction of the sustainability criteria. However, there may be some short term price pressures as biofuel producers gradually adapt to the requirements of the criteria.

Cost benefit analysis

Baseline

31. The baseline provides the counterfactual against which the costs and benefits of the policy option are assessed. The baseline in this case is the unamended RTFO (as it exists currently in legislation in July 2011) with no sustainability criteria in place. The RTFO requires that obligated road transport fuel suppliers must supply a given proportion of their fuel as biofuel. This proportion is determined by the RTFO target (which is expressed in volume terms).

Figure 5: RTFO trajectory

	Target Level
2012/13	4.5%
2013/14	5.0%
2014 onwards	5.0%

32. Given that all other EU member states would be expected to implement the RED sustainability criteria (as they are legally required to do), high GHG saving RED-compliant biofuel is assumed to be diverted to these markets with the UK market receiving the relatively unsustainable (low GHG savings) remainder.

33. This effect has been modelled by assuming that the baseline profile of GHG savings reflects the GHG saving profile of the bottom 50% of the actual GHG savings distribution reported under the RTFO up to Jan 2011. Therefore in the baseline 42% of biodiesel and 74% of bioethanol supplied meets the 35% GHG saving requirement and 0% of biodiesel and 58% of bioethanol supplied meets the 50% GHG saving requirement.

Figure 6: Profile of projected baseline biodiesel GHG savings

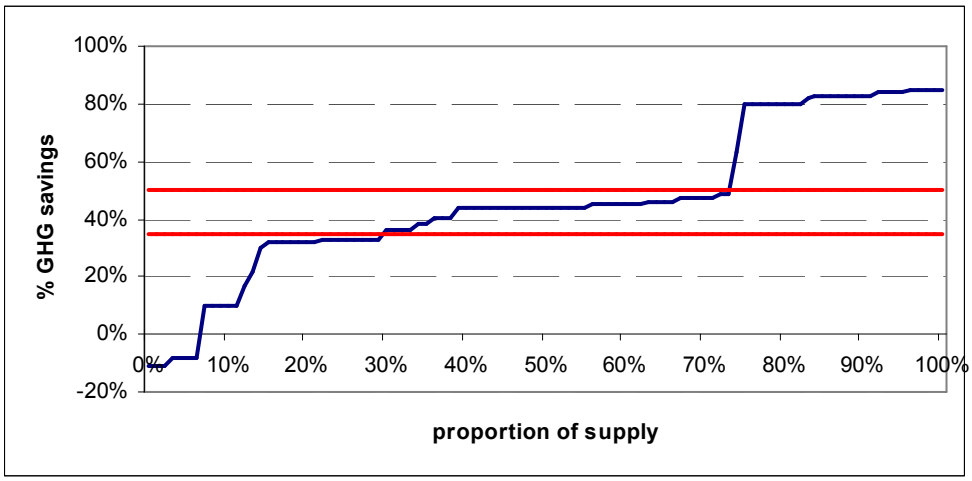
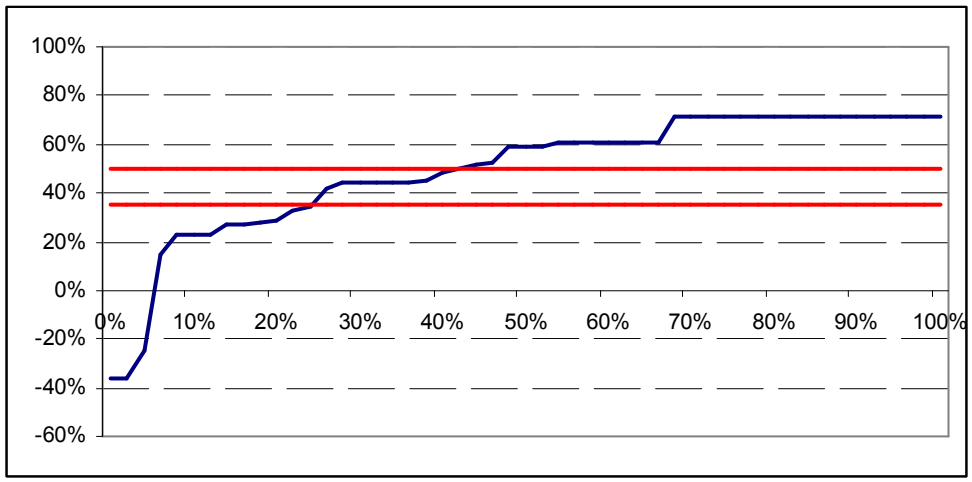


Figure 7: Profile of projected baseline bioethanol GHG savings



34. Given the uncertainty around the baseline GHG savings distribution, 'high baseline GHG savings' and 'low baseline GHG savings' sensitivities have also been explored in the following analysis of GHG saving benefits. The 'high baseline GHG savings' scenario has been modelled by assuming that the baseline profile of GHG savings reflects the GHG saving profile of the actual GHG savings distribution reported under the RTFO up to Jan 2011 (see figures 2 and 3). The 'low baseline GHG savings' takes the bottom 25%.

35. The infraction risk (i.e. a fine for failing to comply with an EU directive) for this option has not been explicitly monetised in the Impact Assessment.

Option 1a) Implement sustainability criteria as prescribed in the RED

Costs

36. The potential cost impacts of the sustainability criteria are subject to considerable uncertainty; the following estimates of the potential impacts are therefore presented across a necessarily wide range.

37. In general, the sustainability criteria would be expected to restrict, to some extent, the origin of the feedstock (i.e. sourcing feedstock from high GHG saving 'NUTS2' regions or crop land with high yields) used for the production of compliant biofuel and require biofuel

producers to switch to less GHG intensive production processes (i.e. using natural gas instead of coal as process fuel, using renewable methanol instead of fossil methanol to produce FAME biodiesel). Greater demand for compliant fuels is expected to cause prices to rise in the short term as demand for sustainable biofuels kicks in and producers make investments to improve the GHG savings from their biofuel (e.g. replacing a coal fired boiler with a gas fired boiler). Biofuel prices are assumed gradually fall back to trend as the supply of sustainable biofuel expands and producers recoup the additional capital costs incurred in order to comply with the criteria.

38. The following cost-benefit analysis assesses this market adjustment period by exploring 'pinch points' in biofuel price projections i.e. hikes in the price of biofuel reflecting the increased demand for available criteria-compliant biofuels. The 'pinch points' have been modelled to reflect the market response to introduction of the criteria in 2012 and subsequent tightening in 2017.

39. Given the uncertainty over the impact these factors may have on the price of biofuel, scenario analysis has been used to reflect low, medium and high price impacts. It could be assumed that these scenarios reflect the ability of the biofuel market to react to the changes in demand and the underlying costs of those fuels offering higher GHG savings.

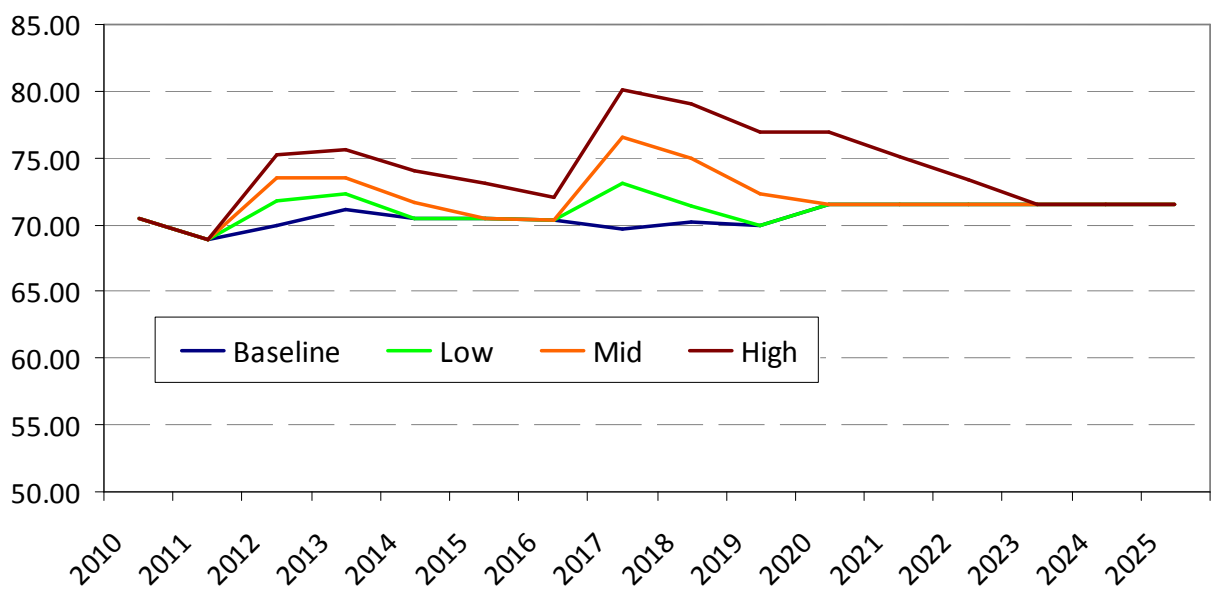
Biodiesel

40. The scenarios explored for biodiesel prices are shown in figures 8 and 9. The prices of sustainability criteria compliant biofuel is expected to rise above the baseline following the introduction of criteria in 2012 and 2017. The central scenario for 2012 is consistent with current market data. The price impacts in 2017 are subject to greater uncertainty but are expected to be greater due to increased stringency of the criteria. A range around the central estimate has been taken to reflect this uncertainty. Prices are then assumed to fall gradually back to trend as the market adapts to the criteria (see para 37 -38 for more detail). The length of time taken for prices to fall back to trend is also uncertain and has been varied across scenarios to reflect this uncertainty.

Figure 8: Scenarios for biodiesel price increases in 2012 and 2017 (% increase above baseline)

Biodiesel	Low	Central	High
2012	2.5%	5.0%	7.5%
2017	5.0%	10.0%	15.0%

Figure 9: Scenarios for biodiesel price increases, 2010 – 2020 (2010 prices)



41. Under the low scenario the price of biodiesel is assumed to increase by 2.5% in 2012 (with the introduction of the sustainability criteria) and fall gradually back down to baseline levels over the following 1.5 years. In 2017, when the 50% minimum GHG savings criteria is introduced, the biodiesel price rises 5% above baseline and then falls back down to trend over the following 1.5 years.

42. Under the central scenario the price of biodiesel is assumed to increase by 5% in 2012 and fall gradually back down to baseline levels over the following 3 years. In 2017, when the 50% minimum GHG savings criteria is introduced, the biodiesel price rises 10% above baseline and then falls back down to trend over the following 3 years.

43. Under the high scenario the price of biodiesel is assumed to increase by 7.5% in 2012 and fall gradually back down to baseline levels over the following 6 years. In 2017, when the 50% minimum GHG savings criteria is introduced, the biodiesel price rises 15% above baseline and then falls back down to trend over the following 6 years.

Bioethanol

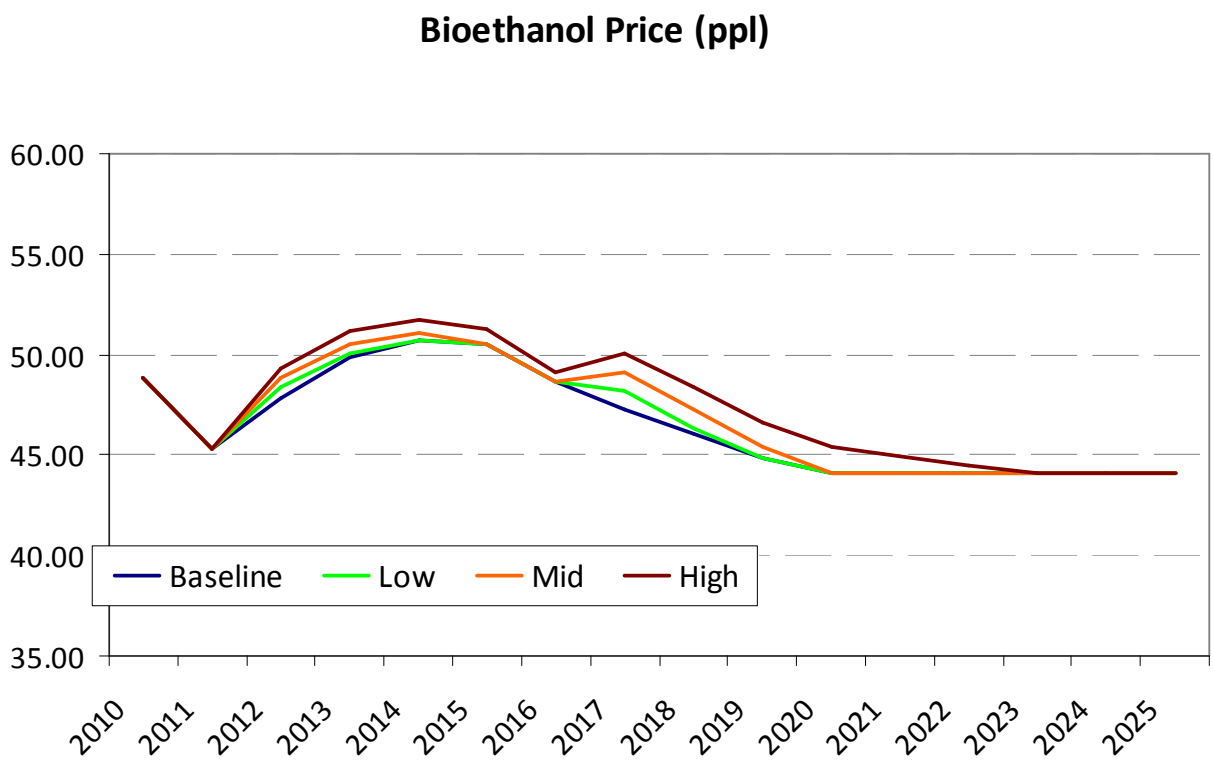
44. The price impacts of the sustainability criteria on ethanol have been modelled in the same way as biodiesel. However, bioethanol prices are assumed to increase to a lesser extent than biodiesel prices. This is due to two main factors: (1) according to RTFO data, bioethanol GHG savings are on average substantially closer to the sustainability criteria and (2) the potential global supply of sustainable biodiesel is expected in the long run to be more constrained than that of sustainable bioethanol. There also potentially exists a large residual market for non-compliant bioethanol in the USA. The scenarios explored for bioethanol prices are shown in figures 10 and 11. It has not been possible to obtain current

market data on sustainability criteria compliant bioethanol prices with which to validate the price assumptions.

Figure 10: Scenarios for bioethanol price increases in 2012 and 2017 (% increase)

Bioethanol	Low	Central	High
2012	1.0%	2.0%	3.0%
2017	2.0%	4.0%	6.0%

Figure 11: Scenarios for bioethanol price increases, 2010 – 2020 (2010 prices)



45. Under the low scenario the price of bioethanol is assumed to increase by 1% in 2012 (with the introduction of the sustainability criteria) and fall gradually back down to baseline levels over the following 1.5 years. In 2017, when the 50% minimum GHG savings criterion is introduced, the bioethanol price rises 2% above baseline and then falls back down to trend over the following 1.5 years.

46. Under the central scenario the price of bioethanol is assumed to increase by 2% in 2012 and fall gradually back down to baseline levels over the following 3 years. In 2017, when the 50% minimum GHG savings criterion is introduced, the bioethanol price rises 4% above baseline and then falls back down to trend over the following 3 years.

47. Under the high scenario the price of bioethanol is assumed to increase by 3% in 2012 and fall gradually back down to baseline levels over the following 6 years. In 2017, when the 50% minimum GHG savings criterion is introduced, the bioethanol price rises 6% above baseline and then falls back down to trend over the following 6 years.

Validation

48. During the consultation process, it was brought to the department's attention that sustainability criteria-compliant biofuel currently trades on international biofuel markets. Therefore it has been possible to test/validate the estimated biodiesel price impacts used in this impact assessment. Recent market data shows that RED compliant biodiesel is trading at a price premium of a similar magnitude to the central estimate (for 2012)

presented in this impact assessment. It has not been possible to obtain equivalent data for bioethanol prices.

Compliance Costs

49. When combined with future biofuel supply projections (which have been produced using the OECD FAO Aglink-Cosimo model – see annexes 6 and 7) the estimated biodiesel and bioethanol price impacts can be used to project the additional compliance costs attributable to implementation of the sustainability criteria for the RTFO as a whole. The estimated profile compliance costs (over the period to 2030) under each of the scenarios are presented in figure 12.

Figure 12: projected sustainability criteria compliance cost profile (£m, undiscounted, 2010 prices)

	Bioethanol	Biodiesel
2012	8.8	46.3
2013	6.5	35.8
2014	3.2	18.2
2015	0	0
2016	0	0
2017	15.6	113.2
2018	9.8	77.0
2019	4.6	38.8
2020	0	0
2021	0	0
2022	0	0
2023	0	0
2024	0	0
2025	0	0
2026	0	0
2027	0	0
2028	0	0
2029	0	0
2030	0	0

Cost Pass Through

50. All additional RTFO compliance costs are assumed to be passed through 100% from obligated fuel suppliers to final consumers of road transport fuel. The increased cost of supplying bioethanol is assumed to be passed through to petrol prices (as bioethanol is blended with petrol) and the increased cost of supplying biodiesel is assumed to be passed through to diesel pump prices. The estimated pump price impacts (inclusive of additional VAT) for petrol and diesel are outlined in figure 13.

Figure 13: Projected pump price impacts of minimum sustainability criteria under central cost scenario (pence per litre, 2010 prices, undiscounted)

	Petrol	Diesel
2012	0.05	0.19
2013	0.04	0.14
2014	0.02	0.07
2015	0	0
2016	0	0
2017	0.11	0.42
2018	0.07	0.28
2019	0.04	0.14
2020	0	0
2021	0	0
2022	0	0
2023	0	0
2024	0	0
2025	0	0
2026	0	0
2027	0	0
2028	0	0
2029	0	0
2030	0	0

51. Projected pump price impacts, which are driven by the assumed increase in biofuel prices, peak in 2017 at around 0.4 pence per litre (including VAT) for diesel and 0.1 pence per litre for petrol including VAT

Benefits

52. Implementation of the minimum sustainability criteria is expected to deliver benefits through:

    - Improved lifecycle GHG savings from biofuels supplied under the RTFO
    - Improved biodiversity outcomes
    - Reduced depletion of high carbon stock land

53. Of these three impacts it has only been possible to quantify estimated improvements in lifecycle GHG savings from biofuels supplied under the RTFO.

54. The sustainability criteria would be expected to increase the level of GHG savings delivered by biofuels supplied in the UK. This benefit can be monetised using Department of Energy and Climate Change carbon values.

55. To estimate the quantity of net carbon saved through sustainability criteria, a baseline of existing GHG savings must first be established. Figures 6 and 7 show the projected baseline (i.e. the RTFO without sustainability criteria enforced) profile of future GHG emissions for bioethanol and biodiesel supplied under the RTFO.

56. The analysis proceeds by estimating what the difference in total GHG savings would be if all biofuels with GHG savings below the minimum threshold were raised to meet the minimum GHG saving requirement (biofuel supplied in the baseline with GHG savings above the minimum threshold are assumed to remain unchanged). Potential GHG savings in excess of the minimum (which may occur as a result of the sustainability criteria) have not been assessed.

Figure 14: GHG savings delivered by sustainability criteria (central baseline scenario), 2011 – 2030

	MtCO2e Saved	
	Bioethanol	**Biodiesel**
2012	0.07	0.34
2013	0.08	0.39
2014	0.07	0.40
2015	0.07	0.41
2016	0.07	0.41
2017	0.13	0.98
2018	0.13	0.99
2019	0.13	1.00
2020	0.12	1.01
2021	0.12	1.01
2022	0.12	1.01
2023	0.12	1.02
2024	0.12	1.02
2025	0.12	1.03
2026	0.12	1.03
2027	0.11	1.04
2028	0.11	1.04
2029	0.11	1.05
2030	0.11	1.05

57. These carbon savings are then priced at the non-traded and traded carbon values accordingly (see annex 8 for a more detailed description of the GHG accounting methodology). Under this approach 16.2 MTCO2e (over the period 2012 to 2030) of net GHG savings are estimated to take place in the non-traded sector (e.g. UK agriculture) and 2.6 MTCO2e are attributed to the traded sector (e.g. UK industry and rest of world industry/agriculture). The resulting valuations of total carbon saving benefits are as follows:

Figure 15: Value of tCO2e saved (central carbon prices), 2010 prices (undiscounted)

	Value of tCO2e Saved, £2010	
	Bioethanol	**Biodiesel**
2012	3.4	16.3
2013	3.7	18.8
2014	3.6	19.6
2015	3.5	20.3
2016	3.4	20.9
2017	6.9	50.3
2018	6.8	51.6
2019	6.7	53.0
2020	6.6	54.3
2021	6.8	55.8
2022	6.9	57.8
2023	7.0	59.7
2024	7.1	61.7
2025	7.3	63.8
2026	7.4	65.7
2027	7.5	67.7
2028	7.6	69.6
2029	7.7	71.5
2030	7.8	73.4

58. The above analysis monetises the estimate of the potential direct GHG savings due to the minimum GHG savings element of the sustainability criteria. Potential benefits of the remaining element of the sustainability criteria - the land-based criteria - would include avoided GHG emissions and improved biodiversity outcomes. However, there is at present no clear consensus or data regarding how such benefits should be accurately quantified or monetised.

Summary of Costs and Benefits

59. The costs and benefits associated with the administration and verification of the sustainability criteria have been assessed separately in an accompanying impact assessment; they are therefore not discussed here.

60. The above analysis is summarised in figure 16.

Figure 16: Summary table of costs and benefits of sustainability criteria

2010 prices Discounted to 2011	**Low**	**Central**	**High**
Costs			
PV: Increased Fuel Prices (£m)	105.9	318.1	809.0
Average Annual Costs, 2011-2031 (£m/yr)	6.9	21.0	55.2
Benefits			
PV: Increased GHG Savings (£m)	1738.9	720.4	187.8
Average Annual Benefits, 2011-2031 (£m/yr)	142.0	59.4	15.6
Net Present Value (£m)	1633.0	402.3	-621.2
Max ppl impact (inc VAT) in 2017 - Petrol	0.06	0.07	0.11
Max ppl impact (inc VAT) in 2017 - Diesel	0.21	0.42	0.63

61. The maximum potential costs of supplying biofuel (and therefore also the sustainability criteria) are effectively capped by the RTFO buy-out price which is currently set at £0.30/litre. Therefore, the sustainability criteria are not expected to become prohibitively expensive in terms of pump price impacts, since the buyout price effectively caps the level of potential pump price impacts of biofuels policy.

62. Given the competitive nature of the fuel market, costs to suppliers of higher biofuel prices are expected to be passed through to the consumer at the pump. Therefore the impact of higher biofuel prices would fall to firms and consumers based on the proportion of petrol and diesel they account for.

63. The above analysis does not monetise all the potential benefits of the sustainability criteria. In particular, the potential benefits of the land-based criteria would include avoided GHG emissions and improved biodiversity outcomes. However, there is at present no clear consensus or data regarding how such benefits should be accurately quantified or monetised.

Risks and assumptions

64. The main areas of uncertainty in the preceding cost-benefit analysis are (1) the biofuel price uplift and (2) the price adjustment phase (i.e. the period of time taken for prices to adjust back down to trend following introduction of the criteria).

65. Biofuel price uplifts resulting from the sustainability criteria are explored using low, central and high scenarios. This provides a sensitivity analysis for the total estimated cost of sustainability criteria and the length of the price adjustment phase (i.e. the length of time it takes the biofuel price to return to trend following introduction of the sustainability criteria). The actual marginal increase in biofuel prices would be affected by a wide range of interacting factors, including: global agricultural supply and demand for a variety of biofuel feedstocks; the technological potential for various feedstocks to deliver higher GHG savings; the market response in terms of the composition of fuel supplied; costs associated with increasing GHG savings delivered by various feedstocks; the availability of capital

investment to deliver improvements to biofuel production facilities; the mix of feedstocks used in blending bioethanol and biodiesel; etc.

66. Along with the assumptions explained in the costs section of this impact assessment, other assumptions have been adopted in producing this analysis. These are the following:

67. Oil prices are sourced from DECC fossil fuel price projections.

68. No new biofuel installations from 2018 – this is a simplifying assumption, as it is not possible to quantify what percentage biofuels would actually be supplied from such installations. The higher GHG target for post-2018 installations could also represent an incentive for installations to be built prior to 2018.

69. No pre-23/01/08 installations – also a simplifying assumption, required as the availability of data on the exact age of installations is constrained and it would be unclear what percentage of biofuel might be expected to supplied by such installations in future years. These installations are assumed to have been preparing for the 35% target as the allowance for pre-23/01/08 installations only applies to April 2013 and several may already deliver at least 35% GHG savings.

70. Any additional benefits from criteria barring the use of biofuels grown on areas with high biodiversity / carbon stocks – the benefits of this part of the sustainability criteria have not been explicitly monetised, because there is at present no clear consensus or data regarding how such benefits should be accurately quantified or monetised. In addition, increasing GHG savings by sourcing sustainability criteria-compliant biofuels could at the same time divert biofuel demand away from areas of high biodiversity / carbon stocks. This could occur if biofuel produced on land that has changed its land use category has to undergo a full before-and-after carbon stock assessment, which could lead to the fuel not passing the minimum GHG saving threshold. The costs of meeting all elements of the sustainability criteria are included in the scenarios for price increases. Also the exact definition of one of the major “areas with high biodiversity” – highly biodiverse grasslands, has yet to be determined by the European Commission.

Administrative burden and policy savings calculations

71. The second impact assessment out of the suite of five final stage impact assessments in this joint impact assessment addresses administrative costs of verifying compliance with the sustainability criteria. While a system of verification is necessary in order to enforce the sustainability criteria, there are a number of options as to how it could be implemented. Therefore a separate impact assessment is dedicated to comparing these options.

72. There may also be minimal additional search costs in securing new supplies of biofuel which meet the requirements of the sustainability criteria. These have not been quantified.

Wider impacts

73. Biofuels could potentially deliver lower GHG savings than currently reported if Indirect Land Use Change (ILUC) impacts were found to be negative. These could arise from the displacement by biofuel feedstocks of other agricultural products onto non-agricultural land. However, currently the impacts are not sufficiently well quantified or understood to be able to be incorporated into GHG calculations. How any particular policy response regarding ILUC would affect the current sustainability criteria also remains unknown. There is a review clause in the RED for the European Commission to recommend how to address ILUC. Therefore, although recognised as an issue, ILUC impacts have had to be excluded from the present analysis of sustainability criteria.

74. A possible increase in biofuel prices is expected to feed through to pump prices, which could in turn marginally increase the cost of driving and reduce the demand for driving (and transport fuel). In turn, this could possibly lead to small ancillary impacts, including reduced congestion, air pollution, noise, road infrastructure and accidents. However, the likely relative magnitude of such effects is expected to be relatively small, particularly given the magnitude of the estimated pump price effects and compared with the fuel resource costs and GHG savings. The total monetisable costs and benefits would be almost entirely comprised of fuel resource costs and GHG savings, respectively.

75. The UK typically supplies biofuels that offer higher GHG savings than across the EU; according to RTFO data (around 90% of biofuel produced in the UK meets the current qualifying standard). Increased sustainability of biofuels supplied in the UK could incentivise greater UK production of biofuels, as fuel suppliers would be incentivised to use sustainability criteria-compliant biofuels, including those produced in the UK. This could lead to greater output and employment opportunities in agriculture and the production of more sustainability criteria-compliant biofuels. Sustainability criteria could potentially improve biodiversity outcomes in the UK and the rest of the world if biofuels with negative biodiversity impacts were disincentivised through the RTFO. However, there is no obvious or clear methodology for monetising any of these impacts, as the size of the potential benefits would be highly uncertain.

Summary and preferred option with description of implementation plan

76. Implementing the sustainability criteria as prescribed in the RED (1a) is the preferred option as it will increase GHG savings and improve the sustainability of biofuel supplied under the RTFO. The transposition of the sustainability criteria is compulsory under the RED and would be implemented via amending the RTFO to include their provision in legislation.

Annexes

Annex 1 should be used to set out the Post Implementation Review Plan as detailed below. Further annexes may be added where the Specific Impact Tests yield information 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. If the policy is subject to a sunset clause, the review should be carried out sufficiently early that any renewal or amendment to legislation can be enacted before the expiry date. 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 basis of the review could be statutory (forming part of the legislation), i.e. a sunset clause or a duty to review , or there could be a political commitment to review (PIR)]; A review of all the RTFO amendments proposed in this consultation exercise will be conducted in April 2014.
Review objective: [Is it intended as a proportionate check that regulation is operating as expected to tackle the problem of concern?; or as a wider exploration of the policy approach taken?; or as a link from policy objective to outcome?] The objective of the review will be to evaluate whether RTFO amendments are performing as intended.
Review approach and rationale: [e.g. describe here the review approach (in-depth evaluation, scope review of monitoring data, scan of stakeholder views, etc.) and the rationale that made choosing such an approach] The review will consist of an analysis of the impact of the RTFO amendments and will draw upon collected market data and stakeholder views.
Baseline: [The current (baseline) position against which the change introduced by the legislation can be measured] Sustainability and price data from biofuels markets unaffected by the minimum sustainability criteria will be used to form a baseline against which the impact of the minimum sustainability criteria can be evaluated.
Success criteria: [Criteria showing achievement of the policy objectives as set out in the final impact assessment; criteria for modifying or replacing the policy if it does not achieve its objectives] An improvement in the sustainability characteristics of the UK renewable transport energy supply without a large increase in costs.
Monitoring information arrangements: [Provide further details of the planned/existing arrangements in place that will allow a systematic collection systematic collection of monitoring information for future policy review] The RTFO administrator collects detailed data on RTFO performance.
Reasons for not planning a review: [If there is no plan to do a PIR please provide reasons here]

Annex 2 - Competition Assessment

77. The same set of sustainability criteria will apply equally to all biofuel suppliers. Setting minimum GHG savings for all biofuels will also help ensure a more even playing field by defining an agreed minimum market standard for biofuels. The introduction of sustainability criteria is anticipated by existing biofuel suppliers, and has been at least since the introduction of the Renewable Energy Directive in 2009, which includes provision for sustainability criteria.

78. There would also be likely to be an impact on those that are currently more reliant on those feedstocks that would not meet the criteria - costs could be higher for such suppliers as they adjust their supply practices. However, such costs would be capped by the RTFO buyout price, since if sourcing criteria-compliant feedstocks happened to cost more on a per litre basis than the buyout price, such companies would be expected to buy out.

Annex 3 - Small Firms Assessment

79. The RED sustainability criteria apply equally to all biofuel suppliers, and allow no exceptions. However, the way that the verification processes are structured potentially reduces the impact on these suppliers. The proposed legislative changes to the RTFO would require that verification (of meeting the sustainability criteria) is done to at least the ISAE3000 limited assurance standard, by a verifier who has the correct skills for the audit they are undertaking. Small suppliers of predominantly waste-derived biofuels may be able to utilise their independent accountant to verify that their product was derived from waste.

80. This will be relevant to many small firms, as to date biofuel producing SMEs have tended to supply biodiesel from used cooking oil, where the verification will be relatively straightforward (i.e. cross checking of volumes produced against waste transfer notes for UCO etc.). As such they will be able to use their accountants, which should be significantly cheaper than using a specialist audit company. Therefore the administrative costs of sustainability criteria are expected to be minimal.

81. In the UK, some 15.2% of biofuel supplied in 2009/2010 was supplied from wastes (RFA provisional 2009/10 data). As this is a biofuel that does not have to pass the high biodiversity and high carbon stock assessment, and many of the suppliers of such fuels are small, they may be expected to benefit to a greater extent than other suppliers. However, because these firms supply very low volumes of fuel, they make up a relatively small percentage of the overall supply of waste-derived biofuel.

Annex 4 - Rural Proofing Assessment

82. UK biofuel feedstocks have the potential to meet a proportion of UK biofuel demand, and some deliver relatively higher GHG savings than feedstocks from other countries (above the minimum GHG savings thresholds). There is also a lower potential for UK biofuel feedstock to be sourced from areas of high carbon stock or biodiversity relative to other countries.

83. Therefore, the proposed sustainability criteria may potentially encourage demand for UK feedstock-derived biofuels, meaning some new business and job opportunities in rural areas as part of an expanding UK biofuel supply chain.

Annex 5 - Sustainable Development

84. The addition of sustainability criteria for biofuels will help ensure that the increase in the use of biofuels in transport delivers carbon reductions and helps tackle climate change. In addition, the restrictions on feedstocks that have been directly grown on land with high carbon stocks and/or high biodiversity will contribute more widely to sustainable development (although these impacts have not been quantified).

Annex 6 - Aglink-Cosimo Global Agricultural Model

85. The biofuel prices that are assumed in the analysis are derived from outputs produced by the OECD-FAO Aglink-Cosimo model. The OECD-FAO Aglink-Cosimo model is a partial equilibrium agricultural commodities model that has a biofuels module attached to it. The biofuels component of the model is focused on four major economic centres: the EU27 group, the USA, Canada, and Brazil. Other important economic areas also enter the modelling, however, including Indonesia, Thailand, Argentina, and China. This gives good coverage of biofuel production: these areas accounted for 95% of world ethanol production and 82% of world biodiesel production in 2007.

86. The model operates by taking a bottom up approach to estimating ethanol and biodiesel prices. Net cost production functions take into account feedstock prices, production costs, revenues from by-products and capital costs. These net cost functions interact with demand functions that are defined by mandates and the price of fossil fuel substitutes. This market clearing price mechanism operates in terms of a global market, taking into account prevailing restrictions on international trade.

87. The OECD-FAO Aglink-Cosimo model was used to generate ethanol and biodiesel price outputs under different EU27 biofuel mandates against a baseline level of demand from other key economic regions. Each run of the model generated one mandate/price output scenario that was interpreted as an individual point on a EU27 consumption supply curve. This process was repeated over a variety of oil price and agricultural yield scenarios in order to give a range of possible biofuel costs and prices. These supply curves were then used to estimate the price of ethanol and biodiesel assuming that the UK is a price taker in the EU27 market. The steps involved in this methodology are set out more fully below.

88. The OECD-FAO Aglink-Cosimo baseline that was used for the preparation of the 2008 OECD outlook paper was taken as the starting point, but it was necessary to make a few adjustments to the assumptions to create a suitable baseline for this analysis. The most important update was issued to include up to date assumptions on mandates in the major economic centres. The US demand side included the Energy Independence and Security Act (EISA). The Brazilian mandate on biodiesel was included, and the Brazilian tax incentives that stimulate the production of ethanol were kept in line with OECD estimates. The much smaller Canadian targets of a 5% ethanol blend and a 2% biodiesel blend by 2010 are also built into the baseline. Exchange rates used are in accordance with those assumed for DECC fossil fuel price projections.

89. This produces sets of prices for both ethanol and biodiesel on a pence per litre basis that were fed into the cost benefit analysis under the UK uptake assumptions that were outlined previously in the section on counterfactuals. This assumes that the UK is a price taker, where the obligation level in the UK has no influence on the price of ethanol or biodiesel that is found in the EU.

Annex 7 – Data Tables

90. The following input data assumptions were used in the cost benefit analysis modelling.

Figure 20: Carbon Price projections (£/tCO2e, 2010 prices)

	low		central		high	
	traded	non-traded	traded	non-traded	traded	non-traded
2012	8	27	14	53	18	80
2013	8	27	15	54	19	81
2014	8	27	15	55	19	82
2015	8	28	15	56	19	84
2016	8	28	15	57	19	85
2017	8	29	16	57	20	86
2018	8	29	16	58	20	87
2019	8	30	16	59	20	89
2020	8	30	16	60	21	90
2021	11	31	22	61	29	92
2022	14	31	27	62	38	93
2023	16	32	32	63	46	95
2024	19	32	38	64	54	96
2025	22	33	43	65	63	98
2026	24	33	49	66	71	99
2027	27	34	54	67	80	101
2028	30	34	59	68	88	102
2029	32	35	65	69	97	104
2030	35	35	70	70	105	105

Source: DECC

Figure 21: Biofuel Price Projections (pence per litre, 2010 projections)

	biodiesel	bioethanol
2012	70	48
2013	71	50
2014	70	51
2015	70	51
2016	70	49
2017	70	47
2018	70	46
2019	70	45
2020	72	44
2021	72	44
2022	72	44

2023	72	44
2024	72	44
2025	72	44
2026	72	44
2027	72	44
2028	72	44
2029	72	44
2030	72	44

Source: OECD FAO Aglink-Cosimo model

Figure 22: Petrol/Diesel split

	diesel	petrol
2012	61.0%	39.0%
2013	62.6%	37.4%
2014	64.2%	35.8%
2015	65.7%	34.3%
2016	67.0%	33.0%
2017	68.1%	31.9%
2018	69.0%	31.0%
2019	69.9%	30.1%
2020	70.6%	29.4%
2021	70.5%	29.5%
2022	71.0%	29.0%
2023	71.4%	28.6%
2024	71.7%	28.3%
2025	72.0%	28.0%
2026	72.3%	27.7%
2027	72.6%	27.4%
2028	72.9%	27.1%
2029	73.2%	26.8%
2030	73.4%	26.6%

Source: DfT National Transport Model

Figure 23 : Total Road Transport Fuel Demand (billion litres)

	diesel	petrol
2012	29.4	20.4
2013	30.2	19.5
2014	31.1	18.7
2015	31.6	17.9
2016	32.1	17.1
2017	32.5	16.5
2018	32.9	16.0
2019	33.3	15.5
2020	33.6	15.1
2021	33.5	15.2
2022	33.7	14.9
2023	33.9	14.7
2024	34.1	14.6

2025	34.3	14.4
2026	34.5	14.3
2027	34.6	14.1
2028	34.7	14.0
2029	34.9	13.9
2030	35.0	13.7

Source: Based on DECC UEP and DfT NTM modelling

Figure 24: RTFO Biofuel Demand (billion litres)

	biodiesel	bioethanol
2012	1.3	0.9
2013	1.5	1.0
2014	1.6	0.9
2015	1.6	0.9
2016	1.6	0.9
2017	1.6	0.8
2018	1.6	0.8
2019	1.7	0.8
2020	1.7	0.8
2021	1.7	0.8
2022	1.7	0.7
2023	1.7	0.7
2024	1.7	0.7
2025	1.7	0.7
2026	1.7	0.7
2027	1.7	0.7
2028	1.7	0.7
2029	1.7	0.7
2030	1.7	0.7

Source: Based on DECC UEP and DfT NTM modelling

Annex 8 — GHG accounting methodology

91. In order to monetise the net change in lifecycle GHG emissions which are projected to occur under a GHG savings obligation, GHG savings and emissions have been split into various sectors and valued at the relevant carbon price. The monetised value of GHG emissions is subtracted from the value of GHG savings to produce a value for lifecycle GHG savings.

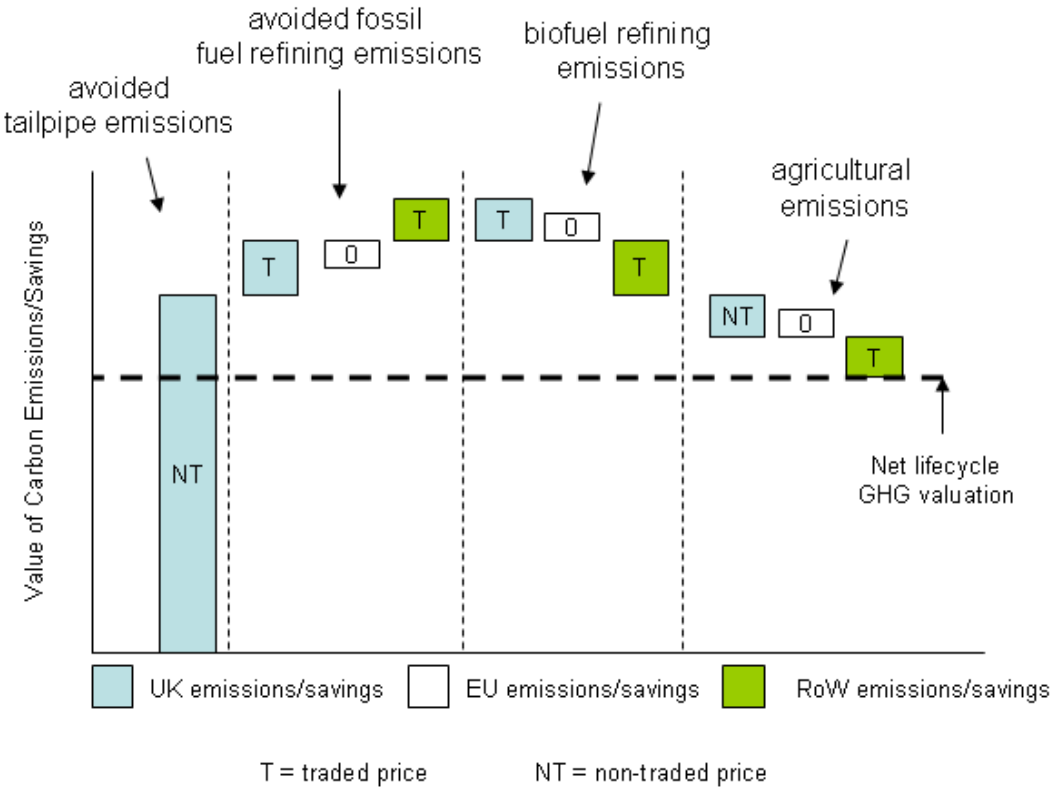
Figure 25: Allocation of GHG savings/emissions to carbon prices

	UK	EU	RoW
Tailpipe	non-traded	n/a	n/a
Industry	traded	zero	traded
Agriculture	non-traded	zero	traded

92. Geographically, emissions/savings have been split into the UK, the EU (ex-UK) and rest of the world. From a sectoral point of view, GHG emissions savings have been split into i) tailpipe savings from displaced fossil fuel (non-traded sector carbon price used); ii) industry

savings from lower emissions due to less fossil fuel refining (carbon price location dependent); industry emissions from biofuel refining (carbon price location dependent); and iv) agricultural emissions from feedstock production (carbon price location dependent). The allocation of savings/emissions to carbon price is summarised in figure 26.

Figure 26: Graphical Illustration of GHG accounting methodology



93. UK transport sector (tailpipe) and agricultural emissions are valued using the non-traded sector carbon price in line with cross-government GHG guidance[1]. There are no tailpipe emissions in the EU (ex-UK) or the rest of the world as this is a UK policy. EU (ex-UK) emissions/savings have not been valued as any change is assumed to be offset under individual member states' carbon reduction schemes and the EU ETS. Emissions/savings in the rest of the world are valued at the traded price in line with cross-government GHG guidance.

Annex 10 — OIOO ('one in one out')

94. This measure is from a European origin and therefore it does not fall within the scope of OIOO.

[1] http://www.decc.gov.uk/assets/decc/statistics/analysis_group/122-valuationenergyuseggemissions.pdf

Regulatory Policy Committee	**OPINION**	
Impact Assessment (IA)	Amendments to the Renewable Transport Fuel Obligation for Compliance with the Renewable Energy Directive – Minimum Sustainability Criteria	
Lead Department/Agency	Department for Transport	
Stage	Final	
Origin	European	
Date submitted to RPC	08/08/2011	
RPC Opinion date and reference	29/09/2011	RPC11-DfT-0672(2)
Overall Assessment	**AMBER**	

The IA is fit for purpose. The IA appears to have identified and assessed the relevant costs and benefits of this proposal and has, where possible, also provided monetised estimates as to their impacts. However, the IA should have provided more evidence in support of the assumptions that underpin the calculation of the costs and benefits, in particular the assumptions regarding the length of time it will take biofuel prices to return to trend.

We accept that the estimates in the IA, although they appear reasonable, are inherently uncertain due to the difficulty in estimating the future renewable fuel market. The Department should endeavour to evaluate their estimates as soon as practicable in the form of a PIR.

Identification of costs and benefits, and the impacts on small firms, public and third sector organisations, individuals and community groups and reflection of these in the choice of options

Assumptions Underpinning the Cost Benefit Analysis. The IA assumes that the spike in the price of biofuel that results from the implementation of this proposal will return to trend within 3 years. Only limited evidence is provided to support this assumption (although the IA does model 1.5 and 6 years). The IA should provide more evidence and analysis that this is an appropriate best estimate, especially as this factor plays a significant role in determining the actual costs to business.

Familiarisation Costs to Business. The IA says there will be additional familiarisation costs to business as a result of the revised regulatory regime and implementing internal processes to ensure compliance, but does not attempt to monetise these costs. It is unclear why these costs cannot be monetised, particularly at this stage of the policy making process. The IA should at least provide a more in depth qualitative discussion on the likely scale of these costs and how they will affect the relevant businesses.

Uncertainty in the renewable fuel market. Although the estimates in the IA appear reasonable in their calculation, the IA accepts that, given the complexity of the proposal and the inherent uncertainty involved in predicting the future price and performance of fuel markets, the estimates should be read with a certain degree of caution. The proposal would therefore benefit from relatively early evaluation to determine if the cost and benefit estimates need to be revised.

Have the necessary burden reductions required by One-in, One-out been identified and are they robust?

As this proposal is of European origin, with no evidence of going beyond minimum requirements, it is out of scope of One-in, One-out.

Signed  **Michael Gibbons,** Chairman