



Department
for Transport

Targeting net zero - next steps for the Renewable Transport Fuels Obligation

Government response

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Contents

Foreword: Secretary of State for Transport, Rt Hon Grant Shapps MP	5
Executive summary	7
The role of low carbon fuels in net zero	7
Consultation proposals and government decisions	7
Next steps	10
Responses received	11
1. Renewable fuel supply trajectory to 2032 and subsequent years	12
Overview of the consultation	12
Government response	17
Summary and next steps with decarbonising transport	22
2. Introducing support for recycled carbon fuels	23
Overview	23
Supporting RCFs through the RTFO scheme	24
Eligible feedstocks	26
Biogenic content of RCFs	28
RCF categorisation as development fuels	30
GHG savings minimum thresholds	32
GHG emissions savings methodology	34
Level of reward for RCFs	37
Verification	38
Summary of government responses on recycled carbon fuels	39
3. Hydrogen and renewable fuels of non-biological origin	41
Eligibility of grid supplied renewable power for RFNBO production and additionality requirements, and changes to the level of reward for biohydrogen	41
Expansion of RTFO support to other transport modes	41
4. Changes to sustainability criteria	45

Overview of consultation and stakeholder responses	45
GHG values	45
GHG calculation methodology	47
Measures to address the environmental impact of crop and forest based renewable biofuels	62
Introducing specific criteria for biofuels derived from forest biomass	66
Changes to the crop cap definition	69
5. Civil penalties – minor amendment to provision on civil penalties	73
Overview	73
Government response	74
6. Changes to ensure renewable fuels and chemical precursors do not receive multiple incentives	76
Overview of the consultation	76
Summary of responses	77
Government response to questions 41 to 43	80
7. Next steps and geographical coverage	82
Annex: 1 The role of the RTFO in domestic maritime – government response to the deep dive consultation	83
Overview of consultation	83
Overview of responses received to the consultation	83
Annex: 2 Cost Benefit Analysis – summary of responses and government response	92
Overview of consultation	92
Overview of responses received to the consultation	92
Annex: 3 List of consultation policy questions	95

Foreword: Secretary of State for Transport, Rt Hon Grant Shapps MP



Two years ago, Parliament passed one of the most far-reaching pieces of legislation in modern history, when we became the first major global economy to commit to net zero carbon emissions by 2050. Ending UK transport's contribution to climate change is our ultimate objective – a giant leap into the future towards a cleaner and safer world. But the only way we'll get there in just three decades will be to take numerous, more modest steps, innovating year after year across all forms of transport. And low carbon fuels will be integral to our success, as we build on the progress made by UK fuel suppliers to date.

Although more than 250,000 purely electric vehicles have been sold across the UK, low carbon fuels still have a massive role to play in helping us achieve our carbon goals. The Renewable Transport Fuel Obligation (RTFO) is the government's key measure for incentivising the use of renewable fuels in transport. In 2019, fuels supplied under the RTFO saved almost 5.5 million tonnes of carbon dioxide emissions. That is the equivalent of taking 2.5 million cars off the road. Increasingly, we'll adapt cleaner fuels for use in other

transport sectors where full decarbonisation will take longer to deliver – like aviation and maritime. So, the prospects for growth are strong.

Further significant progress has been made this year. We have recently launched a public information campaign raising awareness of the new E10 greener fuel, ahead of its introduction in September. And we also unveiled the Green Fuel, Green Skies competition to encourage the development of sustainable aviation fuels (SAF) and explain the benefits that they will bring in decarbonising flight.

Low carbon fuels have been instrumental in cutting greenhouse gas emissions from UK transport for more than a decade. The measures contained in this document will build on that progress, creating more green jobs. Responding to industry feedback, we are increasing the RTFO target by 5 percentage points in the period up to 2032, from 9.6% in 2021 to 14.6% in 2032. This will reduce greenhouse gas emission by a further 23.6 million tonnes over this period, the equivalent of removing a further 1.9 million cars from the road.

We have examined how we can boost uptake of renewable hydrogen and recycled carbon fuels, which can turn household rubbish into aviation fuel. We will introduce rewards for recycled carbon fuels under the RTFO scheme as soon as we can. This will strengthen the business case for advanced conversion technologies and help the UK to become a global leader in this field. We will consult further on whether additional recycled feedstocks should be eligible within the scheme, and how we might exploit their potential before amending the RTFO.

To speed up decarbonisation in maritime and rail, we will expand the RTFO to include other renewable fuels of non-biological origin, like renewable hydrogen. I recognise that the industry wants these fuels to be rewarded in a more flexible way under the RTFO, with more freedom to locate production plants away from sources of renewable energy. This is a complex area, so to address the responses to the consultation fully, we will set out our approach later this summer.

As we increase the supply of low carbon fuels and extend the RTFO eligibility to support a wider range of fuels and feedstocks, we will also strengthen the sustainability rules. This will ensure low carbon fuel delivers significant reductions in carbon emissions, and in a way protects forests and other important habitats.

The measures in this document will ensure that low carbon fuels continue to play a vital part in reducing greenhouse gas emissions in the years ahead. We will continue to work closely with the sector to harness the full potential of cleaner fuels across transport as we recover from COVID by building back better and greener.

Executive summary

The role of low carbon fuels in net zero

Transport decarbonisation is central to the UK's pathway to reduce economy wide greenhouse gas (GHG) emissions and achieve net zero by 2050. The transport sector now accounts for the largest share of UK GHG emissions, contributing 27% of domestic emissions in 2019. Increasing vehicle efficiency and zero emissions vehicles will help secure net zero targets. However, these changes will take time; and liquid fuels will also continue to be required in sectors that currently cannot be easily electrified.

Low carbon fuels have been supported by the Renewable Transport Fuel Obligation (RTFO) since its commencement in 2008. In 2019, the use of low carbon fuel supplied under the RTFO saved approximately 5.5 million tonnes of carbon dioxide emissions, equivalent to taking 2.5 million combustion engine-powered cars off the road. The RTFO continues to play a central role in cutting GHG emissions quickly, and ensures the UK is well placed to benefit from the expanding markets for low carbon fuels.

Earlier in 2021, we consulted on a range of measures to further enhance the existing RTFO and increase the carbon savings it achieves. The consultation proposed faster and higher ambition on the contribution of sustainable low carbon fuels. It also proposed ways of supporting the uptake of a more diverse range of fuels and proposed an update to sustainability requirements for renewable fuels.

Consultation proposals and government decisions

The consultation ran between 25 March and 23 April 2021, seeking views across the six policy areas summarised below.

We received 120 individual responses from a range of organisations concerning the government's proposals. We would like to thank all stakeholders for their time and contribution in responding to the consultation. In developing the government response and final amendments to the RTFO, we have carefully considered all responses and the evidence provided.

Renewable fuel supply trajectory to 2032 and subsequent years

We consulted on increasing the RTFO main obligation to supply renewable fuels by either 1.5%, 2.5% or 5% by 2032. Our preferred proposed option was to increase the RTFO main target by 2.5%: 1.5% in 2022 followed by an additional 1% spread over the period 2023 to 2032. We noted that increasing targets could provide long term certainty to industry, whilst ensuring a more ambitious contribution to net zero.

We intend to increase our ambition compared with the consultation proposal and will increase the RTFO main target by 5% by 2032. This will:

- lead to higher GHG emission savings of 23.6 million tonnes CO₂e over the period 2022 to 2032
- give more certainty to investors by supporting the supply of renewable fuels
- help protect and support UK industry and jobs

Introducing support for recycled carbon fuels

Recycled carbon fuels (RCFs) are fuels produced from fossil wastes that cannot be avoided, reused or recycled; for example, unrecyclable waste plastic and waste industrial gases. They have the potential to deliver GHG savings, so the consultation proposed inclusion of RCFs for support under the RTFO. We sought views on the level of reward and minimum GHG savings RCFs should achieve.

It remains the government's view that there is merit in supporting RCFs made from unrecyclable waste plastic and waste industrial gases under the RTFO scheme.

Introducing RCFs will unlock new feedstocks and increase the number of options available for decarbonising transport fuels. It is also anticipated RCFs will strengthen the business case for developing advanced conversion technologies. This could help the UK to become a global leader in development of advanced technology.

As flagged in the consultation, supporting RCFs through the RTFO will require an amendment to primary legislation (as it is currently beyond the RTFO's scope), and we will look to make this amendment at the earliest opportunity in advance of amending the RTFO Order. We are therefore not able to introduce support for RCFs immediately as part of the package of amendments to the RTFO outlined in this Government Response.

In addition, responses to the consultation have highlighted some areas which would benefit from further engagement with industry. We will consult further on whether additional RCF feedstocks should be eligible for support, and how we might evidence and support GHG savings from such fuels. We will do so as soon as possible, and in advance of any secondary legislation to amend the RTFO scheme itself.

Hydrogen and renewable fuels of non-biological origin

We consulted on the following proposals in relation to hydrogen and renewable fuels of non-biological origin (RFNBOs).

- to expand the scope of the RTFO to make RFNBOs used in maritime, rail and non-road vehicles eligible for support
- to introduce more clarity and flexibility for RFNBOs eligible for support
- to amend the support conditions for biohydrogen

Since 2018, RFNBOs have been eligible for support under the development fuel obligation and the market for RFNBOs continues to expand. The development fuel obligation is designed to help drive investment in novel renewable fuels for use in harder to decarbonise sectors.

We will expand support to renewable hydrogen and other RFNBOs used in maritime, trains and non-road vehicles such as loading and construction equipment powered by hydrogen fuel cells under the RTFO. Note that primary legislation changes may be needed to expand support to loading/construction vehicles. These changes will support decarbonisation of these sectors and support innovation and investments in these low carbon fuels.

We are analysing responses to the other consultation measures and will set out our approach to those later this summer.

Changes to sustainability criteria

We sought views on proposals to promote improvements in the sustainability profile of fuels supported under the RTFO. The RTFO already contains significant safeguards; however, increasing these safeguards will help promote further improvements in the sustainability profile of fuels supports under the RTFO.

In line with the consultation proposals, we will implement the following sustainability criteria:

- extend protection to cover highly biodiverse wooded land and prevent this land from being degraded as a result of biofuel production
- establish criteria to address the specific impacts of biofuels made from forest biomass
- introduce criteria to manage the soil carbon impacts associated with the use of agricultural residues
- improve the accuracy of reported GHG emission values, via the provision of updated emissions values and changes to the GHG methodology which better reflect real world emissions
- secure and increase the minimum GHG savings delivered by eligible fuels

Civil penalties

We sought views on updating the calculation used to determine the relevant civil penalty amounts to reflect recent changes to the buy-out price for the main obligation in the RTFO. We will implement this change as proposed.

Changes to ensure renewable fuels and chemical precursors do not receive multiple incentives

We consulted on strengthening existing restrictions which prevent renewable fuels from receiving support under the RTFO if they or their chemical precursors have already received incentives. This change was intended to help limit market distortions and promote a fair renewable fuels market. We will implement this change as proposed.

Next steps

We intend to make legislative changes so that the new policies including increased targets apply from the start of the next RTFO obligation period, which works on an annual cycle, and commences on 1 January 2022.

To introduce support for RCFs into the RTFO we will need to amend the Energy Act 2004 or find alternative primary powers. The same may also apply for introducing support to renewable hydrogen used in non-road transport, such as construction vehicles. This will take additional time; however, we will make these changes as soon as the Parliamentary timetable allows.

Responses received

A total of 120 responses were received from a range of organisations concerning the government's proposals. The following table provides a breakdown of the responses.

Organisation type	Number of respondents
Academic/research	5
Airport operator	1
Campaigning organisation	1
Consultancy	11
Equipment manufacturer	5
Fossil fuel supplier/producer	6
Government agency	1
Grain merchant	1
Lighthouse authority	1
Non-governmental organisation (NGO)	3
Port authority	1
Power producer	8
Renewable fuel supplier/producer	49
Representative body	22
Road haulage	1
Trader/investor	3
Voluntary scheme	1

1. Renewable fuel supply trajectory to 2032 and subsequent years

Overview of the consultation

Renewable fuels play an important role in reducing carbon emissions, and the UK has led the way in developing policies to support their production and use. The Renewable Transport Fuels Obligation (RTFO) places an obligation on suppliers of fuel for road transport and non-road mobile machinery to supply renewable fuel. Renewable fuels are awarded certificates, which can be traded with suppliers who need them to meet their obligations.

Currently, the main obligation to supply renewable transport fuels is set at 9.6% with an additional 0.5% coming from development fuels, increasing to 2.8% in 2032 and remaining at that level beyond 2032. However, there is an opportunity for renewable fuels to make a greater contribution to decarbonising transport by increasing the RTFO obligation level. This might be achieved in practice by:

- increasing the volume of biofuels blended into petrol and diesel up to the maximum blend wall, including through the supply of E10 petrol (containing up to 10% bioethanol)
- increasing the supply of renewable fuels capable of being supplied at high blends
- increasing the proportion of waste-derived biofuels

When considering whether to increase targets, and by how much, we must consider factors which could have a detrimental impact on the environment. These include:

- biomass availability. There is demand for the same raw materials from multiple other sectors both in the UK and internationally (e.g. food/feed production, electricity, and heat, as well as industrial production)
- life cycle greenhouse gas (GHG) emissions - these can vary significantly by feedstock and we want to ensure supply is increased without adverse environmental impacts

Consultation proposal

We consulted on the following options:

Option 0 - no change. The main obligation would remain at 9.6%.

Option 1 - 1.5% increase to the main obligation. This would apply from 2022. The target would increase from 9.6% in 2021 to 11.1% in 2022 and continue at the same level thereafter.

Option 2 - 2.5% increase to the main obligation. This would apply as a 1.5% increase in 2022 (as per option 1) with an additional 1% increase spread over the period 2023 to 2032. The target would increase from 9.6% in 2021 to 12.1% in 2032 and continue at the same level thereafter. **This was our preferred option.**

Option 3 - 5% increase to the main obligation. This would apply as a 1.5% increase in 2022 with an additional 3.5% spread over the period 2023 to 2032. The target would increase from 9.6% in 2021 to 14.6% in 2032 and continue at the same level thereafter.

In 2019, the bioethanol content of petrol was 4.5% which was close to the fuel standard of 5%. On 25 February, we announced that we will introduce E10 (petrol with up to 10% ethanol) by requiring standard, 'premium' petrol to contain at least 5.5% from September 2021. We anticipate that suppliers will supply bioethanol close to the maximum level permitted of 10% and therefore the introduction of E10 will enable bioethanol supply to increase up to twice its current volume. Our modelling indicates that whilst the introduction of E10 can deliver greater GHG emission savings in petrol compared to E5, if we do not increase targets any increased supply of bioethanol would likely displace biodiesel. Option 1 ensures that this does not happen.

However, option 2 (increase the main obligation by 2.5%) was stated as our preferred option in the consultation because it would deliver an increase in RTFO targets that went beyond the minimum required to allow space for E10. We considered that option 2 provided the right balance in allowing some sustainable growth in renewable fuels without introducing significant delivery and sustainability risks.

Question 1

Should we increase, decrease or keep the main obligation at the same level?

Summary of responses

Total	Increase	Stay the same	Decrease
84	81	3	0

Eighty-one of the 84 respondents agreed with the proposal to increase the main obligation, including all obligated suppliers, non-governmental organisations (NGOs), development fuel suppliers, research institutions and industry representative bodies.

The key reasons given for supporting the proposal were that:

- an increase is needed for the UK to meet current GHG reduction targets including net zero, Carbon Budgets and the Nationally Determined Contributions
- this increase would stimulate the investment needed to increase supply
- the main obligation needs to be adjusted so that the UK can benefit from the additional GHG savings gained from introducing E10
- even with the ramp up of electric vehicles, liquid fuels will still play an important role in the future and there is currently no shortage of demand for them
- as overall fuel supply is forecast to decrease, there will also be a fall in absolute volumes of renewable fuel unless the obligation level is increased, which could not only result in reduced investment in renewable fuels but also could lead to the closure of renewable production facilities

It was also suggested that if there is an increase in the main obligation then there should also be an increase in the development fuel targets. However, others suggested that an increase to the main obligation would provide industry-wide certainty and consequentially help secure funding for those investing in development fuels because it helps with discounting future revenues.

Three respondents, including an NGO and trade representative body, thought that the main obligation should stay the same. Reasons for supporting this option were that:

- we should not put a further cost on the motorist because fuel prices are already high
- some older vehicles do not work with high blends and there are concerns about higher blended biofuels damaging vehicles, for example, by blocking filters
- we should discourage using used cooking oil (UCO) as a feedstock for biodiesel because of potential links to indirect land use change. In some parts of the world used cooking oil can be used as animal feed. If the UCO is being diverted from animal feed, alternative animal feed needs to be sourced. Some studies have shown that it could potentially be replaced with palm oil

No respondents thought that the main obligation should be decreased.

Question 2

If you agree that we should increase the RTFO obligation, what level should it be increased by: 1.5%, 2.5% or 5%?

Summary of responses

Total	1.5%	2.5%	5%	5+	Other
77	2	11	32	29	3

Of the 77 respondents who answered this question, 61 thought that the main obligation should be increased by 5% or more.

Support for increasing the main obligation by 1.5%

Two respondents, including a trade representative body, thought that it was appropriate to increase the main obligation by 1.5% as this would allow for the introduction of E10 without displacing biodiesel. However, both respondents also suggested that if evidence and research show that it is possible to increase to 5% then they would support a higher increase.

Support for increasing the main obligation by 2.5%

Eleven respondents - including a fossil fuel producer, development fuel producers, a representative body, and a research institution - agreed with the government's preferred option to increase the main obligation by 2.5%. Reasons supporting this option included:

- concerns about the cost. It is anticipated that additional costs would likely be passed onto motorists and companies, such as hauliers
- suggestions that changes should be made gradually to allow the market to adapt. Once the market has adapted reviews of the changes can be made and next steps taken

Some respondents thought that this option strikes the right balance between increasing the main obligation and being cautious because of uncertainties, such as, feedstock availability and sustainability. However, if it can be demonstrated that a 5% increase can be met sustainably then some respondents would support this. After more research and analysis these uncertainties would become less risky and a higher increase could be implemented with more confidence.

Support for increasing the main obligation by 5%

Thirty-one respondents thought that the main obligation should be increased by 5%. These included a research institution, renewable fuel suppliers, consultancies, and development fuel suppliers. Reasons supporting this option were that:

- a higher target means more GHG savings. These are needed if the UK is to stay on track to reach net zero by 2050
- there should be a system which is based on the carbon intensity of the fuel to stimulate further GHG savings
- this increase would protect the UK's biofuel industry by ensuring the volume of renewable fuel remains constant in the coming years
- only with a higher main obligation will more investment opportunities be available. A 2.5% increase is acceptable, but it would not unlock investment
- as capital is expensive an increase of 5% increases investor confidence by helping de-risk investment
- a 5% increase would help accelerate the transition to renewable fuels by putting pressure on the fossil fuel industry which is needed to meet GHG targets
- whilst it is currently expensive to invest in renewable fuels, they expect investment costs to come down in the long term

- the UK's sustainability criteria are strict enough to mitigate any possible risk associated with increasing targets such as having a decreasing crop cap and double rewarding wastes
- some respondents noted that there should be a system which is based on the carbon intensity of the fuel to stimulate further GHG savings

Support for increasing the main obligation by over 5%

Twenty-nine respondents - including fossil fuel producers, renewable fuel producers, development fuel producers and fuel representative bodies - thought that none of the proposed options were acceptable and urged that we increase the main obligation by over 5%. The reasons given were similar to those provided for increasing the main obligation by 5%. Additional comments were:

- the higher the target, the more GHG savings there will be to contribute to future Carbon Budgets
- there is enough feedstock to increase much further than the 5%. Evidence for this included a recent report by [PRIMA which was commissioned by the RTFA](#) - it states that there is enough feedstock to increase the main obligation to 21% by 2032 which is an 11.4% increase on the current obligation level of 9.6%
- why were high blend and drop-in fuels not included? A higher target would stimulate drop-in fuels and high blends which will be needed to meet net zero
- a higher target would be easier to meet if the government opened up more avenues to meet the obligation including:
 - coprocessing of renewable fuels alongside fossil fuels
 - allowing only waste bioethanol
 - increasing the super (97+ octane) grade to E10
 - blending biodiesel to 7% all year round
 - allowing B10 (10% biodiesel in diesel) during the summer months
 - rewarding RCFs with general Renewable Transport Fuel Certificates (RTFCs) if they do not qualify for development fuel RTFCs
 - factoring in a higher level of growth in the biomethane market

Other – unspecified increase given

Three respondents - including a representative body, power supplier and a renewable fuel producer - supported a target increase but did not specify which option they preferred. Comments included:

- any of the increases would result in GHG savings but none of them put the UK on the pathway to net zero
- the higher the target increase the more certainty it gives industry and investors
- any increase to the main obligation should be also applied to the development fuel obligation

Government response

Response to points raised by stakeholders

Stakeholders suggested that recycled carbon fuels should be rewarded with general RTFCs if they are not eligible for development fuel RTFCs. Our approach to supporting RCFs is given in chapter two.

An NGO noted the potential indirect impacts of using UCO. We are aware of recent reports concerning used cooking oil derived biofuel, its potential links to indirect land use change and fraudulent supply. There is no evidence showing a causative link between UK policies to promote waste-derived biofuels and increased use of virgin oils in other parts of the world. Factors that influence consumption of virgin oils include changes in eating habits and policies relating to public and animal health.

Stakeholders mentioned that higher blends do not work in older vehicles, which could be a problem for those who cannot afford to purchase a newer vehicle. The content of petrol and diesel is governed by a combination of legislation and industry fuel standards developed by the British Standard Institution (BSI). Most engines are fully compatible with fuel containing biofuel in the proportions set by fuel standards because manufacturers design engines with the fuel standards in mind.

E10 is approved for use in over 95% of petrol vehicles. However, it is not compatible with some older vehicles and we have put measures in place for this, such as ensuring that E5 is still available in super (97+ octane) grade. Vehicle owners can also use the [online checker](#) the department has developed to identify whether their vehicle is compatible with E10.

Some stakeholders commented that we should have a system which rewards GHG savings. We acknowledge the benefits of having a carbon intensity-based system and will take this point into consideration when developing future mandates such as in support of sustainable aviation fuel.

Several stakeholders questioned why drop-in and high blend fuels were not included. We would like to clarify that they were included in the modelling. Please refer to the assumptions section in the cost benefit analysis for more details.

Stakeholders urged the government to increase the development fuel obligation alongside the main obligation. We are fully committed to supporting development fuels and we are encouraged by the level of interest in investment in technologies to produce these fuels. We are pleased to have issued our first development fuels renewable transport fuel certificates (dRTFCs). We did not propose to revise the development fuel obligation at this time given the target was only recently introduced. However, the development fuel obligation will be included in a review of the impacts of the RTFO to be published in 2023.

Government decision: we will increase the main RTFO target by 5%

The government is pleased that most stakeholders agreed with the reasoning outlined in the consultation to increase the RTFO's main obligation. There is support across the industry, including from fossil fuel suppliers, renewable fuel suppliers, consultancies, trade representatives and research institutions.

The majority of stakeholders who supported an increase to the RTFO main obligation also supported a target increase of 5% or higher. The reasoning and evidence presented in the responses showed us that there is scope, appetite, and a need to be ambitious.

We will, therefore, increase the main obligation by 5% by 2032.

Why are we increasing by 5% instead of our preferred option of 2.5% as outlined in the consultation?

Stakeholder support for more ambition

There was widespread support across the industry for a 5% or higher increase to the RTFO main obligation. In contrast to previous consultations to increase targets obligated suppliers were generally supportive.

We agree that we need to:

- give more certainty to investors by limiting the decrease in renewable fuel supply as we anticipate that the uptake of electric vehicles will need to be higher than assumed in the energy and emissions projections (EEP) scenario¹
- have higher targets to help meet net zero, and interim carbon budgets

Impact of electric vehicles

Good progress is being made in reducing emissions from road transport by increasing the numbers of zero emission vehicles on our roads. A recent publication - [Ten Point Plan for a Green Industrial Revolution](#) - outlines the commitment made by the UK to end the sale of petrol and diesel cars and vans by 2030 which is a key part of our decarbonisation plans. Full information on the Department for Transport's approach will be set out in the forthcoming Transport Decarbonisation Plan.

Success in increasing zero emission vehicles has clear implications for renewable fuel demand. As the RTFO sets renewable fuel targets as a proportion of the overall fuel supply, if the overall fuel volume decreases, the volume of renewable fuels, and therefore the total carbon savings also decrease.

¹ [Energy and emissions projections - GOV.UK \(www.gov.uk\)](#). This modelling is published by BEIS and reflects all firm and funded policies and are typically used as the basis for assessing the impact of new policies. The cost benefit for this analysis used this.

As seen in Figure 1, an increase of 5% to the main obligation under the EEP assumptions results in an immediate jump in ethanol supply, as additional space is made for E10. Waste-derived biodiesel remains at approximately current levels, and the volume of waste-derived biomethane increases over time as more gas-powered HGVs enter service.

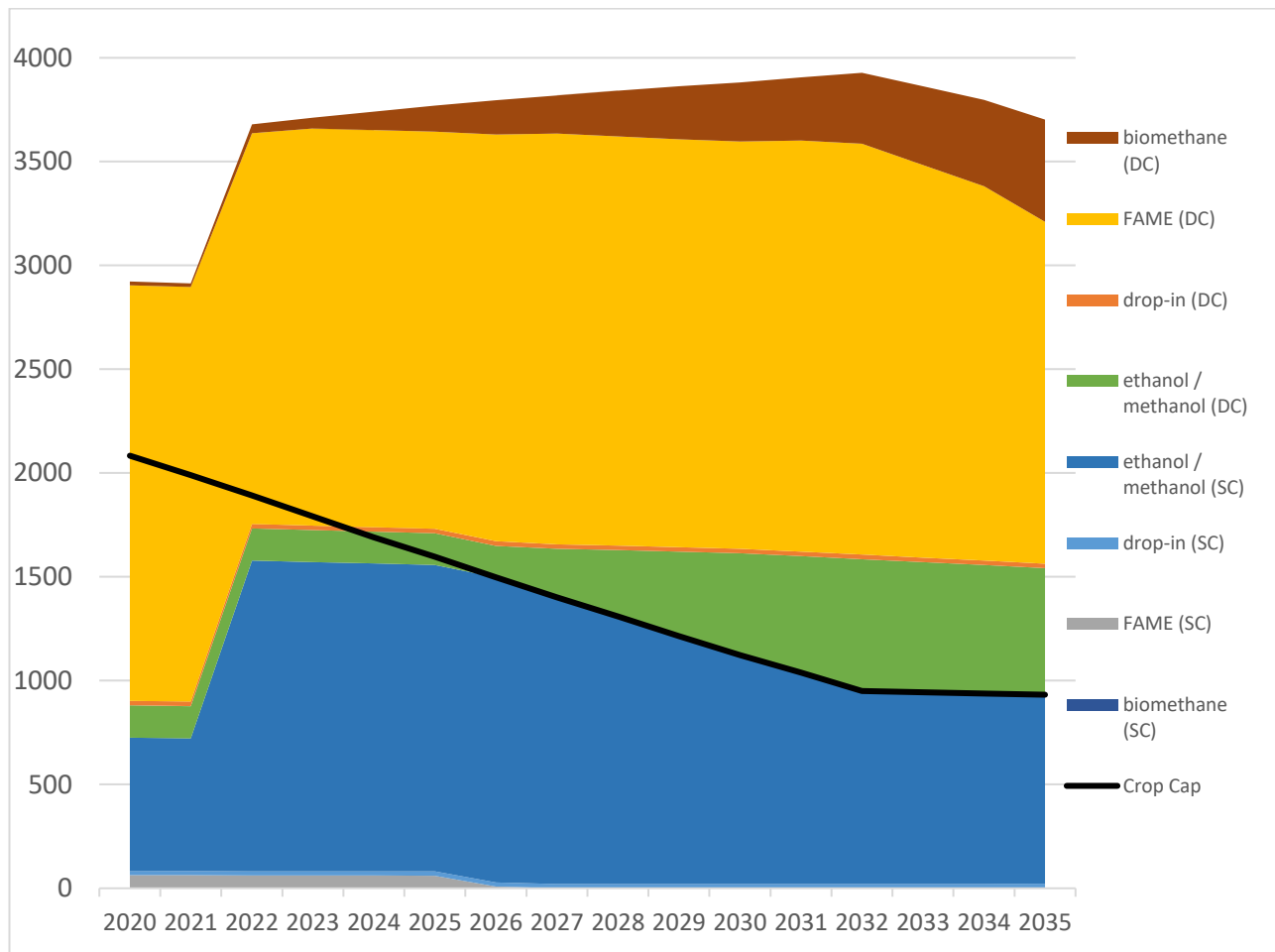


Figure 1 Fuel projections from 2020 to 2035 for the main RTFO obligation with a 5% increase between 2022 to 2032 (EEP). SC = biofuel from feedstocks which single count towards suppliers' obligations (typically crop-derived biofuels) and DC = biofuel from waste feedstocks which double count towards suppliers' obligations.

The rapidly changing consumer and policy landscape for electric vehicles means that the uncertainty over the future fuel demand trajectory is even greater than usual. We have therefore modelled a faster uptake of electric vehicles to see the potential effect on the supply of the renewable fuel. This can be seen in Figure 2 below and is set out in full in the cost benefit analysis at Annex A.

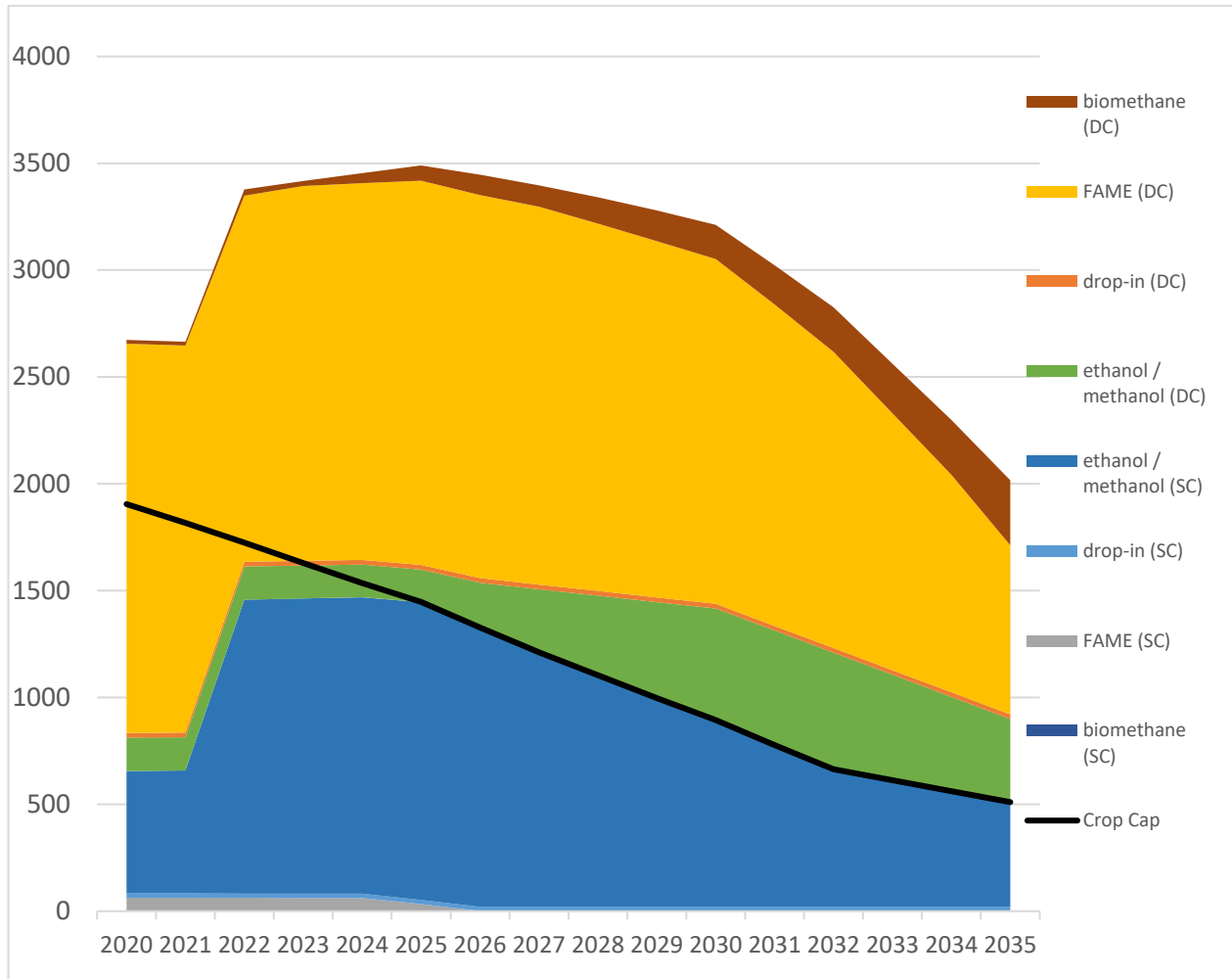


Figure 2 Fuel projections from 2020 to 2035 for the main RTFO obligation with a 5% increase between 2022 to 2032 (more rapid electric vehicle uptake). SC = biofuel from feedstocks which single count towards suppliers' obligations (typically crop-derived biofuels) and DC = biofuel from waste feedstocks which double count towards suppliers' obligations.

This scenario shows the same initial jump in bioethanol supply caused by the introduction of E10, and waste-based biodiesel initially remains broadly the same as today. However, the reduction in overall fuel demand starts to noticeably reduce the amount of biofuel from 2025 onwards. Some stakeholders have argued that this means that RTFO targets should be increased even further. However, we also need to consider the need to increase sustainable renewable fuel supply in other modes of transport, particularly aviation.

The future of the biofuel market - a transition from road biofuels

We know we will need renewable fuel for aviation and freight. We need to encourage and support these sectors. We are working closely with industry on how to do this, in particular, on proposals for a sustainable aviation fuel mandate, and plan to publish a consultation on this soon. As a result of such a mandate, over time there will be a transition of the renewable road fuels market over to an aviation one.

A decline in renewable road fuel would increase biomass availability in the later 2020s. Both the waste-derived biodiesel feedstocks and the ethanol feedstocks can be used to create aviation fuel, with the appropriate processing technologies. This presents us, and

UK industry, an opportunity to push forward the transition of feedstocks currently used for road fuel to other sectors.

Feedstock availability and sustainability

As we identify levers or other policy measures that can be deployed to further facilitate high blends of renewable fuel for road transport and aviation, we need to remain cautious with the increase to the main obligation. A recent PRIMA report which was commissioned by the RTFA suggested that we should increase the main obligation to 21% by 2032. We need to approach this evidence with caution, given the need to ensure that different sectors have the appropriate level of allocated biomass.

We are confident that there is enough sustainable biomass to meet an increase of 5%. We would not be drawing in a substantial amount of additional biomass on top of the feedstock needed to deliver E10 in the first three years of this adjusted policy and it would then reduce after 2025 in the “high electric vehicle” scenario. We will keep future targets under review as future energy demand becomes more certain, factoring in demand for sustainable biomass across other sectors.

GHG emission savings delivered by increasing the main obligation by 5%

All sectors must play their part in reducing GHG emissions to meet carbon budgets four and five. Under the EEP scenario we have modelled an additional 23.6 MtCO_{2e} in GHG savings. This is slightly less for a more rapid uptake of electric vehicles at 19.5 MtCO_{2e}.

The cost of increasing the main obligation by 5%

A 5% increase to the main RTFO obligation is expected to cost £121-235 million per year which is equivalent to 0.5-1.6 pence per litre higher than the cost of meeting existing targets (including VAT). These costs are the same for EEP and rapid uptake of electric vehicle scenarios. A few stakeholders mentioned that this price increase is too expensive at this time. We recognise that any increase to fuel costs is unwelcome. However, we have committed to meeting net zero by 2050, so investment into renewable fuels needs to be made now. Delay is likely to make the task of reaching net zero more difficult and expensive.

Wider economic benefits – protection and creation of UK jobs

An increase of 5% will help maintain the supply of biofuels. As a consequence, and as many stakeholders suggested, this change will stimulate investment not only in the current biofuels market - which would help protect the UK’s biofuel industry and jobs - but also for the development fuels market. Several development fuel suppliers suggested that an increase to the main obligation would help them secure investment. Maintaining the existing market and encouraging new investments will be essential to support the transition to those sectors for which electrification is more challenging and so will continue to need liquid fuels.

Development fuels are not only needed to help decarbonise difficult to electrify sectors, but their production will also create UK jobs. We anticipate that by 2040 there could be up to 11,000 new jobs in the sustainable aviation fuel sector.

Summary and next steps with decarbonising transport

The reasoning and evidence presented means we are going to increase the main obligation by 5%. This will apply as a 1.5% increase in 2022 with an additional 3.5% spread over the period 2023 to 2032. The target will increase from 9.6% in 2021 to 14.6% in 2032 and continue at the same level thereafter. The details of the targets that will apply in each year are set out below.

Obligation period or periods	Existing legislation Target (obligation) level, as share of total liquid fuel by volume, may include double rewarding	New position Target (obligation) level, as share of total liquid fuel by volume, may include double rewarding
2021	9.60%	9.60%
2022	9.60%	11.10%
2023	9.60%	11.45%
2024	9.60%	11.80%
2025	9.60%	12.15%
2026	9.60%	12.50%
2027	9.60%	12.85%
2028	9.60%	13.20%
2029	9.60%	13.55%
2030	9.60%	13.90%
2031	9.60%	14.25%
2032 and subsequent years	9.60%	14.60%

Table 1 The existing legislation and new position of a 5% target increase to the main RTFO obligation

We are not making any changes to the development fuel obligation percentages at this time. The 'headline' development fuel targets which are expressed as a percentage of total fuel will stay the same. However, because the change to the main obligation percentage will change the relative proportion of obligated fuel, we must make a small change to the development fuel numbers shown in the legislation, because these are expressed as a percentage of the obligated amount.

With the government's commitment to net zero and drive to continue to save more GHG emissions, the RTFO is continuously under review and as more evidence and data regarding biomass availability becomes available, targets will be reviewed and adjusted accordingly.

2. Introducing support for recycled carbon fuels

Overview

Recycled carbon fuels (RCFs) are fuels produced from fossil wastes that cannot be avoided, reused, or recycled. Feedstocks used to produce RCFs include the fossil fraction of municipal solid waste (MSW) (e.g. non-recyclable plastic) and industrial waste gases. Such feedstocks may be mixed with biogenic material (e.g. food contaminated packaging, sanitary waste, polycotton). RCFs have the potential to reduce GHG emissions relative to petrol or diesel.

RCFs are not currently supported under the RTFO, only renewable fuels (i.e. biofuels and renewable fuels of non-biological origin (RFNBOs) e.g. renewable power to liquid) are eligible for support. However, evidence suggests that were the government to provide support to RCFs this might encourage investment in the advanced waste processing technologies to bring greater quantities of renewable fuel to market. Support for RCFs has the potential to encourage investment in strategically important fuels such as sustainable aviation fuel.

Given the potential benefits of RCFs, the government proposed to extend the scope of the RTFO so that suppliers of sustainable RCFs would be able to claim development fuel Renewable Transport Fuel Certificates (dRTFCs). In proposing to include RCFs in the RTFO scheme the government sought views on how such fuels might be included. Specifically, the government proposed:

- that eligibility would be limited to RCFs made from two types of feedstock - the fossil component of refuse derived fuel and industrial waste process gases
- that in order to be eligible for support, solid feedstocks used to produce RCFs would need to have at least a 25% content, by energy, of biogenic waste
- that support would be limited to those fuel types listed in the development fuel sub-target
- a GHG assessment methodology for RCFs to take account of emissions from diverting the waste feedstock from incineration
- that RCFs would need to meet a GHG emission saving threshold of 55% initially, and that the minimum GHG saving threshold would increase over time
- that RCFs from solid feedstocks would be awarded 0.5 dRTFCs per litre, and RCFs produced from gaseous feedstocks 1 dRTFC per litre

A total of 79 responses were received to the questions relating to RCFs. Responses were from a broad range of organisations, including fuel suppliers and traders, energy providers, trade bodies, and non-governmental organisations (NGOs). We appreciate the quantity and quality of responses on the government's proposals on RCFs, which is a technical and complex policy area. The below summarises the responses to each question in more detail.

Supporting RCFs through the RTFO scheme

Consultation proposal

The government proposed that given the GHG benefits of RCFs, and to drive investments in advanced technologies, the RTFO should be amended so that suppliers of RCFs can claim support under the RTFO in the form of dRTFCs. Trading dRTFCs provides support under the RTFO scheme to those supplying fuels which reduce GHG emissions compared to fossil equivalents.

Question 3

Do you agree or disagree that recycled carbon fuels should be eligible for support under the RTFO given their potential to deliver GHG savings?

Summary of responses

Total	Agree	Disagree	Other
77	73	4	0

A significant majority of respondents agreed that the government should support RCFs through the RTFO. These included fossil and renewable fuel suppliers and their trade representative bodies, and many energy providers. Several arguments were offered in support of expanding the RTFO so that RCFs are eligible for reward. These included the fact that such fuels have the potential to deliver GHG savings and offer benefits of a circular economy by utilising wastes that would otherwise go to landfill or incineration. Inclusion of RCFs would therefore align with the strategic objectives of the RTFO scheme. It was also suggested by respondents that RCFs offer benefits of diversifying the UK fuel mix, increasing security of fuel supply, and supporting innovation and job growth, particularly in the production of advanced fuels used in aviation.

It is worth noting that agreement to the proposal to make RCFs eligible for dRTFCs was provided with caveats in many cases. These caveats broadly fell into three categories, directing the government to consider the following.

- expanding the qualifying criteria for RCFs eligible for reward
- the adequacy of incentives proposed for RCFs
- increasing targets further under the RTFO and ensuring a level playing field with renewable fuels

Several fuel and energy suppliers and their representative bodies suggested that additional feedstocks and conversion methodologies should be eligible. These included synthetic hydrocarbon products, including those produced using nuclear energy and more broadly RCFs produced at refineries from waste oils, plastics, and tyres. It was noted that the underlying definition of RCFs is “fuels produced from fossil wastes that cannot be avoided, reused or recycled”, and the proposals to restrict eligibility were unduly limiting. They considered that an unduly limiting definition would not incentivise all RCFs capable of

delivering GHG emissions reductions that might fall within that definition. Conversely some respondents cautioned the government to avoid perversely incentivising waste streams. Arguing for robust safeguards to avoid diverting recyclable materials into RCF production, and to preserve the waste hierarchy.

A few respondents suggested that the RTFO should recognise the level of GHG emissions reduction that some gas fuels such as coalbed methane (CBM) can deliver. Similarly, respondents urged the government to consider the viability of less innovative and novel drop in fuels, like hydrotreated vegetable oil (HVO) which it was argued provide the opportunity to make immediate cuts to GHG emissions. It was noted in these, and other responses, that there is a need to focus on fuel replacement in heavy haulage.

Whilst RTFO support was welcomed by respondents, concerns were raised by potential suppliers of RCFs as to whether the support was enough to ensure new technologies are developed and whether the level of reward adequately recognised the carbon reduction benefits of RCFs. It was also argued by energy providers that proposals for a minimum biogenic content requirement, as part of the RCF eligibility criteria, could result in subsidy generated disparities. For example, between green hydrogen and hydrogen from plastics capable of deployment in transport.

Responses received from the renewable fuel sector and their representative bodies, broadly welcomed the inclusion of RCFs under the RTFO as eligible for dRTFCs. However, the sector was clear that feedstocks used to make the RCFs must meet sustainability criteria, and deliver equivalent GHG emissions savings, as is required for renewable fuels. It was also strongly argued by those in the sector that RCFs should not displace renewable fuels, and that inclusion of RCFs in the RTFO strengthened the case for an increase in the RTFO obligation level to 5% or higher (see chapter one).

There were only four respondents in disagreement with the proposition to support RCFs under the RTFO. Arguments offered against supporting RCFs at all included:

- RCFs are too niche to be a serious proposition
- support for RCFs risks overextending and losing the focus of the RTFO which was not established as a scheme to deal with all climate change policies
- support might encourage a market for virgin plastic and may lead to less recycling and waste minimisation by creating value for the waste plastic
- all subsidy efforts should instead concentrate on accelerating the adoption of zero emission high efficiency vehicles with electric powertrains
- it is too early to support RCFs as the European Commission is yet to propose delegated acts outlining a minimum GHG savings threshold, or methodology to assess their GHG emissions for RCFs Government response

We are pleased that there is wide support for our proposal to include RCFs within the RTFO with the majority of respondents expressing support. We are encouraged that most respondents recognised that there is potential for these fuels to contribute to GHG savings and provide wider benefits through the circular economy and for UK industry.

The government recognises the caveats that were provided, particularly relating to the specifics of types of fuel and feedstock that may be eligible for reward and the level of reward. These are addressed under the relevant questions below.

The government is committed to supporting RCFs under the RTFO. As noted in the consultation, to introduce support for RCFs through the RTFO we will need to amend primary legislation first. Given that this will take additional time, we will not be able to introduce support for RCFs as part of the package of amendments to the RTFO outlined in the remainder of this government response.

We will look to amend the primary legislation as soon as the Parliamentary timetable allows in advance of amending the RTFO Order to that end.

Eligible feedstocks

Consultation proposals

We proposed that two types of RCF feedstocks should be eligible for support under the RTFO. One eligible feedstock would be the fossil component of refuse derived fuel (RDF) from the mechanical treatment of municipal solid waste streams, which would be inherently mixed with biological material. The other, industrial waste process gases containing carbon monoxide, that are only suitable for incineration for energy recovery.

The government proposed some qualifications to this eligibility criteria. Firstly, and in order to adhere to principles in the waste hierarchy, RCFs should not be produced from recyclable material and suppliers must be able to demonstrate that feedstocks used are sourced from facilities that have adequate separation processes to remove recyclable dense plastics. Secondly, RCFs produced using gaseous wastes will only be supported under the RTFO if they occur because of an industrial process, and if they cannot be avoided. Thirdly, it was proposed that the fossil-derived component of waste rubber, usually used in processes to make fuel from end-of-life tyres, will not be supported under the RTFO as an RCF. This is because the level of support already available to the renewable component of end-of-life tyres under the RTFO is considered enough.

Question 4

Do you agree or disagree that only RCFs derived from refuse derived fuel and industrial wastes gases should be eligible for RTFO support? If not, please provide an alternative approach and set out why.

Summary of responses

Total	Agree	Disagree	Other
63	35	28	0

Out of 63 respondents 35 agreed that only RCFs derived from refuse derived fuel and industrial wastes gases should be eligible for RTFO support. However, most of these provided a qualification to their agreement. It is also worth noting that amongst respondents disagreeing with the proposal, almost all did so on the basis that they felt the proposals on eligibility were too narrow or specifically ruled out an RCF production pathway they felt should be eligible. As indicated by responses to question three above,

most did not disagree that RCFs derived from refuse derived fuel and industrial wastes gases should be eligible for RTFO support.

Two respondents, a consultancy, and an NGO, suggested that the proposal needed narrowing. This was on the basis that only the bio-content of municipal solid waste (MSW) used to produce fuel should be eligible for support, and RCF eligibility must be qualified by further assurances on how that waste was collected.

Six respondents, including renewable fuel suppliers, energy producers and a consultancy, who agreed with the proposal, suggested some further prioritisation would be helpful. Specifically, that support should be targeted at non-biogenic wastes given existing technologies, such as anaerobic digestion, could be used to produce transport fuels made from organic feedstocks.

Most respondents noted production methods and feedstocks used to produce RCFs missing from the proposed scope of eligible RCFs in the consultation. These included hydrogen produced from low carbon nuclear power and clean syngas produced from municipal waste. Respondents also suggested that the definition of wastes was too narrow. Respondents further explained that RCFs could be produced from residue from transfer stations and waste processing plants, construction and demolition wastes, post-recycling sorting residues, baled non-recyclable plastics, or all end-of-life plastics. Indeed, in arguing for more flexibility many respondents suggested that any technologies using feedstocks that are currently buried, burned, or exported, should be within scope of eligible RCFs.

A number of respondents, including fossil fuel suppliers and their representative body explained that RCF eligibility under the RTFO should be consistent with the Renewable Energy Directive (EU) 2018/2001 (RED II). Therefore, the RTFO should follow GHG emissions-based criteria as far as possible and include other non-recoverable waste sources as eligible feedstocks for RCFs.

The consultation set out why the fossil-derived component of waste rubber, usually used in processes to make fuel from end-of-life tyres would not be eligible for support as an RCF under the RTFO scheme. Ten fossil and renewable fuel suppliers, and their representative bodies objected to this limitation, explaining that tyre pyrolysis oil is economic, scalable and can be brought to market quicker whilst delivering reductions in GHG emissions towards the UK's net zero targets.

The merit of an economic test for eligibility, such as proposed in the consultation as “those fuel pathways which need greater support”, was similarly disputed.

It was also suggested non-fuel carbon reduction measures such as direct air capture projects should be included in the RTFO.

Many respondents proposed alternative eligibility criteria, which irrespective of whether they agreed or disagreed to the question, involved providing some additional flexibility in determining which feedstocks used to produce RCFs should be eligible. This group included renewable and fossil fuel suppliers, and representative bodies in addition to energy producers and a consultancy. For example, it was proposed that the principles that should be used to determine if an RCF is eligible might more broadly and simply include

whether the only alternative uses are energy recovery or landfill and whether the RCF delivers lower GHG emissions than fossil fuels.

Government response

We are pleased that there is wide support for including support for RCFs made from refuse derived fuel and from waste industrial gases in the RTFO. The government therefore remains committed to including these two feedstocks.

We welcome the stakeholder comments and evidence provided on additional feedstocks which should be included, and the suggestions on a broad set of principles that could be used to determine whether a fuel or feedstock should be eligible. We will engage further with industry before we determine whether additional feedstocks should be included and carry out a further targeted consultation in advance of any secondary legislation to amend the RTFO scheme itself.

Biogenic content of RCFs

Consultation proposals

Solid fossil wastes are currently produced in high volumes and have the potential to save GHG emissions if used for fuel rather than sent to landfill or incinerated. These wastes are typically a mixture of fossil and organic waste, so could help increase the supply of renewable fuels. We proposed a further qualification that to be eligible for dRTFCs under the RTFO, RCFs produced from solid waste feedstocks must have a biogenic waste (organic) content of at least 25% by energy. The proposal was based on our view that the 25% threshold was realistic given the typical relative composition and energy content of residual waste streams in the UK.

Question 5

Do you agree or disagree that RCFs produced from solid feedstocks should contain at least 25% biogenic content, by energy? If not, please set out an alternative approach with evidence as to why.

Summary of responses

Total	Agree	Disagree	Other
53	15	38	0

There were 53 responses to this question. Fifteen respondents supported this proposal.

Those who agreed to the threshold included a consultancy, trader, equipment manufacturer, and individual fossil and renewable fuel suppliers. A few fuel suppliers were clear that agreement is conditional on the proposal achieving the aim of not diverting recyclable or reusable materials to RCF production.

Most of those in agreement acknowledged that municipal waste would be above the threshold, and whilst the 25% threshold was pragmatic asked if there may be scope to consider solid feedstocks below that level. For example, it was suggested leaving it open to the RTFO Unit as administrator of the scheme to apply a lower threshold, or that the government might review the threshold if there is evidence that it is preventing sustainable waste management approaches from being developed.

Respondents disagreeing with the proposal broadly fell into two groups. There was a significant consensus between these groups that the policy might result in negative unintended consequences or impacts.

The first group included a trader, an NGO, energy providers, renewable fuel suppliers, and several consultancies. They argued for a higher biogenic content threshold of 40% or 50%. They also urged that more consideration be given to the policy to guard against unintended consequences given the need to adhere to the waste hierarchy and recycling aims, and to make best use of available waste feedstocks.

The second group included renewable fossil fuel suppliers, energy providers, a consultancy, an equipment manufacturer, and representative bodies. This group argued that the purpose of the biogenic content threshold is unclear and unduly restrictive in its treatment of RCFs produced from non-recyclable plastics.

Concerns raised on the policy to set a 25% biogenic content threshold for RCFs included:

- the proposal works counter to the Waste and Resources Strategy (and Action Plan) goals to ensure that energy is extracted from biogenic material using technologies such as anaerobic digestion, composting and other processes
- RCFs should not divert resources from existing upstream uses of biogenic wastes or promote the co-mingling of biogenic material into thermal combustion over their use in anaerobic digestion which has a far lower carbon intensity and supports soil health improvements for food production and climate mitigation
- reaching recycling targets in the collection of wastes will most likely end up with wastes that do not meet the threshold. The limit proposed could create perverse incentives not to separate wastes
- the proposal disadvantages the use of wastes that have been separated in the production of RCFs, be they fossil or biogenic wastes
- the reasoning for 25% biogenic content threshold is unclear and seems arbitrary. Instead the qualifying criteria should be kept to the actual GHG emissions savings achieved compared to the counterfactual outcome should the feedstock have been disposed of and not converted to an RCF
- the most important principle is that suppliers should demonstrate that they are not using material that could have an application higher up the waste hierarchy. The RTFO Administrator might best determine this potentially by considering other models such as the treatment of municipal household waste in the US Renewable Fuel Standard
- there is merit in allowing an alternative threshold for end of life (non-recyclable) materials to be applied. As proposed, the threshold risks excluding non-recyclable plastics waste streams that could be used for RCF production

Government response

Given the significant level of opposition to this proposal, we will review the additional evidence and reasoning provided and determine whether an alternative proposal is appropriate. Should we conclude that an alternative proposal is necessary, this proposal will be discussed with stakeholders and consulted on in advance of any secondary legislation to amend the RTFO scheme.

RCF categorisation as development fuels

Consultation proposals

The RTFO provides additional support for development fuels. Development fuel types are categorised specifically in the RTFO scheme and UK legislation as:

- aviation fuel (avtur or avgas)
- a fuel that can be blended such that the final blend has a total content by volume of renewable and RCF content of at least 25% whilst still meeting BS EN: 228 (for petrol, as revised or reissued from time to time) or BS EN: 590 (for diesel, as revised or reissued from time to time)
- substitute natural gas produced from the product of gasification or pyrolysis
- hydrogen when produced using carbon capture and sequestration (CCS)

It is the government's aim to incentivise low carbon fuels that fit the UK's long-term strategic needs, and to encourage investment in development fuels that can be deployed in modes of transport where there are limited alternatives to decarbonisation. Given this, we proposed to limit support under the RTFO to RCFs which were of a fuel type categorised as a development fuel.

Question 6

Do you agree or disagree that support for RCFs should focus on those RCFs which can meet the UK's future strategic needs? That is, that only RCF types which are equivalent to current development fuels should be eligible for support. As such they would be eligible for development fuel certificates and to count towards the development fuel sub-target under the RTFO.

Summary of responses

Total	Agree	Disagree	Other
61	29	32	0

The 61 respondents providing an answer to question six were almost equally split on the merits of limiting support to RCFs which could be categorised as development fuels. Many of those answering this question focussed on the broader definition of development fuels, as ones which meet the UK's future strategic needs, rather than specific fuel types which might fall within the categories repeated in the consultation. Consequently, only a limited

number of respondents provided comments on fuel type categorisation proposed for RCFs. Most respondents instead made or repeated broader points.

Those agreeing with the proposal but proposing minor modifications included renewable and fossil fuel suppliers, traders, and academic researchers. Such minor modifications included keeping the definitions of RCFs under review as the UK's strategic objectives change and grandfathering the changes so as not disadvantage those supplying RCFs when support for RCFs is first introduced.

The remainder of those in agreement with the proposal including renewable fuel suppliers, power producers, consultancies, equipment manufacturers, made clear that agreement to the proposal was conditional upon wider issues raised by the consultation being addressed i.e. that looser criteria for RCF eligibility are adopted, and these include hydrogen produced from nuclear power. In line with responses from the gaseous fuel sector on proposals to define eligible solid wastes (questions five and six) a further qualification made in agreeing to the proposal was that the definition of RCFs must be one that makes best use of biogenic waste and adheres to the waste hierarchy.

With a single exception, respondents disagreeing with the proposal raised one or more of the following three overarching concerns.

- proposals to categorise fuels as RCFs based upon meeting the UK's future strategic needs were unnecessary, unclear or both
- there is no justification for RCFs meeting sustainability and GHG emissions criteria to not be eligible for ordinary RTFCs, as distinct from dRTFCs
- the categorisation of eligible fuel types proposed was unduly narrow

Those disagreeing with the proposal included renewable and fossil fuel suppliers and their representative bodies, other trade representative bodies, academic researchers, consultancies, power producers and a trader.

It was suggested that more work needs to be done to define the 'UK's future strategic needs' and to develop a strategy which encompasses all liquid fuel uses in the UK across sectors. Concerns were similarly raised that rail, maritime and aviation are subject to different supply and regulatory regimes and should be subject to separate, dedicated renewable fuels targets on a life cycle GHG emissions basis.

It was also argued that there is no merit in including in the test for eligibility an arbitrary assessment of the strategic importance of RCFs as given strategic objectives can change this would risk making it more difficult to secure investment and bring fuels to market. Many of those disagreeing with the policy expressed concern that either RCFs should meet similar sustainability and GHG emissions test as renewable fuels irrespective of any strategic test. It was also noted that the consultation proposal that support should be limited to hydrogen when produced using carbon capture and sequestration (CCS), is not consistent with current RTFO and adds complexity with no justification.

There was some consensus amongst those disagreeing with the proposal that where RCFs deliver enough reductions in GHG emissions, such fuels should be eligible for reward under the RTFO through RTFCs where they did not qualify for dRTFCs.

In raising concerns that the use of current development fuel types was unduly narrow, respondents disagreeing with the proposals argued that the following should be included:

- ethanol RCFs, such as ethanol derived from steel mill flue gas
- green hydrogen and ammonia used in the maritime sector
- biopropane and biobutane
- all RCFs made from end-of-life plastics
- fuels produced through advanced gasification/pyrolysis which can be used at high blends in vehicles today e.g. dimethyl ether
- biomethanol and hydrogen produced from nuclear energy

One NGO objecting to the proposal argued that whilst only fuels that are categorised as development fuels under the current RTFO could be eligible for support, not every feedstock should be eligible and only fuels capable of deployment in aviation should qualify for support and not liquid road fuels.

Government response

In line with the commitments already made to include RCFs in the RTFO, we plan to include those RCFs which fall into the already defined development fuels category.

Whilst we acknowledge the significant stakeholder call for a wider range of RCFs to be supported by offering eligibility for standard as well as development fuel RTFCs, we wish to focus support on those processes which will deliver the fuels of the most long-term importance such as aviation fuels, and those which can be used without blend limits in road fuel. We also note that some of the fuels suggested are not RCFs, and some, such as biopropane, biobutane, and biomethanol are already eligible for incentives under the RTFO.

GHG savings minimum thresholds

Consultation proposals

In common with eligibility criteria for renewable fuels, we proposed that RCFs supported under the RTFO must demonstrate a minimum GHG saving compared to the fossil fuel it would be displaced. The minimum GHG emission saving threshold proposed for RCFs was 55% on introduction, 60% from 2025 and 65% from 2030. It was further proposed that there would be no 'grandfathering' of these thresholds. Meaning that production facilities which are operational in advance of the increase in the GHG savings threshold would not receive any dispensation through having a lower threshold apply as an interim measure. This was justified on the basis that the national grid will decarbonise over time and that will help deliver the additional GHG savings required to meet the minimum thresholds.

Question 7

Do you agree or disagree with the proposed GHG minimum thresholds and the timeline for increasing GHG emission saving criteria for RCFs? Please provide an explanation as to why.

Summary of responses

Total	Agree	Disagree	Other
60	33	27	0

Thirty-three of the 60 respondents agreed with the proposed GHG savings minimum thresholds for RCFs and the timeline for increasing these. Respondents in agreement with the proposal included renewable fuels suppliers, fossil fuel suppliers and their representative body, a trader, trade organisations, consultancies, power producers, academic researchers, an equipment manufacturer, and a logistics company.

Respondents supporting the proposals and GHG thresholds noted that whilst these are initially lower than for renewable biofuels this is acceptable because the thresholds for RCFs are challenging, apply to new technologies and use counterfactuals which are distinct from biofuel production. This justified a different approach to that used for biofuels, which it was noted do not currently have to pass GHG emissions thresholds incorporating indirect land use change impacts.

Whilst the approach to grandfathering was agreed by those supporting the proposals some suggested that to provide investment certainty the proposed thresholds should not be subject to legislative change. Some respondents urged the government not to develop this policy in isolation and have regard to criteria being considered by the European Commission in its assessment of RCFs. It was also noted that if grid decarbonisation targets are different from projections, measures should be taken to ensure the policy can be altered without the need for further legislation.

Those respondents disagreeing with the proposal included renewable fuel suppliers and their representative body, NGOs, fossil fuel suppliers and traders. These responses split broadly into three positions:

- two NGOs and one renewable fuel supplier who pressed for higher GHG emissions savings thresholds
- a larger group of renewable and fossil fuel suppliers who felt there should be parity with thresholds for all renewable fuels, and that the same criteria should apply to all development fuels
- around half of those expressing concerns, who were of the view that the thresholds proposed would not deliver RCFs, especially when considered alongside the GHG emissions savings methodology proposed in question eight

The first two groups provided little detailed comment on the proposals, as the positions of principle are relatively straight forward. Either they believed the GHG thresholds are not ambitious enough in meeting net zero or did not ensure a level playing field between suppliers of low carbon fuels.

Detailed and helpful points were provided by those respondents concerned that the proposal would not actually deliver the RCFs the government seeks to support. This group was predominantly made up of renewable fuel suppliers and their representative body. One trade body summarised the dilemma faced and urged the government to consult further on the GHG threshold and GHG emissions savings methodology. The dilemma

being how to ensure that only fuels with a clear environmental benefit are incentivised, while setting thresholds that are achievable for real projects and the rewards are sufficient so that RCF projects get built. On the final point in the dilemma it was noted that the absence of grandfathering, without other protections for investments, potentially undermined investor confidence. It was also argued that some of the assumptions in the consultation about grid decarbonisation benefits and energy from waste efficiencies overestimated the potential for plants to achieve the increase in GHG savings required to meet the increasing thresholds.

Government response

We have considered the responses to questions seven and eight together - see government response below.

GHG emissions savings methodology

Consultation proposals

At present, there is no framework for assessing the GHG emission savings from RCFs. The government proposed one which relied on determining GHG emissions from RCFs compared to a situation in which the fossil waste would otherwise be disposed of via another means (the counterfactual).

The counterfactual proposed was based on the 'next likely' outcome, which means that we would compare producing RCFs with the method in which they are most commonly disposed of. In the case of solid RCF waste feedstocks this would be incineration with energy recovery, i.e. electricity generation which is currently the most common energy recovery route in the UK. For RCFs made from industrial gases it was proposed to consider alternative counterfactuals based on evidence from RCF suppliers.

The proposed GHG calculation methodology sought to quantify the GHG emission savings from making more effective use of waste by increasing the rate of energy recovery and rewarding the development of carbon capture technology. It assumed the relative GHG emissions savings achievable by RCFs will depend on the efficiency of the RCF plant, the efficiency of the counterfactual use, and the GHG emissions from the replacement of any utility provided by combustion of the waste in the counterfactual (e.g. generation of electricity or heat). In addition to any carbon capture and storage (CCS) deployed.

In calculating GHG emissions savings from RCFs the methodology proposed the following assumptions.

- total GHG emissions from combustion of the input material will be assumed to be the same as the GHG emissions from the counterfactual system. Although, in practice emissions will occur during both production and combustion of RCFs
- the efficiency of conversion in the counterfactual used should be 26%. This is consistent with the Waste Framework Directive energy efficiency standard (the R1 standard). The R1 standard was established to differentiate between energy from waste plants which are classified as 'recovery' under the waste hierarchy and those which are classified as 'disposal'

- the emission factor of displaced energy in the counterfactual should be the latest published figures for a full reporting year for the average generation of that energy. According to the previous year’s data for the country where the feedstock and fuel are produced

Question 8

Do you agree or disagree with the proposed GHG emissions methodology to assess the GHG savings for recycled carbon fuels? Please provide an explanation to why.

Summary of responses

Total	Agree	Disagree	Other
51	28	23	0

There were 51 responses to question eight. In keeping with responses to the question on GHG minimum savings thresholds (question seven) about half agreed with the proposed GHG emissions savings methodology for RCFs. Respondents agreeing with the proposals included renewable fuel suppliers, fossil fuel suppliers and their industry representative bodies, other trade bodies, consultancies, equipment manufacturers, energy producers and an academic researcher.

Arguments offered in support of the proposed GHG emissions savings methodology included that the methodology seems logical, and that basing the counterfactual on next likely outcome is sensible. However, those supporting the proposal also commented that some further clarification was needed on the methodology, including:

- how counterfactuals would be determined
- whether the approach accurately reflects the use of industrial gases
- whether biogenic emissions are included
- if the R1 incinerator efficiency data used is correct and up to date
- how the methodology might account for waste separation

It was also noted that to avoid dislocation of the UK market, consideration should be given to similar measures being considered by the EU.

Those respondents who did not agree with the proposal raised concerns that the R1 incinerator efficiency counterfactual used is not correct and does not work. Specifically, it was suggested by traders, renewable fuel suppliers and their representative body that:

- the assumption that incinerators meet the R1 standard is misplaced, noting there isn’t any incentive or regulation in the UK that encourages incinerators to meet the R1 standard and no independent assessment of incinerator efficiency
- the R1 standard assesses the gross efficiency of the incinerator and does not account for the power used with the incinerator so will be less than 26% efficiency
- a figure of 22% for refuse derived fuel feedstocks is more realistic
- assuming R1 efficiencies for waste gases will significantly underestimate the GHG impact of using them to make fuels

- waste gases produced at steel works or other industrial sites will normally be used to raise process heat. Therefore, it seems inappropriate to use a solid waste incinerator as the counterfactual
- the grid average for the counterfactual is not appropriate

Respondents proposed an alternative approach as recommended in “Future Fuels & Gasification Groups thoughts on Life Cycle Strategies for Recycled Carbon Fuels”.² This suggests that in calculating displacement emissions for RCFs you should use the average carbon intensity of current additions to electricity generation.

Other arguments against the proposed methodology included that:

- the counterfactual should reflect the most realistic scenarios. For example, incineration of waste without energy recovery is likely to be the relevant counterfactual for industrial (hazardous) wastes
- the methodology must consider the full impact of the RCF project and the average electricity carbon intensity for the full operation period, e.g. 25 years
- the EU ETS Innovation Fund specifies a methodology using a 2050 grid carbon intensity forecast for projects with a longer time to market so it is appropriate to look forward when considering the counterfactual
- the proposed methodology does not deal with biofuels plants with integrated materials recycling facilities pre-processing the input waste
- the methodology is unclear about how coproducts should be accounted for
- if CCS (carbon capture and storage) or other processes are factored in, then emissions associated with the CCS plant and process must also be incorporated
- the government should consider extra rewards for plants which achieve higher than required GHG savings per MJ in their biogenic portion in the methodology.
- the methodology assumes grid average for the counterfactual, but that is not representative of the true counterfactual outcome, e.g. where wind or solar are the incremental investments for non-peaking power being added to the grid
- as it stands the methodology does not create a level playing field and should be subject to further consultation

Government response to questions 7 and 8

We would like to thank stakeholders for the detailed responses and evidence they have provided in response to these questions.

We will review the additional evidence and reasoning provided and carry out further work with stakeholders on the GHG methodology and GHG thresholds for RCFs. Should we conclude that alternative proposals are necessary, these proposals will be discussed with stakeholders and consulted on in advance of any secondary legislation to amend the RTFO scheme.

² The ART Fuels Forum, May 2020, Final Methodology Paper “Future Fuels & Gasification Groups thoughts on Life Cycle Strategies for Recycled Carbon Fuels”, https://artfuelsforum.eu/wp-content/uploads/2020/05/RCF-Methodology-Paper_FINAL-1.pdf

Level of reward for RCFs

Consultation proposals

To be eligible for reward RCFs would have to be categorised as a development fuel. We therefore proposed that RCFs would receive dRTFCs and can count towards the development fuel sub-target. In line with other development fuels, we also proposed that RCFs will be eligible for double reward, as they are made from waste feedstocks.

As RCFs are produced from non-renewable material, and the GHG emission saving threshold for RCFs is lower than for renewable transport fuels, it was further proposed that the level of support for RCFs will be lower than renewable development fuels. The rationale behind this approach is to help ensure a level playing field between new RCFs and renewable fuel currently supplied under the RTFO. Specifically, it was proposed that RCFs made from industrial waste gases would receive two x 0.5 development RTFCs per litre, and RCFs made from solid feedstocks meeting eligibility criteria would receive two x 0.25 dRTFCs per litre.

Question 9

Do you agree or disagree with our proposal that RCFs from solid feedstocks are eligible for two x 0.25 dRTFCs per litre, and RCFs produced from gaseous feedstocks are eligible for two x 0.5 dRTFCs per litre?

Summary of responses

Total	Agree	Disagree	Other
51	9	42	0

There were 51 responses to question nine on the proposed level of reward for RCFs. The majority of respondents disagreed with the government's proposals. The few respondents who did agree with the level of reward proposed included renewable fuel suppliers, a trader, an academic researcher, a consultancy, and a power producer. Arguments in support of the proposal included that RCFs should have a low multiplier as they still produce carbon emissions unlike hydrogen. It was also noted that the level of support prioritises biomass resources for development fuel production while creating a clear value to produce fuels from eligible fossil waste. Several respondents supporting the proposed level of reward urged the government to keep it under review, with a view to increasing it.

Of those not in agreement with the proposal, two thirds, stated that the proposed levels of reward for RCFs were too low. The most common reason provided was that they are insufficient to encourage UK investments in RCFs, and do not adequately reflect the GHG savings delivered in meeting the proposed GHG methodology or the risks in bringing new fuels to market. Many of these respondents argued a case had not been made for the different treatment of RCFs as a development fuel, or indeed for the difference in treatment between RCFs produced from solid and gaseous feedstocks.

Several respondents whilst not expressly arguing for an increase in the level of reward also raised concerns over the consistency of the rewards proposed. One respondent noted that there was a lack of clarity around carbon capture factors, and that the level of reward should factor in the GHG emissions benefits from such processes. Some fossil fuel suppliers, and their representative body, suggested the approach is overly complex for novel and commercially unestablished RCFs. This group suggested that the level of reward should be technology neutral and linked to GHG emissions saving criteria. They also noted that it is essential that rewards are maintained to offer investors certainty and not reduced given the limited risk of over-incentivising RCFs.

A small number of hydrogen suppliers argued that the level of reward does not create a level playing field or recognise production costs. A few consultants and renewable gaseous fuel suppliers argued that RCFs be excluded from the RTFO until they can be shown to match the performance of biofuels.

Government response

Given the significant level of opposition to this proposal, we will review the additional evidence and reasoning provided and determine whether an alternative proposal is appropriate. Should we conclude that an alternative proposal is necessary, this proposal will be discussed with stakeholders and consulted on in advance of any secondary legislation to amend the RTFO scheme.

Verification

Consultation proposals

For consistency with all applications for dRTFCs, the government proposed that evidence submitted in support of certificate applications for RCFs must have independent assurance (verification). Further that this would be as similar as possible, and to the same standard, as the verification of sustainability information already required under the RTFO for renewable fuels. As part of this verification process those applying for dRTFCs under the RTFO for renewable fuels have to provide assurance that the fuel has not similarly been counted towards environmental targets in other countries and has not been rewarded under other schemes, such as under Ofgem's Renewable Heat Incentive or Renewables Obligation in the UK. The government sought views on how this might similarly be evidenced for RCFs made from industrial waste gases.

Question 10

RCFs from industrial waste gases have the benefit of avoiding release of the industrial gases to the atmosphere. Do you have evidence as to how it can be demonstrated that avoided GHG emissions have not been claimed elsewhere (e.g. under the Emission Trading Scheme), and that they have been attributed to the final fuel?

Summary of responses

Twelve respondents provided suggestions on how to provide assurance that there is no double claiming for RCFs produced from industrial waste gases, or at least where DfT might look to in developing a verification process.

A number of fossil fuel suppliers and their industry representative body encouraged DfT to consider a contract for difference models being developed by the Department for Business Energy and Industrial Strategy (BEIS). These models deal with support for carbon capture, utilisation and transport and storage and hydrogen production and use. They include forfeiture of free allowances allocated under the UK Emissions Trading Scheme (ETS) in proportion to the amount of carbon captured. A renewable fuel supplier also suggested that should carbon capture utilisation be rewarded, then this could be verified by requiring a statement by the supplier of the industrial gas that no avoided GHG emissions have been claimed under an ETS.

Several respondents from the renewable fuels sector noted that regulated parties (such as steel plants) must account for all GHG emissions from their process, and already have reporting requirements and methodologies. Given waste carbon used to create the RCF would reduce its obligation under an ETS there is a strong incentive to record this output.

A cross section of respondents urged DfT to ensure that waste gases are reprocessed or reused wherever possible, so that only the waste gases that cannot be reused are used in producing RCFs. It was also noted that further work on verification should have regard to classifications of GHG emissions in the EU's Renewable Energy Directive II.

Government response

We would like to thank stakeholders for the detailed responses and evidence they have provided in response to this question. We will review the evidence and reasoning provided and consider the evidence and verification requirements further. Should we conclude that an alternative proposal is necessary, this proposal will be discussed with stakeholders and consulted on in advance of any secondary legislation to amend the RTFO scheme.

Summary of government responses on recycled carbon fuels

The helpful and detailed responses to our proposals for RCFs demonstrate that there is significant appetite from UK industry to begin production of RCFs. This re-enforces our confidence that with the correct support mechanisms in place, the UK is well placed to become a leader in the production and use of RCFs.

Whilst there was significant variation in the responses provided to the questions on how we might include RCFs in the RTFO. There was a large consensus supporting their inclusion. Many respondents noted that RCFs could play an important contribution in decarbonising transport and that RTFO support is a critical component of their commercial models. We therefore intend to make RCFs eligible for support under the RTFO. In the first instance this will apply to RCFs which fall into the 'development fuels' category as defined in the RTFO.

Initially qualifying RCFs will be those made from refuse derived fuel or waste industrial gases. We are confident that these feedstocks can be utilised with a low risk of unintended consequences, however, we recognise that significant evidence has been provided in support of extending eligibility to a wider range of feedstocks. We also note evidenced arguments were put forward for both an increase and decrease in biogenic content requirements. Our proposals on the greenhouse gas reduction methodologies, thresholds and reward levels were also subject to opposing comments and varied levels of support, including suggestions that the proposals were too restrictive.

Consequently, we intend to review this evidence and consider whether it would be appropriate to present alternative proposals on these elements of RCF policy.

3. Hydrogen and renewable fuels of non-biological origin

Eligibility of grid supplied renewable power for RFNBO production and additionality requirements, and changes to the level of reward for biohydrogen

We would like to thank stakeholders for their responses to our questions in these sections. We have decided to take some additional time to consider the responses and will publish a government response later this summer.

Expansion of RTFO support to other transport modes

Background

The RTFO currently supports renewable fuel for use in road vehicles, non-road mobile machinery (NRMM) and aviation. The definition of NRMM covers vehicles and machinery that are not used for driving on the road, including farm and construction machinery and rail vehicles. However, the definition only includes machinery powered by an internal combustion engine - this means that whilst biofuels can be supported, renewable hydrogen, when used in a fuel cell, is not currently eligible for support.

The RTFO currently provides support for renewable fuels used in inland waterway vessels, but not ships operating at sea.

Summary of proposals

Expansion to new transport modes

In the consultation, we proposed to expand the RTFO to support:

- RFNBOs used in maritime – see Annex 1 for summary of responses and government position

- renewable fuels used in trains with alternative propulsion systems e.g. renewable hydrogen in fuel cell powered trains
- alternatively powered non-road vehicles

These proposals provide additional decarbonisation options for maritime, rail and non-road vehicles and create a more consistent support system within the RTFO.

Renewable hydrogen assessment time

The key reporting point for the RTFO is the assessment time, which is when the fuel is supplied for use in transport. It is key to ensuring the fuel is only counted once - both with regards to determining suppliers' obligations, but also in determining volumes of fuel eligible for support. The assessment time is set at the duty point for most road fuels, but as there is no duty point for hydrogen the assessment time applies to the purchase point by a retail customer.

However, to support renewable hydrogen for the full range of transport modes including rail, a change was proposed to account more clearly for commercial uses. We therefore proposed to amend the assessment time for renewable hydrogen to the purchase point, to remove any apparent distinction in purchase by retail and commercial customers to qualify for RTFCs. This would have no practical impact on the existing support for renewable hydrogen under the RTFO.

Introducing support for renewable fuels used in fuel cell powered trains

Question 21

Hydrogen is likely to be an important power source for parts of the railway that are not possible to electrify. Do you agree or disagree that renewable fuel used in trains powered by fuel cells should eligible for RTFCs?

Summary of responses

Total	Agree	Disagree	Other
71	69	2	0

All bar two of the 71 respondents supported expanding RTFO support to fuel cell trains. A range of stakeholders (including renewable fuel producers, NGOs, hydrogen producers, consultants and energy producers) identified the availability of RTFO support as an advantage as it would close the cost difference between renewable fuels such as hydrogen, and diesel. Coordination with hydrogen supply at ports for rail freight was identified as another benefit.

Most respondents felt that this proposal made sense in terms of consistency and the opportunity to decarbonise transport. They also noted the potential to expand the renewable hydrogen market and offer a launch platform to bring costs down.

However, one liquid fuel supplier also stated that this support should be linked to an increase to the development fuel target.

Another liquid fuel supplier suggested that hydrogen was unsafe for use in rail and pointed to the 1937 Hindenburg disaster.

Government response

We are pleased that there is wide support for extending eligibility for RTFCs to renewable fuel used in trains powered by fuel cells and other alternative propulsion systems. The government therefore intends to make this change.

We do not propose to increase the development fuel target at this time given that the target was only recently introduced. However, the development fuel obligation will be included in a review of the impacts of the RTFO to be published in 2023.

In response to the safety concern raised around hydrogen, in common with other fuels, production, storage, transport and transfer of hydrogen are already governed by strict safety legislation.

Introducing support for renewable fuels used in alternatively powered non-road vehicles

Question 22

Hydrogen also has the potential to be an important power source for construction and other non-road vehicles. Do you agree or disagree that renewable fuel used in these vehicles powered by fuel cells should eligible for RTFCs?

Summary of responses

Total	Agree	Disagree	Other
70	68	2	0

All but two respondents supported this proposal. They cited many of the same reasons as given for the proposal to expand support to alternatively powered trains. In particular, welcoming the consistency of support between biofuels used in internal combustion engine powered vehicles and renewable fuels such as hydrogen used in fuel cell vehicles. They also noted the opportunity to expand the size of the market and drive the costs of hydrogen supply down.

Disagreement with the proposal stemmed from an opinion that duty should be paid on hydrogen based on its energy density.

One respondent also stated that this support should be linked to an expansion of the total target.

Government response

We are pleased that there is wide support for extending eligibility for RTFCs to renewable fuel used alternative powered non-road vehicles. The government therefore intends to make this change.

Regarding the comment made about fuel duty for hydrogen - this is a matter for Treasury.

We do not propose to increase the development fuel target at this time given that the target was only recently introduced. However, the development fuel obligation will be included in a review of the impacts of the RTFO to be published in 2023.

We may need to secure primary powers to make this change to the RTFO. We will therefore proceed with this change as soon as we are able to, but it may not be alongside the other amendments to the RTFO which we intend to make in time for the 2022 obligation period.

Hydrogen assessment time for rail, road transport and other non-road transport

Question 23

Hydrogen supplied to retail customers is already eligible for RTFCs. Do you agree or disagree that the assessment time for hydrogen should be amended to make clear that fuel supplied to commercial customers can also qualify for RTFCs?

Summary of responses

Total	Agree	Disagree	Other
65	64	1	0

All bar one of the 65 respondents agreed with this proposal. Stakeholders agreed that it was necessary to ensure that support for renewable hydrogen is available for all vehicle types.

One respondent did not support the change to the assessment time and felt that duty should be paid on hydrogen based on its energy density.

Government response

Given the wide support for changing the assessment time we will proceed with this change. Note that fuels are only eligible for support when the assessment time occurs in the UK (with some exceptions in certain circumstances for renewable aviation fuel).

Fuel duty is a matter for Treasury.

4. Changes to sustainability criteria

Overview of consultation and stakeholder responses

GHG values

Consultation proposal

The RTFO includes GHG saving criteria for renewable fuels. These are intended to ensure that the RTFO only supports fuels which deliver meaningful GHG savings. Currently fuel suppliers must utilise the values and methodology set out in the Annex V of the Renewable Energy Directive (RED) to demonstrate to the administrator that a consignment of fuel meets the GHG saving criteria. These values are now over ten years old.

We proposed to update the default, disaggregated default, and reference values in line with those published in the RED II Annexes. The new values will be used widely across Europe and recognised globally from June 2021 and better represent the real world GHG emissions resulting from common fuel production process. They also cover more fuel pathways and feedstocks than the current values. Their adoption would facilitate trade of feedstocks, intermediate products, and renewable fuel.

Question 24

Do you agree or disagree that the default and disaggregated default values for calculating renewable fuel CI values under the RTFO should be updated in line with those published in the RED II Annexes?

Summary of responses

Total	Agree	Disagree	Other
63	60	3	0

Agree

Sixty respondents agreed with the proposal. Including 30 of the 33 renewable fuel suppliers, and all six obligated suppliers that responded to the question.

Thirty-eight respondents provided further comments. Their comments included:

- this is important for continued compatibility with international standards such as RED II
- the proposals will help facilitate trade
- the new values better represent the real world GHG savings achieved by renewable fuels

Among those that support the proposal, 35 respondents highlighted the importance of maintaining compatibility with international standards (such as RED II), with most emphasising that this compatibility is desirable to facilitate continued trade. Nineteen of these 35 respondents were fuel suppliers and five were representative bodies. Several responses stressed that we should seek to remain compatible with RED II unless there is a very good reason not to. Three fossil fuel suppliers, one renewable fuel supplier and one representative organisation went further and stated that any perceived incompatibility with RED II could act as a barrier to trade or cause a dislocation of the market.

Eleven of the 35 respondents that cited compatibility as important noted the proposal has the additional benefit of providing a more accurate and extensive data set which better represents the real world GHG savings achieved by renewable fuels. Some stressed that this means that the government can have greater confidence in the savings achieved. Three respondents cited the improved accuracy of the new data set as the only reason for supporting the proposal, meaning 14 respondents in total cited this as important factor.

Seven respondents agreed with the proposal and recognised the importance of compatibility with RED II. However, they recommended that the scope of the proposal should be expanded to allow suppliers to utilise alternative/additional GHG lifecycle analysis models in addition to those set out in RED II. Six of these respondents provided very similar suggestions of alternative models and cited the same examples and academic institutions. This suggests that there was a degree of coordination across these responses.

Disagree

Three respondents (all renewable fuel supplier/producers) disagreed with the proposal. One suggested that there should be a review of all default values. They stated that suppliers should be incentivised to calculate actual carbon intensity (CI) values since this increase's transparency. Another suggested the new values provided in the RED II Annexes was a result of political lobbying across the European Union (EU) and not an accurate representation of the latest scientific evidence. They offered no alternative source.

Government response

We are pleased that there is wide support for our proposal with 95% of respondents supporting the proposal. We are encouraged that most respondents recognised that updating the values will help retain compatibility with international markets and improve the accuracy of the GHG emissions values reported for renewable fuels. It is clear from the responses to the consultation that these are important policy requirements.

The government recognises, that whilst one respondent expressed concern about the accuracy of the values, 14 respondents agreed with our position that the RED II values are more accurate than those currently prescribed in the RTFO. Therefore, we are confident that the new values are a better representation of the GHG emissions associated with the production of renewable fuels than those currently permitted under the RTFO.

We intend to proceed with the proposal as set out in the consultation document. We will keep the values under review to ensure they remain accurate and consistent with the latest evidence.

GHG calculation methodology

Consultation proposals

Currently when suppliers submit an actual value, they must calculate this using the methodology stipulated in the RTFO and detailed in the RTFO Carbon and Sustainability guidance.³ This methodology matches the methodology set out in RED.

In the consultation we proposed making three technical changes to the RTFO GHG calculation. Our principal reason for making these proposals is that they will improve the accuracy of the GHG emission calculation. However, we also noted the technical changes have the added benefit of reflecting similar changes that will be required across the EU under RED II. As such, making these changes will support the continued use of voluntary schemes and facilitate trade.

We proposed the following changes to the GHG methodology.

- we proposed that fuel suppliers **can no longer apply an emissions credit to the final carbon intensity of a fuel relative to the emissions saving resulting from the export of excess electricity produced by a CHP as part of the fuel production process**. Currently, fuel suppliers are permitted to do this. We were concerned that under the current rules this could lead to an overestimate of the fuels GHG saving
- we introduced a proposal specifically related to the production of biomethane produced from manure or slurry. **We proposed to allow biomethane suppliers to apply an emissions credit to the final carbon intensity of the fuel**, equivalent to the avoided emissions that are achieved as a result of improved manure/slurry management. We recognise that this better represents the lifecycle GHG emissions of biomethane production

³ <https://www.gov.uk/government/publications/renewable-transport-fuel-obligation-rtfo-guidance-2021>

- **we proposed to update the RTFO to reference the new fossil fuel comparator value set out in RED II.** To allow the effective and consistent calculation of GHG savings renewable fuel savings are calculated by comparing the CI of a renewable fuel (either a calculated actual value or a default value) to a fixed fossil fuel comparator. The fossil fuel comparator has been set at 83.8 gCO₂eq/MJ since 2011. RED II introduces a new fossil fuel comparator. This new value better represents the carbon intensity of transport fuel as supplied across Europe

Biomethane calculation methodology

In the consultation we noted that under RED II suppliers of biomethane operating across the EU will be allowed to provide a single carbon intensity value for biomethane produced from the codigestion of multiple feedstocks. We explained that we consider the RED II practice of aggregating the final carbon intensity on the basis of the combined feedstocks to be undesirable. This is because it could result in fuel suppliers mixing and matching high performing and low performing feedstocks to meet a minimum threshold. We also consider the aggregation of carbon intensities to be inconsistent with the treatment of other fuels which are reported on a consignment basis. **Consequently, we did not propose to permit biomethane suppliers to average CIs across feedstocks. Instead, we proposed to continue to require fuel suppliers to report the CI of each individual consignment.**

Question 25

Do you agree or disagree with our proposal to remove the GHG emissions credit for cogeneration of electricity from the greenhouse gas saving methodology to prevent overstating the GHG emissions savings achieved by the finished fuel?

Summary of responses

Total	Agree	Disagree	Other
53	37	13	3

Agree

Thirty-seven respondents agreed with the proposal, of these 21 simply confirmed agreement.

Sixteen respondents provided comment. Their reasons included:

- the proposal is consistent with changes occurring across the EU and therefore important for continued compatibility
- the proposal will improve the accuracy of the GHG emission values reported by fuel suppliers

The most common rationale provided was the need for continued compatibility with RED II (nine respondents). Six respondents supported the proposal based on the improved

accuracy of the resulting savings. Three noted that it is important to prevent overstating the GHG saving of supported fuels to prevent undermining support for the policy. One respondent agreed with the proposal, however, they provided contradictory evidence supporting this stance. The respondent commented that the 'proposal risks encouraging biomethane suppliers to import 'fossil' electricity to meet the production plants parasitic energy needs rather than utilising excess electricity from the CHP to power the site.'

Disagree

Thirteen respondents disagreed with the proposal. Of these, five simply stated disagreement without providing any further comment.

The most common reason given for disagreeing with the proposal was:

- the proposal reduces the incentive to use renewable energy (rather than fossil fuel/electricity) in the fuel production process

Of the eight respondents to disagree and provide comment, four (all biomethane suppliers) disagreed with the proposal on the basis that 'electrical input is a critical element to the fuel production process without which the fuel would not be created'. Their responses were very similar and are likely to have been coordinated. Three responses included the following statement:

'Where that electricity comes from renewable sources (such as onsite generation from wastes, wind or solar or other routes) whether onsite or offsite it will not have been produced using fossil fuel and the GHG emissions savings will have been made. This credit for renewable electricity use should carry through to the production of renewable transport fuel as it will reduce the carbon intensity of it'.

One respondent who disagreed shared a different rationale and proposed that:

'There is still need for cogeneration in industrial applications within UK and abroad, integrated plants which can bring generation closer to consumption and aid in the development of industrial clusters or lower costs of integrated processes should be encouraged'.

Neither agree nor disagree

Three respondents did not indicate whether they agreed or disagreed with the proposal but provided suggestions on the policy proposal. One respondent suggested that 'It may be appropriate to consider allowing a credit based on the average GHG intensity of the local grid, rather than by reference to the fuel consumed.'

Government response

The government is committed to ensuring that the GHG savings resulting from the use of renewable fuels are accurately calculated. We welcome the fact that a significant majority of respondents supported the proposal and did so on the basis that it reduces the risk that GHG emissions could be overstated at consignment level.

We recognise that a number of respondents were concerned that in the absence of a credit for the use of renewable electricity in renewable fuel production, fuel suppliers would choose to utilise fossil sources to meet their production plants electricity needs.

We wish to clarify that the proposal set out in the consultation will not prevent fuel suppliers from recognising the emissions saving achieved by using on site renewable electricity in the fuel production process. Instead, our proposal sets out that where **excess** electricity is produced on site, the supplier should not be able to apply a standalone credit for this electricity in the GHG value calculation (i.e. a credit will no longer be available for renewable electricity produced on site but not used in fuel production process). Therefore, we do not agree that this proposal will remove the incentive to use renewable energy/electricity in the fuel production process.

One respondent expressed concern that the government's position in this area would be different to the EU and suggested that this could have implications for the trade of biofuel imports from the EU. The government is clear that this policy is consistent with the approach required across the EU under RED II. Therefore, it will help facilitate (rather than hinder) the trade of biofuel. Indeed, this was the principal reason provided by respondents for agreeing with the proposal (see agree section above).

The government will take forward the proposal as set out in the consultation. This will mean that fuel suppliers will **'no longer be permitted to apply an emissions credit to the final carbon intensity of a fuel relative to the emissions saving resulting from the export of excess electricity produced by a CHP as part of the fuel production process.'**

Question 26

Do you agree or disagree that biomethane suppliers should be able to apply a GHG emissions saving credit for avoided emissions when calculating the carbon intensity of biomethane produced from manure?

Summary of responses

Total	Agree	Disagree	Other
55	52	2	1

Agree

Fifty-two respondents agreed with the proposal, of these 19 simply confirmed agreement and did not provide any further comment.

Thirty-three respondents provided comments. The most common of these included:

- the proposal better represents the carbon emissions savings that can be achieved from the use/better management of manure and slurry. It may therefore increase uptake/use of these problematic wastes
- the proposal is consistent with the wider market

Twenty-one respondents supported the proposal on the basis that it better represented the carbon emission savings achieved by biomethane made from these feedstocks and argued it would encourage the use of slurries and manure in anaerobic digestion. Two of these respondents referenced that taking this proposal had the added benefit of retaining compatibility with RED II. A point that was made by seven respondents in total.

Seven respondents agreed with the proposal to allow an emissions credit related to avoided emissions from improved manure management. However, they suggested that this logic should be applied to other feedstocks such as food waste (four respondents). One of the seven respondents suggested that the carbon saving achieved by using the from the digestate from the Anaerobic Digestion to displace fertiliser should also be calculated. One respondent noted 'the principle for extending the evaluation criteria to make the GHG assessments smarter is good but must be for all to avoid providing certain fuel types with a competitive advantage'. Another respondent supported broadening this approach to all appropriate feedstocks 'subject to periodic revision for the state of the wider industry to ensure that the avoided emissions logic remains valid.'

Two respondents that supported the proposal did so with the following conditions:

- that fugitive or 'tramp' methane emissions from the fuel production process, particularly feedstock storage, are properly managed
- that the permitted approach can be implemented with confidence as to transparency and ease of enforcement

One respondent (an NGO) supported the proposal but queried the proposed value of 45 gCO₂eq/MJ of manure value noting that 'this assumes the manure would have otherwise been spread: however, there are other disposal pathways.'

Disagree

Two respondents (both investors/traders) disagreed with the proposal. With one of these suggesting that environmental benefits associated with mitigated methane emissions should be captured through separate bio-methane certificates. The other misunderstood the proposal inferring that it would result in further incentives for biomethane **rather** than allowing a technical credit of a value within the GHG calculation.

N/A

One respondent neither agreed nor disagreed with the statement. The respondent commented that 'Biomethane suppliers should not be able to do so unless other suppliers are also able to claim credits against biogenic portions of waste going to landfill.'

Government response

We recognise that the policy proposal was widely supported with more than 95% of respondents in favour of the proposal. A number of respondents noted that the proposal will bring other benefits in addition to those set out in the consultation.

Whilst supporting the proposal as set out in relation to manure and slurry, several respondents suggested it should be applied to a wider range of feedstocks which can be a further source of methane emissions if they are left untreated.

At this time, we do not have sufficient evidence that the use of the feedstocks suggested by respondents (e.g. food waste) would be suitable for the application of a similar credit. We consider it likely that there are more treatment options for these feedstocks. Therefore, the savings that could be achieved via their anaerobic digestion are likely to be more variable.

Indeed, one respondent whilst supporting the proposal, suggested caution with regards to the proposed emission saving credit value of 45 gCO₂eq/M. They considered that this could potentially be too high because it assumes that the manure utilised in the production of biomethane would have been spread on fields, however, there are other disposal pathways.

An additional factor which we have considered regarding extending this proposal to cover other feedstocks, is the likelihood that to do so would introduce inconsistency with the GHG calculation method set out in RED II.

Many respondents stressed that a benefit of the proposal as it is set out in the consultation (i.e. applicable to manure/slurry) is that it will retain compatibility and consistency with RED II.

For the reasons set out above, the government will take forward the policy proposal which better represents the emissions savings achieved via the anaerobic digestion of manure and slurry.

Question 27

Do you agree or disagree that when biomethane is created via the codigestion of multiple feedstocks, the supplier should continue to be required to report the CI of each individual consignment? That is, the supplier should not be permitted to average the CIs across feedstocks, in line with the mass balance rules which apply to other biofuels.

Summary of responses

Total	Agree	Disagree	Other
51	30	19	2

Agree

Thirty respondents stated that they agreed with the proposal, of these 18 simply confirmed agreement and did not provide any further comment.

Eleven respondents provided reasons for supporting the proposal. These were:

- the RTFO approach should be consistent across feedstocks
- if the RTFO permits biomethane suppliers to average carbon intensities across feedstock, this could encourage the suppliers to grow crops purposely for anaerobic digestion, this would not be desirable
- the RTFO already requires carbon intensities to be reported on a consignment basis
- to permit biomethane suppliers to average carbon intensities across feedstocks would provide biomethane with an unfair advantage over other feedstocks

Six of the respondents that commented stated it is important that a consistent approach is taken across the RTFO. Two noted that the ability to change the GHG emissions values across sustainability characteristics is problematic and could result in misleading reduction claims for the final fuel supplied.

Two respondents (both biomethane suppliers) stated that reporting on a consignment basis is already standard practice, with one suggesting that any move away from this could lead to unintended consequences.

One respondent agreed that suppliers should not be permitted to aggregate carbon intensities across feedstocks citing a wider concern about the general carbon neutrality of biofuels in practice.

Two respondents stated that they agreed with the proposal but provided comments which demonstrated that they disagreed with the proposal. They stated that averaging carbon intensities across feedstocks 'should be reportable/acceptable'.

Disagree

Nineteen respondents stated that they disagreed with the proposal. Reasons included:

- biomethane production is most efficient when different feedstocks are used in combination
- UK policy should remain consistent with the approach taken by the EU
- the aim of the RTFO policy is to decarbonise transport, if the supplied fuel meets the minimum GHG threshold then the individual carbon intensities of the feedstock components should not matter

Eleven respondents, including five biomethane suppliers, several consultants and one representative body argued that biomethane production can benefit from codigestion. One respondent stated the codigestion of various feedstocks may provide other benefits. Including, benefits to the physical and biological process or even wider societal and environmental benefits associated with farming diversification and employment. This was the most common reason for disagreeing with the proposal. Five of the 11 responses were very similarly structured and were likely coordinated.

Ten respondents cited consistency with the EU as the reason for disagreeing with this proposal. One expressed concern about implications for trade and the continued use of voluntary schemes.

Neither agree nor disagree

Two respondents neither agreed nor disagreed with the proposals. One stated that they understand the rationale for the proposal but note that the proposal is not in alignment with RED II. As such, the UK should be mindful when diverting from EU standards in this area. The other respondent, a representative body for the anaerobic digestion industry, reported that they had received mixed responses from their members. They provided examples of their members comments. The comments were largely consistent with those received by DfT directly and are reflected in the agree/disagree sections above.

Government response

We recognise that whilst the majority of respondents (61%) agreed with the proposal, a significant proportion (39%) of respondents disagreed with the proposal. We note that a large number of those disagreeing were biomethane suppliers. We note that one of the principal concerns cited relates to the fact that the codigestion of different feedstocks can result in efficiency improvements and should not be discouraged.

The proposal as put forward does not prevent the codigestion of different feedstocks. It simply requires that a separate carbon intensity value is assigned to each feedstock used in the digester and that this reporting is carried through to the final fuel consignment. We, therefore, consider it unlikely that this proposal will result in efficiency losses in biomethane production. We are also clear that the proposal will maintain the current reporting requirement. As such, is not expected to create an additional administrative burden over and above that which exists already.

We remain of the view that it is important that rules are applied consistently to all fuel types where this is possible. We also consider the proposal to be consistent with our policy focus which is to encourage waste derived feedstocks which deliver some of the highest GHG savings. By allowing the aggregation of GHG savings across feedstocks it is possible that feedstocks that have low GHG savings, and have more sustainable alternative uses, could be pulled into anaerobic digestion. We acknowledge that for practical reasons the likelihood of this occurring may be low. However, we consider our proposal to be a sensible additional safeguard to prevent this occurring.

We note that whilst the proposal is inconsistent with practices required across the EU under RED II, it is likely that voluntary schemes will still collect carbon intensities at feedstock level. This will be required to enable the calculation of any aggregated carbon intensity value (as permitted under the EU). As such, we consider that our proposal to retain the existing practices and prohibit the aggregation of GHG savings is unlikely to create a significant additional administrative burden on fuel suppliers or impact the use of voluntary schemes.

For the reasons set out above the government will be taking the proposal forward.

Question 28

Do you agree or disagree with our proposal to update the fossil fuel comparator from 83.8 gCO₂e/MJ to 94 gCO₂e/MJ to better reflect the real world GHG emissions associated with fossil fuels used in road transport?

Summary of responses

Total	Agree	Disagree	Other
61	59	2	0

Agree

Fifty-nine respondents agreed with the proposition. Twenty-two did so but provided no comment. Thirty-seven respondents provided supporting comments. The most common reasons for supporting the proposal included:

- the new fossil fuel comparator better reflects the real-world emissions resulting from fossil fuels
- the new fossil fuel comparator will be used across the EU market, and it is important to remain compatible

Twenty-one respondents noted that the fossil fuel comparator better reflects the emissions of fossil fuel use. They stressed the importance of using the most accurate accepted value to ensure confidence in the savings values achieved by renewable fuels. This group of respondents included renewable fuel suppliers, fossil fuel suppliers, NGOs, and representative bodies. Of these 21 respondents three noted that the proposal has the additional benefit of maintaining consistency with RED II.

Consistency with RED II wider standards and the associated impacts on facilitating trade were quoted as the main reason for supporting the principle by 17 respondents in total.

Three respondents (two power producers and one NGO) supported the proposal. However, they did so on the condition that the proposed changes related to increasing GHG thresholds (set out in question 29) are also enacted. They suggested that it is critical that the current GHG savings thresholds are increased to compensate for the change in the fossil fuel comparator value. This will prevent feedstocks that currently have savings insufficient to qualify for RTFC's becoming eligible because of the revised fossil fuel comparator.

Disagree

Two respondents disagreed with the proposal. One suggested that the existing calculation is disputed and is theoretical in nature rather than based on fact. The other respondent suggested that the RTFO should support more renewable fuels to offset fossil-based fuels but did not convey why they disagreed with the proposal.

Government response

To enable suppliers to accurately calculate the GHG savings achieved by biofuels it is essential that an accurate and consistent fossil fuel comparator value is provided. This allows suppliers to compare the carbon intensity of the fuel they supply with the carbon intensity of the fossil fuel it displaces. The government considers the new fossil fuel comparator value to be a better reflection of the greenhouse gas emissions associated with the production and use of fossil fuel. This view was supported by the majority of respondents. Respondents noted that it is important that a consistent value is used to enable trading and allow international comparisons.

The government will therefore proceed with the proposal to adopt the new fossil fuel comparator value of 94 gCO₂/MJ.

Revised fossil fuel comparator

We recognise that the revised emissions fossil fuel comparator is higher than the existing fossil fuel comparator. This is a reflection of the increased emissions associated with the production of fossil fuel. Several respondents implied that the new fossil fuel comparator demonstrates that fossil fuels are more polluting than the RTFO currently recognises. Therefore, the GHG savings of alternative fuels are currently understated.

As outlined in the table below, the knock-on impact of an increased fossil fuel comparator is that the maximum carbon intensity of eligible fuels also increases in the absence of a similar increase in the GHG savings threshold.

Fossil fuel comparator gCO ₂ eq/MJ	50% GHG saving maximum CI gCO ₂ eq/MJ	60% GHG saving maximum CI gCO ₂ eq/MJ
83.8	41.9	33.52
94	47.0	37.6

Table 2 Maximum permissible carbon intensity by fossil fuel comparator

The UK's biofuels policy is focussed on supporting fuels that deliver the best GHG savings. Whilst we wish to accurately reflect the emissions savings achieved by biofuels, we do not wish to extend the eligibility of the RTFO to fuels that were previously excluded from support, due to their failure to meet the maximum required carbon intensity.

We were therefore encouraged to see a number of respondents support this proposal on the condition that the minimum GHG thresholds are updated accordingly. This is addressed in question 29.

Question 29

Do you agree or disagree that we should update the minimum greenhouse gas saving thresholds to offset the impact of the revised fossil fuel comparator? This would prevent support for renewable fuels which have worse GHG emissions than those supported now.

If you agree - do you agree with the levels of the new proposed GHG savings thresholds?

If you disagree - please provide your reasoning.

Summary of responses

Total	Agree	Disagree	Other
60	54	4	2

Agree

Fifty-four respondents agreed with the proposition. Thirty-four respondents provided supporting comments. Twenty-eight respondents supported the proposal on the basis of the following.

- the proposal will ensure that the maximum carbon intensities currently permitted under the RTFO do not increase. This will prevent fuels that are not currently eligible to claim RTFCs on the basis of their GHG saving from becoming eligible via a technicality

Other reasons for supporting the proposal included the need to achieve higher GHG savings in the context of the government's net zero ambitions.

Several respondents noted that the thresholds should be kept under review given the likelihood for increased ambition and higher carbon reduction targets.

Regarding the proposed levels most respondents broadly agreed with the proposed GHG saving thresholds. Three respondents supported the proposed levels but suggested they should be regularly reviewed and likely tightened over time. Two respondents (both NGOs) suggested higher thresholds of 75%. Four respondents commented that they did not consider a rudimentary 'in out' threshold as the best solution and suggested a GHG based reward instead. Two of these respondents specifically referenced the scheme that operated parallel to the RTFO under the GHG regulations and suggested this should be reinstated.

Finally, it is worth noting that two respondents suggested that it is unnecessary to round the required savings values and present a threshold. They suggested it would be more sensible to provide a maximum carbon intensity value.

Disagree

Four respondents disagreed with the proposal. One (an obligated supplier) expressed concern that the new thresholds would be inconsistent with thresholds being implemented across the EU. Two respondents suggested placing limits on the maximum emissions fossil fuels can emit in order to achieve emissions reductions. They stated:

- all emissions reduction is needed - from a GHG reduction perspective it would make more sense to put limits on the maximum emission fossil fuels may emit. For example, the 94g CO₂eq/MJ as an upper limit for fossil fuels
- the scheme should support the production of renewable and/or less carbon intensive fuels to displace the use of fossil-based fuels, rather than penalise a process/feedstock with lower GHG savings

Neither agreed nor disagreed

Two respondents did not indicate whether they agreed or disagreed with the proposal but instead provided the following comments.

- the policy should be reviewed in light of new clean energy technologies that are rapidly being developed. The situation should be monitored and periodically reviewed so that the development of emerging technology is not inadvertently prejudiced
- the purpose of this proposal seems to be to negate the impact of updating the fossil fuel comparator, this calls into question the rationale for updating the fossil fuel comparators. The desired intent of this policy (as agreed by all stakeholders) is to incentivise fuels which deliver increasingly stringent GHG savings. However, since the start of 2021 there is no longer a policy to reward GHG savings performance, instead it is a simple carbon intensity threshold combined with age of plant. We would instead encourage reward mechanisms for production facilities to achieve further decarbonisation, instead of a less sophisticated approach of qualification versus non-qualification

Although related to the commentary provided by several respondents that agreed with the proposal the second comment is slightly different. The second comment suggests that fuels should be rewarded in relation to GHG saving achieved but should still have to exceed a minimum GHG saving to be considered eligible.

Government response

In the government response to question 28, we confirmed that we will take forward our proposal to update the fossil fuel comparator. We also noted that this could result in fuels which are currently excluded from the RTFO, on the basis of their carbon intensity, becoming eligible for support unless a similar adjustment is made to the GHG thresholds.

This concern was shared by a number of stakeholders and was a main reason given for supporting the proposal in question 29. With 28 respondents noting that the proposal will ensure that fuels that are not currently eligible to claim RTFCs, due to their GHG saving, will not become eligible via a technicality.

We are pleased that the majority of the respondents supported the threshold levels proposed and note that some commented on the importance of setting challenging but achievable thresholds. We note the proposed thresholds will be higher than those required across the EU under RED II and recognise the argument that a higher threshold could drive further savings per litre of fuel supplied (a point made by several respondents). However, we consider that the proposed thresholds are appropriate and sufficiently

achievable to ensure a consistent supply of fuels, whilst still delivering a growing contribution to the UK's carbon budgets.

We will therefore be taking the proposal forward and we will increase the thresholds to match the values set out in the consultation. We are clear that this does not preclude the government from reviewing these values in the future with a view to increasing them further in light of technical developments, improved efficiencies, and a need to drive further carbon emission reductions. We are confident that the new thresholds are consistent with the use of voluntary schemes, given that voluntary schemes record the carbon intensity of fuels as part of the certification process.

Question 30

Do you think we should consider introducing a tighter GHG emission savings threshold for fuels produced in new production facilities in the future? This would be in addition to the existing thresholds that we are proposing and would only apply to installations not yet built.

Summary of responses

Total	Agree	Disagree	Other
63	33	17	13

Agree

Thirty-three respondents agreed that we should consider introducing a tighter GHG threshold in the future. This included renewable fuel suppliers, obligated suppliers, and, NGOs. Thirteen respondents highlighted the pressing need to accelerate decarbonisation as a reason to support the proposal. A number of respondents agreed with the proposal but added the following conditions to their agreement.

- thresholds should be tightened but only when evidence is available to inform the levels (five respondents). This evidence should consider the deliverability of projects both commercially and technically
- adequate notice should be given before implementing any new requirements (four respondents)
- thresholds should be tightened but in addition the rewards fuel receive should be reflective of the GHG savings the fuel achieves (three respondents)
- thresholds should be tightened but requirements for existing plants should be grandfathered (one respondent)

Disagree

Seventeen respondents disagreed with the proposal, including renewable fuel suppliers, obligated suppliers, representative bodies, and, NGOs. These respondents provided a range of reasons for disagreeing with the proposals. Many of these reasons could be

addressed by the conditions suggested by respondents in agreement with the proposals. Reasons for disagreeing with the proposal included:

- the proposals could result in a lack of certainty for project developers. Developers need clarity on required thresholds to determine the deliverability of their projects
- the UK's strategy is to focus on novel waste feedstocks. Given that many new installations involve first of kind technologies, the technology required to convert these into fuel is less developed and plants are unlikely to operate at maximum efficiency initially. Increased thresholds could prevent projects which would utilise these feedstocks from being developed
- introducing additional GHG thresholds that are more stringent than those required across the wider market could result in fuel being diverted to countries with lower thresholds

Four respondents suggested that the rules around thresholds should be simpler. They proposed that the multiple thresholds (dependent on date of production) should be replaced with a flat minimum threshold which all fuel should be subject to.

One of these respondents further suggested that this single minimum GHG saving threshold could be combined with a mechanism to reward fuels based on the GHG saving they achieve. This would incentivise producers to achieve higher GHG savings.

Neither agreed nor disagreed

Thirteen respondents did not indicate whether they agreed or disagreed with the proposal but instead provided a commentary on the important factors to consider with regards to setting tighter targets in the future.

These included:

- any changes in the thresholds should consider the likely impact projects in development/seeking investment and warning should be provided to developers
- the UK should maintain compatibility with the EU and not create a two-tier system
- the government should consider establishing (or reintroducing) a GHG based reward system rather than simply having a pass-fail threshold

Government response

Whilst most respondents supported the proposal in principal many suggested the government should be cautious about increasing thresholds unless they have evidence that this can be achieved without negatively impacting the supply and therefore overall GHG savings achieved by renewable fuels.

The government recognises that as we accelerate on the path to net zero, we will need to seek further reductions in the emissions resulting from the use of biofuels and other low carbon fuels. We are also conscious that these fuels play a vital role in decarbonising existing vehicles. We note the point made by multiple stakeholders that as the government looks to broaden RTFO support to a wider range of difficult to treat feedstocks, a simultaneous tightening of GHG thresholds could hamper investment in innovative

technologies due to concerns about the ability of the final fuel to meet the GHG saving threshold.

A wide range of stakeholders supported the proposal including, renewable fuel suppliers and NGOs. However, a number of respondents noted that certainty is important for investment and that thresholds should be reviewed once more evidence was available to inform the most appropriate level, and once set should not be reviewed more than once every five years. As in previous questions we note that a number of respondents stressed the merits of a GHG saving linked reward level, rather than a simple in out threshold.

The government is encouraged to note the wide support for increasing the GHG thresholds in principle. We note the lack of consensus with regard to the new threshold levels. We agree with most respondents that more evidence is required before a level is set, a number highlighted that compatibility with international policy should also be a consideration.

The government will not introduce a new higher threshold for fuels produced in new installations at this stage. But we will continue to review the evolving evidence and may bring forward proposals to update the thresholds in the future. Any future changes will be subject to consultation.

Question 31

Do you agree or disagree that we should increase the RFNBO GHG threshold to 65%? Please provide supporting evidence.

Summary of responses

Total	Agree	Disagree	Other
41	34	5	2

Agree

Thirty-four respondents, including NGOs, renewable fuel suppliers, and obligated suppliers, agreed with the proposal to increase the RFNBO threshold to 65%. Almost half of these (16 respondents) cited parity with the rules applied to other fuels as the key reason for their support. One respondent (an obligated supplier) agreed with the proposal but suggested that the level should be re-evaluated once the EU has published an agreed fossil fuel comparator for RFNBOs under RED II.

Another common reason for supporting the proposal was that the threshold should be easily achievable for fuels which utilise predominantly renewable power in production.

Disagree

Five respondents disagreed with the proposal:

One respondent stated that 'Projects over the line is better than none'. This suggests the respondent considered that the 65% threshold is excessively high and could prove a barrier to entry for new projects.

Two respondents (one obligated supplier and one trader) proposed a threshold of 70% citing the need to maintain compatibility with RED II as the rationale for this figure. Whilst we recognise that RED II includes a threshold of 70% for RFNBOs, it does not currently list a comparator against which the 70% saving should be compared. As such, it is not currently possible to secure compatibility with RED II given these criteria are unknown.

Two respondents (both NGOs) pressed for a higher threshold for RFNBOs. One suggested a threshold of 70% and the other a threshold of 75%. They noted that this will ensure RFNBOs secure real climate benefits.

Neither agreed nor disagreed.

Two respondents neither agreed nor disagreed with the proposal but provided comments. One (an obligated party) suggested that a GHG emissions saving scheme should be reinstated consistent with the approach taken by Germany. Another noted that the threshold should be close to 'RED II'.

Government response

We are pleased that the majority of respondents supported the proposal and the rationale underpinning the proposed threshold levels. We recognise some industry concerns remain regarding long term compatibility with RED. However, given the absence of an agreed EU fossil fuel comparator for RFNBOs we consider the risks associated with this to be small.

We expect in practice most RFNBOs to achieve GHG savings well in excess of the minimum saving threshold. But we consider a parity of threshold with biofuels desirable, a view echoed by respondents to this question. On this basis, the government will proceed with updating the RFNBO threshold to 65% as set out in the consultation.

Measures to address the environmental impact of crop and forest based renewable biofuels

The RTFO includes land criteria to provide protection for land with high carbon stock and or high biodiversity. The criteria set out land categories on which feedstocks for biofuels cannot be grown at all. It also set out categories where the harvesting of biomass feedstocks must not change the status of the land. Land with high carbon stocks are natural carbon stores and sinks - which if destroyed or damaged can release carbon and contribute to climate change.

We proposed to update these criteria to enhance this protection. We proposed to:

- extend the protected land categories to include 'highly biodiverse forest and other wooded land which is species rich and not degraded'
- update the definition of the protected land type 'highly biodiverse grassland'

- introduce specific criteria to address the environmental impacts associated with biofuels produced from forest biomass
- require producers of biofuels from agricultural wastes to demonstrate that impacts on soil carbon and quality are being monitored or managed

Question 32

Do you agree or disagree with our proposal to add ‘highly biodiverse forest and other wooded land which is species rich and not degraded’ to the list of restricted land categories? This will increase existing environmental protections and keep pace with international protections.

Summary of responses

Total	Agree	Disagree	Other
47	47	0	0

Agree

All 47 respondents agreed with the proposal. Eight respondents including four obligated suppliers, a representative body, and two NGOs supported the proposal on the basis that it keeps pace with international protections and will facilitate the continued use of voluntary schemes. Nine respondents (including six concerned with biomethane production), supported increased protection. However, they stressed that fuels from wastes and residues should continue to be eligible for support when it can be demonstrated that harvesting the wastes and residues does not compromise the land type's nature protection purposes.

Four respondents supported the proposal because it improves protection for areas with biodiverse value.

The government responses to questions 32 and 33 are covered together - see below.

Question 33

Do you agree or disagree that we should continue to allow the production and harvesting of biofuel feedstocks from ‘highly biodiverse forest and other wooded land’ when it can be demonstrated that the production and harvesting of the feedstock from the land was completed without compromising the land type’s nature protection purposes?

Summary of responses

Total	Agree	Disagree	Other
41	37	4	0

Agree

Thirty-seven respondents, including obligated parties, renewable fuel suppliers, and representative bodies agreed with the proposal. Eight respondents noted that allowing responsible harvesting of biomass is a good example of the appropriate/best use of biomass resources, some argued that an outright ban would therefore not be appropriate. Five respondents (including three obligated parties) stressed that the proposal is consistent with the wider market, which will allow the use of this material. Some respondents added that this will support the continued use of voluntary schemes to demonstrate compliance with the land criteria.

Three respondents agreed with the proposal but stressed the importance of robust criteria, certification, and auditing to ensure that no negative impacts arise from the harvesting of biomass.

Disagree

Four respondents disagreed with the proposal. One suggested that 'harvesting biomass from highly biodiverse forest does not preserve the integrity and biodiversity of natural eco systems.' Two expressed concerns around rules and certification. One respondent (a renewable fuel supplier) disagreed unless very transparent rules and procedure can be put in place with regular audits. Another respondent (an NGO) stressed that they don't have sufficient confidence in certification schemes or assessments of a 'sustainable yield' to enable them to support the proposal.

Government response (question 32 and 33)

The government will take forward the proposals. This will extend protection to an important biodiverse habitat whilst enabling the continued use of biomass from this land type when it can be harvested without negative impacts on the land's status. Taking forward this proposal will also maintain compatibility with wider changes underway across international markets. It will enable the continued use of voluntary schemes which a number of respondents noted to be of importance to facilitate trade of biofuels, feedstocks and associated products.

Question 34

Do you agree or disagree with our proposal to update the definition of highly biodiverse grassland to maintain consistency with other land types, international definitions, and to facilitate the continued use of voluntary schemes?

Summary of responses

Total	Agree	Disagree	Other
40	40	0	0

Agree

All 40 respondents to this question supported the proposal to update the definition of highly biodiverse grassland. Fifteen respondents including renewable fuel suppliers, obligated suppliers, trade associations, and UK voluntary schemes supported the proposal. These respondents stressed that this proposal would facilitate the continued use of voluntary schemes which respondents considered essential for enabling trade of UK feedstocks to the UK. Eight of these 15 respondents stressed that this definition is needed imminently to allow continued export of UK bioethanol or UK grain (destined for biofuel production) to the EU due to changes coming into force across the EU from June 2021. These respondents also noted that cross government coordination will be required so that a competent authority can be identified as required across the EU.

Government response

Support for the proposal was unanimous with many respondents calling for the proposal to be brought forward imminently. The government will bring forward the proposal. Since launching the consultation, the Department for Transport has been working with Defra, Natural England and the devolved administrations to provide UK based voluntary schemes with the information they need to satisfy the requirements of the European Commission with regard to RED II. This is important to facilitate the continued export of UK feedstocks and finished fuels to European markets.

Question 35

Do you agree or disagree with our proposal to require that suppliers of biofuels produced from agricultural residues must demonstrate that monitoring and management plans are in place which address the impact of the removal and processing of the feedstock on the site's soil quality and soil carbon content?

Summary of responses

Total	Agree	Disagree	Other
41	34	7	0

Agree

Thirty-four respondents agreed with the proposal, with eight of these stressing that it is imperative for sustainability that soil health is protected. Three respondents (including two obligated suppliers) noted that this proposal is consistent with wider changes across the

international space, and that some voluntary schemes already check for this practice. Three respondents suggested that adoption of this practice could also be used to deliver a more accurate representation of the full GHG savings achieved by biofuels across their lifecycle.

Disagree

Seven respondents disagreed with the proposal, five respondents all associated with biomethane production, disagreed with the proposal on the basis that it adds an additional regulatory burden on the bioenergy sector. These five responses were coordinated and all proposed that the efforts to boost access to bio-residues should include less not more regulations. One respondent was concerned that the proposal is vague in nature and subjective with regard to a requirement for 'plans'. The final respondent to disagree (an obligated supplier) argued that the proposal is inconsistent with practice across the EU but noted that they would support the proposal if it was consistent with the EU and covered by voluntary schemes. The government is clear that this proposal will be consistent with practice across the EU following the implementation of RED II in June 2021 and will be checked by voluntary schemes.

Government response

In the consultation we recognised that without measures and monitoring plans in place there is a risk that the removal of agricultural residues from a site can lead to losses in soil carbon and quality. We are pleased that our proposal to introduce measures to mitigate this risk is supported and we will proceed with this proposal. We are clear that this is consistent with wider international practice and that the presence of these measures will be checked by voluntary schemes. As such, we do not expect that these measures will place a significant additional burden on fuel suppliers. We attribute this to the fact that fuel suppliers often do not know the end market for their fuel at the point of production, therefore, will be required to have these measures in place to access other international markets.

Introducing specific criteria for biofuels derived from forest biomass

Currently the same sustainability criteria apply to all biofuels regardless of the feedstock utilised (with exemptions from the land criteria for processing residues and wastes). All biofuels must meet the land criteria and no distinction is made between biofuels made from feedstocks derived from forestry or agriculture.

In the consultation we proposed to introduce new sustainability criteria specifically for feedstocks sourced from forest biomass. We proposed that these criteria better address the specific environmental impacts associated with forestry. We noted that if the proposal is taken forward biofuels produced from forestry feedstocks would no longer be required to meet the existing land criteria, but instead will be required to meet new specific forest criteria.

Question 36

Do you agree or disagree with our proposal to introduce new sustainability criteria specifically for feedstocks sourced from forest biomass? Note that this would mean that biofuels from forestry feedstocks will no longer be required to meet the land criteria, but instead would be required to meet specific forest criteria.

Summary of responses

Total	Agree	Disagree	Other
33	23	8	2

Agree

Twenty-three respondents agreed with the proposal. Four obligated suppliers noted that the proposal is consistent with changes in the international space and is therefore important to enable the continued use of voluntary schemes. This point was made by six respondents in total. Four respondents supported the proposal in recognition of the fact that it offers more appropriate protection for forest biomass and better addresses the likely impacts of its use. Two consultancies supported the proposal but suggested it could also be expanded to other biomass types such as dedicated energy crops. One respondent (a research provider) supported the proposal to introduce specific criteria for forest biomass. However, they proposed that these criteria should 'exclude all roundwood from eligibility as a feedstock to produce biofuel' on the basis that 'its use does not reduce lifecycle GHG emissions compared to fossil fuels when the lengthy reduction in forest carbon stocks is taken into account'.

Disagree

Eight respondents disagreed with the proposal with four providing reasons. Two respondents, one renewable fuel supplier and one consultancy, provided the same rationale for disagreeing with the proposal. They proposed that 'government and regulators should trust land managers to do what is necessary to protect the fertility of the solids they manage. This could be done in other ways than adding to the rural regulatory burden.' Two respondents, one consultancy and one renewable fuel supplier, proposed that DfT should have a separate consultation on this proposal to allow industry to assess and comment on what would work best in practice.

Neither agree nor disagree

Two respondents neither agreed nor disagreed with the proposal. One respondent (an obligated supplier) noted that there needs to be alignment with international standards to facilitate the continued use of voluntary schemes and therefore UK alignment is needed.

The second respondent noted that it could be appropriate to apply specific criteria to forest biomass but reiterated that these must be robust. They queried whether or not the proposal offers significant protection for primary forest.

The government responses to questions 36 and 37 are covered together - see below.

Question 37

Do you agree or disagree that the proposed criteria better represent the specific environmental impacts associated with forestry?

Summary of responses

Total	Agree	Disagree	Other
20	15	5	0

Agree

Fifteen respondents agreed that the proposed criteria better reflect the specific environmental impacts associated with forestry. Three respondents provided comment. One comment (from an obligated supplier) agreed with the proposed criteria because they will maintain compatibility with the wider marketplace and voluntary scheme processes. A second obligated supplier also commented on the importance of compatibility whilst stressing that the protection of highly biodiverse forest will be critical if the UK and international community is to meet global targets for 30% of land and ocean to be protected by 2030 (as stipulated in the Leader's Pledge for Nature and the pending UN post-2020 global biodiversity framework). The third respondent to provide comment noted the importance of carbon stock criteria and supported the inclusion of these.

Disagree

Five respondents disagreed with the proposed criteria with four providing comment. Of these, two disagreed with the preceding question (question 36). These respondents suggested that forestry in the UK is going through significant change and that the government should consider a wider consultation on this subject to allow industry to assess and comment on what would work best in practice.

The third respondent to provide comment, an obligated supplier, suggested that 'ISCC and other RTFO approved certification schemes already protect against land use change.'

The final respondent to provide a comment, an NGO, supported most of the proposed criteria. But they did not support the suggestion that changes in carbon stock associated with forest biomass harvest could be accounted for in submissions related to the country's commitment to reduce or limit greenhouse gas emissions under international agreements such as the 'Paris Agreement'. Rather they suggested that such feedstocks should not earn RTFC certificates.

Government response (question 36 and question 37)

The government recognises the importance of conserving the world's highly biodiverse forests and ensuring that the use of forest biomass is sustainable. We also recognise that

the environmental impacts of forestry are different to those of agriculture. Given the increasing interest in producing transport fuels from products and residues from forestry we consider it important that specific sustainability criteria should apply to forest biomass. These should manage/prevent negative impacts of forest biomass in fuel production. We note that support for this position is significant with the vast majority of respondents to the consultation supporting our proposal to introduce specific forest criteria. We will therefore proceed with our proposal to introduce specific criteria for biomass from forestry.

We are pleased that most respondents supported the criteria we proposed. Many respondents recognised that these criteria are compatible with wider changes across the international market, which is important to avoid negative impacts on trade. We also note that a number of respondents felt the criteria should be subject to further consultation or offer enhanced protection. Whilst others argued that the criteria could create a further unnecessary regulatory burden. On balance we consider the proposals will offer enhanced protection with regard to current practice, whilst facilitating trade and maintaining compatibility with wider certification schemes and carbon accounting standards. We therefore propose to adopt the criteria set out in the consultation, but we will continue to monitor the effectiveness of the measures to ensure they meet our policy aims.

Changes to the crop cap definition

The crop cap under the RTFO

The incentives available to crop-derived renewable fuels are restricted by a ‘crop cap’ which restricts the maximum amount of fuel from biofuels derived from crops (except for dedicated energy crops) that can be rewarded under the RTFO and counted towards a suppliers’ obligation. It was introduced to the RTFO in 2018 and decreases incrementally from 4% in 2018 to 2% in 2032. This acts as an additional safeguard to address potential indirect land use change (ILUC) risks posed by crop-derived biofuels and to encourage suppliers to increasingly move towards waste feedstocks.

To determine which crops are limited under the crop cap the term ‘relevant crops’ is used. Relevant crops include cereals, tubers and root crops, corn crops, but excludes wastes, processing residues, agricultural residues, and dedicated energy crops (see below for the wording in the legislation).

Article 2(1) RTFO Order relevant crops definition

“relevant crops” means starch-rich crops, sugars, oil crops and main crops,

where “starch-rich crops” include -

(a) cereals (regardless of whether only the grains are used or the whole plant);

(b) tubers and root crops, including potatoes, Jerusalem artichokes, sweet potatoes, cassava and yams; and

(c) corn crops, including taro and cocoyam, but feedstocks listed in Annex IX of the directive are not relevant crops.

Consultation proposal

We proposed to update the definition of which feedstocks fall under the crop cap in the RTFO by removing reference to the RED. This would not change which feedstocks are captured by the crop cap.

We proposed to remove the reference to Annex IX feedstocks of the RED. The term was not necessary because Annex IX feedstocks primarily consist of wastes and residues which are not crops and so are not caught by the definition of 'relevant crop'.

Question 38

Do you agree or disagree that we should remove references to RED Annex IX Part A from this definition?

Summary of responses

Total	Agree	Disagree	Other
30	24	5	1

Twenty-four of the thirty respondents agreed that we should remove the reference to Annex IX Part A. These included representative bodies, fossil fuel producers and renewable fuel producers. Reasons supporting this option were:

- it is in the UK's interest to diverge from RED II and do what is best for the UK. Although the principles of Annex IX Part A should be kept - any additional crops added to the list should be double rewarded
- energy crops should be excluded from the crop cap. Science and literature shows that energy crops deliver more GHG savings compared to food and feed crops. Further to this they are needed to meet net zero - such as using sugar beet to produce isobutene

Five respondents, including an NGO and an obligated fossil fuel supplier, did not agree that we should remove the reference to Annex IX Part A. Reasons for this were that the UK should follow RED II guidance on Annex IX Part A. There needs to be harmony with the EU otherwise this could increase costs.

Some respondents suggested that energy crops should continue to be limited by the crop cap. Conversely, others suggested that energy crops do not have higher GHG savings than food and feed crops and could potentially have ILUC risks.

One respondent did not specify whether they supported this change or not. They had concerns that future reviews of Annex IX would not be captured by the RTFO.

Question 39

Are there any impacts that we have not foreseen?

Summary of responses

Total	Yes	No	Other
18	5	12	1

Five of the eighteen respondents - including obligated fossil fuel suppliers and a representative body - suggested that there are unintended consequences to removing the reference to Annex IX Part A. Reasons supporting this option were that:

- these changes could have an impact on the price of feedstock and availability to the UK
- a clarification is needed on how processing residues are handled
- food and feed crops can be eaten or used as a biofuel. If there was a disaster that led to food shortages the food and feed crops could be diverted from biofuel production to be eaten instead. It is not possible to do this with energy crops
- this would put additional pressure on administration. The biofuel registration process needs more support and needs to be improved

Two thirds of respondents, including development fuel producers, an obligated fossil fuel supplier and a consultancy, did not think there would be unintended consequences but left comments. Some comments were:

- it is unclear how the crops which are not relevant crops will be updated
- there needs to be more alignment with other agencies relating to the bioenergy sector - such as regulation procedures

One respondent did not specify whether there are any unintended consequences with this change but highlighted the importance of aligning with RED II.

Government response

We thank respondents for their comments. We note that the majority of respondents agreed that Annex IX Part A is not necessary in our 'relevant crop' definition. Therefore, we intend to proceed with our proposal to remove Annex IX Part A from our current definition of 'relevant crop'.

One respondent mentioned that biofuels from dedicated energy crops should continue to be limited by the crop cap. We would like to clarify that that under current policy biofuels made from dedicated energy crops they are not limited by the crop cap. They will continue to be an exemption because of the benefits they have over relevant crops, such as being neither a food or feed crop, and their potential to be grown on degraded land.

Stakeholders expressed concerns with removing the reference to RED Annex IX Part A, especially if additional feedstocks are added to the list. We would like to clarify that at present this list consists of residues and wastes. Currently any application for RTFCs where the feedstock is on this list the feedstock is treated as any other waste or residue. If additional feedstocks were added to the list, we would need to evaluate how we treat them as we may or may not agree.

To address the comment that departing from referring to Annex IX Part A may lead to increased costs and additional administration. We would like to clarify that the proposed changes will have no impact on current exclusions and inclusions of crops limited by the crop cap. It will also not change the way we treat processing residues, wastes or dedicated energy crops under the RTFO.

5. Civil penalties – minor amendment to provision on civil penalties

Overview

Suppliers who fail to comply with the RTFO are liable to civil penalties. The process by which the Administrator determines the amount to be paid in a civil penalty is set out in Article 23 of the RTFO Order 2007, and Section 129 of the Energy Act 2004. Section 129 of the Energy Act 2004 prescribes that the civil penalty amount must not exceed the lesser of the specified amount, as set out in an RTFO Order, or 10% of the turnover of the defaulter's business (as calculated in accordance with article 23 of the RTFO Order). Should RTFCs be gained or attempted to be gained, and the RTFO Order is contravened attracting a civil penalty, the specified amount relevant to determining the penalty charge has apart from the current obligation year (2021) been linked to the price suppliers must pay to buy-out of their obligation.

The RTFO is a certificate trading scheme. Where a supplier cannot meet their obligation by acquiring RTFCs through the supply of renewable fuels, or purchasing RTFCs from other suppliers, they can discharge their obligation by making a buy-out payment. The buy-out amount is calculated by multiplying the buy-out price with the volume of renewable fuel a supplier is short of their obligation. Last year the buy-out price for the main obligation in the RTFO was increased so that from 1 January 2021 it increased from £0.30 per litre to £0.50 per litre. However, in introducing the increase in the buy-out price the Department did not make a corresponding change to the "specified amount" relevant to determining amounts due as civil penalties.

Consultation proposal

We proposed that the calculation used to determine the relevant civil penalty amounts be updated to reflect recent changes to the buy-out price for the main obligation in the RTFO. The effect of this change would be that the specified amount will once again be equivalent to twice the value of the RTFCs which the account holder has gained or attempted to gain. This would mean that from the 2022 obligation period the specified amount would be determined by using a £0.50 multiplier per RTFC, as opposed to £0.30 per RTFC, as is the case now. No changes were proposed to the calculation of civil penalties with respect to development fuels, which remains at twice the buy-out price of £0.80 pence per litre.

Question 40

Do you agree that the specified amount used in determining civil penalty amounts related to the main obligation, should change to twice the buy-out price?

Summary of responses

Total	Agree	Disagree	Other
36	34	2	0

There were 36 responses to the question on civil penalties. The proposal to update the specified amount as proposed was strongly supported by fossil fuel and renewable fuel suppliers and their representative bodies, in addition to traders that responded. Arguments offered in support of the proposal were that it is important to ensure the civil penalty amount remains consistent and set at a dissuasive level which is significantly less attractive than non-compliance. It was also noted that there was reassurance that rights of appeal would be unaffected.

Those not in favour of the change offered contrasting views. One suggested that penalties discourage innovation. The other suggested that the increase in the new specified amount may not be sufficiently dissuasive and should instead be five times the buy-out amount instead of double.

Government response

Given the widespread support for this proposal, in addition to the need to ensure consistency and that civil penalties remain dissuasive, we intend to proceed with the change proposed on civil penalties. The change is intended to be introduced for the start of the next obligation year on 1 January 2022.

The proposal is not driven by evidence that civil penalties are more likely to be issued or of an increased risk that the RTFO scheme is likely to be abused. Based on the experience of running the RTFO scheme, the government does not believe there is a strong case for increasing civil penalty amounts beyond the proposal in the consultation. As with all aspects of the RTFO scheme the government will keep this under review.

It remains the government's view that a key benefit of having an effective civil penalty regime is to ensure a level playing field for all those companies participating in the RTFO certificate trading scheme. We do not believe that such penalties stifle innovation. The civil penalties regime provides a safeguard so that all suppliers properly evidence the sustainability and greenhouse gas emissions reductions of the renewable fuels supplied. In this way all with an interest can be assured in the benefits of the RTFO scheme. Both in terms of RTFCs being rewarded to fuels which meet sustainability criteria and that greenhouse gas emissions associated with renewable fuels are accurate. Those supplying renewable fuels in the UK have a long and excellent record in this regard, and one which the government is determined to help them preserve.

We are grateful for all the responses provided. These serve to underline the value fuel suppliers who interact regularly with the scheme place on the need for a civil penalties regime which dissuades non-compliance and is fair.

6. Changes to ensure renewable fuels and chemical precursors do not receive multiple incentives

Overview of the consultation

Renewable fuels and feedstocks originate from all over the world and are traded between countries. Renewable fuels and feedstocks are also used across multiple sectors including transport, heat, and electricity generation, and in the biochemicals industry. Governments support the production of renewable fuels through different schemes such as issuing green certificates or providing tax exemptions. It is therefore possible that renewable fuels and feedstocks could be eligible to receive incentives in more than one country or sector.

As the need to address climate change becomes more important in countries around the world, it is likely that there will be an increase in demand for renewable fuels and energy in all sectors. Along with this, governments may decide to assist the production/supply through some type of support scheme.

Note that we already have measures in place to restrict multiple reward of renewable fuels and their precursors as set out in Table 3. However, to help limit opportunities for an individual consignment of renewable fuel to benefit from more than one incentive and to promote a level playing field, we proposed making minor changes to the RTFO.

Consultation proposal

We proposed to further limit the potential for renewable fuel to have received multiple incentives outside the RTFO. A summary of the current legislative position and proposed changes can be seen in Table 3.

Situation	Now	Proposed change
Counting towards targets	If a renewable fuel or chemical precursor counted towards the RED target or a UK target other than the RTFO then it would not be eligible for support under the RTFO.	If a renewable fuel or chemical precursor counts towards any renewable energy obligation other than the RTFO in any country, including the UK, then it would not be eligible for support under the RTFO.

Situation	Now	Proposed change
Multiple reward	If a renewable fuel or precursor has received support in another country or sector, so long as it does not count towards a RED or UK target (other than the RTFO), then it is eligible for support under the RTFO.	Renewable fuel or the chemical precursor cannot be in receipt of support which benefits the end supply of fuel. Such schemes may include feed-in tariffs or premium payments.

Table 3 Current legislative position and proposed changes

We proposed to further limit the opportunity for multiple incentives for renewable fuel and chemical precursors. This would mean that the following conditions must be met in order to claim support under the RTFO:

The renewable fuel or chemical precursor:

- must not count towards any renewable fuel or renewable energy target other than the UK's RTFO
- must not have received, or be going to receive, support in the UK or any other country. Exceptions include financial support to develop fuels and technologies e.g. laboratory scale testing and support for construction of demonstration scale production. This means that fuels produced in a plant that has received funding from the Future Fuels for Flight and Freight Competition, for example, would remain eligible to claim support under the RTFO

Summary of responses

Question 41

We proposed that RTFCs should not be awarded if the renewable fuel or chemical precursor benefits from other support schemes such as feed-in tariffs and premium payments. Do you agree that we should further limit multiple reward of renewable energy and chemical precursors?

Summary of responses

Total	Yes	No	Other
49	36	9	4

Thirty-six of the forty-nine respondents agreed that we should further limit multiple rewards of renewable energy and chemical precursors. These included an NGO, consultancies, fossil fuel producers, industry representatives and development fuel producers. Reasons provided were that:

- double reward should not be allowed because it creates a market distortion
- with the UK having left the EU, such policies should be extended to an international basis and not limited to the UK and EU

Stakeholders had different opinions relating to whether electricity should be an exemption. Some considered that electricity should also be limited by this proposed policy, for example the electricity used in an electrolyser to produce hydrogen should not also be able to claim additional support e.g. Renewables Obligation Certificates⁴. Other stakeholders suggested that electricity should be excluded.

Nine respondents, including development fuel producers and a consultancy, did not support limiting multiple incentives further. Reasons were that:

- it would be too restrictive for fuel producers and may be a barrier to investment
- these restrictions do not adhere to the World Trade Organisations' agreement relating to subsidies and countervailing measures
- certain scenarios require double rewards to promote energy efficiency or to encourage new investment
- surplus heat should be rewarded to encourage efficiency

Four of the respondents, including fossil fuel producers and industry representatives, did not answer the question but provided the following comments:

- more information is needed
- suppliers should be given the choice of which support scheme they use, they should not be automatically excluded or included into the RTFO

Question 42

We have set out some circumstances where support in addition to that offered by the RTFO might be appropriate. These include if the production facility receives investment aid, including government grants or government loans. Should there be other exceptions when limiting multiple reward of renewable energy and chemical precursors?

Summary of responses

Total	Yes	No	Other
47	24	19	4

Twenty-four respondents - including consultancies, NGOs, and development fuel producers - thought that there should be additional exemptions to the ones we outlined in the proposal.

However, only one respondent suggested additional exemptions. They suggested an additional exemption should be that fuels which have negative GHG emissions should be exempt from being limited by multiple incentives.

⁴ ROCs are certificates issued to operators of accredited renewable generating stations for the eligible renewable electricity they generate.

Twenty-three did not include any additional exemptions. Some respondents asked for clarifications that the following are exempt:

- funds from local authorities and educational facilities
- enhanced capital allowances and business rates
- precursors e.g. electricity receiving contract for difference.

Nine respondents, including obligated suppliers and development fuel producers, thought that no additional exemptions were needed. However, some thought it would be difficult to assess if investment aid is given.

One respondent thought there should be no exemptions.

Four of the respondents including a fossil fuel producer and industry representative body did not answer the question but provided the following comments:

- the exemptions proposed are supported
- electrolyzers should be exempt from grid fees
- guidance is needed on whether if a project receives funding from the net zero hydrogen production fund it would still be able to claim RTFCs

Question 43

Do you anticipate any unintended consequences with this change?

Summary of responses

Total	Yes	No	Other
36	17	17	2

Seventeen respondents thought that there would be unintended consequences to limiting multiple incentives further. These included development fuel producers, consultancies, and industry representatives. Many of the comments provided were also raised in response to questions 41 and 42. Additional comments are that:

- there is a risk that certain projects will still receive multiple incentives such as the US Production Tax Credits for wind projects
- limiting access to the RTFO could reduce investment in the production of low carbon fuels
- there may be many unintended consequences as this is a complex area

Seventeen respondents including development fuel producers and industry representatives did not anticipate any unintended consequences.

Government response to questions 41 to 43

Response to points raised by stakeholders

Stakeholders suggested that this policy would act as a barrier for investment. Some stakeholders also had concerns that this policy change may add additional costs and administrative costs to the process. We would like to clarify that this is not a substantive policy change and the main effect is to ensure we continue to level the playing field. The main change is expanding the scope of the policy so that it applies to renewable fuels and chemical precursors which have received support from any country in the world rather than just within the EU or the UK. We, therefore, do not agree the change would become a barrier for investment or significantly impact on costs or administration.

Stakeholders suggested that electrolysers should be exempt from grid fees. This area of policy is not a decision for the Department for Transport: we suggest stakeholders speak to the Department for Business, Energy and Industry Strategy (BEIS) about this.

One respondent suggested that fuels which have negative GHG emissions should be exempt from being limited by multiple incentives. We have identified the key areas which warrant an exemption such as the need to support first of its kind plants. However, we will keep this policy under review.

One respondent asked for a clarification on whether projects will still receive multiple incentives such as the US Production Tax Credits for electricity produced from renewables such as wind. We understand this is a tax credit for generating electricity. We would like to clarify that electricity which has benefitted from support such as under the US Production Tax Credit, BEIS Contract for Difference (CfD) or Renewables Obligation scheme will remain exempt as it is not a renewable fuel or chemical precursor.

Several stakeholders mentioned the complexity of the policy and there may be unknown unintended consequences. We encourage stakeholders to let us know the impacts of the policy when unknown consequences become known. We will also keep this policy under review.

A few stakeholders had concerns that limiting multiple incentives would not adhere to the World Trade Organisation's agreement relating to subsidies and countervailing measures. We disagree with this and there is no obvious incompatibility between this policy and the various WTO agreements.

Some stakeholders suggested that multiple rewards or incentives are needed in certain situations, such as scenarios where it is difficult to secure funding because there is uncertainty in the market or technology is new and expensive. We have identified the key areas which warrant an exemption such as the need to support first of its kind plants. However, we will keep this policy under review.

Some stakeholders thought that suppliers should be given the choice of which support scheme they use, they should not be automatically excluded or included into the RTFO. Unless a supplier is obligated then the supplier has the choice of whether to apply for RTFCs.

Some stakeholders said that surplus heat should be rewarded to encourage efficiency. We would like to clarify that if the surplus heat is not part of the fuel which is being used to claim RTFCs then it could be rewarded under another scheme.

Government position

We welcome the support for this policy which puts further limits on renewable fuel receiving multiple incentives. We agree that this policy would promote a fair renewable fuels market and limits market distortions.

We will therefore proceed with the policy as proposed in the consultation. This means that for a renewable fuel or chemical precursor to get support under the RTFO it:

- must not count towards any renewable fuel or renewable energy target other than the UK's RTFO
- must not have received, or be going to receive, support in the UK or any other country

Exceptions will include:

- financial support to develop fuels and technologies e.g. laboratory scale testing and support for construction of demonstration scale production. This means that fuels produced in a plant that has received funding from the Future Fuels for Flight and Freight Competition, for example, would remain eligible to claim support under the RTFO. We would like to clarify that other sources of funding, such as from educational institutions, would also be exempt so long as the funding is used for the same reasons as set out above e.g. for supporting the development of fuels and technologies. Sources of funding which are related to business costs such as business rates would also be exempt
- support for electricity as a precursor. There was some confusion from respondents as to whether electricity as a precursor is a valid exception. We would like to clarify that electricity which has benefitted from support such as under the BEIS Contract for Difference (CfD) or Renewables Obligation scheme will remain exempt as it is not a renewable fuel or chemical precursor. If the electricity is being used to produce renewable hydrogen and the electricity has benefitted from support, the hydrogen would still be eligible for RTFCs
- any reduction in duty payable in the United Kingdom under the 1979 Act

7. Next steps and geographical coverage

We intend to make legislative changes so that the new policies including increased targets apply from the start of the next RTFO obligation period, which works on an annual cycle, and commences on 1 January 2022.

To introduce support for RCFs into the RTFO we will need to amend the Energy Act 2004 or find alternative primary powers. The same may also apply for introducing support to renewable hydrogen used in non-road transport, such as construction vehicles. This will take additional time; however, we will make these changes as soon as the Parliamentary timetable allows.

The amendments to the Renewable Transport Fuel Obligations Order 2007 will apply across the whole of the United Kingdom.

Annex: 1 The role of the RTFO in domestic maritime – government response to the deep dive consultation

Overview of consultation

The Maritime Deep Dive considered the current treatment of biofuels for maritime use, the prospect of advanced biofuels entering the market, and the role of the RTFO in supporting advanced marine fuels that have been identified as forming a key part of the future energy mix for maritime transport.

Engagement with the consultation was high, with a good range of respondents from industry and civil society, and representation of fuel producers, suppliers and consumers spread across small, medium, and large businesses.

There was significant convergence on most questions, with support for the approach set out in the consultation document, and some important issues around advanced biofuels and the future regulation of marine fuel highlighted for action outside of the RTFO process.

A large number of respondents also noted the importance of joining up policy at the International Maritime Organisation (IMO), at domestic level, and on a regional basis. It was highlighted that while an intervention to support advanced fuels through the RTFO was welcomed by the majority, there is a need for wider supportive and regulatory interventions to take shipping to net zero. The Department hopes to address many of these questions in the forthcoming Transport Decarbonisation Plan, and in the longer term in the refresh of the Clean Maritime Plan planned to commence in summer 2022.

Overview of responses received to the consultation

A total of 40 responses were received for the maritime deep dive, but many respondents highlighted they did not have strong views on some, or all questions, and in some cases felt that questions were beyond the scope of their knowledge. This is reflected in the summaries below. Where principled objections have been made to the inclusion of maritime in the RTFO across the board these have been reflected in the questions relating to inclusion, but not in questions relating to the technical and administrative approaches arising from inclusion.

Question 1

Do you agree with the governments current position not to support biofuels for use in maritime transport under the RTFO and instead promote the use of bioenergy in other sectors of the economy that have fewer decarbonisation options compared to maritime?

Summary of responses

Total	Yes	No	Other
24	11	13	0

This question dealt with the current policy of not rewarding biofuel for use in maritime transport (outside of those inland vessels that fall under NRMM). The question prompted a very high level of engagement from stakeholders and a very significant split in views.

Many stakeholders agreed strongly with the current position, citing concerns about the availability of biofuel for existing users and highlighting concerns around creating significantly increased demand with resulting impacts on land use, food security and the ability of existing biofuel users to compete with the maritime sector for the fuel.

Some stakeholders have, however, cited studies (notably the recent PRIMA study) that in their view suggest concerns over supply may be overstated, and that support to maritime would not have a significant negative impact.

More broadly, some stakeholders noted that maritime globally is likely to move to a mix of electrification, ammonia and hydrogen-based fuels, and that encouraging the use of biofuel would discourage investment in these alternatives at a critical time for the sector.

Additionally, many noted that as maritime is not a contributor to the system it would be unfair to allow cross-subsidy of the sector to occur. They noted that this is particularly an issue with biofuels as they represent a drop-in solution that does not require significant research and development and maritime could potentially become a major consumer in a relatively short period of time.

Some respondents opposed inclusion of biofuels in this instrument but noted that the broader policy could be reconsidered if a system specifically for, and funded by, shipping was developed to maintain a level playing field.

Other stakeholders took the view that biofuels drop-in status was a strength, and that the position should change to reflect the opportunity that existed to rapidly reduce emissions from some vessels by supporting biofuel uptake.

It was noted that some maritime stakeholders felt the system was not a level playing field, with other users being able to access biofuel under the RTFO while maritime users had to pay market rate, leading to vessel operators being unable to compete for existing stocks of biofuel.

Some respondents questioned the degree to which a lack of support for biofuels would undermine the UK's wider approach to decarbonisation at the IMO. They noted that in their view, the Department should support any/all options to reduce carbon emissions in the near term rather than focusing on longer term alternatives like ammonia and hydrogen.

It was also noted by some respondents that the Department should explore supporting some sub-sectors, notably small craft and recreational boats, as the respondents felt these groups have fewer options for decarbonisation and would need additional support in the near-term to reduce emissions. They highlighted that this would reduce the risk of the RTFO being negatively impacted by the larger vessels purchasing significant volumes of biofuel.

Finally, it was noted by some respondents that alternatives such as hydrogen and ammonia are less well understood, and that they have significant safety implications, it was suggested therefore that in the near-term biofuel should be supported until alternatives were de-risked.

Government response

Having considered responses to this question and to question two the Department is of the view that the case for inclusion of conventional biofuels in marine use under the RTFO has not been made at this time.

In reaffirming our position, we would observe that biofuel is generally a drop-in option for vessels, and does not have significant additional research and development needs that would justify support to unlock deployment, and that as maritime remains outside of the obligation process for the RTFO it would not be justified to provide ongoing support to a proven fuel. This position does not preclude vessels purchasing and using biofuel in a commercial fashion.

Question 2

Do you consider that there could be biofuel options that would be suitable for use in maritime transport under the RTFO, including sub-sectors like fishing, that address concerns about feedstock availability? When replying please provide any additional evidence you feel is useful in explaining your response

Summary of responses

Total	Yes	No	Other
23	16	7	0

This question was included following feedback from stakeholders that developments in biofuel was leading to the availability of biofuels that could be suitable for use in the maritime industry, or in sub-sectors of the industry, without creating competition for feedstocks.

Consultees were split on the possibility, with some feeling the focus should be on lower technology readiness level advanced fuels like hydrogen and ammonia, while others were of the view that marine biofuel needed support and that some projects were developing that would address concerns around existing biofuel feedstock.

Some consultees highlighted their view that existing biofuels like biodiesel fatty acid methyl ester (FAME) were worthy of support, while others specifically cited concerns around FAME and its stability in fuel tanks as a reason not to support the fuel.

It was highlighted that both HVO and glycerine based fuels could offer options that met the need to avoid diverting feedstock, and that both are very suitable for marine use, while other respondents opposed the use of these as a distraction from hydrogen and ammonia.

Government response

In assessing the outcome of this consultation, the Department notes there is some evidence that some new biofuels may offer solutions to the concerns highlighted, and that further engagement on the matter is needed. However, we would also note that there was significant opposition to inclusion of biofuels at this time.

The Department will not be including these fuels in the RTFO at this time; however, we will begin a process of engagement with industry to explore in more detail the opportunities afforded by advanced biofuels, and to consider if government intervention is warranted in the future.

Question 3

Do you agree that RFNBOs for use in maritime transport, such as renewable hydrogen and ammonia, should be eligible for reward under the RTFO?

Summary of responses

Total	Yes	No	Other
27	22	5	0

This question prompted widespread support for hydrogen as a marine fuel, with consultees highlighting their expectation that international shipping would make use of hydrogen or ammonia in its transition to net zero, and that these fuels would form the bulk of energy supplied to vessels in the 2050s and beyond.

There was strong support for reward today, to help unlock the technology and support the development of demand for these advanced fuels. The majority of respondents indicating that while take-up would likely be low it was important to provide support as a priority as vessels were long term investments, and 2050 is a relatively near-term target for long-lived assets.

It was noted that the regulatory regime will need to catch up in some cases, with respondents highlighting the need for action on both the domestic and international stage to support the use of these fuels.

Some respondents were concerned that supporting these fuels, but not biofuels, would create unfair competition, and could favour one solution over another, while other respondents strongly supported inclusion of advanced fuels with lower technology readiness level such as ammonia and hydrogen over relatively proven fuels such as biofuel.

Some concerns were also raised about the risks of vessels tankering advanced fuels for resale outside of the UK, and the potential for this to lead to the UK supporting fuel consumed beyond our national commitments.

The tankering issue has been explored within government and it is considered unlikely to arise, as any fuel purchased under this scheme would necessarily need to be declared for use as marine fuel and could not be loaded as a cargo, and given the specialist nature of ammonia/hydrogen/methanol transport it would be very unlikely a vessel would be able to load commercial quantities of fuel for shipment and resale. This will, however, be kept under review.

Government response

More broadly, noting the significant degree of support and importance of these lower technology readiness level fuels for the future decarbonisation of maritime the Department intends to move ahead with the inclusion of these fuels under the system to make them eligible for reward under the RTFO.

Question 4

Do you agree that renewable ammonia should be eligible for reward under the RTFO when used in marine fuel cell applications?

Summary of responses

Total	Yes	No	Other
18	15	3	0

This question considers the use of ammonia in a fuel cell environment, and the approach proposed to make the fuel eligible for reward was supported by a significant majority of consultees.

Some concern was raised about the risk profile of ammonia, and it was noted that the IMO is yet to develop standards for the fuel, but this was felt to be an issue that was already being progressed and the consultees did not oppose inclusion of ammonia at this time.

Government response

We therefore propose to include renewable ammonia for reward when deployed in marine fuel cell applications.

Question 5

Do you agree that renewable ammonia should be eligible for reward under the RTFO when used in marine combustion applications if air quality concerns can be adequately addressed? If yes, do you have any views on what standards should apply to the use of ammonia in ICE applications in order to attract reward under the RTFO, for example NOx IMO Tier III? Please include in your response any evidence on air quality implications arising from the use of ammonia in ICE applications.

Summary of responses

Total	Yes	No	Other
13	11	2	0

This question prompted a significant volume of responses, with a significant majority agreeing that ammonia could be rewarded for use in vessels propelled by internal combustion engines if emissions performance was at least as good as the existing minima for traditional fuels.

Consultees noted that it was important not to place additional burdens on uptake, and that modern nitrogen oxides (NOx) standards for marine engines are already extremely challenging, and that going further would likely prevent the use of ammonia in internal combustion engines.

It was highlighted by some respondents that use of ammonia in internal combustion engine propelled vessels was a necessary first step to ensure marine supply of ammonia was rolled out nationally, and that a longer-term transition to fuel cells would necessarily need infrastructure in place that would be incentivised by use in internal combustion engines.

A small number of respondents argued that internal combustion engines are essentially a legacy technology, and should not be supported at all, but indicated that if it was to be supported, we should apply the IMO NOx Tier III air quality standard.

Government response

The Department proposes to make renewable ammonia rewardable when used in an internal combustion engine application, with the requirement that engines comply with IMO NOx Tier III (or appropriate equivalent) and are optimised to prevent ammonia slip.

Question 6

Do you agree with the proposed treatment under the RTFO for RFNBOs used in shipping, including the proposed level of reward for renewable hydrogen, ammonia and methanol? Please provide an explanation as to why you agree or disagree.

Summary of responses

Total	Yes	No	Other
11	9	2	0

The majority of respondents supported the approach proposed in the consultation document, with respondents noting that this was a complex area and in the longer term it would be something worth revisiting as the cost basis of these fuels change and they become more widely accepted.

Some respondents indicated opposition to inclusion as a point of principle, as maritime was not obligated under the system and in their view RFNBOs used in maritime should be excluded from support under the RTFO.

One respondent also queried the decision to reward methanol, as it was carbon bearing, but other respondents strongly supported including renewable methanol and cited its near readiness as a strong justification for support to get the fuel into commercial use.

Government response

Having considered views of stakeholders we intend to move ahead with the proposed level of reward, and to cover the three fuels cited.

Question 7

Do you agree that the point at which RFNBOs are dispensed to a ship for use as a navigation fuel is an appropriate ‘assessment time’ for these fuels? Please provide an explanation as to why you agree or disagree.

Summary of responses

Total	Yes	No	Other
10	8	2	0

This question dealt with the point at which assessment of supply would occur and did not prompt a significant number of responses with some stakeholders indicating the issue was for the Department to resolve as part of scheme design. Objections to the approach were on issues of principle (rewarding maritime) rather than objections to the approach proposed.

The majority of those that engaged with the question agreed with the proposed approach and highlighted that they believed the identified option was the most simple available for maritime operations, and that it made sense to take this approach rather than building a more complex process. It was also highlighted that the approach proposed would be compatible with existing regulatory requirements on marine fuel supply.

Two consultees highlighted that the question was very complex, and that they felt that the approach proposed was the correct one at this time due to its relative simplicity, but that it would need to be held under review to ensure the system was working as intended due to the relative complexity of marine fuel supply. They noted that the differing roles of vessel operator and vessel charterer could impact the arrangement.

Government response

We propose to take forward the system as outlined in the consultation document but recognise that as a novel addition to the RTFO we will need to keep the regime under scrutiny to ensure it is functioning as intended. Note that the assessment time occurs in the UK i.e. the point at which RFNBOs are dispensed to a ship in the UK for use as a navigation fuel.

Question 8

Do you agree that the proposed powers for the Administrator are sufficient to ensure the independent verification of the amounts of RFNBOs used in shipping? Please provide an explanation as to why.

Summary of responses

Total	Yes	No	Other
4	4	0	0

This question did not prompt any significant feedback from consultees, with the majority of respondents highlighting that they felt it was beyond their area of expertise, and that it was for the regulator to determine if powers were adequate. Objections were in relation to the principle of rewarding maritime rather than the approach proposed.

Those that did respond agreed with the proposed powers in the consultation document, highlighting that the inclusion of shipping would be a significant change and that they were comfortable with the level of assurance proposed.

Government response

We will therefore develop the powers for the Administrator as described in the consultation document.

Question 9

Do you agree that the requirement for a reasonable level of assurance, rather than the lower limited level of assurance, is appropriate? Please provide an explanation as to why.

Summary of responses

Total	Yes	No	Other
3	2	1	0

This question considered if the inclusion of marine fuels should be accompanied by requirements to provide for a 'reasonable level of assurance' under ISAE 3000 rather than a less detailed 'limited level' of assurance. The Departments proposal was informed by the need to provide the Administrator with the tools to ensure the system is working transparently, and fairly, and reflects the lower resolution of data currently available on marine fuel.

The majority of consultees considered that this question was outside of their expertise and indicated that a decision would sit with the Department. Of those who responded there was a split in views. There were also some principled objections to the inclusion of maritime noted that did not relate to the technical handling, but the principle of maritime inclusion.

Those in favour noted that this was a novel sector and that it was preferable to maintain a higher level of control to ensure that the system operated effectively. While a small number of respondents indicated that marine fuel was already well regulated with an international system of bunker delivery notes, fuel sampling and compliance systems in place, and that the additional level of assurance would create an unnecessary administrative burden.

Government response

The Department has reviewed the use of the Bunker Deliver Note system⁵ and the available fuel information from both DUKES and HMRC. It has concluded that these systems do not currently provide adequate reassurance for novel and advanced fuels such as ammonia and hydrogen, as the systems currently in use across government are focused on liquid and gaseous hydrocarbons. As a result, we will be taking forward the 'reasonable level of assurance' system at this time.

⁵ The Bunker Delivery Note is a document required under Annex VI of the MARPOL Convention, it contains statutory information relating to the fuel that has been delivered including the particulars of the vessel, detail about the fuel supplier and the nature of the fuel supplied. The purpose of the BDN is to demonstrate a fuel supplied is in line with statutory and safety minima (normally to an ISO standard) and to provide a mechanism of redress in the event that fuel is identified as being off-specification.

Annex: 2 Cost Benefit Analysis – summary of responses and government response

Overview of consultation

In our modelling, an important underlying assumption is the order in which fuels are supplied, as that determines the fuels that are used to meet an increased obligation. In our consultation Cost-Benefit Analysis we assumed that biodiesel derived from used cooking oil (FAME UCO) was the marginal fuel - i.e. the fuel which responds first to an increase in renewable fuel demand. This is because FAME UCO is typically the cheapest fuel to supply after ethanol, and ethanol is already assumed to be supplied up to its limit (as defined by the crop cap and blend wall) in our baseline. We have asked views on whether FAME UCO should still be regarded as the marginal fuel, as well as whether or not the other assumptions in our modelling are reasonable.

Overview of responses received to the consultation

Question 1

Do you think that FAME UCO is still the marginal biofuel?

Summary of responses

Total	Yes	No	Other
14	11	3	0

Eleven of the 14 respondents agreed that FAME UCO is still the marginal fuel.

Of those who disagreed, one respondent stated that FAME UCO was no longer the marginal fuel as its use was limited due to filter blocking issues, meaning many fuel suppliers cannot achieve 7.0% maximum FAME content consistently. Another raised an issue over the fuel being incompatible with certain vehicle types, especially engines in legacy fleets, and expressed a preference for HVO drop-in. The final respondent put forward palm derived biodiesel as the marginal fuel.

Amongst those who agreed, one respondent noted that whilst that FAME UCO is currently the marginal fuel, this could change after the introduction of E10.

Government response

Whilst we recognise the situation may change, on the basis of the available evidence and the majority of the respondents agreeing with our assessment that FAME UCO is the marginal fuel, we have continued to use this assumption when assessing impacts of the RTFO change. We will continue to monitor this with industry to ensure that future policy developments are based on the evidence available at the time.

In response to filter blocking issues, the content of diesel is governed by a combination of legislation and industry fuel standards developed by the British Standard Institution (BSI). The BS EN 590 fuel standard for road diesel provides that up to 7% biodiesel can be included in diesel placed for sale at UK forecourts. Most engines are fully compatible with fuel containing biofuel in the proportions set by fuel standards because manufacturers design engines with the fuel standards in mind.

Question 2

Do you agree that the assumptions within our modelling are reasonable?

Summary of responses

Total	Agree	Disagree	Other
13	3	10	0

We received 13 responses which directly answered this question. Most stakeholders disagreed that our assumptions were reasonable.

The majority of respondents who disagreed with our assumptions stated this was due to the use of the Energy Emission Projections (EEP) from BEIS as our baseline fuel demand scenario for assessing impacts. Respondents claimed that by adopting the EEP we were not fully taking into account, or reflecting, the government's future electrification ambitions, and felt we needed to investigate and assess the impact of electrification further.

Some linked this to the questions in the main consultation about what the appropriate main RTFO target should be, in particular, making reference to questions one and two within our consultation on increasing the RTFO target. The comments received have been considered in our response to those questions as well as here.

One respondent outlined a number of limitations within the modelling. In particular, they highlighted the need to incorporate biomass availability into the analysis, and the need to understand the impacts of renewable fuel policies of neighbouring countries on the competition for finite biomass availability.

The importance of the red diesel rebate for NRMM and how this may impact renewable fuel demand was also raised.

One respondent questioned the assumptions within the modelling around blending biodiesel close to the blend wall of 7%, whilst another questioned the modelling assumptions around high blends, stating that 100% HVO⁶ are currently used in many countries.

Government response

In response to the main challenge received on EEP not taking into account government's electrification ambitions, we have sought to address this through placing greater emphasis on alternative electric vehicle uptake scenarios in our updated Cost-Benefit Analysis.

In response to the modelling not incorporating biomass availability amongst other limitations, the Department recognises the importance of these issues and has considered them carefully when deciding on its preferred policy. Due to the current lack of data and evidence on these subjects it has not been possible to incorporate these factors explicitly into the Cost-Benefit Analysis; however, we are planning to undertake further research to understand these issues better.

Regarding the importance of the red diesel rebate for NRMM, we understand the relevance of this policy, but consider it unlikely to have a material impact on our RTFO analysis.

In response to the assumption of blending biodiesel close to the blend wall, as well as questions around HVO, the updated Cost-Benefit Analysis has explored additional scenarios for the types of biofuels that might be supplied in the future under our chosen option, to test how this affects the impact of our policies.

One stakeholder had concern for the lack of demand for liquid fuel due to high EV ambitions. We understand this concern and have addressed this through deciding to increase the main obligation by 5%. More details on the reasoning can be found in the government response document.

⁶ Hydrotreated vegetable oil - a renewable diesel that can be produced from a wide array of virgin or waste vegetable oils and fats which can be used interchangeably with fossil diesel.

Annex: 3 List of consultation policy questions

Renewable fuel supply trajectory to 2032 and subsequent years

1. Should we increase, decrease or keep the main obligation at the same level? Please provide evidence and reasoning for your answer.
2. If you agree that we should increase the RTFO obligation, what level should it be increased by; 1.5%, 2.5% or 5%? Please provide evidence and reasoning for your answer.

Introducing support for recycled carbon fuels

3. Do you agree or disagree that recycled carbon fuels should be eligible for support under the RTFO given their potential to deliver GHG savings?
4. Do you agree or disagree that only RCFs derived from refuse derived fuel and industrial wastes gases should be eligible for RTFO support? If not, please provide an alternative approach and set out why.
5. Do you agree or disagree that RCFs produced from solid feedstocks should contain at least 25% biogenic content, by energy? If not, please set out an alternative approach with evidence as to why.
6. Do you agree or disagree that support for RCFs should focus on those RCFs which can meet the UK's future strategic needs? That is, that only RCF types which are equivalent to current development fuels should be eligible for support. As such they would be eligible for development fuel certificates and to count towards the development fuel sub-target under the RTFO.
7. Do you agree or disagree with the proposed GHG minimum thresholds and the timeline for increasing GHG emission saving criteria for RCFs? Please provide an explanation as to why.
8. Do you agree or disagree with the proposed GHG emissions methodology to assess the GHG savings for recycled carbon fuels? Please provide an explanation to why.

9. Do you agree or disagree with our proposal that RCFs from solid feedstocks are eligible for two x 0.25 dRTFCs per litre, and RCFs produced from gaseous feedstocks are eligible for two x 0.5 dRTFCs per litre?

10. RCFs from industrial waste gases have the benefit of avoiding release of the industrial gases to the atmosphere. Do you have evidence as to how it can be demonstrated that avoided GHG emissions have not been claimed elsewhere (e.g. under the Emission Trading Scheme), and that they have been attributed to the final fuel?

Hydrogen and renewable fuels of non-biological origin

11. Is “renewable energy that would not have been available to the grid in the absence of power demand from the RFNBO plant in question” an appropriate definition of additional renewable energy?

12. Should the Administrator be able to take into account the use of power purchase agreements (PPAs) as evidence that suppliers have purchased additional renewable energy in order to allow the renewable power generation to be located in a separate location from the RFNBO production facility?

13. A consequence of allowing the use of PPAs to demonstrate renewability, in combination with also permitting other suppliers to use a grid average renewability, is that the same renewable energy could be accounted for more than once. We consider this to be low risk when hydrogen energy and other RFNBO demand is small compared to the total renewable energy available on the grid. We are seeking views on whether this risk is acceptable. Is this risk acceptable?

14. Should appropriate adjustments be made to the amount of renewable energy supplied to a RFNBO production facility to account for transmission losses where renewable energy is transferred over the electricity grid?

15. Do you have any comments on the proposal to use a 30-minute time period for temporal correlation of renewable energy production and use, in cases where renewable energy has been purchased and transmitted across the grid?

16. Should the Administrator be able to permit fuel suppliers to use local grid GHG emissions factors in RFNBO GHG emission calculations? Circumstances in which this might be appropriate include where there are local grid constraints or other local conditions which mean that the local grid GHG intensity differs substantially from that of the national grid.

17. A consequence of allowing local grid GHG emissions to be used in calculating the GHG intensity for a RFNBO is that GHG savings may be claimed by a production facility on a low GHG emission regional/local grid which have also been accounted for in the average national grid GHG intensity. Is this risk acceptable?

18. Have we captured all the additionality scenarios as set out in the proposals in the chapter and in the decision tree (Figure 13)? Please suggest alternatives with evidence

19. Do you agree or disagree that biohydrogen produced from biomethane reformation should be eligible for standard RTFCs rather than development fuel RTFCs?

20. Certain advanced production methods for biohydrogen are likely to be of strategic future importance and require new investments, such as addition of CCS. Do you agree or disagree that when these methods are used, biohydrogen produced from biomethane reformation should remain eligible for development fuel RTFCs?

21. Hydrogen is likely to be an important power source for parts of the railway that are not possible to electrify. Do you agree or disagree that renewable fuel used in trains powered by fuel cells should be eligible for RTFCs?

22. Hydrogen also has the potential to be an important power source for construction and other non-road vehicles. Do you agree or disagree that renewable fuel used in these vehicles powered by fuel cells should be eligible for RTFCs?

23. Hydrogen supplied to retail customers is already eligible for RTFCs. Do you agree or disagree that the assessment time for hydrogen should be amended to make clear that fuel supplied to commercial customers can also qualify for RTFCs?

Changes to sustainability criteria

24. Do you agree or disagree that the default and disaggregated default values for calculating renewable fuel CI values under the RTFO should be updated in line with those published in the RED II Annexes?

25. Do you agree or disagree with our proposal to remove the GHG emissions credit for cogeneration of electricity from the greenhouse gas saving methodology to prevent overstating the GHG emissions savings achieved by the finished fuel?

26. Do you agree or disagree that biomethane suppliers should be able to apply a GHG emissions saving credit for avoided emissions when calculating the carbon intensity of biomethane produced from manure?

27. Do you agree or disagree that when biomethane is created via the codigestion of multiple feedstocks, the supplier should continue to be required to report the CI of each individual consignment? That is, the supplier should not be permitted to average the CIs across feedstocks, in line with the mass balance rules which apply to other biofuels.

28. Do you agree or disagree with our proposal to update the fossil fuel comparator from 83.8 gCO₂e/MJ to 94 gCO₂e/MJ to better reflect the real world GHG emissions associated with fossil fuels?

29. Do you agree or disagree that we should update the minimum greenhouse gas saving thresholds to offset the impact of the revised fossil fuel comparator? This would prevent support for renewable fuels which have worse GHG emissions than those supported now.

If you agree - do you agree with the levels of the new proposed GHG savings thresholds?

If you disagree - please provide your reasoning.

30. Do you think we should consider introducing a tighter GHG emission savings threshold for fuels produced in new production facilities in the future? This would be in addition to the existing thresholds that we are proposing and would only apply to installations not yet built.

31. If yes - what do you think the minimum GHG emission savings threshold should be and what should the start date be? Do you agree or disagree that we should increase the RFNBO GHG threshold to 65%? Please provide supporting evidence.

32. Do you agree or disagree with our proposal to add 'highly biodiverse forest and other wooded land which is species rich and not degraded' to the list of restricted land categories? This will increase existing environmental protections and keep pace with international protections.

33. Do you agree or disagree that we should continue to allow the production and harvesting of biofuel feedstocks from 'highly biodiverse forest and other wooded land' when it can be demonstrated that the production and harvesting of the feedstock from the land was completed without compromising the land type's nature protection purposes?

34. Do you agree or disagree with our proposal to update the definition of highly biodiverse grasslands to maintain consistency with other land types, international definitions, and to facilitate the continued use of voluntary schemes?

35. Do you agree or disagree with our proposal to require that suppliers of biofuels produced from agricultural residues must demonstrate that monitoring and management plans are in place which address the impact of the removal and processing of the feedstock on the site's soil quality and soil carbon content?

36. Do you agree or disagree with our proposal to introduce new sustainability criteria specifically for feedstocks sourced from forest biomass? Note that this would mean that biofuels from forestry feedstocks will no longer be required to meet the land criteria, but instead would be required to meet specific forest criteria.

37. Do you agree or disagree that the proposed criteria better represent the specific environmental impacts associated with forestry?

If you disagree, please provide your reasoning.

38. Do you agree or disagree that we should remove references to RED II Annex IX Part A from this definition?

39. Are there any impacts that we have not foreseen? If yes, please explain your reasoning.

Civil penalties – minor amendment to provision on civil penalties

40. Do you agree that the specified amount used in determining civil penalty amounts related to the main obligation, should change to twice the buy-out price?

If yes, please explain the reasons you agree.

If you do not agree, please state what you think the multiplier should be, and also explain why, and state what you think the multiplier should be if you have an alternate proposal.

Changes to ensure renewable fuels and chemical precursors do not receive multiple incentives

41. We propose that RTFCs should not be awarded if the renewable fuel or chemical precursor benefits from other support schemes such as feed-in tariffs and premium payments. Do you agree that we should further limit multiple reward of renewable energy and chemical precursors? Please provide reasoning and evidence for your answer.

42. We have set out some circumstances where support in addition to that offered by the RTFO might be appropriate. These include if the production facility receives investment aid, including government grants or government loans. Should there be other exceptions when limiting multiple reward of renewable energy and chemical precursors? If yes, please list them and provide reasoning and evidence for your answer.

43. Do you anticipate any unintended consequences with this change? Please provide reasoning and evidence for your answer.