

Title: Amendments to the Renewable Transport Fuel Obligation for compliance with the Renewable Energy Directive - (3) Non-Road Mobile Machinery (NRMM) Lead department or agency: Department for Transport (DfT) Other departments or agencies:	Impact Assessment (IA)
	IA No: DFT00051
	Date: 10/03/2011
	Stage: Consultation
	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). Incoming low sulphur regulations for NRMM fuel mean that downgraded road diesel (containing biodiesel) may be supplied for NRMM uses. The UK is also required to decarbonise NRMM fuel by the Fuel Quality Directive (FQD).	
What are the policy objectives and the intended effects? This impact assessment looks at options around inclusion of non road mobile machinery (NRMM) fuel in the Renewable Transport Fuel Obligation (RTFO) to meet the requirements of the FQD. The objective is to cover NRMM fuel in a cost effective manner taking into account the impacts of incoming low sulphur regulations for NRMM fuel also required by the FQD.	
What policy options have been considered? Please justify preferred option (further details in Evidence Base) This impact assessment is the third in a set of seven impact assessments considering amendments to the RTFO. It considers options for obligating NRMM under the RTFO in the UK. The policy options are: 3a) Same 2014 RTFO target of 5% biofuel (by volume) in fuel supplied; obligation and certification applied to both road and NRMM fuels. 3b) NRMM-adjusted 2014 RTFO target of ~4.75% biofuel (by volume) in fuel supplied; obligation and certification applied to both road and NRMM fuels. 3c) Same 2014 RTFO target of 5% biofuel (by volume) in fuel supplied; obligation stays on road fuel only and certification applied to both road and NRMM fuels. Option 3b is the preferred option since this will obligate NRMM in the RTFO thus covering the FQD requirements, but without increasing the overall amount of biofuel supplied while there are still concerns over sustainability.	
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 04/2014
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 Minister:  Date: 17/02/2011.....

Summary: Analysis and Evidence

Policy Option 1

Description:

3a) Same 2014 RTFO target of 5% biofuel (by volume) in fuel supplied; obligation and certification applied to both road and NRMM fuels.

Price Base Year 2010	PV Base Year 2010	Time Period Years 20	Net Benefit (Present Value (PV)) (£m)		
			Low: £27m	High: -£459m	Best Estimate: -£256m

COSTS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)	
Low	£37m	1	£15m	£304m
High	£37m		£30m	£569m
Best Estimate	£37m		£24m	£475m

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

£436m of additional costs due to increased biofuel supply and £37m transition costs of using biofuel in NRMM (i.e. new tanks, tank cleaning, engine modifications). Additional admin costs (due to an increase in the number of obligated suppliers) of £1.4m have also been estimated. The additional cost of supplying biofuel and admin costs will be borne by fuel suppliers and are assumed to be passed through 100% to final fuel consumers. Transition costs will be borne by both NRMM fuel consumers and fuel suppliers.

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

BENEFITS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Benefit (Present Value)	
Low	0		£18m	£330m
High	0		£6m	£110m
Best Estimate	0		£12m	£219m

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

£289m monetised GHG savings due to increased biofuel deployment.

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

Potential GHG savings and other ancillary benefits (i.e. air quality) from reduced demand for NRMM fuel (due to higher pump prices).

Key assumptions/sensitivities/risks

Discount rate (%) 3.5%

The main assumptions are carbon prices and biodiesel resource costs - these are subject to sensitivity analysis. Other assumptions include oil prices, fuel demand, rate of cost pass through, and marginal GHG savings per litre of biodiesel.

GHG savings calculations do not include potential emissions from indirect land use change. This is thought to be of particular significance for biodiesel (which would be used in NRMM) feedstocks.

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

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?		RTFO administrator			
What is the annual change in enforcement cost (£m)?		£0m			
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: 0.7		Non-traded: -5.3	
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	
Annual cost (£m) per organisation (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 duties¹ Statutory Equality Duties Impact Test guidance	No	
Economic impacts		
Competition Competition Assessment Impact Test guidance	Yes	27
Small firms Small Firms Impact Test guidance	Yes	28
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	28
Sustainable development Sustainable Development Impact Test guidance	Yes	28

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

Description:

3b) NRMM-adjusted 2014 RTFO target of ~4.75% biofuel (by volume) in fuel supplied; obligation and certification applied to both road and NRMM fuels.

Price Base Year 2010	PV Base Year 2010	Time Period Years 20	Net Benefit (Present Value (PV)) (£m)		
			Low: -£59m	High: £100m	Best Estimate: £34m

COSTS (£m)	Total Transition (Constant Price) Years		Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low	£37m	1	-£5m	-£51m
High	£37m		-£10m	-£136m
Best Estimate	£37m		-£8m	-£107m

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

£145m of cost savings due to decreased biofuel supply and £37m transition costs of using biofuel in NRMM (i.e. new tanks, tank cleaning, engine modifications). Additional admin costs (due to an increase in the number of obligated suppliers) of £1.4m have also been estimated. Additional admin costs and biofuel cost savings will be felt by fuel suppliers and are assumed to be passed through 100% to final fuel consumers. Transition costs will be borne by both NRMM fuel consumers and fuel suppliers.

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

BENEFITS (£m)	Total Transition (Constant Price) Years		Average Annual (excl. Transition) (Constant Price)	Total Benefit (Present Value)
Low	n/a	0	-£6m	-£110m
High	n/a		-£2m	-£37m
Best Estimate	n/a		-£4m	-£73m

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

-£73m monetised GHG savings (i.e. an increase in GHG emissions) due to decreased biofuel deployment.

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

Potential GHG savings and other ancillary benefits (i.e. air quality) from reduced demand for NRMM fuel (due to higher pump prices).

Key assumptions/sensitivities/risks

Discount rate (%) 3.5%

The main assumptions are carbon prices and biodiesel resource costs - these are subject to sensitivity analysis. Other assumptions include oil prices, fuel demand, rate of cost pass through, and marginal GHG savings per litre of biodiesel.

GHG savings calculations do not include potential emissions from indirect land use change. This is thought to be of particular significance for biodiesel (which would be used in NRMM) feedstocks.

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

Enforcement, Implementation and Wider Impacts

What is the geographic coverage of the policy/option?	United Kingdom				
From what date will the policy be implemented?	01/10/2011				
Which organisation(s) will enforce the policy?	RTFO administrator				
What is the annual change in enforcement cost (£m)?	£0m				
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: 0.2		Non-traded: -1.8		
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		
Annual cost (£m) per organisation (excl. Transition) (Constant Price)	Micro	< 20	Small	Medium	Large
Are any of these organisations exempt?	No	No	No	No	No

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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.

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Economic impacts		
Competition Competition Assessment Impact Test guidance	Yes	27
Small firms Small Firms Impact Test guidance	Yes	28
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	28
Sustainable development Sustainable Development Impact Test guidance	Yes	28

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

Description:

3c) Same 2014 RTFO target of 5% biofuel (by volume) in fuel supplied; obligation stays on road fuel only and certification applied to both road and NRMM fuels.

Price Base Year 2010	PV Base Year 2010	Time Period Years 20	Net Benefit (Present Value (PV)) (£m)		
			Low: -£21m	High: £140m	Best Estimate: £73m

COSTS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low	£0m	-£5m	-£89m
High	£0m	-£10m	-£176m
Best Estimate	£0m	-£8m	-£145m

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

£145m of cost savings due to decreased biofuel supply. The cost savings from supplying less biofuel will benefit fuel suppliers and are assumed to be passed through 100% to final fuel consumers.

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

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BENEFITS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Benefit (Present Value)
Low	n/a	-£6m	-£110m
High	n/a	-£2m	-£37m
Best Estimate	n/a	-£4m	-£73m

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

-£73m monetised GHG savings (i.e. an increase in GHG emissions) due to decreased biofuel deployment.

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

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Key assumptions/sensitivities/risks	Discount rate (%)	3.5%
Main assumptions are carbon prices and biodiesel resource costs - these are subject to sensitivity analysis. Other assumptions include oil prices, fuel demand, rate of cost pass through, and marginal GHG savings per litre of biodiesel.		
GHG savings calculations do not include potential emissions from indirect land use change. This is thought to be of particular significance for biodiesel (which would be used in NRMM) feedstocks.		
This option might make it difficult to deliver GHG savings in NRMM which are required by the FQD.		

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

Enforcement, Implementation and Wider Impacts

What is the geographic coverage of the policy/option?		United Kingdom			
From what date will the policy be implemented?		01/10/2011			
Which organisation(s) will enforce the policy?		RTFO administrator			
What is the annual change in enforcement cost (£m)?		£0m			
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: 0.2		Non-traded: -1.8	
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	
Annual cost (£m) per organisation (excl. Transition) (Constant Price)	Micro	< 20	Small	Medium	Large
Are any of these organisations exempt?	No	No	No	No	No

Specific Impact Tests: Checklist

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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	28
Sustainable development Sustainable Development Impact Test guidance	Yes	28

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	Digest of UK Energy Statistics (DUKES): http://www.decc.gov.uk/en/content/cms/statistics/publications/dukes/dukes.aspx
2	LowCVP / Fivebargate Report for the RFA on the Impacts of the RTFO on UK business: http://www.renewablefuelsagency.gov.uk/sites/rfa/files/_documents/Impacts_of_the_RTFO_on_UK_business_-_AEA_for_RFA.pdf
3	UK Renewable Energy Strategy 2009: Impact Assessment for the Transport Sector: http://www.decc.gov.uk/assets/decc/What%20we%20do/UK%20energy%20supply/Energy%20mix/Renewable%20Energy/Renewable%20Energy%20Strategy/1_20090715120318_e_@@_UKRenewableEnergyStrategy2009IAfortheTransportSectorURN09D684.pdf
4	DfT Consultation Impact Assessment for the draft Motor Fuel Regulations 2010 http://www.dft.gov.uk/consultations/closed/2010-26/annexb.doc
5	Committee on Climate Change website – transport sector: http://www.theccc.org.uk/sectors/surface-transport
6	Climate Change Act 2008: http://www.legislation.gov.uk/ukpga/2008/27/contents
7	The Renewable Transport Fuel Obligations (Amendment) Order 2009: http://www.legislation.gov.uk/ukxi/2009/843/contents/made
8	DECC IAG Carbon Prices (Table 3): http://www.decc.gov.uk/assets/decc/Statistics/analysis_group/81-iag-toolkit-tables-1-29.xls
9	DECC Oil Price Projections (2008 prices) and Energy and Emissions Projections July 2010 (UEP): http://decc.gov.uk/en/content/cms/statistics/projections/projections.aspx
10	EU Fuel Quality Directive: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:140:0088:0113:EN:PDF

+ 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										
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* 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 current biofuels obligations in order for the UK to be compliant. These are being consulted on and are described in full in the accompanying consultation document.
2. This Impact Assessment (IA) is one of seven consultation stage impact assessments and is to be considered alongside the consultation document. It focuses on the possible expansion in scope of the current Renewable Transport Fuel Obligation (RTFO) (which currently only obligates fuels used for road transport purposes) to include fuel supplied for the non-road uses that are obligated under the Fuel Quality Directive.
3. The suite of 7 impact assessments is:
 - i) Sustainability Criteria
 - ii) Verification
 - iii) Non-Road Mobile Machinery
 - iv) Minimum Obligation Threshold
 - v) Double-Certification of Waste-Derived Biofuels
 - vi) Buyout Recycling
 - vii) Partially Renewable Fuels
4. This IA examines three options, against a 'do nothing' baseline, for expanding the scope of the RTFO to cover fuel used in non-road mobile machinery (including rail and inland waterways), agricultural and forestry tractors and recreational craft when not at sea. Throughout this document, these end uses are collectively referred to as NRMM for simplicity.
5. 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 three policy options for expanding the scope of the RTFO are described and the methodology for analysing the costs and benefits of each 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.
6. There are significant uncertainties in the analysis presented, not only because of the long timeframe considered (to 2030) but also in terms of 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 be illustrative only. This is a consultation stage IA only, therefore, if consultees have any additional evidence and analysis that they consider would improve the assessment presented here, they are invited to provide it in response to the consultation.

Problem under consideration

7. 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). We also have a renewable energy target which is for 15% of UK energy to be supplied from renewable sources by 2020, with a transport-specific target of 10% (Directive 2009/28/EC).
8. 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.
9. This impact assessment looks specifically at options around the inclusion of biofuel supplied for NRMM uses in the RTFO.

Rationale for intervention

10. The RTFO currently places an obligation on suppliers of petrol and diesel used for road transport purposes to supply a certain proportion of the total volume of fuel they supply as biofuel.
11. In Article 3(4) the RED counts petrol, diesel and electricity used in all forms of transport and biofuel uses in road and rail towards the amount of which a member state must ensure 10% comes from renewable energy. It allows all forms of renewable energy in all forms of transport to count towards this 10%.
12. Article 7a of the FQD requires fuel suppliers to reduce the GHG emissions of fuel supplied for use in road vehicles, non-road mobile machinery (including inland waterway vessels when not at sea), agricultural and forestry tractors, and recreational craft when not at sea.
13. In addition to the requirements on renewable energy and GHG savings from transport fuels, on 1st January 2011 a requirement to provide sulphur free gas oil⁴ to the end uses that are listed in paragraph 12 above was introduced. It is understood that, due to practical constraints, a significant proportion of the fuels supplied to the non-road uses listed above will be supplied from diesel originally produced for road use. As such, this diesel is highly likely to already have biofuel blended into it. As fuel supplied to NRMM is not eligible to be counted towards the existing RTFO, this may represent a loss in potential revenue to those suppliers.
14. In order to ensure that the wider definition of fuels and end uses covered by the FQD (as compared to the RTFO) and to minimise lost revenue to suppliers, we are proposing to expand the RTFO to obligate all petrol, diesel and gas oil used in the end uses covered by the

⁴Fuel Quality Directive 2009/30/EC

FQD and to make any type of liquid biofuel or bio-methane used in these end uses eligible for Renewable Transport Fuel Certificates (RTFCs).

Policy objective

15. The objectives of the policy options considered in this impact assessment are to ensure that the RTFO is aligned with the requirements of both the RED and the FQD and to ensure that the RTFO can efficiently accommodate the biofuel supply implications of incoming desulphurisation regulations for NRMM fuel.

Description of options considered (including do nothing)

16. Given that the RTFO is already in place, there are several options for making amendments to ensure that it addresses the impact of low sulphur regulations and the FQD on the NRMM fuels sector adequately and recognises the requirements of the FQD on the NRMM fuels sector. Each option has its own costs, benefits and impacts on the market which will be explored in this section.
17. All options considered in this impact assessment are assessed against a 'do nothing' baseline:

Baseline

18. The baseline describes what would happen in the absence of any policy change relating to the inclusion of NRMM fuel in the RTFO. There is considerable uncertainty over what this baseline would look like and, specifically, how fuel suppliers will adapt to incoming desulphurisation regulations for NRMM fuel. Fuel suppliers essentially have 3 separate options (each of these options involves a cost to the fuel supplier which are highlighted in bold):
- i) source low sulphur NRMM fuel from the road diesel fuel stream which has biodiesel blended with fossil diesel (**incur the cost of supplying biofuel to NRMM**)
 - ii) introduce a dedicated low sulphur NRMM fuel stream with no biofuel (**incur additional infrastructure costs**)
 - iii) cease supplying NRMM fuel (**loss of profits**)
19. In reality, a combination of these outcomes could occur. Discussions with industry have suggested a baseline scenario where 25% of NRMM fuel may be supplied blended with biodiesel (i) and the remaining 75% may be supplied through a separate dedicated NRMM fuel stream which has not been blended with biofuel (iii). This scenario has been taken as the baseline scenario for the following cost benefit analysis. **Consultee views are invited on the likely accuracy of this baseline scenario.**

Additional cost of supplying biofuel in the baseline

20. Under the baseline scenario an estimated 730 million litres of biodiesel is supplied to NRMM fuel at a cost of £145m (in net present value terms discounted to 2010) over the period 2012 to 2030. As biofuel supplied to NRMM is not currently counted towards the RTFO, obligated suppliers will not receive RTFCs which can be used to demonstrate compliance with their obligation. The additional cost of supplying this biofuel will therefore not be rewarded under the RTFO, resulting in a potential loss of revenue for fuel suppliers and higher costs for fuel consumers.

Cost pass-through in the baseline

21. It is not clear how the costs of supplying biofuel to NRMM will be passed through to final consumers in the baseline. Suppliers who supply NRMM fuel blended with biodiesel may not be able to pass-through the full cost of supplying biodiesel to NRMM consumers as competitors who have additional fuel streams in their production and distribution network (and therefore do not incur the additional cost of supplying biofuel) may constrain their ability to raise prices. In the following analysis the simplifying assumption has been made that on average half of the additional cost of supplying biofuel to NRMM is passed through to consumers. This means that the baseline pump price of NRMM fuel is expected to be around 0.2ppl (pence per litre) higher than it would be in absence of desulphurisation regulations.

Transition costs in the baseline

22. Introduction of biofuel to the NRMM fuel stream is expected to result in transition costs for NRMM operators. These include the costs of new tanks, tank cleaning and replacing engine filters (for a breakdown of transition cost estimates, please refer to annex 2). As 25% of NRMM fuel is expected to be blended with biofuel in the baseline, 25% of these costs are also attributed to the baseline. The net present value (discounted from 2012) of these transition costs is estimated to be £21.6m (see annex 2).

Admin costs

23. Inclusion of NRMM fuel in the RTFO is expected to result in 8 additional fuel suppliers becoming obligated. Being obligated under the RTFO imposes administrative burden as obligated suppliers are required to register with and report to the RTFO administrator⁵.

Policy Options

24. A number of options have been considered around how to account for fossil fuel and biofuel supplied to NRMM under the RTFO. The options for consideration are as follows:

⁵ This is currently the Renewable Fuels Agency (RFA) but the RFA is undergoing restructuring and may become part of the Department for Transport (DfT). See the consultation document for further information.

3a) Expand certification and obligation to cover fuel supplied for NRMM. Hold supply targets the same.

This would count biofuel being supplied in NRMM fuel towards an unchanged percentage target of a larger obligated fuel supply (now including fuel supplied to NRMM). Under this option the absolute volume of biofuel required by the RTFO would increase.

3b) Expand certification and obligation to cover fuel supplied for NRMM. Adjust supply targets to ensure the same volume of biofuel is supplied.

This would count biofuel being supplied in NRMM fuel towards an adjusted percentage target of a larger obligated fuel supply (now including NRMM). Annual obligation percentage targets would be adjusted downwards so that the total volume of biofuel supplied is the same as that which would have been supplied had the obligation not been expanded to include NRMM. Under this option the absolute volume of biofuel required by the RTFO would remain constant.

3c) Expand only certification to cover NRMM fuel. Keep obligation on road fuel only, not NRMM.

This would count biofuel being supplied in NRMM fuel towards an unchanged percentage target of an unchanged obligated fuel supply (i.e. while certificates would be awarded for biofuel blended into fuel for use in NRMM, there would be no obligation requiring biofuel to be blended into the NRMM fuel). Under this option the absolute volume of biofuel required by the RTFO would remain constant. This option might make it more difficult to deliver the GHG savings in NRMM which are required by the FQD.

Costs and benefits of each option

25. The following cost benefit analysis quantifies the following impacts for each policy option:
- the volume of biofuel supplied;
 - the cost of biofuel supplied;
 - lifecycle GHG savings;
 - monetised GHG savings;
 - NRMM pump price
 - transition costs of introducing biofuel into NRMM fuel
 - admin costs
26. Estimated changes in these variables are presented relative to the baseline scenario outlined in paragraphs 18 to 22. Quantified costs and benefits are presented in 2010 prices and future costs and benefits have been discounted into 2010 terms at the standard 3.5% government discount rate.

Results and sensitivities

Biofuel Supply/Transition Costs

27. For each option the additional cost of supplying biofuel and transition costs (relating to the inclusion of biodiesel in the NRMM supply – see annex 2) have been estimated.

Admin Costs

28. Inclusion of NRMM fuel in the RTFO is expected to result in 8 additional fuel suppliers⁶ becoming obligated. Being obligated under the RTFO imposes administrative burden as obligated suppliers are required to register with and report to the RTFO administrator. Admin costs are estimated to be around £12,000 per annum for a small supplier (with a high estimate of £24,000 and a low estimate of £6,000).⁷

Benefits

29. The primary benefit of the options considered is GHG savings. Where more biofuel is supplied, increased GHG savings create a monetised benefit (calculated using Department of Energy and Climate Change (DECC) carbon prices).
30. For each option the net change in lifecycle GHG emissions is presented along with the aggregated monetised value of estimated changes within the traded and non-traded sectors.

Sensitivities

31. For each option central, high and low overall cost (to society) scenarios have been presented capturing oil price and carbon price sensitivities (i.e. the high overall cost scenario is based on a low oil price, meaning that biofuels are relatively more expensive, and low carbon price projections, meaning that monetised GHG benefits are lower).

Option 3a

Costs

32. Under option 3a, NRMM fuel (including rail) would become obligated under the RTFO (in addition to road transport fuel which is obligated in the baseline). Certificates would be issued for biofuel supplied for NRMM use. The annual RTFO percentage biofuel blending targets would remain as currently legislated but the overall volume of biofuel supplied (across all sectors) would increase as the volume of fossil fuel obligated would increase.

⁶ Based on analysis using HMRC and RFA data.

⁷ Based on analysis by AEA and 5bargate for lowCVP and the RFA.

http://www.renewablefuelsagency.gov.uk/sites/rfa/files/documents/Impacts_of_the_RTFO_on_UK_business_-_AEA_for_RFA.pdf

33. Under this option NRMM fuel is assumed to be supplied from the same fuel stream as road diesel in all cases (which is assumed to be blended with biodiesel at a concentration set by the level of the RTFO target), i.e. NRMM fuel would be downgraded road diesel. Therefore, all NRMM fuel is assumed to contain the same percentage of biodiesel as road diesel as soon as the RTFO amendments come into force in late 2011. In the baseline, biodiesel (from the road diesel fuel stream) is assumed to be blended into 25% of NRMM fuel. Under this option the remaining 75% of NRMM fuel would also be blended with biofuel leading to a net increase in the supply of biofuel (relative to the baseline). Over the period 2012 to 2030 this leads to an additional estimated 2.2 billion litres of biodiesel being supplied to NRMM fuel at a cost of around £436m (in net present value terms discounted to 2010).
34. As (under this option) NRMM fuel is explicitly obligated under the RTFO it is assumed that the additional cost of supplying the biofuel required by the RTFO is passed through 100% to consumers of NRMM fuel as the market is competitive. This additional cost is therefore reflected in higher pump prices. The additional pump price impact (including VAT) for NRMM fuel is estimated to be around 1.7ppl⁸ in 2013/14 when the obligation peaks.
35. Including NRMM in the RTFO is expected to lead to 8 additional suppliers becoming obligated who would incur additional costs estimated to be £1.4m over the period to 2030.
36. As the biofuel supplied to NRMM increases by 75% under this option, the assumption has been made that 75% of the transition costs (of using biofuel in NRMM) are also attributed to this option (see annex 2 for more detail). These transition costs are valued at a net present value of £37m (discounted from 2012).

Benefits

37. The increase in the supply of biodiesel would cause a rise in estimated GHG savings⁹ relative to the baseline. Over the period 2012 to 2030, an estimated 3.1 MTCO₂e of additional GHG savings are estimated to be delivered. These are valued at a net present value of around £219m using central DECC carbon price values. The net benefit (i.e. the benefit to society net of costs) of this option is estimated to be -£256m (i.e. a net cost to society) over the period 2012 to 2030.
38. Additional potential benefits include GHG savings and other ancillary benefits (i.e. air quality) from reduced demand for NRMM fuel (due to higher pump prices). These have not been estimated or monetised due to a lack of data.

⁸ It is not clear how much of this cost would be passed through to NRMM consumers in the baseline, therefore this estimate should be thought of as a maximum additional increase (under the central fossil fuel / biofuel price scenario) over and above the baseline.

⁹ GHG savings are assumed to be the minimum permissible under the RED sustainability criteria (see the accompanying sustainability criteria impact assessment for more detail).

Cost Benefit Summary

Figure 1: Option 3a – Low, Central and High cost scenarios

		Low	Central	High
Costs				
biofuel costs	£m	266	436	529
transition costs	£m	37	37	37
admin costs	£m	0.7	1.4	2.7
Benefits				
lifecycle GHG savings	MTCO ₂ e	3.1	3.1	3.1
GHG savings	£m	330	219	110
Net Benefit				
net benefit	£m	27	-256	-459
Pump Price Impacts				
NRMM (2013)	ppl	1.0	1.7	2.0

Option 3b

39. Under option 3b, NRMM fuel (including rail) would be brought into the RTFO (in addition to road transport fuel), increasing the overall volume of obligated fossil fuel. Certificates would be issued for biofuel supplied for NRMM use (in addition to road transport fuel). The annual RTFO percentage biofuel blending targets would be adjusted downwards (to roughly 4.7%) so that the overall volume of biofuel required by the RTFO (across all sectors) would remain constant (relative to the baseline).
40. In the baseline, additional biofuel (over and above what is obligated under the RTFO) is supplied for NRMM use. This biofuel does not receive certificates and cannot be counted towards the obligation. Issuing certificates for biofuel supplied to NRMM whilst maintaining the absolute volume of fuel obligated under the RTFO is expected lead to a reduction in the overall volume of biofuel supplied relative to the baseline. This is because biofuel supplied to NRMM (which would previously not have counted towards the obligation) would now be counted against the obligation allowing suppliers to reduce the volume of biofuel supplied in other sectors whilst still meeting their obligation.
41. Under option 3b, it is estimated that (relative to the baseline), over the period 2012 to 2030, around 730 million fewer litres of biodiesel will be supplied. This avoided cost of supplying biofuel leads to savings which are estimated to have a net present value of £145m (discounted into 2010 terms).
42. Explicitly obligating NRMM fuel would impose additional costs on suppliers of NRMM fuel as they would now be required to supply biofuel under the RTFO. The increased cost of supplying biofuel to NRMM is assumed to be passed through 100% to NRMM fuel consumers. The additional pump price impact (including VAT), on top of the baseline, of supplying 4.7% biodiesel (the revised RTFO target in 2013/14 under this scenario) to NRMM fuel is estimated to be 1.6 ppl in 2013/14 when the RTFO peaks. The pump price impact of the RTFO on road transport fuel is expected to fall slightly as less biofuel will also be required to meet the obligation in those sectors.

43. Including NRMM in the RTFO is expected to lead to 8 additional suppliers becoming obligated who would incur additional costs estimated to be £1.4m over the period to 2030.
44. As the biofuel supplied to NRMM increases by 75% under this option, 75% of the transition costs (of using biofuel in NRMM) are also attributed to this option (see annex 2 for more detail). These transition costs are valued at a net present value of £37m (discounted from 2012).

Benefits

45. The decrease in the supply of biodiesel causes a fall in estimated GHG savings¹⁰ relative to the baseline. Over the period 2012 to 2030, 1 MTCO₂e fewer GHG savings are estimated to be delivered. These are valued at a net present value of -£73m using central DECC carbon price values. The net benefit (i.e. the benefit to society net of costs) of this option is estimated to be £34m over the period 2012 to 2030.
46. Additional potential benefits include GHG savings and other ancillary benefits (i.e. air quality) from reduced demand for NRMM fuel (due to higher pump prices). These have not been estimated or monetised due to a lack of data.

Cost Benefit Summary

Figure 2: Option 3b – Low, Central and High cost scenarios

		Low	Central	High
Costs				
biofuel costs	£m	-89	-145	-176
transition costs	£m	37	37	37
admin costs	£m	0.7	1.4	2.7
Benefits				
lifecycle GHG savings	MTCO ₂ e	-1.0	-1.0	-1.0
GHG savings	£m	-110	-73	-37
Net Benefit				
net benefit	£m	-59	34	100
Pump Price Impacts				
NRMM (2013)	ppl	0.9	1.6	1.9

Option 3c

47. Under option 3c, NRMM fuel would **not** be brought into the RTFO obligation (in addition to road transport fuel). Certification would be expanded to cover biofuel in NRMM fuel. Therefore suppliers would be able to claim RTFCs for biofuel supplied to NRMM (including rail). The annual RTFO percentage biofuel blending targets would remain as currently legislated.
48. Under this option, all NRMM fuel is assumed to be sourced from the same fuel stream as road diesel. This assumption is based on the fact that suppliers will now be able to gain RTFCs for biofuel supplied to NRMM and will have no financial incentive to invest in

¹⁰ GHG savings are assumed to be the minimum permissible under the RED sustainability criteria (see the accompanying sustainability criteria impact assessment for more detail).

additional non-biofuel low sulphur NRMM fuel streams. Consultees are invited to comment on the likely accuracy of this assumption.

49. As suppliers would be able to use biofuel supplied to NRMM to comply with their obligation under the RTFO, total biofuel supply (to NRMM and road transport) would be reduced by the volume of biodiesel supplied to NRMM in the baseline (which is not eligible to be counted against the obligation in the baseline). Therefore, over the period 2012 to 2030, around 730 million fewer litres of biodiesel will be supplied. This avoided cost of supplying biofuel leads to savings which are estimated to have a net present value of £145m (discounted into 2010 terms).
50. Under this option, no additional pump price impacts (due to the additional cost of supplying biofuel) are expected for NRMM fuel as it is not explicitly obligated under the RTFO. The burden of payment for the RTFO is expected to remain on road transport fuel users (as this fuel is obligated and NRMM fuel isn't).
51. Biofuel supplied to NRMM is assumed to remain at baseline levels. This is because NRMM consumers are expected to express a preference for fuel which has not been blended with biodiesel where possible (due to transition costs). Therefore no additional transition costs are anticipated under this option. Stakeholder views are welcomed on the likely accuracy of this assumption.

Benefits

52. The decrease in the supply of biodiesel (relative to the baseline) causes a fall in estimated GHG savings relative to the baseline. Over the period 2012 to 2030, 1 MTCO_{2e} fewer GHG savings are estimated to be delivered. These are valued at a net present value of -£73m using central DECC carbon price values.
53. The net benefit (i.e. the benefit to society net of costs) of this option is estimated to be £73m over the period 2012 to 2030 as the cost savings from supplying less biofuel outweigh the costs of lower GHG savings.

Figure 3: Option 3c – Low, Central and High cost scenarios

		Low	Central	High
Costs				
biofuel costs	£m	-89	-145	-176
transition costs	£m	0	0	0
admin costs	£m	0	0	0
Benefits				
lifecycle GHG savings	MTCO _{2e}	-1.0	-1.0	-1.0
GHG savings	£m	-110	-73	-37
admin costs				
Net Benefit				
net benefit	£m	-21	73	140
Pump Price Impacts				
NRMM (2013)	ppl	0.0	0.0	0.0

Summary of Costs and Benefits

54. The above cost benefit analysis is summarised in figure 4 (under the central cost scenario). It is important to recognise that these are relative to the baseline.

Figure 4: Summary table of costs and benefits of verification system options, central scenario

		3a	3b	3c
Costs				
biofuel costs	£m	436	-145	-145
transition costs	£m	37	37	0
admin costs	£m	1.4	1.4	0.0
Benefits				
lifecycle GHG savings	MTCO2e	3.1	-1.0	-1.0
GHG savings	£m	219	-73	-73
Net Benefit				
net benefit	£m	-256	34	73
Pump Price Impacts				
NRMM	ppl	1.7	1.6	0

55. Option 3a is the only option which increases the supply of biofuel (as the obligation is extended to cover NRMM fuel). As biofuel supply is estimated to be a net-cost measure (i.e. the cost of supplying the biofuel outweighs the monetised GHG savings benefits) this option is estimated to have a negative net benefit to society of -£256m over the period 2012 to 2030. Option 3b is estimated to have a positive net benefit to society of £34m due to a lower volume of biofuel supply (relative to the baseline). This cost saving is offset by transition costs (associated with blending biofuel into the NRMM fuel stream) and lower GHG savings. Option 3c is estimated to have a positive net benefit to society of £73m. The change in biofuel supply costs and GHG savings are the same as in option 3b but there are no transition costs as the level of biofuel supplied to NRMM is the same as in the baseline.

56. Options 3a and 3b both formally extend the RTFO to cover NRMM. Therefore the biofuel required by the obligation is attributed to NRMM fuel demand and suppliers are assumed to pass the additional cost of supplying biodiesel (shown for 2013 when the obligation peaks) through to NRMM fuel consumers, leading to an above baseline increase of 1.7pppl (for a 5% RTFO target) and 1.6pppl (for a RTFO target adjusted downwards to 4.7%) for options 3a and 3b respectively. This impact is estimated to gradually fall over time as the price of fossil diesel rises, reducing the additional cost of supplying biofuel. In 2030, the estimated additional pump price impact for option 3a is 1.3pppl. Under option 3c, no additional pump price impacts are expected on NRMM fuel as it remains outside the RTFO.

Risks and assumptions

57. This analysis is only intended to be illustrative and to be used as a guideline to the potential costs and benefits of addressing NRMM within the RTFO, in view of the wide range of uncertainties detailed below. However, it is able to indicate the order of magnitude of expected impacts.

58. Indirect land use change: GHG savings calculations do not include potential emissions from indirect land use change. This is of particular significance for biodiesel (which would be used in NRMM) feedstocks.
59. Biodiesel blending: in the baseline and throughout the scenarios it is assumed that biodiesel is blended with diesel (for road and, potentially, NRMM use) at a concentration determined by the RTFO target level (i.e. at a concentration of 5% for an unadjusted RTFO from 2013/14 onwards).
60. Carbon prices: these are subject to uncertainty, and have therefore been modelled using low, central and high scenarios. Projected carbon prices affect the value of total costs through valuing lifecycle GHG savings/emissions associated with biofuels use. The proportion of carbon savings being made by biofuels in the traded and non-traded sectors is derived from the split¹¹ used in the RES Impact Assessment for the Transport Sector, 2009. Once the GHG savings are attributed to their respective sectors, they are priced using the traded and non-traded price series.
61. GHG savings: the biodiesel used in NRMM fuel, and that biodiesel which is substituted out of the road fuel supply, is assumed to deliver the minimum 35% GHG savings from 2011 and 50% from 2017 (compared to baseline petrol / diesel CO₂ content), in line with the sustainability criteria assessed in the first section of this joint impact assessment. These GHG savings values are subject to uncertainty and may be different in practice.
62. Biodiesel prices (figure 7): these are sourced from the Aglink-Cosimo global agricultural model, and are used to calculate the additional cost of biodiesel over and above fossil diesel.
63. Diesel prices (figure 7): these are sourced from the DfT fuel price forecasting model, and are used to calculate the additional cost of biodiesel over and above fossil diesel. Fuel price forecasts are based upon DECC oil price projections.
64. NRMM fuel demand (figure 6): this is based on a combination of HMRC fuel duty data, data from the Digest of UK Energy Statistics and discussions with industry. NRMM fuel demand is assumed to hold constant over the period 2010 to 2030.

Figure 5: DECC IAG traded and non-traded carbon price scenarios, £/tCO₂

Real £2010	Traded			Non-traded		
	Low	Central	High	Low	Central	High
2010	8	15	18	27	53	80
2011	8	15	19	27	54	81
2012	8	15	19	27	55	82
2013	8	15	19	28	56	84
2014	8	15	19	28	57	85
2015	8	16	20	29	57	86
2016	8	16	20	29	58	88

¹¹ Based on internal analysis and worked carried out by independent consultants E4tech.

2017	8	16	20	30	59	89
2018	8	16	21	30	60	90
2019	9	17	21	31	61	92
2020	9	17	21	31	62	93
2021	11	22	30	31	63	94
2022	14	28	39	32	64	96
2023	17	33	47	33	65	98
2024	20	39	56	33	66	99
2025	22	45	65	34	67	101
2026	25	50	74	34	68	102
2027	28	56	82	35	69	104
2028	31	61	91	35	70	105
2029	33	67	100	36	71	107
2030	36	72	108	36	72	108

Figure 6: NRMM Fuel demand projections (internal analysis based on HMRC data, Digest of UK Energy Statistics and discussions with industry)

	obligation level	NRMM demand	NRMM biodiesel demand
	%	(million litres)	(million litres)
2010	3.50%	3,079	108
2011	4.00%	3,079	123
2012	4.50%	3,079	139
2013	5.00%	3,079	154
2014	5.00%	3,079	154
2015	5.00%	3,079	154
2016	5.00%	3,079	154
2017	5.00%	3,079	154
2018	5.00%	3,079	154
2019	5.00%	3,079	154
2020	5.00%	3,079	154
2021	5.00%	3,079	154
2022	5.00%	3,079	154
2023	5.00%	3,079	154
2024	5.00%	3,079	154
2025	5.00%	3,079	154
2026	5.00%	3,079	154
2027	5.00%	3,079	154
2028	5.00%	3,079	154
2029	5.00%	3,079	154
2030	5.00%	3,079	154

Figure 7: Diesel and biodiesel prices, pence per litre, real 2010 prices, central scenario

	Biodiesel Price	Diesel Price	Biodiesel Resource Cost
2010	70	39	31
2011	69	40	29
2012	70	40	30
2013	71	41	30
2014	70	41	29

2015	70	42	29
2016	70	42	28
2017	70	43	27
2018	70	43	27
2019	70	44	26
2020	72	44	28
2021	72	44	27
2022	72	45	27
2023	72	45	26
2024	72	46	26
2025	72	46	25
2026	72	47	25
2027	72	47	24
2028	72	48	24
2029	72	48	23
2030	72	49	23

Wider impacts

65. Under the options where small firms could be particularly impacted (3a and 3b), in particular through higher NRMM fuel costs because they are obligated under some options explored, wider knock-on impacts are possible. These could include a loss of future competitive pressure in the NRMM-dependent markets if small suppliers or new entrants are discouraged.
66. Biofuels might deliver lower lifecycle GHG savings than currently reported if Indirect Land Use Change (ILUC) impacts were found to be negative. These 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 mandatory sustainability criteria also remains unknown. Therefore ILUC impacts have had to be excluded from the present analysis of mandatory sustainability criteria.
67. Biofuel production could also potentially impact on food markets, through creating competition in demand for agricultural land and inputs, as well as increased demand for food crops also suitable for biofuel feedstock use. However, there is as yet no clear consensus on how to quantify and value any potential links between biofuel demand and food prices. Therefore any such possible impacts have been excluded from the analysis.

Summary and preferred option with description of implementation plan

68. Option 3b is currently the preferred option since this obligates NRMM, ensuring delivery of the GHG emission reductions required by the FQD, but without increasing the overall biofuel supply while there are concerns about sustainability.

69. This is a consultation stage IA only, therefore, if consultees have any additional evidence and analysis that they consider would improve the assessment presented here, it would be most welcome. Any additional evidence might also impact upon the relative merits of the three policy options.

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. 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.

<p>Basis of the review: [The basis of the review could be statutory (forming part of the legislation), it could be to review existing policy or there could be a political commitment to review]; A review of all the RTFO amendments proposed in this consultation exercise will be conducted in 2014</p>
<p>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 the RTFO amendments are performing as intended.</p>
<p>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.</p>
<p>Baseline: [The current (baseline) position against which the change introduced by the legislation can be measured] A 2011 baseline of the NRMM fuel supply following the impact of the desulphurisation regulations can be used to evaluate additional impacts of the RTFO on the NRMM supply.</p>
<p>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] Successful integration (or not, depending upon the chosen policy option) of NRMM fuel in the RTFO.</p>
<p>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 regulator collects detailed data on RTFO performance.</p>
<p>Reasons for not planning a PIR: [If there is no plan to do a PIR please provide reasons here]</p>

Annex 2 -Transition Costs

70. Introduction of biofuel into the NRMM fuel stream is expected to result in one-off transition costs for operators of NRMM machinery. Estimates of these transition costs are summarised in figures 8 to 12. Total costs are presented in 2010 terms.

Figure 8: Tank cleaning costs

	number of units	unit cost	total cost
marinas	114	£500	£57,000
recreational vessels	66,200	£586	£38,793,347
commercial vessels	387	£5,000	£1,935,000

71. NRMM fuel storage tanks are assumed to require cleaning in advance of biofuel being introduced into the NRMM fuel stream in order to avoid microbial infection of the fuel.
72. The number of affected marinas is based upon data from the British Marine Federation and discussions with inland waterway stakeholders. The marina tank cleaning cost estimate is based upon discussions with ExxonMobil. The number of recreational vessels is based upon Association of Inland Navigation Authorities survey data (88,267 total recreational vessels) with an adjustment made to reflect that only 75% of these vessels are believed to be diesel powered. Tank cleaning costs for recreational vessels are based upon data from the Great Ouse Boating Association agreed by the inland waterway stakeholder group. Commercial vessel numbers are based upon input from the inland waterway stakeholder group (516 in total – 70% of which are not subject to regular tank cleaning).

Figure 9: Fuel pump seal replacement costs

	number of units	unit cost	total cost
recreational vessels	662	£525	£347,551

73. A small subset of NRMM engines will require fuel pump seals to be replaced in advance of biofuel being introduced into the NRMM fuel stream. The fraction of recreational vessels (1%) which will require replacement is based upon discussion with engine industry experts.

Figure 10: NRMM fuel filter replacement costs

	number of units	unit cost	total cost
general NRMM	643,772	£16	£10,300,352
rail	4,285	£165	£707,025
recreational vessels	66,200	£16	£1,059,204
commercial vessels	516	£165	£85,140

74. NRMM engines will require new fuel filters in advance of biofuel being introduced into the NRMM fuel stream. These figures are likely to be overestimates as fuel filters tend to be replaced during routine servicing. Fleet size estimates for general NRMM and rail have been taken from UK Air Quality Archive data. Recreational and commercial inland waterway vessel data are as before. Unit cost data is based upon estimates provided by the NFU.

Figure 11: Marking costs

	number of units	unit cost	total cost
Marking Costs	44	£100,000	£4,400,000

75. As NRMM fuel is taxed at a lower rate than road transport fuel it is marked with a red dye. Sourcing NRMM fuel from the road transport fuel stream will require additional marking

facilities to be installed at sites where this occurs. Data provided by the UK Petroleum Industry Association (UKPIA).

Figure 12: Aggregated costs

total transition costs	£53,284,619
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76. The total estimated (central) transition cost of introducing biofuel into the entire NRMM fuel stream is estimated at £53.3m.

Annex 3 - Competition Assessment

77. Under the options where small firms could be particularly impacted (3a and 3b), in particular through higher NRMM fuel costs, wider knock-on impacts are possible. These could include a loss of future competitive pressure in the NRMM-dependent markets (e.g. agricultural markets) if small suppliers or new entrants are discouraged through higher prices. There could also be a negative impact on innovation if small suppliers were disadvantaged and future competition in supply was restricted.
78. Economic theory suggests that a less competitive market may be less likely to reduce costs in the long run, due to a lack of pressure to reduce costs through price competition. Therefore, barriers to entry, or barriers to small suppliers being able to compete for market share with major fuel suppliers, could reduce the long-run competitiveness of the market for transport fuels.
79. NRMM is supplied by the major fuel suppliers, as well as NRMM-majority or –only suppliers. There are estimated to be up to six NRMM suppliers for the purposes of this impact assessment. Options that increase the obligation may potentially create a barrier to entry for new market participants because they now face an additional hurdle (e.g. administrative costs) to enter the market.
80. Higher certification levels also mean that there are more RTFCs in circulation, as the obligation is not increased in absolute terms in options 3b and 3c, and is only partly but not equivalently increased in option 3a. Therefore the price of RTFCs may be reduced temporarily. This would only be likely in the short run as fuel suppliers would soon substitute biofuel out of the traditional fuel supply, since there are RTFCs available from blending in NRMM which occurs at a higher rate than the obligation % target level. This would return the total quantity of RTFCs to the level of the obligation in the long run. Even so, in the short run, any fall in the price of RTFCs would have a negative impact on the cashflow of biofuel suppliers, in particular smaller suppliers.
81. There may also be some profits created for NRMM-only suppliers who could sell RTFCs at a price higher than their production costs, if those suppliers could blend biodiesel into their NRMM supply at a lower cost than other suppliers.

Annex 4 - Small Firms Assessment

82. Under the options where small firms could be particularly impacted (3a and 3b), in particular through higher NRMM fuel costs, wider knock-on impacts are possible. These could include a loss of future competitive pressure in the NRMM-dependant markets if small suppliers or new entrants are discouraged. There could also be a negative impact on innovation if small suppliers were disadvantaged and future competition in supply was restricted.
83. Higher certification levels also mean that there are more RTFCs in circulation, as the obligation is not increased in absolute terms in options 3b and 3c, and is only partly but not equivalently increased in option 3a. Therefore the price of RTFCs may be reduced temporarily. This would only be likely in the short run as fuel suppliers would soon substitute biofuel out of the traditional fuel supply, since there are RTFCs available from blending in NRMM which occurs at a higher rate than the obligation % target level. This would return the total quantity of RTFCs to the level of the obligation in the long run. Even so, in the short run, any fall in the price of RTFCs would have a negative impact on the cashflow of biofuel suppliers, in particular smaller suppliers.

Annex 5 - Rural Proofing Assessment

84. An increase in NRMM fuel prices (under options 3a and 3b) could pose an additional cost burden on rural businesses, as many of these will be in the agricultural sector, which is one of the main users of non-road mobile machinery (e.g. tractors).
85. A reduction in biofuel demand (relatively greater under options 3b and 3c) would reduce opportunities for UK biofuel producers, which may have impacts on rural incomes through either lower employment in biofuel production facilities or through reduced opportunities for UK biofuel supply chains.

Annex 6 - Sustainable Development

86. A reduction in biofuel demand (relatively greater under options 3b and 3c) would reduce the potential for sustainable biofuels to contribute to sustainable development through the decarbonisation of the UK's transport system. This reduction however would only be sufficient to return biofuel demand to levels prior to the enforcement of desulphurisation regulations, so there would be very little risk of an overall impact on the likelihood of meeting DfT carbon budgets through the mandating of biofuel blending.