



Department  
for Transport

# The Renewable Transport Fuel Obligations Order Proposed amendments

**Moving Britain Ahead**

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Department for Transport  
Great Minster House  
33 Horseferry Road  
London SW1P 4DR  
Telephone 0300 330 3000  
General enquiries <https://forms.dft.gov.uk>  
Website [www.gov.uk/dft](http://www.gov.uk/dft)

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# Foreword: Rt Hon John Hayes CBE MP



Climate change is an issue of global importance. Efforts to implement the Paris Agreement<sup>1</sup> to tackle this century-defining challenge will require both global co-operation and domestic action to reduce emissions. To that end, the UK has committed to considerable greenhouse gas emission reductions – 80% by 2050 – which will require transformative changes across all areas of the economy.

Transport, which accounts for around a quarter of our domestic greenhouse gas emissions, will be a key part of that transformation. Indeed, achieving our 2050 target will require us to make the transition to near zero-emissions in transport, and it is the Government's ambition that by 2040 every new car and van bought in the UK will be zero emission.

As we transition to electric cars, we will continue to need low carbon liquid and gaseous fuels for decades to come, particularly to decarbonise transport sectors that are not as easy to electrify, such as planes and lorries.

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<sup>1</sup> An agreement within the United Nations Framework Convention on Climate Change. It seeks to limit global temperature rises to less than 2 degrees Celsius. It seeks to mitigate greenhouse gas emissions, improve climate change adaptation, and finance initiatives to achieve these goals.

New challenges bring new opportunities. Today, the UK is a net importer of fossil diesel. We have already reduced our reliance on these imports by producing over a quarter of a billion pounds worth of low carbon biodiesel in the UK each year.<sup>2</sup> In carbon terms, biofuels delivered under our Renewable Transport Fuel Obligations are equivalent to taking over a million cars off UK roads each year.

Looking ahead it is clear that low carbon fuels have further potential to deliver economic benefits and carbon reductions. This is because industry, with Government support, is developing fuels made from wastes and residues. These 'advanced' biofuels could offer significant carbon savings without the sustainability concerns of those derived from crops. And crucially, thanks to the use of high-tech, novel processing technologies, these fuels are also up to the task of fuelling aviation and freight while lowering carbon emissions. Advanced biofuels also offer an economic opportunity with real potential for the development of a domestic industry contributing to economic growth and highly-skilled jobs in a global market worth up to £15 billion by 2030.<sup>3</sup>

Our strategy is therefore to provide a positive investment environment beyond 2020 to further encourage the development of waste-based and advanced fuels, while limiting the use of fuels made from crops. This should provide a firm platform for the development of sustainable advanced fuels, whilst ensuring costs are tightly controlled in line with developments in the market. The proposals in this consultation put these principles into practice and aim to identify, and ultimately implement, the most effective approach to deploying renewable fuels and meeting both our 2020 renewable energy and greenhouse gas emission savings targets and help to make sure transport is able to meet its share of the Carbon Budget reductions required by 2050. The proposals outlined in the coming pages have been informed by the work of the Transport

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<sup>2</sup> This is a total gross value estimate based on anticipated biodiesel production for 2016-7, sourced from UK biodiesel producers, and recent biodiesel prices, sourced from Bloomberg New Energy Finance

<sup>3</sup> Medium scenario estimation of global advanced biofuel industry turnover over in 2030, based on estimated deployment figures and technology costs, [E4Tech/Ricardo-AEA Advanced Biofuel Demonstration Competition Feasibility Study](#)

Energy Taskforce, whose open approach to policy-making created a framework of shared evidence and transparent scenarios.

# 1. Executive Summary

- 1 The transport sector contributes significantly to greenhouse gas emissions – in the UK just under a quarter of all greenhouse gas emissions come from transport, and demand for travel is expected to grow.
- 2 The UK has committed to 80% greenhouse gas emission reductions by 2050. This represents a significant challenge and will require real progress to be made across all areas of the economy, including transport.
- 3 Progress towards the 2050 target is measured through a series of five year Carbon Budgets. Taking into account advice from the independent Climate Change Committee, the Government develops policies aimed at meeting the Carbon Budgets and the 2050 target, as cost effectively as possible.
- 4 Ambitious action will be required across all sectors of the economy to achieve the 2050 target. In transport, measures that will keep us on a cost-effective pathway to meeting the 2050 target include improvements in the efficiency of vehicles as a result of tighter CO<sub>2</sub> limits, promotion of sustainable travel such as walking and cycling and supporting the development of ultra-low emission technologies.
- 5 This has led to real improvements to the way we live, from health benefits from more cycling to cost benefits to motorists from more efficient cars. Since 2009 the fuel efficiency of the average car has increased by 8%, equivalent to saving around 9 pence per litre in fuel costs for the average motorist.<sup>4</sup>
- 6 We are also looking at ways in which the environmental performance of freight can be improved; we have built on the progress made under the Low Carbon Truck Trials by announcing a further £24m funding for trialling alternative propulsion technologies for commercial vehicles. The Government has committed over £600m to support the uptake and manufacture of ultra-low emission vehicles, with the aim that by 2040 every new car and van will be zero emission.
- 7 However, we remain hugely reliant on liquid fuels for our transport needs and will be for decades to come. Sustainable biofuels offering good carbon savings can reduce the carbon intensity of the fuels we need to run our cars and lorries on the roads today. In the longer term the use of biofuels in aviation could be essential to ensure that we can continue to enjoy the benefits of air travel whilst still meeting essential reductions in emissions. The Committee on Climate Change has identified that biofuels should play a part in meeting the UK's carbon targets both in the short-medium term as well as the 2050 target.
- 8 The proposals we are consulting on in this document include a range of measures to reduce the impact of transport by increasing the supply of biofuels, making them more sustainable, and realising the industrial opportunities from developing advanced biofuels. They include:

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<sup>4</sup> We estimate that the average petrol car on the road is around 8% more fuel efficient in 2016 than the average in 2009. Given petrol prices around 110ppl at the pump this fuel saving reduces driving costs by the equivalent of 9ppl.



- i) establishing long term targets to 2030 to provide industry certainty
  - ii) a growing sub target for the contribution of advanced 'development fuels'
  - iii) setting a sustainable contribution from crop derived fuels and encouraging fuels from waste; and
  - iv) extending rewards under the obligation to include aviation fuels, hydrogen and renewable fuels of non-biological origin
- 9 The proposals aim to deliver the emissions reductions required from transport biofuels in the third Carbon Budget (2018-2022) and to put the UK on track towards delivering the contributions required from transport biofuels for Carbon Budgets four and five. Current projections suggest these proposals would deliver around one third of the savings from transport by 2022.
- 10 The measures outlined will not just help transport meet its share of the Carbon Budget reductions - they also offer UK industry the long term certainty it needs to invest and be in a position to take advantage of the growing global advanced fuels market. The Renewable Transport Fuel Obligations (RTFO) scheme has been designed as a market based mechanism to ensure that fuel suppliers are incentivised to supply sustainable biofuels at the lowest cost possible and to protect consumers from significant price rises. By providing long term certainty to encourage investment in the most sustainable fuels, we anticipate decreases in the relative cost of biofuels over the period to 2030, potentially leading towards cost neutrality in the long term. This consultation seeks views on whether there are further measures the Government could take to minimise costs.
- 11 In 2014 the Transport Energy Taskforce was created by the department and the Low Carbon Vehicle Partnership to recommend a way forward on fuels policy. The Taskforce brought together a wide range of stakeholders including fuel suppliers, biofuel producers, motoring groups and environmental NGOs to help the department develop its proposals. The proposals in this consultation have been informed by that process.
- 12 The decision to leave the EU inevitably raises questions around policy areas such as this one that are aligned to EU requirements. The proposals outlined here to increase the production and use of low carbon fuels have been designed to meet the needs of our country. Nevertheless, after we leave the EU we will look afresh at how to develop our policy further, not least to maximise the huge domestic industrial opportunity.

# Introduction and summary of proposals

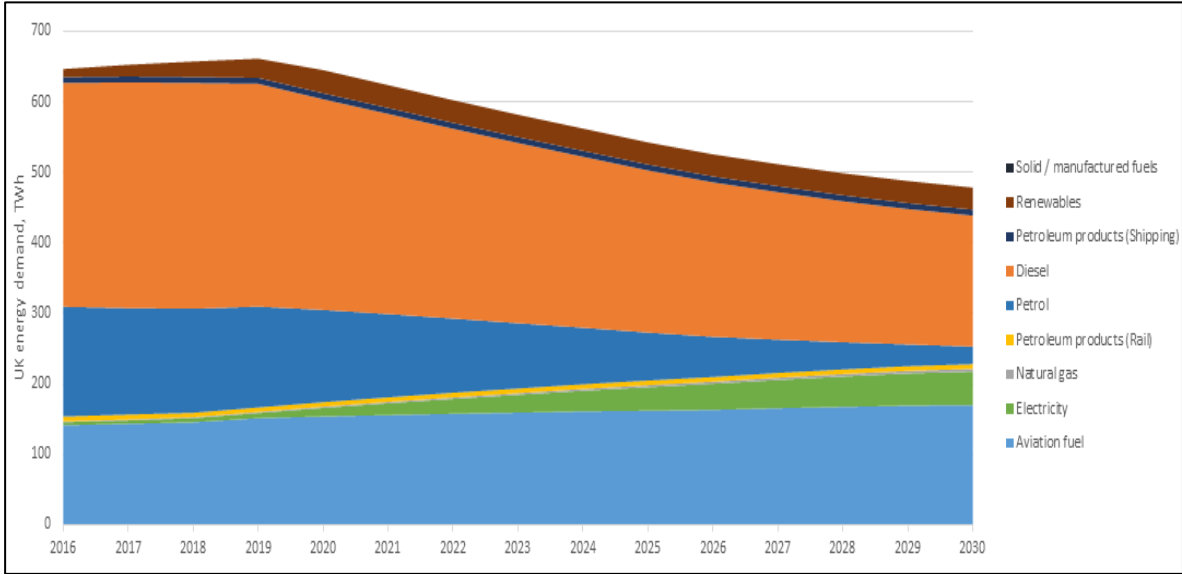
## Carbon challenge

- 13 The Government has set the fifth Carbon Budget which limits greenhouse gas (GHG) emissions to 57% of 1990 levels over 2028-2032 (as an average annual level). The Government is now preparing the Emission Reduction Plan which will set out our approach to delivering these reductions.
- 14 Domestic transport is now the largest emitting sector, accounting for nearly a quarter of UK greenhouse gas emissions. Transport emissions increased in both 2014 and 2015. As demand for travel continues to grow, we need to decarbonise transport more rapidly to meet our future Carbon Budgets.

## Role of low carbon liquid fuels

- 15 Increasing vehicle efficiency, including the promotion of ultra-low emission vehicles, is a key plank of Government strategy to reduce carbon emissions. Our aim is for every new car and van to be zero emission by 2050. This will be an exciting, truly transformative change in the way we experience the motor car, but will require a major growth in sales over the next two decades. In the meanwhile, liquid fuels will continue to be required, and even in the longer term, areas such as aviation and heavy goods will continue to be reliant on liquid fuels.
- 16 Figure 1 below illustrates the extent of our reliance on liquid fuels for transport. It shows the amount of fuels still needed even if we were able to achieve the aim of all new cars and vans to be zero emission in 2020 rather than 2050. With Government support sales are increasing, and we expect ultra-low emission vehicles to be 5% of new car sales by 2020.

**Figure 1: Illustrative scenario of transport energy demand**



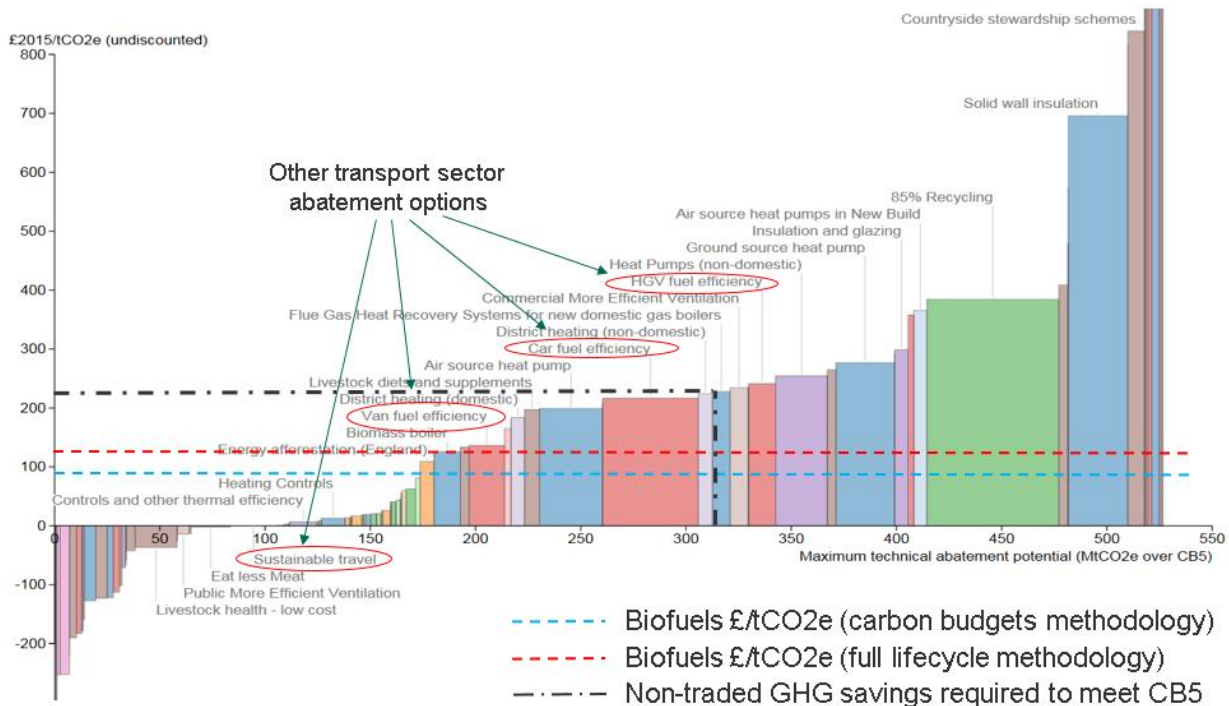
*NB – This chart is for illustrative purposes only, and should not be considered a firm projection. It is very unlikely that 100% of new cars will be electric by 2020. Furthermore, it is a largely crude assessment uncalibrated to overall mileage.*

- 17 It is clear, therefore, that low carbon liquid fuels are likely to be required to support the decarbonisation of transport alongside a wide range of other measures, including electrification and the promotion of sustainable travel such as cycling and public transport.
- 18 Current Government emission projections illustrate that additional measures are required to meet the 4th Carbon Budget (2023 – 2027). Our central Carbon Budget projection for this period already assumes that biofuels will make up around 8% of transport energy. As our existing policies under the RTFO deliver only around 3% of transport energy, we need to do more.
- 19 The Committee on Climate Change published their Annual Progress Report to the Government in June. The key message for transport is that progress in this sector has not been as quick as it should, and that new policies are urgently needed. Their recommendations on a cost-effective path to achieve the 2050 target include increasing the uptake of sustainable biofuels to around 8% of transport energy by 2020.

**Cost effectiveness**

- 20 Achieving our carbon savings objectives cost-effectively is a priority for the Government. Low carbon fuels are among the less expensive emission mitigation measures, as illustrated in Figure 2 below. Carbon Budget analysis indicates that those biofuels offering high carbon savings are likely to be cost-effective, compared with many other measures that we will need.

Figure 2: Cost of delivering carbon savings from different technologies (CB5 central case, 2028-2032)<sup>5</sup>



## Industrial opportunity

- 21 A long-term, joined-up strategy is required to ensure that the UK captures the significant industrial opportunity presented by the world-wide shift to low-carbon transportation. A stable, sustainable policy environment is an essential enabler of investment in renewable, low carbon fuel production infrastructure, and will be crucial if we are to position ourselves at the forefront of a lucrative global industry.
- 22 The domestic market for low carbon fuels has been created by the Renewable Transport Fuel Obligations. Since the Obligation was created in 2008, the UK has benefitted from over £1 billion of private investment in biodiesel and bioethanol facilities.
- 23 Increases in the overall target set under the Obligation, as well as a specific sub-target for fuels of most strategic importance, will create long-term certainty for industry, helping stimulate further investment in advanced production technologies, and encourage the utilisation of existing capacity. The increase in overall supply is reinforced by the creation of a greenhouse gas savings target to reward the supply of those fuels delivering the greatest greenhouse gas savings.
- 24 The industrial benefits of a domestic industry are already being felt. For instance, we are now producing over a quarter of a billion pounds worth of low-carbon, primarily waste-derived, biodiesel in the UK each year, reducing our reliance on imported fuel and creating jobs. In addition, the increased demand for waste feedstocks created by the Obligation has led to business and employment opportunities, such as in the

<sup>5</sup> Figure 2 is derived from the impact assessment for the 5th Carbon Budget. It is published at [http://www.legislation.gov.uk/ukia/2016/152/pdfs/ukia\\_20160152\\_en.pdf](http://www.legislation.gov.uk/ukia/2016/152/pdfs/ukia_20160152_en.pdf) Cost figures for biofuels have been added. The full lifecycle methodology cost figures account for the ILUC impact of anticipated biofuel supply under a 2% crop cap. The cost effectiveness of the different options illustrated in the chart are one of many factors taken into account during decision making when determining which policies to implement.

collection of used cooking oil from restaurants.

- 25 This demand has also brought forward new sources of wastes and new technologies to help convert more challenging materials, such as the 'fat-bergs' which are clogging up our sewer and waste water treatment network, into valuable transport fuel. Indeed, the new £75million Argent facility at Stanlow will be capable of converting these 'fat-bergs' into biodiesel.
- 26 Other benefits include reducing reliance on imports of animal feed, particular soy-meal: the majority of the estimated 333 million litres of bioethanol produced in the UK<sup>6</sup> uses animal feed-wheat and produces an important animal protein feed.
- 27 Looking ahead, the global imperative to radically reduce the carbon impacts of transport, particularly air travel, presents a window of opportunity for the UK. With our world-class research and engineering capacity we are well-positioned to claim a significant portion of a global advanced fuels market that could be worth up to £15 billion in 2030.
- 28 Exploiting our competitive advantage to establish a successful, world-leading domestic industry would boost growth, create highly skilled jobs, and see UK technology and intellectual property exported around the world.

## Fulfilling legislative commitments

- 29 The UK has committed to meet a number of targets regarding reductions in the emissions of greenhouse gases and the increased use of renewable energy sources. These include:
  - The [UK Climate Change Act 2008](#) which requires an 80% saving in carbon emissions (compared to the 1990 baseline) by 2050.
  - The [Renewable Energy Directive 2009/28/EC](#) (RED), as amended, which set a target to supply 10% of energy used in transport from renewable sources in 2020.<sup>7</sup>
  - Article 7a of the [Fuel Quality Directive 98/70/EC \(FQD\)](#), as amended, which requires a 6% saving in greenhouse gas emissions from transport fuel in 2020.
- 30 The recently published [Directive 2015/1513](#) (referred to in this consultation as the ILUC Directive) amended both the RED and the FQD and is intended to begin the transition from fuels based on food crops towards advanced biofuels produced from wastes and residues. It is due to be transposed into UK legislation by September 2017.
- 31 In a parallel consultation, we are setting out proposals to amend the UK Motor Fuel Greenhouse Gas Regulations 2012 to reduce greenhouse gas emissions from transport fuel by 6% by 2020, and to increase the transparency of transport fuels used in the UK. These proposals will implement Article 7a of the FQD.

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<sup>6</sup> [Digest of UK Energy Statistics 2016 \(DUKES\)](#) p167.

<sup>7</sup> Includes multiple counting for energy from electricity and waste based biofuels

## Transport Energy Taskforce

- 32 In developing the proposals outlined in this consultation, the Department has engaged extensively with a broad range of stakeholders using an open and inclusive approach to policy development. In 2014, the [Transport Energy Taskforce](#) was formed by the Department and the Low Carbon Vehicle Partnership. It comprised representatives from fuel suppliers, vehicle manufacturers, motoring organisations, non-governmental organisations, farming and independent experts.
- 33 The Taskforce considered a range of policy objectives including ensuring the sustainability of renewable fuels, the importance of long-term certainty for industry and the needs of consumers. We agree with its assessment that fossil fuels will remain dominant in transport energy to 2030 and beyond. We also agree that sustainable biofuels are crucial to meeting our carbon reduction commitments. The Taskforce report was published in March 2015 and can be downloaded [here](#).

## A low carbon fuels strategy

- 34 To ensure that the UK benefits from the industrial opportunities available from the decarbonisation of transport, and fulfils our climate change commitments, a long-term, joined-up strategy is required to provide a stable, sustainable policy environment to support investment in renewable low carbon fuel production and supply.
- 35 The UK's current policy mechanism, the Renewable Transport Fuel Obligations (RTFO), provides an existing platform on which to build.
- 36 Created in 2007 to support the supply of renewable transport fuel and reduce the UK's carbon emissions, it is also the means through which the UK plans to meet the RED transport sub-target for advanced biofuel supply.
- 37 The target level for suppliers to meet has been held constant since 2013 while concerns about the indirect land-use change (ILUC) impacts of biofuels derived from crops were addressed. Agreement was reached at EU level on measures to address ILUC in 2015 and we are now in a position to set a course to increase the proportion of sustainable biofuels in transport to a level closer to that recommended by the Climate Change Committee in its advice to Government on achieving domestic Carbon Budgets.
- 38 We propose to increase the RTFO obligation level to achieve between 5-6% of renewable energy use in transport by 2020, and to maintain at least that level of supply to 2030 to support our longer term decarbonisation goals and provide certainty to industry. In future, it may be possible to go further if technology develops and sustainable sources of biomass are available. Progress will be kept under review as part of the Carbon Budget process.
- 39 In the meanwhile, we must first ensure that UK policy continues to promote those biofuels that offer genuine greenhouse gas emissions savings. Policy needs to address concerns regarding sustainability, in particular around the use of food crops, the associated impact on food prices and potential deforestation which can result from indirect land-use change.

## Consultation

40 This consultation contains three associated proposals aimed at promoting sustainable renewable fuels:

- increasing the supply of waste derived fuels;
- encouraging the production of advanced, or 'development', fuels, and renewable fuels of non-biological origin such as renewable hydrogen; and
- setting a maximum level for the supply of fuels made from food crops.

### Increasing waste based renewable fuels

41 To incentivise renewable fuels derived from waste feedstocks we propose to ensure that wastes eligible for additional reward are genuine wastes that do not have higher value applications. We propose to do this by incorporating the waste hierarchy concept set out in the Waste Framework Directive into the Renewable Transport Fuel Obligations Order.

### Encouraging the production of renewable 'development' fuels

42 'Development' fuels, i.e. those created from wastes using 'advanced' technology which meet the UK's long term energy needs, currently have higher production costs. To provide support to encourage these fuels we propose creating a sub-target for specific 'development' fuels that comply with both the new definition of waste and the waste hierarchy, apart from those derived from used cooking oil and tallow which are already widely used feedstocks. Eligible renewable fuels would be hydrogen, biomethane, aviation fuels, biobutanol and fuels that are compatible with standard petrol and diesel significantly beyond today's blend limits. The sub-target would increase over the period from 2017-2030.

### Levels for the supply of crop based fuels

43 To further support the growth of sustainable renewable fuels, we propose to set a maximum level for the supply of those produced from food crops. Demand for biofuels derived from crops can increase food prices and cause deforestation as land is converted for agriculture at a global level in response to growing global demand for food, animal feed and biomass energy. To mitigate this, we propose to maintain the current levels of crop derived supply as a proportion of total fuel use to ensure that future supply is increasingly derived from waste.

44 In addition, further proposals are designed to support decarbonisation in aviation and promote hydrogen.

### Aviation

45 The Aviation sector is already pursuing a range of practical measures to grow sustainably to avoid increases in carbon emissions. While significant improvements in aircraft design and operational efficiency will be critical to continue on a path towards reducing emissions, carbon offsetting and low carbon liquid fuels are likely to be necessary to meet long-term emission reduction goals, since transformative technology such as electrification appears unlikely in the foreseeable future.



- 46 As a step towards encouraging the use of low carbon fuels in aviation, we propose to reward renewable aviation fuels under the RTFO. There would not be an obligation to supply a certain level of fuel but suppliers would be able to claim Renewable Transport Fuel Certificates (RTFCs) for eligible fuel.

### Renewable fuels of non-biological origin (RFNBOs)

- 47 The RTFO currently only rewards renewable fuels of biological origin, such as bioethanol derived from wheat. We propose to increase the range of eligible renewable fuels by extending incentives to fuels created from non-biological feedstocks, such as hydrogen produced from electrolysis of water using renewable electricity; or methanol via catalytic fuel synthesis of renewable hydrogen.
- 48 In order to ensure non-biological renewable fuels are sustainable we propose that they deliver at least the same minimum greenhouse gas savings as biofuels.

### Hydrogen

- 49 We propose to introduce changes to help realise the potential benefits of renewable hydrogen, both biological and non-biological.
- 50 We propose to amend the Order to make hydrogen eligible for RTFCs.
- 51 We also propose to set a level of reward for hydrogen that reflects its higher energy density compared to the average for liquid renewable fuels supplied under the RTFO (in line with the approach for other renewable gaseous fuels).

## Summary of proposals

- 52 The full list of proposals is:
- a. Raise the RTFO in equal steps to 9.75% (by volume) in 2020 to achieve 5-6% renewable energy in transport, supporting the achievement of UK Carbon Budgets and the transport sub-target in the RED, and maintain at least that level of obligation to 2030.
  - b. Define wastes to meet the definition used in the RED, and incorporate in the RTFO the waste hierarchy concept to ensure wastes with higher value end uses are not incentivised for biofuel production.
  - c. Maintain double rewards under the RTFO, to incentivise the production of renewable fuels made from wastes that meet the new definition and the hierarchy.
  - d. Introduce and set a sub-target for specific advanced or 'development' waste-derived fuels that meet the waste definition and hierarchy and qualifying non-biological renewable fuels.
  - e. Define the 'development' fuels which will qualify for the sub-target to include fuels of strategic importance to the UK, including hydrogen, aviation fuel, and fuels that can be blended at high levels with standard grade petrol and diesel.
  - f. Set a maximum level for the supply of crop based biofuels at around current levels to mitigate the risk of an increase in their supply, which can result in increased emissions due to high indirect land-use change impacts.



- g. Make renewable aviation fuel eligible for reward under the RTFO. Suppliers would be issued with RTFCs but would not be obligated to supply a certain percentage of the overall supply.
- h. Define, and make eligible for reward, non-biological renewable fuels, such as renewable hydrogen.
- i. Ensure these renewable fuels of non-biological origin are delivered sustainably by applying existing greenhouse gas savings criteria to them.
- j. Set a level of reward for renewable hydrogen of 4.58 RTFCs per kg to reflect its higher energy content compared to the average for liquid renewable fuels supplied under the RTFO (in line with the approach for other gaseous renewable fuels), and use the point of sale as the 'control point'.
- k. Remove rewards for renewable fuels created using precursors already rewarded under another Member State's incentive scheme. An example of this is when subsidised methane is used to produce methanol.
- l. Update the RTFO's sustainability criteria to include a definition of highly biodiverse grasslands.
- m. Amend the definitions of new and old chain installations (relevant for processing of biofuels) and set the corresponding thresholds for greenhouse gas savings the biofuels produced must meet.
- n. Remove the requirement to share, amongst compliant suppliers, the monies received from suppliers choosing to buy-out of their obligation. Removing this 'recycling' of any buy-out fund prevents the RTFO scheme from being classified as a state aid scheme and having to comply with the associated regulations and extensive notification periods.
- o. Align operation of the RTFO with the Motor Fuel (Road Vehicle and Mobile Machinery) Greenhouse Gas Emissions Reporting Regulations by moving to a calendar year reporting cycle. This will ease the burden on suppliers, as the deadlines for required information will more closely align with those Regulations.
- p. Suspend the carry-over of RTFCs in 2020. The 2020 target must be met with fuel supplied in that year (in line with the EU target under the RED), and we propose to suspend the carry-over of RTFCs issued in 2019 into 2020. To maintain some flexibility for suppliers, the RTFCs issued in 2019 will be eligible for carry over in the 2021 obligation year.
- q. Expand the circumstances in which suppliers are allowed to use default carbon intensity values provided in the RED for the biofuel they supply. This takes account of recent changes to the RED which now allow this for crops grown in certain agricultural regions where previously actual carbon intensities were required. This change means that the same rules apply to EU agriculture as currently apply to agriculture from the rest of the world.
- r. Removal of the duty on the Secretary of State to review whether the RTFO obligation level is sufficient to meet the RED 2020 transport. As we propose to set a trajectory to reach that target through these amendments, this is no longer required.

## Implications of the EU referendum result

- 53 On 23 June, the EU referendum took place and the people of the United Kingdom voted to leave the European Union. Until exit negotiations are concluded, the UK remains a full member of the European Union and all the rights and obligations of EU membership remain in force. During this period the Government will continue to negotiate, implement and apply EU legislation.
- 54 As outlined above, whilst the policy proposals outlined in this consultation will fulfil current EU requirements, the underlying policy driver - climate change - is relevant to the UK at domestic, EU and international level. The measures outlined will not just help transport meet its share of the Carbon Budget reductions - they also offer UK industry the long term certainty it needs to invest and be in a position to take advantage of the growing global advanced fuels market. Leaving the EU is therefore not expected to have a material effect on the direction of the policy outlined in this consultation.
- 55 Looking ahead, the decision to leave the EU means we have the opportunity to look afresh at how we can act to further reduce the climate change impact of the transport fuels we use in the UK. We have designed the approach outlined in this consultation to meet the needs of our country. We want a smart, efficient approach focused on delivering the outcomes we all want to support low carbon transport and a strong economy. In Chapter 6 we consider the options for UK policies when we leave the EU and for developing a long term strategy for renewable fuels.

## Geographical coverage

- 56 This consultation, and the proposed amendments to the Renewable Transport Fuel Obligations Order 2007 apply across the whole of the United Kingdom.

## Who should read this consultation?

- 57 This consultation will be of particular interest if you are:
- a supplier of fossil fuel;
  - a supplier of renewable fuel;
  - a body or individual with an interest in renewable fuels;
  - a body or individual with an interest in environmental concerns related to use and production of renewable or fossil fuels.
- 58 This consultation may be of interest to other parties and all are welcome to comment on our proposals. Your comments are invited on the proposed amendments to the Renewable Transport Fuel Obligations Order 2007, and the accompanying Cost benefit analysis

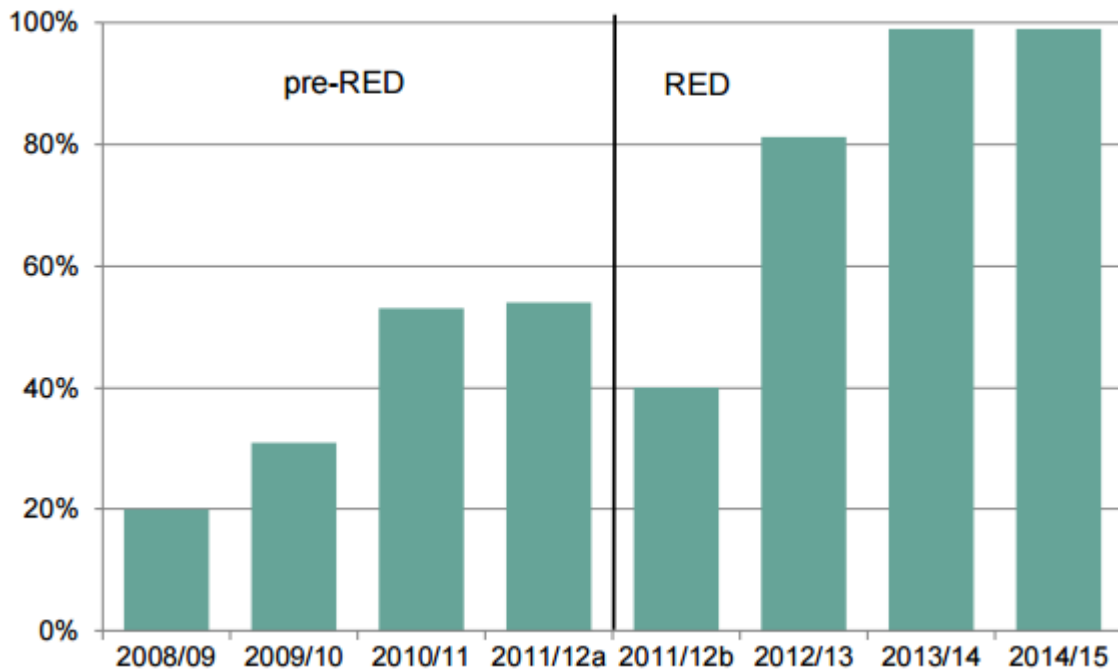
## Achievements of the Renewable Transport Fuel Obligations scheme

- 59 In 2008, the UK introduced the RTFO scheme to provide support for renewable transport fuel and to meet targets for increased use of renewable energy in transport across the EU. It is the mechanism through which the transport elements of the RED have been implemented in the UK.
- 60 The RTFO is a market based mechanism that uses the competitive nature of the UK fuels market to ensure that fuel suppliers seek to source the lowest cost renewable fuels that both meet the sustainability criteria set by the RTFO and satisfy the stringent fuel quality standards that consumers demand.
- 61 Suppliers can claim certificates through supplying renewable fuel and multiple certificates may be earned for biofuels supplied made from wastes and residues. Certificates can also be purchased from other suppliers. This flexibility enables suppliers to minimise the costs of supplying renewable fuels, and deliver significant greenhouse gas emissions reductions. Potential costs that may be passed on to end users of fuel are also capped by a buy-out mechanism in the RTFO.
- 62 The RTFO was amended in 2011 to implement the RED. This gave greater certainty over the sustainability of biofuels by introducing mandatory sustainability criteria, as well as incentivising biofuels derived from non-food crops by introducing 'double rewarding' (making them eligible for two RTFCs per litre supplied, rather than one) for those derived from wastes and residues.
- 63 Voluntary agri-environmental and social accountability schemes (also referred to as 'voluntary schemes') provide assurance on the sustainability of fuels supplied and minimise the cost and administrative burden of compliance on suppliers.
- 64 Following the 2011 changes, suppliers increasingly made use of these voluntary schemes. The percentage of supply certified by voluntary schemes was 39.8% at April 2012<sup>8</sup> (the period immediately following the changes) and reached its current level of 99% by 2013/14 (see Figure 3 below).

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<sup>8</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/137647/rfo-2011-12-yr-4-report-6-summary.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/137647/rfo-2011-12-yr-4-report-6-summary.pdf) (p4)

**Figure 3: 99% of all biofuel supplied in the UK now meets the sustainability standards covered by voluntary schemes**



- 65 The RTFO has been successful in moving biofuel supply from a niche activity to a normal business operation for all major UK suppliers of road fuels, and UK production capacity has increased significantly over the life of the policy. The level of the obligation has increased from 2.5% to 4.75% and the vast majority of suppliers have met their obligations every year through the supply of biofuels rather than 'buying out'.
- 66 The market share for small suppliers has been broadly maintained over the period since the introduction of the RTFO, while the number of small firms has reduced. There has been significant consolidation and a move from small to large scale commercial supply, and overall UK production capacity has increased.
- 67 A 2013 report by Ecofys<sup>9</sup> on the industry quotes a joint study by the Renewable Energy Association and Innovas which estimates that 3,500 jobs were supported by the UK biofuel industry across the supply chain in 2010/11 (including production, supply and distribution – but not including feedstock collection). Analysis undertaken by Ecofys indicates that around 517 people are directly employed at the main UK biofuel plants, and the industry in turn, supports additional jobs in sectors such as farming, transport and distribution. They estimate that several thousand jobs are supported by the collection of used cooking oil (UCO), the UK's primary feedstock sourced for biodiesel.
- 68 The RTFO has been successful in significantly increasing the supply of sustainable biofuels in line with the obligation levels set. From 1.1% of transport fuel supply immediately before the RTFO was implemented to 3.28% in 2014/15.
- 69 The proportion of feedstocks from UK sources has also grown over the period, from 8% in 2008/09<sup>10</sup> to 30% in 2014/15.<sup>11</sup>
- 70 As with the wider obligation, the mix of feedstocks is moving increasingly towards

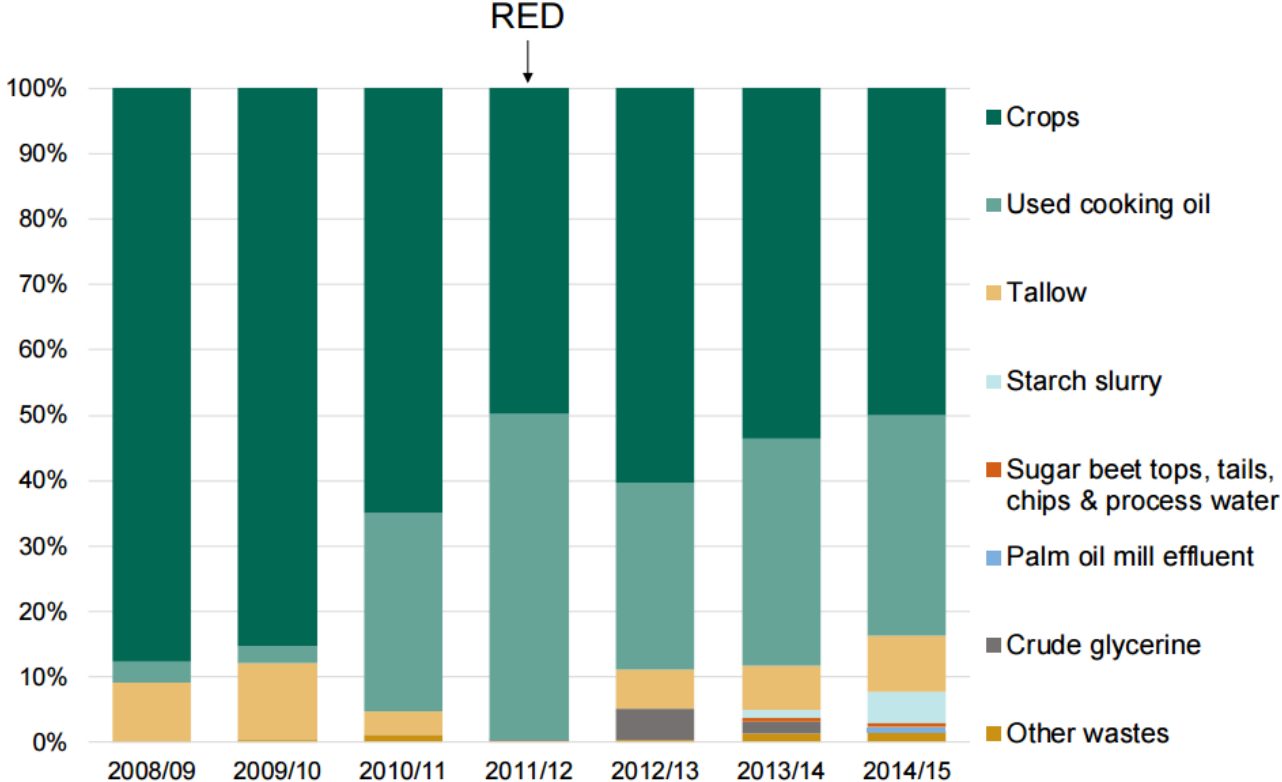
<sup>9</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/266090/ecofys-uk-biofuel-industry-overview-v1.5.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/266090/ecofys-uk-biofuel-industry-overview-v1.5.pdf)

<sup>10</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/230295/Verified\\_data\\_2008-09.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/230295/Verified_data_2008-09.pdf) (p7)

<sup>11</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/472852/rtfo-2014-15-year-7-report-5.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/472852/rtfo-2014-15-year-7-report-5.pdf) (p2)

waste based fuels for biodiesel, replacing virgin vegetable oils where concerns over sustainability are most acute. Changes to provide double rewards for biofuels created from qualifying waste materials, e.g. biodiesel from UCO, resulted in an increase in the overall biofuel supply created from feedstocks eligible for double rewards, from 14% prior to April 2010<sup>12</sup> to 40% in 2012/13<sup>13</sup> and 50% in 2014/15.<sup>14</sup>

**Figure 4: Wastes have made up an increasing proportion of UK biofuel supply over time**

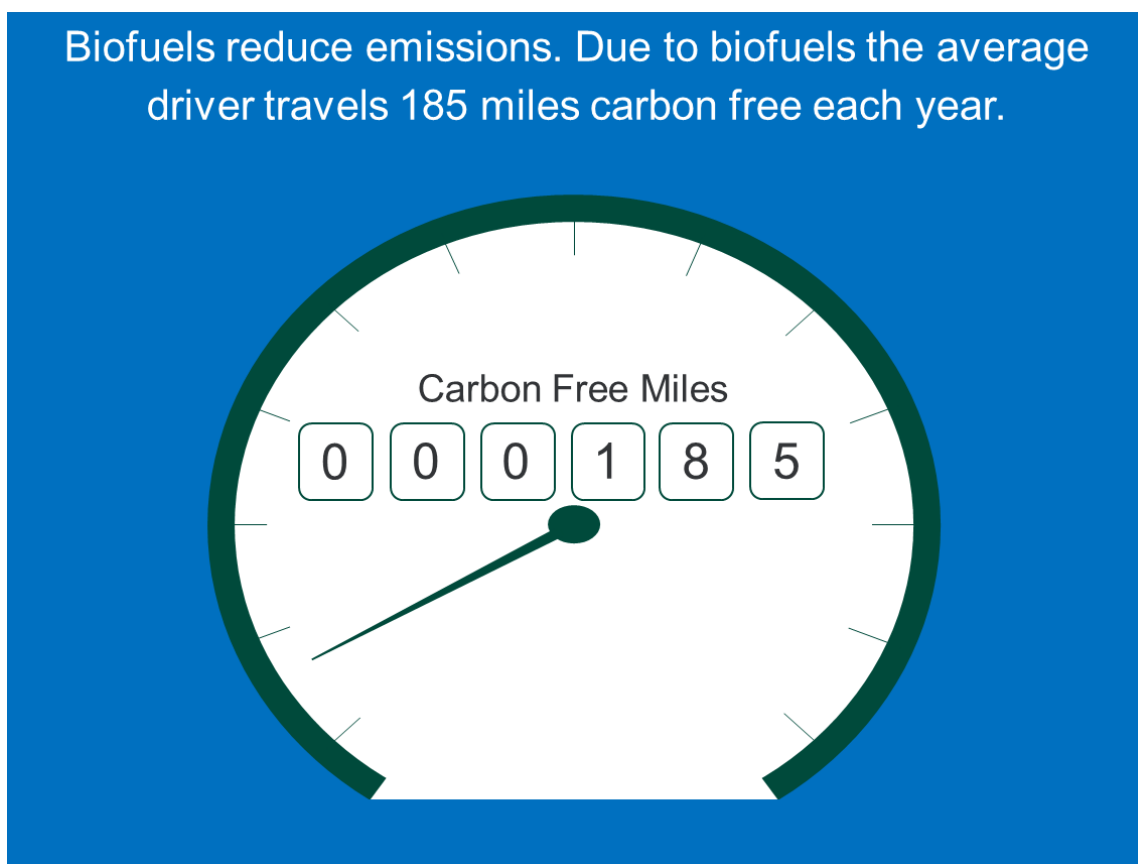


- 71 This shift was the result of concerns about the indirect effects of biofuel production derived from food crops. The UK has been at the forefront of countries pressing for consideration of those concerns. At the time the RTFO was being implemented in 2008, scientists were questioning whether the lifecycle methodologies used for biofuels appropriately reflected their net effect on greenhouse gas emissions. The [Gallagher Review](#), commissioned by the Department, concluded that crop derived biofuels could 'indirectly' cause expansion of agricultural production onto carbon rich land.
- 72 The increased supply of waste based biofuels also resulted in a significant increase in greenhouse gas savings, even when estimated emissions from indirect land-use change ('ILUC' factors) are included, from -5% (a net increase in emissions) in 2008/09 to 60% in 2012/13.<sup>15</sup>
- 73 Another result of increasing the use of waste derived biodiesel was to significantly reduce the carbon abatement costs per tonne of CO<sub>2</sub> when including ILUC,<sup>16</sup> making

<sup>12</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/266390/rtfo-consultation-document.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/266390/rtfo-consultation-document.pdf) (p50)  
<sup>13</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/279171/rtfo-2012-13-year-5-report-6.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/279171/rtfo-2012-13-year-5-report-6.pdf) (p2)  
<sup>14</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/472852/rtfo-2014-15-year-7-report-5.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/472852/rtfo-2014-15-year-7-report-5.pdf) (p2)  
<sup>15</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/266390/rtfo-consultation-document.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/266390/rtfo-consultation-document.pdf) (figure 6.6)  
<sup>16</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/266390/rtfo-consultation-document.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/266390/rtfo-consultation-document.pdf) (tables 4.3 & 4.4)

the overall policy more cost-effective.

- 74 The proposals included in this consultation aim to build on these successes by further increasing the share of waste derived biofuels and improving the sustainability of renewable fuels.
- 75 Amendments in 2011 to implement the RED requirements have helped assure the sustainability of biofuels reported under the RTFO. Following the 2011 amendments to implement the RED, in 2014/15 99.6% of biofuel supplied met the sustainability criteria.<sup>17</sup>
- 76 The increased supply of sustainable biofuels and reductions in emissions have been delivered through a market based mechanism to minimise costs, protecting consumers from excessive impacts on their fuel bills.
- 77 In 2014/15 the carbon savings delivered by the RTFO were equivalent to taking 1.3 million cars off the road, or 185 zero carbon miles per year for the average motorist.<sup>18</sup>



- 78 The RTFO mechanism has led the way in increasing the supply of sustainable renewable transport fuels. The greenhouse gas savings of biofuels delivered under the RTFO have increased year on year, even when ILUC is taken into account, and the proportion of sustainable waste derived biofuels has increased to around half of total supply.
- 79 The proposals set out in this consultation have been designed to build on the achievements of the RTFO to date and make it even better. They are aimed at:
- Providing an important long term contribution to decarbonisation in transport;
  - Meeting our commitments, including the 2020 renewable energy target;

<sup>17</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/472852/rtfo-2014-15-year-7-report-5.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/472852/rtfo-2014-15-year-7-report-5.pdf) (p3)

<sup>18</sup> These figures include ILUC emissions.

- Providing long term certainty to industry to support jobs and growth;
- Stimulating the supply of those sustainable 'development' fuels which the UK needs the most;
- Increasing the re-use of low value wastes and supporting the growth of the [bioeconomy](#);
- Minimising the supply of biofuels with a high ILUC risk; and,
- Targeting those transport sectors that are difficult to decarbonise such as aviation and freight.

# How to respond

The consultation period began on 29 November 2016 and will run until 22 January 2017. Please ensure that your response reaches us before the closing date. If you would like further copies of this consultation document, it can be found at <https://www.gov.uk/government/collections/renewable-transport-fuels-obligation-rtfo-orders#consultations>, or you can contact the Department if you need alternative formats (Braille, audio CD, etc.).

An official response form is provided at Annex C, please submit your responses using this form.

When responding, please state whether you are responding as an individual or representing the views of an organisation. If responding on behalf of a larger organisation, please make it clear who the organisation represents and, where applicable, how the views of members were assembled.

In addition, when responding to the questions please provide supporting reasons and/or evidence as to why you agree or disagree with the proposals set out in this consultation.

Please send consultation responses to:

Michael Wright  
Department for Transport  
Great Minster House  
33 Horseferry Road  
London  
SW1P 4DR  
[LowCarbonFuel.Consultation@dft.gsi.gov.uk](mailto:LowCarbonFuel.Consultation@dft.gsi.gov.uk)



# Freedom of Information

Information provided in response to this consultation, including personal information, may be subject to publication or disclosure in accordance with the Freedom of Information Act 2000 (FOIA) or the Environmental Information Regulations 2004.

If you want information that you provide to be treated as confidential, please be aware that, under the FOIA, there is a statutory Code of Practice with which public authorities must comply and which deals, amongst other things, with obligations of confidence.

In view of this it would be helpful if you could explain to us why you regard the information you have provided as confidential. If we receive a request for disclosure of the information, we will take full account of your explanation, but we cannot give an assurance that confidentiality can be maintained in all circumstances. An automatic confidentiality disclaimer generated by your IT system will not, of itself, be regarded as binding on the Department.

The Department will process your personal data in accordance with the Data Protection Act (DPA) and in the majority of circumstances this will mean that your personal data will not be disclosed to third parties.

# What will happen next?

The Department for Transport will analyse the responses received and will lay a draft Renewable Transport Fuel Obligations (Amendment) Order before Parliament as soon as possible. The draft Order will be accompanied by an Explanatory Memorandum and final cost benefit analysis.

The draft order will be subject to the affirmative resolution procedure, which in this case means that it needs to be laid in draft while Parliament is sitting and approved by both Houses. It will be made and come into force as soon as it has completed the Parliamentary process, and no sooner than 21 days after the final Order is laid.

Our aim is to implement the changes as soon as possible, taking into account the needs of stakeholders, operational deliverability and our legal obligations. We will keep stakeholders informed of progress through our existing regular communication channels.

We will aim to publish a summary of responses, including the next steps, on the Department's website early next year. Paper copies will be available on request.

As we approach implementation, guidance on how to comply with the amended regulations will be drafted in consultation with stakeholders. We will continue to publish data already provided in the RTFO statistics and will discuss with suppliers and other interested parties the extent of any publication of any additional data that may be reported as a consequence of the changes proposed in this consultation. Amendments to the IT system used for reporting data will be made as necessary, and will also be informed by discussions with suppliers.

If you have questions about this consultation please contact:

Michael Wright  
Great Minster House  
33 Horseferry Road  
London  
SW1P 4DR  
[LowCarbonFuel.Consultation@dft.gsi.gov.uk](mailto:LowCarbonFuel.Consultation@dft.gsi.gov.uk)

Further background information can be found at <https://www.gov.uk/government/collections/renewable-transport-fuels-obligation-rtfo-orders>

# Full list of consultation questions

*For each of the following questions, please set out the reasons for your answers, including the impacts of any alternative that you may propose and any anticipated implications. Please also provide any supporting evidence you may have.*

## Chapter 1: Renewable fuel supply trajectory to 2030

Q 1 Do you agree with setting the RTFO overall obligation level at 9.75% for 2020 and maintaining at least that level until 2030?

### Approach to wastes and double rewarding

Q 2 Do you think there will be any unintended consequences of including the waste hierarchy concept in the RTFO Order?

### Introduce a sub-target for particular advanced, or 'development', fuels derived from specified wastes/residues

Q 3 Do you agree with the rationale to support particular fuels that meet the UK's long-term strategic objectives?

Q 4 Do you agree with the feedstocks that are eligible for the sub-target?

Q 5 Do you consider that certain energy crops - namely ligno-cellulosic material and non-food cellulosic material except saw logs and veneer logs - should be excluded from the sub-target?

Q 6 Do you agree with the proposed levels for the sub-target?

Q 7 Do you think that biomethane should be included in the development fuel sub-target?

Q 8 Do you agree that each of the other specified fuels (hydrogen, aviation fuel, HVO, biobutanol and fuel that can be blended with petrol or diesel above current limits) should be included?

Q 9 For those development fuels that can be blended with standard fuels, at what level should the minimum blend capability requirement be set, whilst still meeting the relevant fuel standard?

a) 15%   b) 20%   c) 30%   d) Other

Q 10 Are there ways in which we can increase the supply of advanced biofuels in a cost-neutral way?

Q 11 Do you agree that for novel fuels it is appropriate for the Administrator to require independent assurance of the volume of fuel when necessary?

Q 12 Do you agree that for novel fuels the RTFO Administrator should have the discretion to require a 'reasonable' level of assurance rather than a 'limited' level?

## **Setting a level for the supply of crop based biofuels**

Q 13 For both 2020 and 2030 at what level should the supply of crop derived fuels be set?

a) 0%                      b) 2%                      c) 7%                      d) another percentage

Q 14 Do you anticipate any unintended consequences as a result of basing the definition of crop and starch rich crops on that provided by the ILUC Directive?

Q 15 Do you agree with the labelling of RTFCs for crop derived fuels as 'crop' and the proposal to limit the number of 'crop' RTFCs that can be redeemed in a single year?

## **Chapter 2: Eligible fuels**

### **Aviation fuels**

Q 16 Do you agree that both renewable avtur and renewable avgas should be eligible for reward under the RTFO?

Q 17 Do you agree that the blending/certification point is a suitable control point for renewable avtur used for both commercial and private pleasure use?

Q 18 Is there an alternative control point which we should consider?

Q 19 Do you agree that the duty point is a suitable control point for renewable avgas?

Q 20 Do you agree that for renewable avtur, it is appropriate for the Administrator to require independent assurance of the volume of fuel when necessary?

Q 21 Do you agree that the requirement for a reasonable level of assurance, rather than the lower limited level of assurance, is appropriate for renewable avtur?

### **Inclusion of non-biological renewable fuels, including hydrogen**

Q 22 Do you agree with applying the definition of non-biological renewable fuels used in the amended RED? If not, please provide an alternative and set out why.

Q 23 How might low carbon fossil fuels be supported beyond 2020, which fuels, feedstocks and/or technologies should be encouraged, and is the RTFO the right mechanism?

Q 24 Do you agree with the proposed approach for determining how much of the fuel is a renewable fuel of non-biological origin?

Q 25 Do you agree that renewable fuels of non-biological origin should meet the same sustainability criteria (apart from the land criteria) as biofuels?

Q 26 Do you agree that the GHG calculation methodology should align with the RED, where possible, for consistency with biofuels?

Q 27 Do you have any other comments on the GHG calculation methodology?

Q 28 Do you agree with the proposed level of reward for renewable hydrogen - 4.58 RTFCs per kg?

Q 29 Do you agree that the point at which renewable hydrogen is sold to a retail customer for use in a fuel cell vehicle is an appropriate 'control point' for this fuel?

Q 30 Do you agree that the proposed powers for the Administrator are sufficient to ensure the independent verification of the amounts of fuels which are not subject to duty of excise?

Q 31 Do you agree that the requirement for a reasonable level of assurance, rather than the lower limited level of assurance, is appropriate?

#### **Preventing double reward for the same energy**

Q 32 Do you agree with the proposal to prevent the claiming of RTFCs for fuels created by a precursor that has been rewarded under another renewable energy scheme?

Q 33 Do you have any opinion as to whether either of the two options considered would be preferable and whether either would have unintended consequences?

### **Chapter 4: Operational changes**

#### **Calendar year reporting and changes to deadlines**

Q 34 Do you think there will be any negative consequences as a result of changing the RTFO obligation period to a calendar year?

#### **Carry over of Renewable Transport Fuel Certificates in 2020**

Q 35 Do you agree with the proposal in option 4 to prohibit the carry over of RTFCs into 2020, and also allow RTFCs from 2019 to be carried over into 2021?

Q 36 Do you prefer any of the other options in Table 9, or have alternative suggestions?

#### **Review clause**

Q 37 Do you agree that the specific duty to review the obligation level to ensure we meet the RED 2020 targets for transport is no longer required and should be removed?

### **Chapter 6: Further potential for low carbon transport fuels**

Q 38 When we leave the EU, what further opportunities should we consider to develop our low carbon transport fuels policy framework and related policies? Please explain why.

Q 39 What is the potential in the UK for the use of biofuels (waste derived biomethane and biodiesel etc.) as fuel for HGVs?

Q 40 What are the key barriers to wider deployment of biofuels in the HGV sector?

Q 41 What should be the role of Government / industry in addressing these barriers?

Q 42 Do road freight operators and freight fuel suppliers welcome initiatives to promote the use of biofuels into freight?

Q 43 Will the fuel industry deploy biofuels directly into road freight in the period to 2020 at the obligation level set out in this consultation (9.75% in 2020)?

Q 44 How can the Government cost effectively promote biofuels in the road freight sector?

## **Annex A - RTFO cost benefit analysis**

Q 45 Do you have any evidence on the supply cost of 'development fuels' or any other evidence that could inform the level of the buy-out price?

Q 46 Do you agree with the approach taken to calculating net value added to the economy by UK biofuel production?

Q 47 Do you have any additional evidence we should consider in estimating the costs and benefits of the policy options?

Q 48 Do you have any evidence of waste feedstock availability to 2020 and how markets are likely to react to increased demand in the run up to 2020?

Q 49 Do you have any additional evidence regarding expected future supply cost of renewable fuels, and specifically of waste biodiesel?

Q 50 Do you have any evidence of UK refining and refuelling infrastructure that precludes or supports a moderate introduction of E10? How does this compare to other countries such as Germany and France with similar retail forecourt facilities (i.e. limited to two pumps for petrol grades)?

Q 51 Do you have any evidence on the supply cost of waste-derived drop-in fuels that can be used either in aviation or in diesel (in excess of B7, still meeting the diesel standard EN590)?

Q 52 Do you expect to see any significant changes in the share of renewable fuels used in non-road mobile machinery? Can you provide any evidence of these changes?

Q 53 Do you have any additional evidence regarding expected deployment of gas-powered vehicles and likely future demand for biomethane as a transport fuel?

Q 54 Do you agree that the impacts of proposed operational changes listed in table 7 and covered by Sections 2, 3, 4 and 5 of the consultation document are relatively minor? Do you have any evidence that would help us identify and quantify impacts of any of these amendments?

Q 55 Do you have any evidence on the impact of proposed changes to RTFC carry-over in 2020?

Q 56 Do you have any additional evidence that you consider relevant to this cost benefit analysis?

# Glossary

Administrator	The Secretary of State is the Administrator of the scheme. (This function of the Secretary of State is exercised through the RTFO Unit in the Department for Transport).
Avgas	Aviation fuel used in aircraft powered by piston engines.
Avtur	Aviation fuel used in aircraft powered by gas turbine engines.
Biofuel	A liquid or gaseous fuel used in transport that is produced wholly from biomass. <sup>19</sup>
Biodiversity	Measurement of the variety of different life forms in a given area. High biodiversity is viewed as an indication of a healthy ecosystem.
Bioeconomy	Applying the results of scientific research into biological processes to improve industrial process and create economic opportunities, growth and jobs.
Bioenergy	A term that covers all energy produced from biomass: most common uses are transport, heat and electricity.
Blend wall	The level of biofuel that can be blended into fossil fuel without changes needed to infrastructure, supply and/or vehicles. Fuel standards, such as BS EN590 which allows up to 7% biodiesel in diesel (known as B7), and BS EN228 which allows up to 10% ethanol (known as E10), are agreed and led by industry who take into account the compatibility of vehicles. In the UK petrol supplied typically contains no more than 5% ethanol (known as E5). Some drop in fuels, such as hydrotreated vegetable oil (HVO), can be blended at much higher levels with little or no impact on vehicle compatibility
Buy-out fund	Under the RTFO obligated suppliers must demonstrate that they have met their obligation by redeeming Renewable Transport Fuel Certificates or through 'buying-out' of their obligation at a rate of 30

<sup>19</sup> Defined in the Energy Act 2004

pence per litre of biofuel not supplied. Any buy-out paid is put into a buy-out fund and recycled amongst those suppliers who surrender or redeem Certificates.

Carbon Budget	<p>Introduced as part of the Climate Change Act 2008 to help the UK reduce greenhouse gas emissions by at least 80% by 2050.</p> <p>Covering periods of 5 years, a Carbon Budget places a restriction on the total amount of greenhouse gases the UK can emit.</p> <p>Under the system every tonne of greenhouse gases emitted between now and 2050 will count. Where emissions rise in one sector, the UK will have to achieve corresponding falls in another.</p>
Carbon capture and utilisation	<p>A term covering a range of technologies that capture waste carbon, usually in the form of carbon dioxide (CO<sub>2</sub>), and convert it into commercial products, including fuels.</p>
Carbon defaults	<p>Default carbon intensity (or greenhouse gas emission) values expressed in grams of CO<sub>2</sub> per megajoule of fuel used.</p>
Carbon stock	<p>Measurement of the carbon stored in the vegetation and soil of a given area of land. The carbon stock can go up or down depending on the use of that land. Forests and peatland are examples of land with high carbon stocks.</p>
Carry over	<p>The current RTFO Order allows an obligated supplier to meet 25% of its obligation in any given period with RTFCs issued in the preceding period and carried over to the period in question, this is known as carry over.</p>
Commission	<p>European Commission. Institution of the European Union which drafts proposals for new European laws, manages the day-to-day business of implementing EU policies and spending EU funds.</p>
Consolidated Fund	<p>The Consolidated Fund is the Government's general bank account at the Bank of England. Payments from this account must be authorised in advance by the House of Commons.</p>
Defaults	<p>Shorthand for default carbon values (see carbon defaults above).</p>
Development fuels	<p>Advanced renewable fuels that also comply with both the proposed new definition of waste and the waste hierarchy. Eligible renewable fuels are proposed to be</p>



hydrogen, methane, aviation fuels, biobutanol and fuels that are compatible with standard petrol and diesel fuels beyond current blend limits.

Double reward	The Renewable Transport Fuel Obligations (RTFO) Order (the Order) was amended in 2011 to provide double reward for biofuels made from certain wastes, residues, non-food cellulosic material and ligno-cellulosic material. Where these meet sustainability criteria they are eligible for twice the number of Renewable Transport Fuel Certificates (RTFCs) than biofuels from crops or other non-waste feedstocks. In determining which renewable transport fuels should be eligible for double rewards under support schemes member states must consider compatibility with criteria in the Waste Framework Directive and the objectives of the Renewable Energy Directive.
Economic operator	Any company or organisation involved in the fuel supply chain.
Energy crop	Crops grown for the purpose of generating heat and electricity, or to produce transport biofuels. Crops grown for biofuel use are typically wheat and sugar beet for bioethanol, and oilseeds for biodiesel. Dedicated energy crops are non-food crops including ligno-cellulosic material and non-food cellulosic material except saw logs and veneer logs.
FAME	Fatty-acid-methyl-ester is made through the chemical reactions of vegetable or animal fats being processed with alcohols, typically methanol or ethanol. A mixture of fatty-acid-methyl-esters, or 'FAME', is commonly referred to as biodiesel, which is a renewable fuel typically produced from vegetable oil.
Feedstock	Raw material used to produce transport fuels including biofuels.
Fossil fuel	Fuels which have been formed from the organic remains of prehistoric plants and animals.
Fuel cell	Fuel cells use a chemical process to convert hydrogen rich fuel into electricity to power a vehicle.
FQD	Directive 98/70/EC (as amended) known as the Fuel Quality Directive. Requires suppliers to reduce the lifecycle greenhouse gas (GHG) intensity of transport fuels and introducing sustainability criteria for biofuels.
GHG	Greenhouse gas – a gas which in the atmosphere absorbs and emits radiation causing the 'greenhouse effect' whereby heat is trapped in the atmosphere

making the earth warmer and leading to climate change. For example carbon dioxide (CO<sub>2</sub>) nitrous oxide (NO), methane, water vapour, hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride.

GHG Reporting Regulations	The Motor Fuel (Road Vehicle and Mobile Machinery) Greenhouse Gas Emissions Reporting Regulations 2012. Currently provides a UK scheme for reporting the greenhouse gas intensity of liquid and gaseous fuels used in road vehicles and mobile machinery.
HVO	Hydrotreated vegetable oil - a renewable diesel that can be produced from a wide array of vegetable oils and fats which are thermochemically treated with hydrogen.
Installation	A processing plant used to make a material modification from any relevant feedstock to the finished fuel. It does not include installations solely used for the collection, transportation or storage of the feedstocks (as defined in the schedule to the Renewable Transport Fuel Obligations Order).
Indirect land-use change - ILUC	Land-use change where the cause is at least a step removed from the effects - the knock-on effects on expansion of agricultural land use resulting from the cultivation of biofuel feedstocks.
ILUC Directive	Directive 2015/1513, known as the ILUC Directive, which amends the RED and the FQD in order to take account of the effect of indirect land-use change, and aims to encourage the transition away from first generation biofuels.
ISO	International Organisation for Standardisation
ISAE	International Standard on Assurance Engagements.
Mandatory sustainability criteria	Criteria specified in the Renewable Energy and Fuel Quality Directives – requiring that biofuels, with some exceptions, must deliver greenhouse gas savings of at least 35% when compared to fossil fuels and that biofuels must not be sourced from areas of high biodiversity, or from high carbon soils (e.g. rainforests or wetlands). All biofuels must meet these mandatory sustainability criteria in order to be counted towards meeting the targets in the Directives.
Minimum threshold	The RTFO Order places an obligation on entities that supply a volume of road transport and NRMM fuel above a minimum threshold. The minimum threshold is set at 450,000 litres.

NGO	Non-Government Organisation.
Non-biodegradable feedstocks	Waste that cannot be broken down by other living organisms.
NRMM	Non-road mobile machinery. NRMM is used to collectively refer to the end uses of fuel specified in the Fuel Quality Directive, namely: non-road mobile machinery (including inland waterway vessels when not at sea); agricultural and forestry tractors; and recreational craft when not at sea.
Obligated supplier	A transport fuel supplier upon whom a renewable transport fuel obligation is imposed.
Non-obligated supplier	A supplier of fuel below the minimum threshold of 450,000 litres per annum. Non-obligated suppliers may open RTF accounts and apply for RTF certificates.
Partially-renewable fuel	Fuels that are produced in part from renewable feedstocks and in part from mineral/fossil feedstocks.
RED	Renewable Energy Directive 2009/28/EC. Requires Member States to ensure that 10% of the energy used in transport is from renewable sources in 2020.
Renewable fuel	A fuel used from a source that is either inexhaustible or can be indefinitely replenished at the rate at which it is used. Such as a biofuel or other fuels produced from a renewable energy source i.e. renewable fuels or non biological origin .
Renewable fuel of non-biological origin (RFNBO)	A renewable transport fuel that does not have any biological content - rather the renewable energy content comes from renewable energy sources other than biomass. For example, renewable methanol produced from waste CO <sub>2</sub> and hydrogen where the process is powered by geothermal electricity.
ROS	Renewable Transport Fuel Obligations operating system. The IT system used to administer the RTFO.
RTFC	Renewable Transport Fuel Certificate. One RTFC is awarded for every litre of liquid biofuel reported. Biomethane receives 1.9 RTFCs per kg and bio-LPG receives 1.75 RTFCs per kg. Biofuels from wastes receive double the number of RTFCs. They can be traded between suppliers. Their value is determined by the market.
RTFO	Renewable Transport Fuel Obligations. Introduced in 2008, it is the UK's main mechanism for supporting

the supply of renewable fuels in transport. It places an obligation on suppliers of more than 450,000 litres per year of fuel intended for road transport and NRMM use to ensure a certain percentage of the fuel supplied is renewable, and operates as a certificate trading scheme.

RTFO Order	The Renewable Transport Fuel Obligations Order 2007, as amended. The legislation establishing the RTFO scheme.
Verification	The process of providing assurance of biofuel sustainability data or other fuel related data (e.g. place of purchase, volume produced) supplied on behalf of reporting parties. Verifiers must be independent of the reporting party whose data they are verifying.
Voluntary scheme	Schemes run by independent organisations that offer a route to providing assurance that biofuels meet certain sustainability criteria.
Waste hierarchy	Defined in EU Directive 2008/98/EC. A waste management strategy that prioritises the prevention, re-use, recycling and recovery of waste products over disposal.
Waste Framework Directive	EU Directive 2008/98/EC. Sets the basic concepts and definitions related to waste and lays down some basic waste management principles, including the waste hierarchy.

# 1. Renewable fuel supply trajectory to 2030

This section sets out a proposed straight line trajectory increase for volumes of renewable fuel between 2017 and 2020, and to maintain this level (as a proportion of total road transport fuel) to 2030.

Setting the target out to 2030 will provide long term certainty to industry, whilst ensuring an ongoing contribution to UK Carbon Budgets (set under the UK Climate Change Act 2008).

This trajectory sets the path to meet the 10% renewable energy sub-target in 2020 under the Renewable Energy Directive 2009/28/EC, and to help meet the GHG reduction target set by the amended Fuel Quality Directive 98/70/EC.

## Meeting the 2020 renewable energy target

- 1.1 The Renewable Transport Fuel Obligations Order 2007, as amended (the Order), sets an annual obligation on fuel suppliers<sup>20</sup> to supply a certain percentage of renewable fuel. The obligation has been held at 4.75% since 2013/14 whilst measures to address indirect land use change (ILUC) - the knock-on effects on expansion of agricultural land use resulting from the cultivation of biofuel feedstocks - were being negotiated at EU level. Now those negotiations have concluded, we are in a position to increase the obligation level and set a trajectory to 2020 to meet our target to deliver 10% renewables in transport by energy, set in accordance with Article 3 of the Renewable Energy Directive (which determines the mandatory national overall and transport targets for the use of energy from renewable sources).
- 1.2 The RTFO works on a volume basis, therefore the proposed 2020 volume obligation target will be set to ensure that the RED 10% energy target is achieved.
- 1.3 The obligation is calculated as the total volume of fuel supplied (taking into account the minimum threshold provisions) minus the volume of sustainable fuel. This total is then multiplied by a percentage to give the specified amount (which is a volume of fuel) for that period.
- 1.4 We have modelled the obligation level required to meet the target by taking into account the different energy contents of the biofuels that are likely to be supplied and their likely volumes (depending on blend wall constraints<sup>21</sup> and whether high blends will be delivered to specific sectors such as heavy goods vehicles (HGVs) or trains).

<sup>20</sup> The obligation applies to fuel suppliers that supply more than 450,000 litres per year.

<sup>21</sup> The limits on how much biofuel can be blended with a fossil fuel.

- 1.5 We have also determined that 1.1% of the target (in energy terms) can be delivered through renewable electricity used in cars and trains (see the cost benefit analysis at Annex A for further details).

### Providing certainty for industry

- 1.6 We also propose maintaining the obligation level at the 2020 level as a minimum until 2030. We will continue to keep the level under review and raise it if required, subject to assessment of the cost and benefits of such an increase. This is intended to provide industry and investors with long term certainty.

### Delivering greenhouse gas savings

- 1.7 A contribution from renewable fuels at this level of supply is needed in order to deliver the greenhouse gas savings required to meet UK Carbon Budgets.

### Proposed supply of renewable transport fuel

- 1.8 The RTFO trajectory levels to 2020 and beyond are set out in Table 1 below. The RTFO obligation percentage determines the volume of renewable transport fuel supply obligated suppliers will have to deliver (either through their own supply or through purchase of Renewable Transport Fuel Certificates or RTFCs).<sup>22</sup> See the cost benefit analysis (Annex A) for details on how this meets the RED target.

It might be necessary to increase the target obligation level part way through the 2017-18 obligation period. Should this be required further engagement with stakeholders will take place to assess the operational and practical effects before a final decision is made.

**Table 1: 2020 RTFO target and trajectory**

Obligation period	Specified amount*, as share of fossil fuel, by volume	Target (obligation) level, as share of total liquid fuel by volume
15th April 2017-14th April 2018	6.38%	6.00%
15th April 2018-31st December 2018**	7.82%	7.25%
1st January 2019-31st December 2019	9.29%	8.50%
From 1st January 2020 & for subsequent obligation periods	10.80%	9.75%

\*In the current Order, the obligation percentage is the percentage by which the obligated fuel is multiplied to determine how much sustainable renewable fuel needs to be supplied. In the Order, the resultant fuel volume is called the specified amount.

\*\*2018 is a short obligation period so that we can switch to a calendar basis (see chapter 4 for proposals regarding the change to calendar year reporting).

<sup>22</sup> Note that it would remain possible for an obligated supplier to "buy-out" of their obligation at 30 pence for each litre of renewable fuel not supplied.

**We propose to increase the percentage of renewable fuel required to be supplied by fuel suppliers each year from 2017 to 2020 such that by 2020 sufficient renewable fuel is supplied to reach the 10% target for renewable energy in transport.**

**Q 1 Do you agree with setting the RTFO overall obligation level at 9.75% for 2020 and maintaining at least that level until 2030?**

**When replying please provide supporting evidence as to why you agree or disagree.**

## Meeting the target sustainably

1.9 Meeting the target sustainably is essential to ensure genuine carbon savings are delivered and indirect impacts of biofuels are minimised. The RED also requires that Member States set a target for a minimum proportion of renewable fuels that are supplied from the materials set out in RED Annex IX Part A which include waste materials, by-products and some energy crops.<sup>23</sup> The RED also sets a maximum level for the amount of crop derived biofuels which can count towards Member State targets at 7% of energy used in relevant transport.

1.10 We propose to address these issues in three ways:

- Double rewarding biofuels made from wastes and residues that meet the waste hierarchy for use as a fuel;
- Creating a specific sub-target for specified advanced, or 'development', fuels; and
- Setting a level for the supply of fuels derived from crop feedstocks

Proposals to implement each of these are the subject of the remaining sections of this chapter.

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<sup>23</sup> Includes ligno-cellulosic material and non-food cellulosic material except saw logs and veneer logs - see paragraph 1.24 for a full definition of these materials.

## Approach to wastes and double rewarding

We propose to change the way in which fuels created from wastes and residues are rewarded under the RTFO. We wish to incentivise the production of renewable fuels from wastes and discourage the use of 'wastes' that are currently employed for more productive uses. This will involve:

- a. Providing a definition of waste in the Order to transpose the new definition for waste in the RED which is based on the Waste Framework Directive (WFD) definition;
- b. Introducing the waste hierarchy concept from the WFD into the Order;
- c. Continuing the current approach whereby materials that are classified as wastes do not have to meet the criteria set out in paragraphs 7-9 of the Order's Schedule (the land criteria);
- d. Issuing two RTFCs to renewable fuels derived from wastes and residues that meet the waste hierarchy requirements;
- e. Issuing one RTFC to renewable fuels derived from wastes and residues that do not meet the waste hierarchy requirements for use as a fuel.

### How wastes are currently assessed and rewarded

1.11 Currently there is no definition of waste in the Order. The RTFO [guidance](#) provides details on the process by which the administrator assesses whether materials are considered wastes or residues. Where a feedstock is assessed as a waste it is double rewarded. The guidance contains a list of materials assessed by the RTFO administrator, and details of the process by which suppliers can request new materials to be assessed.

1.12 The list in the RTFO guidance was established by:

- Including materials listed or treated (for the purposes of calculating greenhouse gas emissions) as wastes or residues in the RED;
- Assessing new materials, including a 'loose' assessment against the WFD waste hierarchy.

1.13 Materials that are assessed as products usually need to demonstrate that the land criteria have been met and are not double rewarded.



### **How will the definition of wastes change?**

1.14 The definition of waste in the revised RED (Article 2(p)) is that in Article 3(1) of the Waste Framework Directive (WFD):

*'Waste' means any substance or object which the holder discards or intends or is required to discard.*

1.15 The RED (Article 2(p)) extends this definition to exclude:

*substances that have been intentionally modified or contaminated to meet that definition.*

1.16 We propose to transpose this definition into the Order.

### **Which feedstocks would be eligible for double reward?**

1.17 Using the definition set out above could result in a wide range of materials being doubly rewarded with RTFCs, including those that could either be prevented, reduced or recycled.

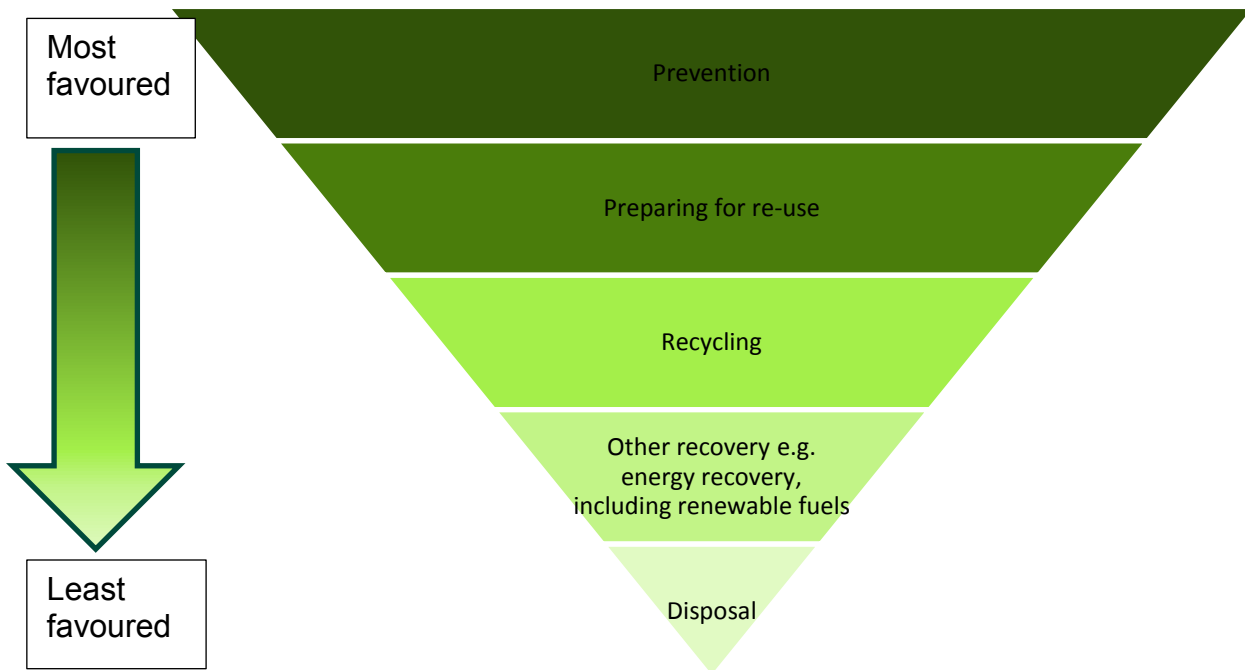
1.18 To counter the potential risk that wastes that would otherwise have been deployed to higher value end uses are diverted to biofuel production we propose to apply the waste hierarchy concept when determining whether a waste based feedstock should be double rewarded.

### **What is the waste hierarchy?**

1.19 The waste hierarchy concept is set out in Article 4 of the WFD. The concept is that the following actions should be undertaken in priority order:

- a. prevention;
- b. preparing for re-use;
- c. recycling;
- d. other recovery (this includes energy recovery, including renewable fuels); and
- e. disposal.

Figure 5: The Waste hierarchy concept



## Wastes

- 1.20 To prevent the potential negative outcomes that could occur by using the definition of wastes in the WFD, we propose to transpose both this and the principle of the waste hierarchy into UK law, and **introduce** a two stage process into the RTFO **whereby**:
- Waste will be defined in line with the WFD. Materials that are wastes for the purposes of the WFD will not have to meet the land based sustainability criteria (set out in paragraphs 7-9 of the schedule to the Order), waste that meet this requirement ; and
  - Wastes are assessed as to whether they also meet the requirements of the waste hierarchy for use as a fuel (e.g. they would not otherwise be expected to be re-used, recycled, or used for a higher value end use). Wastes that meet this requirement will receive double reward.
- 1.21 The current approach to wastes set out in the RTFO guidance is already based on the waste hierarchy concept and the changes may not require extensive changes to current practice. However, the legislative changes further clarify how waste status should be determined, in line with the changes to the Directive. Relevant considerations may include not just the particular material, but the context in which it occurs. For example, materials such as used cooking oil may be a waste if generated in locations where it is not used for animal feed, but may not be in other cases where it is. Similarly, some materials might usually have higher value uses, but due to specific circumstances some consignments of the material may be waste (e.g. due to contamination).
- 1.22 When applying the waste hierarchy, Member States are required to encourage the options that deliver the best overall environmental outcome. This may require specific waste streams departing from the hierarchy where this is justified by life-cycle thinking on the overall impacts of the generation and management of such waste. This flexibility will also be reflected in the revised Order. The proposed changes are

intended to ensure that the RTFO is consistently incentivising the use of genuine wastes that lead to greenhouse gas savings.

### How would the treatment of wastes change under the RTFO?

1.23 Tables 2 & 3 below summarise the current approach to these materials and the new proposed approach.

**Table 2: Current RTFO approach to wastes, residues etc.**

Material	Must meet land criteria (schedule 7-9)?*	Receives double RTFCs?
Wastes or residues other than residues from agriculture, aquaculture, fisheries or forestry; or	No	Yes
Residues, non-food cellulosic material or ligno-cellulosic material derived from agriculture, aquaculture, fisheries or forestry.	Yes	Yes

\*Note that all fuels need to meet the minimum GHG saving threshold in the Schedule - see RTFO Order Schedule, paragraph 2.

**Table 3: Revised RTFO approach to wastes, residues, etc.**

Material	Must meet land criteria (Schedule 7-9)?	Meets the waste hierarchy and receives double RTFCs?	Qualifies for new development fuels sub-target?
Wastes or residues (including processing residues) other than residues from agriculture, aquaculture, fisheries or forestry that meet the waste hierarchy	No	Yes	Yes*  *Except for UCO & tallow. Also subject to being a qualifying fuel type (paragraph 1.47)
Wastes or residues (including processing residues) other than residues from agriculture, aquaculture, fisheries or forestry that do not meet the waste hierarchy	No	No	No
Residues from agriculture, aquaculture, fisheries or forestry that meet the waste hierarchy	Yes	Yes	Yes*  *If a qualifying fuel type (see paragraph 1.47)

non-food cellulosic material or ligno-cellulosic material derived from agriculture, aquaculture, fisheries or forestry.	Yes	Yes	No
Non-biological renewables	No	Yes	Yes*

\*If a qualifying fuel type (see paragraph 1.47)

Note that, with the current approach, materials that are not considered wastes, but that are also not directly derived from land (such as palm fatty acid distillate), have to demonstrate that the land criteria have been met. The revised approach would remove this requirement for such materials.

**Q 2 Do you think there will be any unintended consequences of including the waste hierarchy concept in the RTFO Order?  
If so please provide evidence when replying.**

### Introduce clarifying definitions in the RTFO Order

- 1.24 The revised RED includes amendments to Article 2 (r-u) with definitions for 'ligno-cellulosic material', 'non-food cellulosic material', 'processing residue' and 'agricultural, aquaculture, fisheries and forestry residue'. These definitions do not materially change anything to the current approach in the Order, but we propose to include them for the purpose of clarity. These definitions are:
- (r) '*ligno-cellulosic material*' means material composed of lignin, cellulose and hemicellulose such as biomass sourced from forests, woody energy crops and forest based industries' residues and wastes;
  - (s) '*non-food cellulosic material*' means feedstocks mainly composed of cellulose and hemicellulose, and having a lower lignin content than ligno cellulosic material; it includes food and feed crop residues (such as straw, stover, husks and shells), grassy energy crops with a low starch content (such as ryegrass, switchgrass, miscanthus, giant cane, cover crops before and after main crops), industrial residues (including from food and feed crops after vegetal oils, sugars, starches and protein have been extracted), and material from biowaste;
  - (t) '*processing residue*' means a substance that is not the end product(s) that a production process directly seeks to produce; it is not a primary aim of the production process and the process has not been deliberately modified to produce it;
  - (u) '*agricultural, aquaculture, fisheries and forestry residues*' means residues that are directly generated by agriculture, aquaculture, fisheries and forestry; they do not include residues from related industries or processing;
- 1.25 The revised Directive also includes a definition for low indirect land-use change risk biofuels as below. However, as the concept is not used elsewhere in the Directive

there is no practical effect of this change. We propose therefore not to add this definition to the RTFO Order:

- (v) 'low indirect land-use change risk biofuels and bioliquids' means biofuels and bioliquids, the feedstocks of which [...] were produced within schemes which reduce the displacement of production for purposes other than for making biofuels and bioliquids, and which were produced in accordance with the sustainability criteria for biofuels.

## Introduce a sub-target for particular advanced, or 'development', fuels derived from specified wastes/residues

In addition to the proposal to increase the use of waste feedstocks for renewable fuels, we propose to incentivise specific renewable advanced, or 'development', fuels (made from sustainable wastes and residues, or of non-biological origin) through the introduction of a sub-target. This would entail rewarding specific fuels from wastes and residues that meet the waste hierarchy requirements (except for used cooking oil (UCO) and tallow), with a new category of RTFC for suppliers to redeem against the sub-target. This is intended to stimulate the supply of specific advanced renewable fuels suitable for use in transport sectors that are difficult to decarbonise such as aviation and heavy goods vehicles.

### Why introduce a sub-target for certain feedstocks?

- 1.26 We wish to increase the supply of advanced fuels, created by using novel technology, and those that are of strategic importance to the UK. We propose to do this by creating a 'development fuels' sub-target.
- 1.27 The revised RED includes a target for a minimum proportion of biofuels to be produced from feedstocks contained in RED Annex IX Part A; fuel from those feedstocks should be 0.5% of the total fuel supply. Our assessment of the current fuel supplied under the RTFO is that this target of 0.5% can be met without introducing a specific, legally binding, target for suppliers.
- 1.28 This is because RTFO statistics illustrate that the fuel supplied under the obligation already includes around 0.2% of fuels made from RED Annex IX part A feedstocks. This has been stimulated through the introduction of double rewards for waste derived fuels. The feedstocks include:
  - crude glycerine,
  - palm oil mill effluent and
  - other feedstocks that can be converted to biofuel using broadly conventional technologies.
- 1.29 We anticipate that maintaining the double rewarding system and setting a trajectory under the RTFO to meet the overall 10% transport target will support further supply of Annex IX materials. Maintaining the supply of crop based fuels at current levels (section 1.65) would also be expected to encourage the uptake of Annex IX Part A feedstocks.

1.30 However, we have concerns about simply using the feedstocks included in the RED Annex IX Part A as the sole basis for a sub-target. There are no clear principles or criteria underlying their choice, other than that they are not 'food crops' and do not include used cooking oil and tallow, which are already widely used for biofuels. Our concerns are that:

- Non-food energy crops are included in this list - specifically *ligno-cellulosic* material and non-food cellulosic material except saw logs and veneer logs (see 1.36 below);
- Some feedstocks on the list can be converted into conventional biofuel using conventional technologies; therefore, simply setting a target based on these feedstocks might merely expand further conventional biofuels made from wastes. While this is not an issue in itself, it would appear unlikely to provide market certainty and additional support for suppliers/investors in order to stimulate investment in production facilities for advanced fuels (which cost more than conventional technologies);
- Some feedstocks from waste and residues on the list have 'higher value' alternative market uses, and therefore re-directing their use to biofuels could have adverse indirect effects in a similar way to some crop based fuels.

1.31 The last of the above points is addressed through the proposal to introduce the waste hierarchy into the Order, as required by the Directive. The first two are intended to be addressed through the creation of a 'development fuels' sub-target for specific fuels.

1.32 The 'development fuels' sub-target will be restricted to specific renewable fuels created from wastes and residues using advanced technology. The target will start at a low level, and rise over time to reflect the early stages of development those fuels are presently at.

### What about energy crops?

1.33 As outlined above, we have some concerns about including non-food energy crops in the development fuels target given that the ILUC effects of these crops are not yet well understood. However, [recent research](#) published by the European Commission indicates that short rotation and perennial energy crops could have net positive land use change effects due to an increase in carbon stock on the land.<sup>24</sup> We would be particularly interested to hear views on whether to include these energy crops in the development fuels target.

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<sup>24</sup> [https://ec.europa.eu/energy/sites/ener/files/documents/Final%20Report\\_GLOBIOM\\_publication.pdf](https://ec.europa.eu/energy/sites/ener/files/documents/Final%20Report_GLOBIOM_publication.pdf) p xi

## What level would the sub target be set at?

1.34 The proposed level of target each year is set out below. These targets are not in addition to, but instead would form a growing proportion of, the overall RTFO target.

**Table 4 Proposed sub-target levels**

Obligation period	Sub target (obligation) level, counts towards RTFO obligation	Resultant 'advanced' renewable fuel supply as proportion of total fuel supply (by volume)
15.4.2017 - 14.4.2018	0.1%	0.05%
15.4.2018 - 31.12.2018 <sup>25</sup>	0.2%	0.1%
1.1.2019 - 31.12.2019	0.3%	0.15%
1.1.2020 - 31.12.2020	0.4%	0.2%
1.1.2021 - 31.12.2021	0.6%	0.3%
1.1.2022 - 31.12.2022	0.8%	0.4%
1.1.2023 - 31.12.2023	1%	0.5%
1.1.2024 - 31.12.2024	1.2%	0.6%
1.1.2025 - 31.12.2025	1.4%	0.7%
1.1.2026 - 31.12.2026	1.6%	0.8%
1.1.2027 - 31.12.2027	1.8%	0.9%
1.1.2028 - 31.12.2028	2%	1%
1.1.2029 - 31.12.2029	2.2%	1.1%
For 1.1.2030 - 31.12.2030 and subsequent obligation periods	2.4%	1.2%

## Why are certain fuels not included in the sub-target?

- 1.35 If renewable fuels derived from crops qualified for the development fuels sub-target, there is a significant risk that the sub-target would not achieve the intended policy outcome of encouraging truly advanced fuels. This is because genuine 'advanced' technologies would not be able to compete with fuels made from those wastes/residues (included in RED Annex IX) using conventional technologies which are already on the market. These new 'advanced' production pathways are largely still in development, but currently have higher production costs and appear unlikely to achieve investment without further support.
- 1.36 A sub-target restricted to a more limited range of fuel types would provide some level of market certainty, enabling additional support for suppliers and potentially for investors to stimulate investment in production facilities.
- 1.37 Furthermore, the UK has greater strategic need for some 'advanced fuels' than others. For example, advanced diesel fuels are typically 'drop in', i.e. chemically very close to fossil diesel fuel and capable of being blended with conventional fuel at higher levels than conventional biodiesel.

<sup>25</sup> See chapter 4 for details of the proposed move to calendar year reporting

- 1.38 Diesel and kerosene are anticipated to be required in the HGV and the aviation sectors into the very long term where electrification is unlikely to be an option – advanced diesel based fuels are therefore critical to long term decarbonisation of these sectors.
- 1.39 In contrast, 'advanced' bioethanol has the same physical properties as today's crop derived bioethanol, and is consequently constrained by blending limits to ensure petrol is suitable for the UK vehicle fleet.
- 1.40 UK crop bioethanol production capacity is already sufficient to meet the majority of UK demand, and therefore any significant expansion of advanced bioethanol could come at the expense of existing UK production facilities.
- 1.41 UK bioethanol production is based on sugar beet and animal feed wheat. The process for producing ethanol from animal feed wheat also produces a valuable animal protein supplement. It has low 'ILUC' effects according to the ILUC factors used in the RED and is understood to be significantly more sustainable than crop biodiesel whose use it is a priority to minimise.
- 1.42 Furthermore, the wider UK petrol market is currently forecast to decline, limiting opportunities to decarbonise through bioethanol in the longer term. This is because the passenger vehicle fleet is set to become increasingly fuel efficient and move toward electricity for the energy source.
- 1.43 For all of these reasons we intend not to focus additional support on advanced bioethanol, and similar fuels including biomethanol that are significantly constrained by the BS EN228 petrol standard.
- 1.44 We would therefore like to set a specific 'development fuels' sub-target under the RTFO that takes into account both the fuel type and the feedstock so as to target those fuels which need greater support and fit the UK's long term strategic needs. These include, in particular, fuels requiring additional support that in the long term will be suitable for use in aviation, and in the short to medium term, fuels that can be deployed in HGVs.

### **Which fuels would count towards the sub-target?**

- 1.45 A 'development fuel' would be a fuel made from a sustainable waste or residue (subject to an assessment against the waste hierarchy, excluding used cooking oil and tallow), or a non-biological renewable fuel, and would be one of a specified fuel type.



1.46 We propose to define eligible development fuels in the following way:

- A renewable transport fuel (as defined in Article 3 (12) of the Order) which is either:
  - made from a sustainable waste or residue (other than used cooking oil or tallow) which meets the requirements of the waste hierarchy for use as a fuel (see above paragraphs on changes to the eligibility of waste feedstocks in the RTFO); or
  - a renewable fuel of non-biological origin (see the section on 'Inclusion of non-biological renewable fuels, including hydrogen' (Chapter 2) for the proposals on including these in the Order).

And

- A fuel type that meets the UK's long term strategic objectives, i.e. one of the following specified fuel types:
  - Hydrogen (see the section on 'Support for hydrogen' (Chapter 2) for proposals to include hydrogen fuel in the RTFO)
  - Biomethane
  - Aviation fuel (kerosene or avgas) (see the section on 'Aviation fuels' (Chapter 2) for proposals to include them in the RTFO)
  - Hydrotreated Vegetable Oil
  - Biobutanol
- Alternatively, a qualifying fuel could also be a fuel with the following characteristics:
  - Fuel that can be blended at rates of at least [x]% *and* still meet the relevant fuel standard i.e. EN228 for petrol, EN590 for diesel

1.47 The final category is intended as a 'catch-all' to ensure that novel fuels meeting the required characteristics are encouraged and incentivised without needing to revise the legislation for individual fuels. Regular FAME for example would not meet this criterion because EN590 specifies that FAME can only be blended at a maximum of 7%.

1.48 We are considering an appropriate minimum blend rate, i.e. what x% should be (whilst still meeting the fuel standard). We wish to set this at a level that will effectively promote fuels with significant additional benefits over today's conventional biofuels. However, we have not yet determined what the appropriate level is and therefore we invite views on the following options:

- a. 15%
- b. 20%
- c. 30%
- d. Other

1.49 The list of proposed eligible fuels currently includes biomethane. This is because it is one of the few options to offer significant potential towards decarbonising the HGV sector in the 2020s. However, for the reasons below we are particularly keen to hear whether this fuel should be included in the development fuels sub-target.

- 1.50 Sustainable feedstocks for biomethane are limited, and biomethane can also be injected into the gas grid and used to provide heat and electricity. Recently published advice from the Committee on Climate Change on achieving the Carbon Budget targets<sup>26</sup> suggested that biomethane use should be prioritised for non-transport applications.<sup>27</sup>
- 1.51 Although sustainable feedstocks for biomethane are limited, there is currently significantly greater potential availability of biomethane compared to the other fuel types proposed to be included in the 'development fuels' sub-target. This means that if biomethane were to be included within the development fuels sub-target, it may 'fill up' the target, reducing any incentive available to the less commercially developed fuels in most need of support.
- 1.52 As part of the amendments to the RTFO made in 2015, the level of reward for biomethane was almost doubled to reflect its higher energy content relative to liquid renewable transport fuels such as bioethanol and biodiesel.
- 1.53 When biomethane is used in dual fuel compression-ignition engines with diesel, the engine efficiency is comparable to that of diesel and therefore the RTFO reward, calculated on an energy basis, is appropriate. However, this type of engine can experience 'methane slip' (where unburnt methane is expelled with exhaust gases). This can undermine the overall GHG savings from road fuel gas (including biomethane). Methane can also be used in spark-ignition engines, which has been shown to significantly reduce methane slip. However, due to the inherently lower efficiency of spark-ignition engines, the distance travelled for a given amount of energy in fuel is less than for a compression-ignition engine, currently around 20% less. It is however recognised that technological improvements to spark-ignition gas engines are likely in future to close this efficiency gap between spark-ignition and compression-ignition engines.
- 1.54 Further work is required in this area and the Government is currently undertaking testing as part of the '[Low carbon truck trials](#)' project due to report in 2016. The results will be taken into account in determining whether to include biomethane in the development fuels target.

### **Reducing the costs of advanced biofuels**

- 1.55 The Government recognises that advanced biofuels are at an early stage of development and support is required to ensure that UK industry is able to take this technology to commercial scale production.
- 1.56 The Government has already provided support to the advanced biofuels industry in the form of £25m of privately match funded capital investment to UK SMEs. This funding is designed to support the development of new technology in the UK and allow the companies to take it to commercial production stage. In addition, £20m funding was announced in the 2016 Autumn Statement to further develop alternative fuels for transport sectors with limited options for decarbonisation, such as aviation and HGVs.
- 1.57 The sub-target is intended to provide UK industry with the long term certainty it needs to invest and be in a position to take advantage of the growing global advanced fuels market. The RTFO has been designed as a market based mechanism to ensure that

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<sup>26</sup> <https://www.theccc.org.uk/publication/the-fifth-carbon-budget-the-next-step-towards-a-low-carbon-economy/>

<sup>27</sup> The findings of the Committee on Climate Change relate to the broader question of the best use of biomass across the economy, and analysis of this is ongoing. If biomethane is not to play a long-term role in decarbonising HGVs, an alternative technology must be modelled and current projections for the development of battery-electric and hydrogen-fuel cell technologies suggest that a heavy-duty application suitable for HGVs is highly uncertain in the timeframes being considered here. We are working with the Committee on Climate Change in our consideration of the most appropriate policy pathways.

fuel suppliers are incentivised to supply sustainable biofuels at the lowest cost possible and to limit any price rises for consumers.

- 1.58 By providing long term certainty to encourage investment in the most sustainable fuels, we anticipate decreases in the relative cost of biofuels over the period to 2030, potentially leading towards cost neutrality in the long term. This consultation seeks views on whether there are further measures the Government could take to minimise costs.

**Q 3 Do you agree with the rationale to support particular fuels that meet the UK's long-term strategic objectives?**

**Q 4 Do you agree with the feedstocks that are eligible for the sub-target?**

**Q 5 Do you consider that certain energy crops - namely ligno-cellulosic material and non-food cellulosic material except saw logs and veneer logs - should be excluded from the sub-target?**

**Q 6 Do you agree with the proposed levels for the sub-target?**

**Q 7 Do you think that biomethane should be included in the development fuel sub-target?**

**Q 8 Do you agree that each of the other specified fuels (hydrogen, aviation fuel, HVO, biobutanol and fuel that can be blended with petrol or diesel above current limits) should be included?**

**Q 9 For those development fuels that can be blended with standard fuels, at what level should the minimum blend capability requirement be set, whilst still meeting the relevant fuel standard?**

a) 15%

b) 20%

c) 30%

d) Other

**Q 10 Are there ways in which we can increase the supply of advanced biofuels in a cost-neutral way?**

**In each case, when replying please provide evidence as to why you agree or disagree, and suggest an alternative if appropriate.**

### **How would the sub-target operate?**

- 1.59 We intend to amend the Order to require suppliers to meet the sub-target with a new category of 'development RTFCs' (labelled accordingly to distinguish them) issued to qualifying 'development fuels'.
- 1.60 Qualifying fuels would be rewarded with two 'development RTFCs'. This is to ensure they are not disadvantaged compared to conventional waste based fuels if we get supply beyond the proposed sub-target level (i.e. any 'excess' development RTFCs could be traded, carried over, or used to meet the wider obligation).

- 1.61 Should a sub-target for development fuels be introduced, RTFCs labelled as development fuel RTFCs could be carried over for use in meeting both the development fuel sub-target and the overall obligation. As is the case now, suppliers would be limited to only being able to discharge a maximum of 25% of their overall obligation through redeeming carried over RTFCs. We do not intend to apply any restrictions on carry over within particular categories of RTFCs i.e. crop RTFCs or development RTFCs. The limit on carry over applies to the overall number of RTFCs only.
- 1.62 The level of the 'buy-out' price would be higher to reflect the additional costs of development fuels.

### **How would the Administrator assess whether a fuel qualified for the sub-target?**

- 1.63 As it does currently for wastes, the RTFO Administrator would assess whether the fuel/feedstocks met the criteria for a development fuel set out in the Order, and would use the information provided in RTFC applications to issue new 'development RTFCs' accordingly.
- 1.64 In the case of novel fuels (i.e. those not specifically listed), the Administrator would need to be satisfied that the fuel meets the criteria, including that it can be blended above x% and meet the appropriate (EN228/EN590) standard. The Administrator would be given powers to determine if the criteria are met based on the documentation submitted or to require independent auditing up to a 'reasonable assurance' standard using the standards set out in the International Standard on Assurance Engagements (ISAE) 3000.

**Q 11 Do you agree that for novel fuels it is appropriate for the Administrator to require independent assurance of the volume of fuel when necessary?**

**Q 12 Do you agree that for novel fuels the RTFO Administrator should have the discretion to require a 'reasonable' level of assurance rather than a 'limited' level?**

**Please provide an explanation and evidence to support your answers. In each case, when replying please provide evidence as to why you agree or disagree.**

## **Setting a level for the supply of crop based biofuels<sup>28</sup>**

### **Why set a level for the amount of crop derived fuel that can be supplied?**

- 1.65 In order to complement the proposals to increase the supply of fuel created from the most sustainable feedstocks via the proposal on wastes and development fuels we intend to set a maximum level for the proportion of fuels created from crops.

<sup>28</sup> The maximum permitted level of crop based biofuels will not apply to dedicated energy crops, these are grassy crops such as miscanthus, and woody crops such as short rotation coppiced trees.

- 1.66 This is because additional demand for agricultural land to grow biofuels can result in additional demand for agricultural land elsewhere, and the nature of global supply in biofuel feedstocks means that this can happen anywhere in the world. Globally, land conversion for agriculture includes deforestation and destruction of important habitats. This effect has been termed indirect land-use change (ILUC).
- 1.67 Estimations of the effects of ILUC derived from economic modelling - known as 'ILUC factors' - suggest that some crop derived biofuels can lead to an increase rather than a decrease in carbon emissions. According to the ILUC factors in the revised RED, crop derived biodiesel increases carbon emissions, whilst the GHG savings for crop derived bioethanol are more modest than previously estimated when ILUC is included.
- 1.68 There are also concerns regarding increases in food prices as land and crops are diverted to fuel rather than food production, and this effect is more pronounced for oil crops (crop biodiesel) than for starch and sugars (crop bioethanol).
- 1.69 The ILUC Directive sets a maximum amount of crop based biofuels which may be counted towards each Member State's Transport target under the RED and the amended FQD. This maximum is 7% of the total energy used in relevant transport. We propose to set a level in the Order for the amount of biofuels supplied under the RTFO that can be made from crops. The current UK level of crops used in transport is around 1.5% on an energy basis, which equates to approximately 2% on a volume basis.

### **What are the main options for the level of crop derived fuel for 2020?**

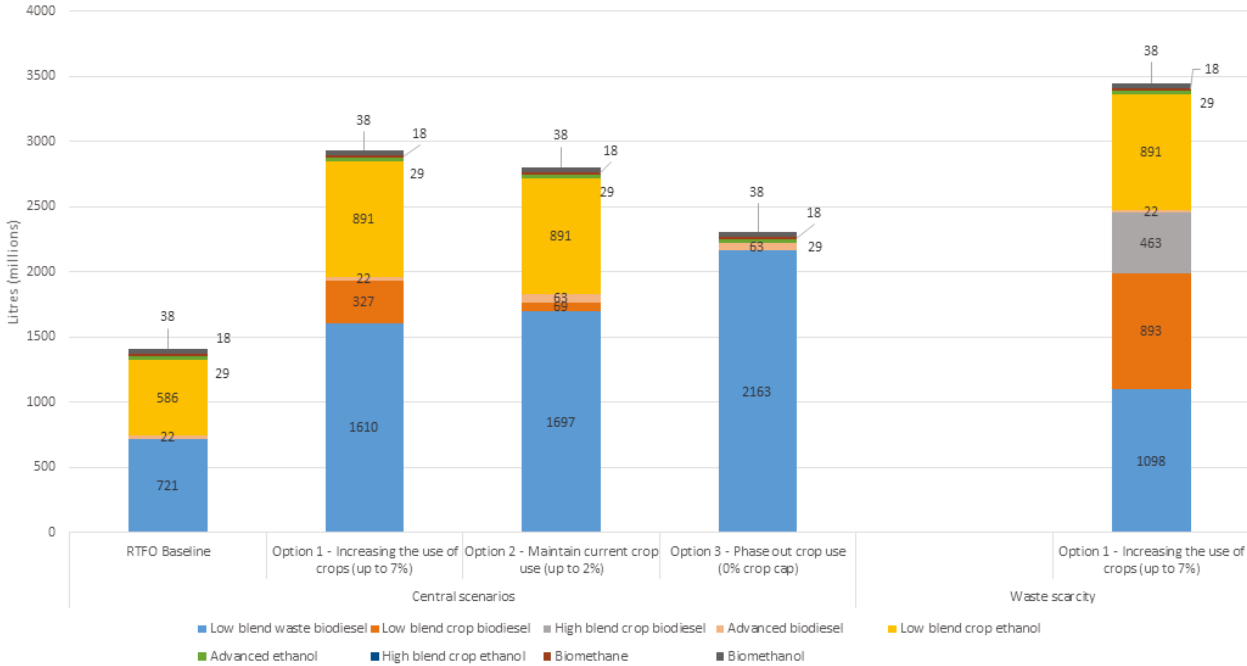
- 1.70 We have considered three main options for setting the level of crop derived fuel in the time period to 2020 which we have modelled in the accompanying cost benefit analysis. These are:
- increase the use of crops up to 7%, (option 1 in the cost benefit analysis);
  - maintain current levels of crop use at a 2% share, (option 2 in the cost benefit analysis);
  - phase out the use of crops to zero % (option 3 in the cost benefit analysis).

### **What are the estimated effects of the different options?**

- 1.71 We have developed a range of supply scenarios to understand the impacts of the different levels of supply of crop derived fuels. These are covered in detail in the cost benefit analysis at Annex A. It is important to recognise that there are limitations to the analysis due to significant uncertainty around some of the inputs, in particular regarding the future availability of biofuels made from sustainable waste feedstocks. The analysis should be viewed in this light.
- 1.72 As illustrated in the cost benefit analysis and table below, setting the maximum crop level at 7% would not actually limit the supply of crop based biofuels in the UK. This is partly because the overall level of biofuels required to meet the RED target is expected to be less than 7% by energy, when the contributions from multiple counting fuels including electrification are accounted for using the RED rules.

- 1.73 Double rewarding provides an ongoing incentive for waste based renewable fuels, and it is therefore possible that even without setting a maximum level of crop based biofuel the majority of the obligation would be met primarily through waste based biofuels.
- 1.74 However, a cap level as high as 7% would permit a significant increase, as much as trebling the current supply of crop based biofuels. As a result the UK would risk its renewable fuels having a larger ILUC impact in 2020 than current supply, leading to increases in carbon emissions. There is also a risk of increasing food prices due to competition between food and fuel for the same raw materials.
- 1.75 Maintaining the share of crop based fuels at around current levels of supply accepts the current level of risk associated with crop feedstocks, seeks to prevent any increase in risk associated with increasing targets, but also enables present UK production capacity to continue at current levels. This option does not eliminate the risk of ILUC, deforestation or increases in food prices but manages them, preventing excessive increases in these risks, even in the scenario where waste availability is more limited. This option is our preferred one and supports our preference for focussing increases in UK biofuel production capacity on biofuels derived from wastes and residues rather than crops, whilst maintaining an important market for existing UK bioethanol production.
- 1.76 Maintaining the use of crops at around current levels would also provide a clear signal to industry of the future direction of policy in this area, directing future investment to the sourcing, processing and production of sustainable waste derived fuels.
- 1.77 Phasing out the use of crops by 2020, by setting a crop level at zero, is not our preferred option as it would make it very unlikely that the UK would achieve the overall target of 10% transport fuel from renewable sources and would be expected to have a significant upward pressure on prices. It would also be expected to undermine UK producers, particularly bioethanol producers, who would no longer have access to the UK market. This could lead to a loss of jobs and loss of animal feed protein production, for which the UK is in deficit and reliant on imports of soy meal. The figure below illustrates possible impacts of the different options in the 'central scenario' in the cost benefit analysis.

**Figure 6: Predicted biofuel mix in 2020 under the different policy options**



**Table 5 Summary of 2020 impacts under different policy options**

	RTFO Baseline	Option 1 (central waste)	Option 1 (low waste & high crop)	Option 2 (central waste)	Option 3 (central waste)
GHG savings (MtCO <sub>2</sub> e)	2.4	+2.3	+1.1	+2.7	+2.9
Renewable fuels, % share of total fuel volume	3%	6.1%	7.2%	5.8%	4.8%
Crop share (energy, %)	0.8%	2%	4.2%	1.4%	0%
Total cost (£m)	327	+332	+464	+366-679	+554-753
Cost per MWh (£/MWh)	30	26	26	31-58	55-75
Abatement cost (£/tCO <sub>2</sub> e)	135	142	423	137-254	193-262
Pump price impact (ppl)	0.9	+0.9	+1.3	+1.0-1.9	+1.6-2.1

NB: Costs and GHG savings for options 1,2 and 3 are presented as additional to the RTFO baseline. It should also be noted that the costs presented are highly sensitive to underlying energy prices and waste biofuel availability. Further sensitivities can be found in the accompanying cost benefit analysis.



## Options for levels of crop based fuel between 2020 and 2030

- 1.78 Beyond 2020, there are two main options regarding the supply of crop based fuels. Either maintaining it at the 2020 level for the 0% or 2% options or, if we increase the level to 2020, reducing it to meet current levels of crop derived fuels by 2030.
- 1.79 With our proposal to maintain current levels of supply at 2% of fuel by volume in 2020, we would expect crop based supply to be dominated by bioethanol with relatively low ILUC effects. In this case continuing to maintain current levels of supply to 2030 is our preferred option.
- 1.80 A 2020 level set above current production levels could result in a significant proportion of crop biodiesel being supplied and therefore an increased risk of ILUC emissions. In that case, our preferred option would be to reduce the proportion of crop based fuel between 2020 and 2030, in order to avoid an ongoing increase in emissions. Our intention would be to achieve a level equal to current production, or below, in 2030.

**Q 13 For both 2020 and 2030 at what level should the supply of crop derived fuels be set?**

- a) 0%
- b) 2%
- c) 7%
- d) another percentage

**When replying please provide supporting evidence.**

## How would crops be defined?

- 1.81 We intend to define the relevant crop feedstocks based on the text in the ILUC Directive Article 2 (2)(b)(iv), i.e. crops are:
- "cereal and other starch-rich crops, sugars and oil crops and from crops grown as main crops primarily for energy purposes on agricultural land", "Biofuels produced from feedstocks listed in Annex IX [of the RED] shall not count".*
- 1.82 An additional definition of "starch-rich crops" will be required and created using that provided by the ILUC Directive Article 2 (1) (q)
- "crops comprising mainly cereals (regardless of whether only the grains are used, or the whole plant, such as in the case of green maize, is used), tubers and root crops (such as potatoes, Jerusalem artichokes, sweet potatoes, cassava and yams), and corm crops (such as taro and cocoyam)".*
- 1.83 ILUC Directive Article 2 (2)(b)(iv) gives the option to exclude dedicated non-food energy crops which have been grown on contaminated or degraded land from the limit on crop based biofuels. Given that all dedicated non-food energy crops<sup>29</sup> are already excluded from the maximum permitted level of crops by virtue of their

<sup>29</sup> Annex IV includes ligno-cellulosic material and non-food cellulosic material except saw logs and veneer logs



inclusion in Annex IX of the RED, we do not intend to create a specific provision for those grown on contaminated or degraded land.

**Q 14 Do you anticipate any unintended consequences as a result of basing the definition of crop and starch rich crops on that provided by the ILUC Directive?**

**If so please provide evidence for your reply.**

### **Operation of the supply level for crop based fuels**

- 1.84 In order to apply a maximum level to the supply of crop derived fuels, RTFCs will be labelled as 'crop' according to their feedstock. The maximum number of 'crop' RTFCs that can be redeemed by each supplier will be calculated alongside their obligation. Once this level has been reached, no further 'crop' RTFCs will be able to be redeemed by that supplier.

**Q 15 Do you agree with the labelling of RTFCs for crop derived fuels as 'crop' and the proposal to limit the number of 'crop' RTFCs that can be redeemed in a single year?**

**When replying please provide an explanation as to why you agree or disagree.**

## 2. Eligible fuels

### Aviation fuels

We wish to promote the development of sustainable renewable fuel for aviation, a transport mode that appears unlikely to be electrified. We propose to extend eligibility for reward under the RTFO to both renewable avtur and renewable avgas. They will be subject to the same sustainability criteria as other renewable fuels. Renewable aviation fuels which do not meet the sustainability criteria will not receive a reward and will be subject to an obligation under the RTFO.

#### Why include renewable aviation fuel?

- 2.1 The UK aviation industry has for some time advocated that eligibility for reward under the RTFO would help to provide the support needed to kick-start the use of aviation biofuels, which at present are not produced or supplied in the UK.
- 2.2 In the absence of new measures, aviation emissions are likely to grow significantly towards 2050, both as a proportion of UK emissions and in absolute terms. Low carbon fuels, such as biofuels, are considered to be the only viable energy source available to significantly limit aviation emissions by 2050.
- 2.3 The UK supports a global agreement on a market-based measure at the International Civil Aviation Organisation (ICAO) as the most effective way of addressing the growth in aviation emissions. However, other measures are likely to be required if aviation is to make a significant contribution towards reducing emissions.
- 2.4 There are two types of aviation fuel:
  - Aviation turbine fuel (avtur) which is high specification kerosene used in jet and turboprop aircraft. This is not subject to fuel duty, except when it is for 'private pleasure' use.<sup>30</sup>
  - Aviation gasoline (avgas) also known as aviation spirit in the UK, which is a high specification petrol, used in spark-ignited piston engines. This is subject to fuel duty.

<sup>30</sup> See Section 16 of Excise Notice 554 for a definition <https://www.gov.uk/Government/publications/excise-notice-554-fuel-used-in-private-pleasure-craft-and-for-private-pleasure-flying/excise-notice-554-fuel-used-in-private-pleasure-craft-and-for-private-pleasure-flying>

**Q 16 Do you agree that both renewable avtur and renewable avgas should be eligible for reward under the RTFO?**

**When replying please provide any evidence as to why you agree or disagree.**

**How would aviation fuels be treated under the revised RTFO?**

- 2.5 Since the market for renewable aviation fuels is in its infancy, we are not proposing to provide a mandate for their supply, which could put the UK at a commercial disadvantage relative to EU and international competitors. We are therefore proposing that fossil aviation fuels will not be subject to the RTFO.
- 2.6 It is proposed that renewable aviation fuels will be eligible for rewards in line with liquid road fuels, i.e. they will be eligible for 1 RTFC per litre. They will also be eligible for the double rewards under the RTFO for biofuels made from wastes and residues, and for counting towards the development fuels sub-target if they meet the applicable requirements.
- 2.7 In common with the treatment of all other renewable fuels under the RTFO, all renewable aviation fuel will be required to meet the sustainability criteria in order to be eligible for reward.
- 2.8 Renewable fuels which do not meet the sustainability criteria may have contributed to environmental damage during their production. Under the RTFO, these are treated in the same way as fossil fuels and are therefore subject to an obligation. We propose to treat renewable aviation fuels which do not meet the sustainability criteria in the same way, i.e. they will become obligated.

**Accounting for aviation fuels**

- 2.9 Under the current RTFO, the duty point, i.e. the time when duty of excise becomes payable, is used as the control point for all fuels. This control point is used to determine which fuels should be counted, when they should be counted and to determine ownership at the time of counting. Owners of eligible fuels at the control point can apply for RTFCs.
- 2.10 Because avtur for commercial purposes is not subject to fuel duty, we need to define a control point which is not dependent on the duty system.
- 2.11 All aviation fuel in the UK must meet certain stringent quality standards. For avtur, the main specifications used are Defence Standard 91-91, ASTM D7566, and ASTM D1655. These currently permit the blending of specified amounts of certain renewable fuels into fossil avtur, and then require that the resulting blend is certified. Since this applies to all renewable avtur, it is proposed that the point at which the blending and certification of the blend occurs, i.e. the blending/certification point, is used as the control point for renewable avtur for commercial use.
- 2.12 Avtur for private pleasure use is subject to fuel duty, therefore we have the option to use the duty point as the control point for this fuel. However, for simplicity it is proposed that avtur for private pleasure use is treated the same as avtur for commercial use and both use the blending/certification point as the control point.

**Q 17 Do you agree that the blending/certification point is a suitable control point for renewable avtur used for both commercial and private pleasure use?**

**Q 18 Is there an alternative control point which we should consider?**

**When replying please provide an explanation as to why you agree or disagree.**

2.13 All avgas is subject to fuel duty. Therefore it is proposed that any renewable avgas should use the duty point as the control point, in line with most other fuels under the RTFO.

**Q 19 Do you agree that the duty point is a suitable control point for renewable avgas?**

**When replying please provide an explanation as to why you agree or disagree.**

#### **Additional powers for the Administrator to validate volumes of aviation fuel**

- 2.14 One advantage of using the duty point as a control point for fuels in the RTFO, is that the Administrator is able to access HMRC records to validate the fuel volumes which have been reported. Since comparable records are not available for avtur, an alternative method of validating renewable avtur volumes will be required.
- 2.15 Whilst the industry is still developing, it is possible that direct examination by the Administrator of evidence held by industry on fuel supply may be feasible. However, once a significant number of applications are being received each month, it may be necessary to require independent assurance (verification) of the fuel. It is therefore proposed that the Administrator will be given powers to do this as necessary.
- 2.16 It is envisaged that this independent assurance would be as similar as possible to the verification of sustainability information already required under the RTFO, and therefore that it would be carried out using the standards set out in the International Standard on Assurance Engagements (ISAE) 3000.<sup>31</sup>
- 2.17 In order to provide the Administrator with the required level of assurance over the volumes supplied, and one that is comparable to the cross checking of all volumes against HMRC data, we believe that it is necessary to require the more detailed 'reasonable' assurance level provided for under ISAE 3000 for fuel volumes, rather than the 'limited' level which is used for renewable fuel sustainability information.

<sup>31</sup> [International Standard on Assurance Engagements \(ISAE\) 3000 Revised, deals with assurance engagements other than audits or reviews of historical financial information](#)

**Q 20 Do you agree that for renewable avtur, it is appropriate for the Administrator to require independent assurance of the volume of fuel when necessary?**

**Q 21 Do you agree that the requirement for a reasonable level of assurance, rather than the lower limited level of assurance, is appropriate for renewable avtur?**

**Please provide an explanation and evidence to support your answers.**

## Inclusion of non-biological renewable fuels, including hydrogen

We intend to extend the scope of the RTFO to make renewable fuels of non-biological origin (RFNBOs) eligible for RTFCs. Benefits of including them are as follows:

- RFNBOs can provide a contribution towards the UK's renewable energy target;
- This contribution can be made sustainably given the potential for these fuels to deliver high GHG savings with a low risk of ILUC or competition with food;
- RFNBOs from eligible fuels can contribute to the proposed development fuels sub-target; and
- They can provide a means of utilising remote or constrained renewable electricity resources that would otherwise be too far from the grid or from demand.

Given that these fuels use novel processes and technologies, policy support is needed now to help bring them to market and encourage investment and further development.

To ensure RFBNOs make a sustainable contribution we intend to require that they meet the same minimum GHG savings threshold as biological renewable fuels.

### Support for renewable fuels under the RTFO

- 2.18 Support for fuels under the RTFO is currently limited to biological renewable fuels (i.e. biofuels).
- 2.19 The ILUC Directive, which amends the RED, introduces a definition of RFNBOs (Article 2 (u)) and sets out that they count twice towards the transport target through their inclusion in Annex IX, Part A (r).
- 2.20 RFNBOs can make a sustainable contribution towards decarbonising the transport sector: they are typically non-land using so avoid adverse sustainability impacts including direct and indirect land-use change as well as competition with food.
- 2.21 We are therefore proposing to extend the scope of the RTFO so that RFNBOs, as well as biofuels, are eligible for RTFCs.

### What are non-biological renewable fuels?

- 2.22 RFNBOs are renewable transport fuels that do not have any biological content. These fuels are considered renewable where the energy content of the fuel comes

from non-biomass derived renewable energy sources as defined in the amended RED (Article 2(u)). Energy from renewable energy is defined in Article 2(a).<sup>32</sup> This means that RFNBOs could be made using power from wind, solar, aerothermal, geothermal, hydrothermal and ocean energy, or hydropower.

- 2.23 These fuels are novel and mostly at laboratory, pilot or demonstration stage of development, though some are ready to come to market. We anticipate that they are likely to be more expensive than fossil fuels up to 2030 and therefore will require support to come to market and to stimulate further development and investment.
- 2.24 The simplest RFNBO is renewable hydrogen. One common method of production is via the electrolysis of water using renewable (non-biomass) electricity as the power source. This hydrogen can then be directly used in transport applications, either in an internal combustion engine or a fuel cell vehicle.
- 2.25 However, a range of other RFNBOs can also be generated by reacting this renewable hydrogen with carbon dioxide (CO<sub>2</sub>), to produce renewable transport fuels such as methane, methanol, ethanol, di-methyl ether, gasoline, kerosene and diesel. The carbon dioxide can come from waste fossil sources (for example, waste flue gases from power generation or similar industrial combustion processes), from biological sources (e.g. alcohol fermentation or anaerobic digestion) or from atmospheric or naturally-occurring/geothermal sources.
- 2.26 If from fossil sources, the carbon dioxide must be a waste – if the carbon dioxide is made from fossil energy sources specifically for the purposes of conversion into a transport fuel, this fuel will not be eligible as a RFNBO, and would instead be considered as a fossil fuel (as the feedstock is the fossil energy source, not the carbon dioxide).
- 2.27 The proposed change brings RFNBOs, including renewable hydrogen used in a fuel cell vehicle,<sup>33</sup> into the scope of the RTFO and therefore making them eligible for RTFCs. Where RFNBOs are not proven to be sustainable they will contribute to a supplier's obligation.

### Previous consultations

- 2.28 Following our [Advanced Fuels Call for Evidence](#) in 2013/14, we consulted in the summer of 2014 on the possibility of including RFNBOs in a future amendment to the RTFO. The consultation proposed that RFNBOs would need to meet the same minimum GHG threshold as biofuels and would receive double rewards. There was general agreement from respondents to that consultation that the RTFO should be amended to allow RFNBOs to be eligible for support. Respondents underlined the importance that these fuels should have the same or improved environmental benefits in comparison to existing biofuels.
- 2.29 In tandem with the 2014 consultation, we commissioned research from Ecofys and E4tech to understand a) what novel low carbon fuels, such as RFNBOs, were in development, and b) the potential sustainability risks and practical implications of widening the scope of the RTFO. Recommendations included ensuring that RFNBOs met the same, or equivalent, sustainability criteria as biofuels.

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<sup>32</sup> Article 2(a) defines "energy from renewable sources" as "energy from renewable non-fossil sources, namely wind, solar, aerothermal, geothermal, hydrothermal and ocean energy, hydropower, biomass, landfill gas, sewage treatment plant gas and biogases". RFNBOs cannot be derived from biomass energy and therefore would not be able to be derived from biomass, landfill gas, sewage treatment plant gas and biogases.

<sup>33</sup> Renewable hydrogen used in an internal combustion engine is already in scope of the RTFO.

2.30 The Transport Energy Taskforce, created by the Department to engage industry stakeholders and advise on policy, [reported in March 2015](#) and noted the potential for including RFNBOs in the RTFO, provided that they delivered greenhouse gas savings and met sustainability criteria.

### Definition of renewable fuel of non-biological origin

2.31 Amendments to the RED made by the ILUC Directive made a number of changes to how RFNBOs are treated. 'Renewable liquid and gaseous transport fuels of non-biological origin' are now explicitly defined in both the RED (Article 2(u)) and the FQD (Article 2(10)) as: 'liquid or gaseous fuels other than biofuels whose energy content comes from renewable energy sources other than biomass, and which are used in transport'. We propose to use this definition of RFNBOs in the Order.

2.32 This definition leads us to distinguish fuels on the basis of the type of energy in the feedstock. Fossil fuels are made from feedstocks containing fossil energy e.g. crude oil, whereas biofuels are made from feedstocks containing biological renewable energy e.g. sugar beet or used cooking oil. However, RFNBOs are somewhat different in that their feedstocks - typically water and CO<sub>2</sub> - contain no inherent energy.<sup>34</sup>

2.33 With the input of renewable energy, such as electricity or heat, these materials can be converted into transport fuels, or pre-cursors to fuels.

2.34 Table 6 below sets out how biofuels are classified under the RTFO and how we propose that RFNBOs fit in.

**Table 6 Fuel categories and how they are treated under the RTFO**

Process energy source	Feedstock energy source	
	Biological	None (e.g. CO <sub>2</sub> or H <sub>2</sub> O)
<b>Renewable (non biomass)</b>	<b>Biofuels</b> Process energy input is taken into account in the GHG calculation.  Renewability is determined by the feedstock.	<b>RFNBOs</b> Process energy input is taken into account in the GHG calculation and also determines whether the fuel is renewable.
<b>Renewable (biomass)</b>		Biomass is specifically excluded in the amended RED from the type of renewable energy that can be used to make RFNBOs. These are therefore not RFNBOs and will not be eligible for RTFCs.
<b>Fossil</b>		<b>Fossil fuels</b> These do not receive RTFCs

<sup>34</sup> In this definition, materials containing no energy are those with a lower heating value of zero. These materials cannot be burnt to release energy.



- 2.35 Note that this RFNBO definition excludes fuels made from waste fossil carbon monoxide (CO) or waste fossil plastic, as these feedstocks contain fossil energy and therefore result in a fossil fuel. An example of such a fuel is low carbon ethanol created (using bacteria) from the waste CO generated by the steel mill process. We recognise that these fuels have good sustainability potential as they utilise a waste source (if the steel mill would otherwise flare the CO) and can deliver good GHG savings. However, as these fuels are not renewable we are unable to count them towards the RED renewable energy target, and are therefore not proposing to include them in the RTFO at this time. Similarly, fuels made from CO<sub>2</sub> and/or H<sub>2</sub>O but using non-renewable waste heat as the energy source (e.g. from nuclear or fossil fuel power plants) could have good GHG savings, but would not be renewable, so we are not proposing to include them in the RTFO at this time.
- 2.36 Note that where low carbon fossil fuels are supplied for road transport and NRMM they would count towards the amended FQD's GHG target and would therefore be eligible for GHG credits under our proposals to set a GHG obligation with targets in the period 2018-2020 (see parallel consultation on the Motor Fuel (Road Vehicle and Mobile Machinery) Greenhouse Gas Emissions Reporting Regulations).
- 2.37 Beyond 2020 we propose that low carbon renewable fuels will continue to be supported through the RTFO. However, we are also interested in the potential of low carbon fossil fuels in helping to decarbonise transport beyond 2020. We welcome suggestions on how they might be supported, which fuels, feedstocks and/or technologies should be encouraged, and whether the RTFO is the right mechanism.

**Q 22 Do you agree with applying the definition of non-biological renewable fuels used in the amended RED? If not, please provide an alternative and set out why.**

**Q 23 How might low carbon fossil fuels be supported beyond 2020, which fuels, feedstocks and/or technologies should be encouraged, and is the RTFO the right mechanism?**

### Level of reward

- 2.38 RFNBOs are also included in RED Annex IX Part A (r) and so count twice towards the UK's renewable energy in transport target. They are also typically non-land using (similarly to wastes) and need additional support to come to market. We therefore propose to reward them with two RTFCs per litre (adjusted to the appropriate multiplier for gaseous fuels - see the section on 'Setting the level of reward for renewable hydrogen').
- 2.39 Where RFNBOs also meet the criteria for RTFO development fuels, they will instead receive two 'development' RTFCs (for further information on the sub-target see section: 'Introduce a sub-target for particular advanced, or 'development', fuels derived from specified wastes/residues').

### Determining how much of the fuel is renewable

- 2.40 As set out above, all of the energy content in a RFNBO is derived from the process energy which therefore must be renewable (and not derived from biomass). Where the process energy is partially renewable, e.g. electricity drawn from the grid, then the resulting fuel will be partially a RFNBO and partially a fossil fuel.



- 2.41 The amount of renewable electricity used in the creation of RFNBOs can be calculated according to the grid share of renewable electricity in the country of production. We propose that where renewable electricity is used to produce a fuel, the calculation of how much of the final fuel is renewable (and hence a RFNBO) should use the grid average share of renewables - excluding the grid average share of renewable biomass. For example, if 100 litres of fuel were produced using grid electricity with a grid average share of 20% from solar, 10% from biomass and 70% from coal, then 20 litres would be classified as a RFNBO (eligible for RTFCs), and the remaining 80 litres would not be classified as a RFNBO (and not be eligible for RTFCs).
- 2.42 We propose that where the renewable electricity used to produce the fuel is not connected to the grid, or where the production facility is not drawing energy from the grid (e.g. is a net exporter to the grid) then the renewability of the final fuel should similarly reflect the renewability of the electricity, e.g. 100% renewable fuel if the electricity is wholly renewable (but not from biomass).
- 2.43 The ILUC Directive allows the European Commission to present a proposal on how the whole amount of renewable electricity used in the production of RFNBOs should be accounted for by the end of 2017. This proposal may consider both onsite generation and the potential for the allocation of renewable electricity via grids - e.g. with a 'green electricity' certification scheme. Therefore the proposed approach may have to be amended to align with any European Commission proposal.
- 2.44 Sunlight, renewable heat and/or renewable cold may also be used as energy inputs, e.g. using artificial photosynthesis to build molecules, or using high temperature heat to make hydrogen via thermolysis of water. We propose a similar approach here i.e. the volume of renewable fuel is determined by the proportion of the energy inputs attributable to renewable (non-biomass) sources. Given the different amounts of useful work contained within these input sources (that they are able to pass onto the transport fuel), we propose using a similar 'useful heat' basis<sup>35</sup> as used in the UK's Renewables Obligation.<sup>36</sup>

**Q 24 Do you agree with the proposed approach for determining how much of the fuel is a renewable fuel of non-biological origin?**

**Please provide an explanation as to why.**

**Ensuring renewable fuels are sustainable**

- 2.45 To ensure consistency with other renewable fuels and the objectives of the scheme to reduce GHG emissions from transport, we propose that RFNBOs meet the same minimum GHG saving threshold as biofuels. However, as they are typically non-land using we do not intend to apply the land criteria.

<sup>35</sup> "Useful heat" is determined by the exergy, measured in Joules. Exergy is the maximum amount of useful work that can be extracted from a system. Exergy reflects that some forms of energy, such as electrical and chemical potential energy, are much more useful than other forms of energy, such as low grade waste heat (due to the Carnot efficiency). The following approximations can be made:

- the exergy of feedstocks or fuels are based on their Lower Heating Value
- the exergy of electricity is the electrical energy
- the exergy of sunlight is the photon energy entering the process
- the exergy of heat is its thermal energy x (1 - 273 K / heat temperature in Kelvin )
- the exergy of cold is its thermal energy x (1 - cold temperature in Kelvin / 273 K)

<sup>36</sup> See page 45 of The RO carbon and sustainability guidance.

[https://www.ofgem.gov.uk/sites/default/files/docs/2014/06/renewables\\_obligation\\_sustainability\\_criteria\\_guidance\\_0.pdf](https://www.ofgem.gov.uk/sites/default/files/docs/2014/06/renewables_obligation_sustainability_criteria_guidance_0.pdf)

- 2.46 In the absence of a carbon default value in the RED for RFNBOs, it is proposed that suppliers should calculate and report actual greenhouse gas emissions from RFNBOs using the GHG methodology of the RED as far as possible. This proposed methodology is set out below. Additional guidance will be supplied in the RTFO Guidance which will be subject to a subsequent consultation.
- 2.47 The European Commission has powers to adopt delegated acts to set default greenhouse gas emission default values for renewable fuels of non-biological origin, and carbon capture and utilisation under the ILUC Directive.
- 2.48 When these become available, changes will need to be made to the RTFO to enable suppliers to report these defaults.

### Proposed greenhouse gas calculation methodology

- 2.49 The following proposed GHG calculation methodology has been adapted from Annex V of the RED (which sets out the GHG emissions calculation methodology for biofuels) and is proposed to be included in the RTFO. Note that this methodology is proposed to apply for RFNBOs, but also be flexible enough to consider other non-renewable but low carbon fuels that might be added to the RTFO at a later date.
- 2.50 Greenhouse gas emissions from the production and use of renewable liquid and gaseous transport fuels of non-biological origin shall be calculated as:

$$E = eec + ep + etd + eu - eccs - eee ,$$

where

- E = total emissions from the use of the fuel;
- eec = emissions from the extraction or collection of raw materials;
- ep = emissions from processing;
- etd = emissions from transport and distribution;
- eu = emissions from the fuel in use;
- eccs = emission saving from carbon capture and geological storage;
- eee = emission saving from excess electricity from cogeneration

- 2.51 Note that the following terms from the equation used for biofuels have been removed.

- eccr = emission saving from carbon capture and replacement
- el = annualised emissions from carbon stock changes caused by land-use change
- esca = emissions saving from soil carbon accumulation via improved agricultural management

- 2.52 The process to produce a RFNBO is either initially relying on carbon capture to collect the feedstock, or is not handling carbon at all (i.e. for hydrogen fuels). Although the process to produce a RFNBO is unlikely to result in a waste CO<sub>2</sub> stream that could then be sequestered (as any purified CO<sub>2</sub> stream would likely be recycled back into the process to produce more fuel), the Carbon Capture Storage credit option should not be excluded. However, to avoid confusion and to reduce the risks of over-claiming of GHG savings, we are proposing to exclude the carbon capture and replacement term (eccr). This is because RFNBO production itself cannot count

as a form of carbon capture and replacement, many existing CO<sub>2</sub> applications are only using waste CO<sub>2</sub> (and not purposely burning fossil fuels that could be displaced), and given that many of the near-term carbon sources likely to be used in RFNBO production are waste fossil sources (and hence there is a risk a GHG credit would be given to displace fossil CO<sub>2</sub> with fossil CO<sub>2</sub>).

- 2.53 Emissions from the manufacture of machinery and equipment shall not be taken into account.
- 2.54 Greenhouse gas emissions from fuels, E, shall be expressed in terms of grams of CO<sub>2</sub> equivalent per MJ of fuel, gCO<sub>2</sub>eq/MJ.
- 2.55 By derogation from point 2.54, for transport fuels, values calculated in terms of gCO<sub>2</sub>eq/MJ may be adjusted to take into account differences between fuels in useful work done, expressed in terms of km/MJ. Such adjustments shall be made only where evidence of the differences in useful work done is provided.
- 2.56 Greenhouse gas emission saving from renewable liquid and gaseous transport fuels of non-biological origin shall be calculated as:

$$\text{SAVING} = (\text{EF} - \text{EB}) / \text{EF} ,$$

where

EB = total emissions from the renewable liquid or gaseous transport fuel of non-biological origin; and

EF = total emissions from the fossil fuel comparator.

- 2.57 The greenhouse gases taken into account for the purposes of point 2.50 shall be CO<sub>2</sub>, N<sub>2</sub>O and CH<sub>4</sub>. For the purpose of calculating CO<sub>2</sub> equivalence, those gases shall be valued as follows:

CO <sub>2</sub>	:	1
N <sub>2</sub> O	:	296
CH <sub>4</sub>	:	23

- 2.58 Emissions from the extraction or collection of raw materials, eec, shall include emissions from the extraction process itself; from the collection of raw materials; from waste and leakages; and from the production of chemicals or products used in extraction or collection of the raw materials (this includes the additional energy and chemicals used in any carbon capture).
- 2.59 Water, biogenic CO<sub>2</sub>, atmospheric CO<sub>2</sub> and naturally occurring/geothermal CO<sub>2</sub> shall be considered to have zero lifecycle greenhouse gas emissions up to the process of collection of these materials. Where naturally occurring or geothermal CO<sub>2</sub> sources are utilised, evidence should be provided that these emission sources have not been increased by the extraction of the CO<sub>2</sub>, or that any additional emissions have been included within the extraction emissions, eec. Where biogenic CO<sub>2</sub> sources are utilised, evidence should be provided that this CO<sub>2</sub> is not already being used to claim a GHG credit in the original bioenergy supply chain, and would otherwise have been emitted to atmosphere.<sup>37</sup>

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<sup>37</sup> For example, a biofuels producer cannot claim that any biogenic CO<sub>2</sub> used to make a RFNBO constitutes an "emission saving from carbon capture and replacement" within their own biofuel supply chain GHG calculation. This would be an erroneous double claim of GHG savings between biofuel and RFNBO supply chains. Due to their consumption and emission to atmosphere, RFNBOs also do not count as an "emission saving from carbon capture and geological storage" in the biofuels calculation.

- 2.60 Waste fossil CO<sub>2</sub> and other waste fossil carbon sources shall also be considered to have zero lifecycle greenhouse gas emissions up to the process of collection of these materials, provided these materials meet the definition of a waste (as per Article 2 (p) of the ILUC Directive), evidence is provided that the carbon in these materials would have otherwise been emitted to atmosphere, and provided the facility generating these waste materials does not claim a reduction in their emissions due to the new use of the wastes. If the waste fossil generating facility does wish to claim a reduction in their emissions,<sup>38</sup> then these greenhouse gas emissions instead need to be assigned to the waste fossil material and contribute to eec, in line with the material's global warming potential (e.g. one tonne of waste fossil CO<sub>2</sub> would be assigned 1 tCO<sub>2</sub>e/tonne). Similarly, if the carbon in the material would not otherwise have been emitted to atmosphere (e.g. waste fossil plastic might have sequestered its carbon for centuries in landfill, or as a building insulation material), then the additional greenhouse gas emissions from this avoided sequestration also need to be assigned to the waste fossil material and contribute to eec.
- 2.61 Emissions from processing (ep), shall include emissions from the processing itself; from waste and leakages; and from the production of chemicals or products used in processing.
- 2.62 In accounting for the consumption of electricity not produced within the fuel production plant, the greenhouse gas emission intensity of the production and distribution of that electricity shall be assumed to be equal to the average emission intensity of the production and distribution of electricity in that country. By derogation from this rule, producers may use an average value for an individual electricity production site for electricity produced by that site, if:
- a. that electricity production site is not connected to the electricity grid and is connected to the fuel production plant; or
  - b. that electricity production site is connected directly to the fuel production plant and the electricity grid, and can evidence that the annual electricity generation that would have been lost due to local grid capacity constraints has been consumed by the fuel production plant instead; or
  - c. that electricity production site is connected directly to the fuel production plant and the electricity grid, and the fuel production plant can evidence that their consumption has been provided by the electricity production site without importing electricity from the wider grid.
- 2.63 Emissions from transport and distribution, etd, shall include emissions from the transport and storage of raw and semi-finished materials, wastes and leakages, and from the storage and distribution of finished materials. Emissions from transport and distribution to be taken into account under point 2.58 shall not be covered by this point.
- 2.64 Emissions from the fuel in use, eu, shall be taken to be zero for renewable liquid and gaseous transport fuels of non-biological origin.

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<sup>38</sup> For example, from a desire to reduce their costs under the EU's Emission Trading Scheme, or other national taxes on emissions. The waste fossil generating facility cannot claim a GHG savings whilst the RNFBO manufacturer also claims a low carbon fuel is being made, as this would be an erroneous double claim of only one set of GHG savings - since the original fossil carbon is still ultimately ending up in the atmosphere.

- 2.65 Emission saving from carbon capture and geological storage, eccs, that have not already been accounted for in ep, shall be limited to emissions avoided through the capture and sequestration of emitted CO<sub>2</sub> directly related to the transport, processing and distribution of fuel. The capture of any CO<sub>2</sub> at the start of the fuel chain, i.e. the collection of raw materials used to manufacture the assessed fuel, cannot be included within this eccs emission saving – nor can any recycling of captured CO<sub>2</sub> within the fuel chain – as these are not sequestration activities.
- 2.66 Emission saving from excess electricity from cogeneration, eee, shall be taken into account in relation to the excess electricity produced by fuel production systems that use cogeneration. In accounting for that excess electricity, the size of the cogeneration unit shall be assumed to be the minimum necessary for the cogeneration unit to supply the heat that is needed to produce the fuel. The greenhouse gas emission saving associated with that excess electricity shall be taken to be equal to the amount of greenhouse gas that would be emitted when an equal amount of electricity was generated in a power plant using the same fuel as the cogeneration unit.
- 2.67 Where a fuel production process produces, in combination, the fuel for which emissions are being calculated and one or more other products (co-products), greenhouse gas emissions shall be divided between the fuel or its intermediate product and the co-products in proportion to their energy content (determined by lower heating value in the case of co-products other than electricity).
- 2.68 For the purposes of the calculation referred to in point 2.67, the emissions to be divided shall be eec + those fractions of ep, etd and eee that take place up to and including the process step at which a co-product is produced. If any allocation to co-products has taken place at an earlier process step in the life-cycle, the fraction of those emissions assigned in the last such process step to the intermediate fuel product shall be used for this purpose instead of the total of those emissions.
- 2.69 In the case of renewable liquid and gaseous transport fuels of non-biological origin, all co-products shall be taken into account for the purposes of that calculation. Co-products that have a negative energy content shall be considered to have an energy content of zero for the purpose of the calculation.
- 2.70 In the case of fuels produced in refineries, the unit of analysis for the purposes of the calculation referred to in point 2.67 shall be the refinery.
- 2.71 For renewable liquid and gaseous transport fuels of non-biological origin, for the purposes of the calculation referred to in point 2.56, the fossil fuel comparator EF shall be 83.8 gCO<sub>2</sub>eq/MJ.

**Q 25 Do you agree that renewable fuels of non-biological origin should meet the same sustainability criteria (apart from the land criteria) as biofuels?**

**Q 26 Do you agree that the GHG calculation methodology should align with the RED, where possible, for consistency with biofuels?**

**Q 27 Do you have any other comments on the GHG calculation methodology?**

**In each case, please provide an explanation as to why.**

## Support for hydrogen

Renewable hydrogen can play a strategic role in contributing to the decarbonisation of transport and we are keen that renewable hydrogen suppliers are able to participate in, and capture value from, the RTFO.

We intend to amend the RTFO to support hydrogen through:

- Aligning the treatment of renewable hydrogen with other gaseous fuels (this will include both bio-hydrogen and non-bio renewable hydrogen, i.e. a type of RFNBO). This will involve setting the number of RTFCs for which 1kg of renewable hydrogen is eligible to reflect its energy content.
- Ensuring that hydrogen supplied for fuel cell vehicles is eligible and can be properly accounted for.
- Including hydrogen in the development fuels sub-target.

### Setting the level of reward for renewable hydrogen

2.72 The market for hydrogen is now starting to develop with small quantities of hydrogen being used in road transport, and since the Government is supporting the development of this market as strategically important for decarbonising road transport, we intend to take this opportunity to align the incentive for supplying hydrogen with that for other gaseous renewable fuels.

2.73 Previous amendments in 2015 to the RTFO increased the rewards for biomethane and bio-liquefied petroleum gas (bio-LPG) to reflect their higher energy content relative to liquid biofuels. A baseline figure for the average energy content of an RTFC representing liquid biofuels was calculated in order to determine the gaseous renewable fuel reward. This figure was 26.25 MJ/l, based on lower heating values. We propose to use this same figure when calculating the appropriate reward for hydrogen.

2.74 We propose that this will be achieved by introducing an RTFC multiplier of 4.58 for hydrogen to reflect the fact that 1 kg of hydrogen contains this times as much energy as an average litre of liquid biofuel. In line with the treatment of other renewable fuels the fuel would receive double RTFCs when made from waste material (or where the resultant fuel is a RFNBO).

Table 7 Hydrogen energy content and proposed reward

	Energy content (Lower Heating Value)	Energy content divided by implied energy content of 1 liquid biofuel RTFC	Adjusted number of RTFCs per kg
Average liquid biofuels	26.25 MJ/litre		
Hydrogen	120.21 <sup>39</sup> MJ/kg	120.21 / 26.25	4.58

<sup>39</sup> <http://hydrogen.pnl.gov/hydrogen-data/hydrogen-properties>

**Q 28 Do you agree with the proposed level of reward for renewable hydrogen - 4.58 RTFCs per kg?**

**Please provide an explanation as to why.**

**Ensuring that hydrogen supplied for fuel cell vehicles is eligible and can be properly accounted for**

- 2.75 In common with some aviation fuel (see section on Aviation), duty of excise is not payable on hydrogen for use in fuel cell vehicles, meaning that there is no duty point for these fuels. Because the RTFO uses the duty point as the control point to determine how much fuel has been supplied for transport and which supplier is eligible to receive RTFCs, it is necessary to find an alternative control point for hydrogen which will be used in fuel cell vehicles.
- 2.76 The supply chain for hydrogen for fuel cell vehicles is currently very short, with the main model consisting of generation equipment and storage situated at the filling station. It is possible that in future other models may emerge; however, because of the lengthy processes involved in legislative changes, it is necessary to make a decision now on the control point which will be applicable for the foreseeable future.
- 2.77 We are therefore proposing to use the point at which hydrogen is sold to a retail customer for use in a fuel cell vehicle as the control point. This will mean that the supplier of the hydrogen is eligible to claim RTFCs, and that they will need to be able to provide evidence that it has been sold for the appropriate use. Given that sales invoices will be issued, it should not be necessary to create additional documentation for this purpose.

**Q 29 Do you agree that the point at which renewable hydrogen is sold to a retail customer for use in a fuel cell vehicle is an appropriate 'control point' for this fuel?**

**Please provide an explanation as to why.**

- 2.78 One advantage of using the duty point as a control point for fuels in the RTFO, is that the Administrator is able to access HMRC records to validate the amounts of fuel which have been reported. Since these records do not exist for hydrogen used in fuel cell vehicles, an alternative method of validating the amount of hydrogen will be required.
- 2.79 Whilst the industry is still developing, it is possible that direct examination by the Administrator of evidence held by industry applicants may be feasible. However, once a significant number of applications are being received each month, it may be necessary to require independent assurance (verification) of the amounts of fuel.
- 2.80 It is therefore intended that the Administrator will be given powers to do this as necessary. It is envisaged that this independent assurance would be as similar as possible to the verification of sustainability information already required under the RTFO, and therefore that it would be carried out using the assurance standard ISAE 3000.



- 2.81 In order to provide the Administrator with the required level of assurance over the volumes supplied, and one that is comparable to the cross checking of all volumes against HMRC data, we believe that it is necessary to require the more detailed 'reasonable' assurance level provided for under ISAE 3000 for fuel volumes, rather than the 'limited' level which is used for renewable fuel sustainability information.
- 2.82 Where suppliers are required to provide independent assurance for fuel volumes, this will be in addition to the independent assurance for sustainability information. The Administrator will work with fuel suppliers to develop guidance on how this can be achieved with the minimum of administrative burden and cost.

**Q 30 Do you agree that the proposed powers for the Administrator are sufficient to ensure the independent verification of the amounts of fuels which are not subject to duty of excise?**

**Q 31 Do you agree that the requirement for a reasonable level of assurance, rather than the lower limited level of assurance, is appropriate?**

**In each case, please provide an explanation as to why.**

## Preventing double reward for the same energy

Under the current RTFO Order, RTFCs cannot be issued to fuels already rewarded under similar reward schemes in either the UK or other European Economic Area states. The intention of this is to prevent the same renewable energy being claimed towards Member States targets multiple times.

We propose to amend the RTFO so that this exclusion will also apply to renewable fuels where the renewable energy contained within the fuel has already been rewarded - for example, where the fuel was derived from a precursor.

This will reduce the risk of the same energy being claimed as renewable on multiple occasions and eliminate this potential market distortion.

- 2.83 The award of RTFCs is subject to a number of conditions. One of these is that "the renewable transport fuel has not already been, and will not be, counted under the support scheme of another EEA state within the meaning of Article 2(k) of the RED, or a UK renewable energy obligation other than the renewable transport fuel obligation of the supplier." This is currently set out in RTFO Article 16(2)(a)(ii). This measure was included at the time the RED was implemented in 2011.
- 2.84 In 2011, we were not aware of the production of fuels where a precursor to that fuel had already been supported under a renewable energy obligation. This production involves a chemical transformation from one fuel type to another which is not currently prohibited under the RTFO Order. An example of this is the conversion of biomethane into biomethanol.



- 2.85 A number of EEA states (including the UK) allow the injection of biomethane into a national gas grid to be eligible for reward under their renewable energy obligations. As this reward occurs at the point of injection to the grid, the methane is not consumed at that point. Therefore methanol producers are able to withdraw methane from the grid to convert to methanol.
- 2.86 As the RED does not require sustainability criteria to be met when gaseous fuels are used in heating or power generation, most Member States do not apply sustainability criteria at the point of grid injection. In contrast, the UK does apply sustainability criteria to biomethane under the Renewable Heat Incentives (at the point of grid injection). Therefore the requirements that sustainability information has only been used once prevent UK biomethane being subsidised under the RHI and then again under the RTFO, either as biomethane or after conversion to biomethanol).
- 2.87 Our understanding is that as well as the support, the energy in the methane/methanol is being claimed twice against different Member States RED targets: once as heat or power generation in the country in which the methane is injected into the grid and again in the UK as part of transport's contribution towards the overall UK renewable energy target.
- 2.88 This therefore creates both the situation where two Member States are claiming the same energy towards their RED targets and a potential market distortion in that non UK biomethane to biomethanol can receive subsidies under two regimes in a way that UK biomethane producers are prevented from receiving. We therefore propose to amend the RTFO to address this issue.
- 2.89 There are two ways that this could be done. The first is to expand the definition of what prevents a claim for an RTFC to include 'chemical precursors for fuels', this would be a relatively specific set of requirements and may result in new developments in fuels production falling outside of this prohibition. The second option is to place the 'cannot be claimed' requirement onto the energy contained within a fuel. This is a more generic approach that is likely to be applicable to any new fuel production pathway; however, there may be a need for an exemption for RFNBOs produced with renewable electricity that has been supported.

**Q 32 Do you agree with the proposal to prevent the claiming of RTFCs for fuels created by a precursor that has been rewarded under another renewable energy scheme?**

**Q 33 Do you have any opinion as to whether either of the two options considered would be preferable and whether either would have unintended consequences?**

**Please provide evidence as to why you agree or disagree and include any proposed solutions.**

# 3. Changes to sustainability requirements

## Introduction

- 3.1 The adoption of EU [Regulation 1307/2014](#) along with recent amendments to the RED introduce a number of changes to a range of sustainability requirements regarding:
- the reporting of default carbon intensity values for feedstocks;
  - the definition of highly biodiverse grasslands set by EU regulation 1307/2014;
  - changes to the definitions of new and old installations and deadlines for meeting the minimum greenhouse gas savings; and
  - additional reporting requirements for the ILUC emissions of food crops.
- 3.2 The changes set out in this chapter are not included in the proposals being consulted on as they are required by EU Regulation 1307/2014 and the recent amendments to the RED, they are therefore set out here for information only. This is to enable suppliers and producers time to prepare for the introduction of the changes set out in this chapter.

## Change to requirements on when default values can be reported

- 3.3 The ILUC Directive amends the conditions under which the carbon defaults in RED Annex V can be reported. We intend to amend the RTFO to transpose this.
- 3.4 Suppliers are required to report on the associated carbon intensity of the biofuels they supply. Default carbon intensity values are provided in Annex V of the RED by biofuel feedstock type, and in some cases by production pathway. They are split into three component parts or 'disaggregated defaults' involved in the creation of the biofuel, these are:
- Cultivation of the biofuel feedstock;
  - Emissions from processing of the feedstock into fuel; and
  - Transport (of the feedstock and/or fuel).
- 3.5 Currently, the defaults can only be used where biofuels fall into one of the following three categories:
- a. Cultivated outside the EU;
  - b. Cultivated in regions in the EU where the cultivation emissions from the relevant biofuel feedstock are below the disaggregated default for cultivation; or
  - c. Made from wastes/residues.

- 3.6 The EU regions referred to in (b) are standardised EU regions for collection of data known as Nomenclature of Territorial Units for Statistics 2 (NUTS2) level. The NUTS2 regions where the carbon default can be reported (known as NUTS2 compliant regions) were determined by reports submitted by each Member State. These reports (known as 'NUTS2 reports') modelled the greenhouse gas emissions from cultivation for different biofuel feedstocks by region.
- 3.7 Amendments to the RED Article 19, paragraph 3 remove this restriction and allow the relevant default to be reported for all types of biofuel, whether they are derived from wastes/residues, EU or non-EU crops. We therefore intend to remove this restriction from the RTFO by removing paragraphs 5(2)(b), all of 5(3) and 6(4), and the definition of 'low emission zone' from the Schedule.
- 3.8 Note that it is not the intention to change the option for suppliers to use the UK NUTS2 report data as a source of actual cultivation data as set out in the RTFO Guidance. The ILUC Directive also sets out that the European Commission may decide through comitology procedure that the NUTS2 reports submitted by EU Member States (or equivalent reports from territories outside the EU) contain accurate data on GHG cultivation emissions so that suppliers of biofuels can report these values.

## Defining highly biodiverse grassland

We propose updating the sustainability criteria in the RTFO Order to include highly biodiverse grassland in the land criteria for biofuels. The land criteria set out where biofuels cannot be grown if they are to count towards renewable energy targets, or be eligible under national support schemes.

- 3.9 Highly biodiverse grassland (HBG) was included in the RED and amended FQD land criteria but a full definition was not provided. Instead, a European Commission proposal on the criteria and geographic range to determine which grasslands would be covered, would be agreed at EU level by the European Council and Parliament.
- 3.10 The definition and geographic range was provided by [Regulation 1307/2014](#), adopted on 8 December 2014. The Regulation applies from 1 October 2015 and has direct effect in the UK. The RTFO Carbon and Sustainability Guidance was updated to provide suppliers with information on how to comply. For completeness, we now propose amending the RTFO Order to add the definition of HBG to the list of prohibited land types in the sustainability criteria.
- 3.11 In keeping with the Regulation, we also propose to include an exemption for non-natural HBG where evidence is provided that the harvesting of the raw material is necessary to preserve its grassland status. The existing powers for the RTFO Administrator to impose requirements on what form the evidence must be provided would remain in place and apply to this exemption.

## GHG threshold changing dates

We propose to amend the definitions of new and old chain installations in the RTFO Order and the corresponding minimum greenhouse gas savings which must be delivered by biofuels to transpose amendments made to the RED.

This is necessary to ensure that minimum GHG savings thresholds achieved by biofuels eligible for reward under the RTFO, and counted towards the UK's renewable energy targets, align with the minimum GHG savings thresholds set by the ILUC Directive.

- 3.12 The ILUC Directive introduces measures to address indirect land-use change, and also makes changes to the minimum greenhouse gas savings biofuels must deliver in order to meet the mandatory sustainability criteria.
- 3.13 In transposing the ILUC Directive we must ensure that greenhouse gas emission savings from biofuels are at least 60% where produced in installations starting operation after 5 October 2015 if they are to count towards the RED targets. In the case of installations that were in operation on or before 5 October 2015, biofuels are required to achieve a greenhouse gas emission savings of at least 50% from 1 January 2018 to count towards the targets in the RED.
- 3.14 The Schedule to the RTFO Order sets minimum greenhouse gas emissions savings for installations producing biofuels. These vary according to when production at an installation begins and when the fuel is supplied.
- 3.15 We are proposing that new and old chain installations be redefined as below:

**Table 8 GHG threshold deadlines for old and new installations**

Type of chain	Current definition in RTFO Order	Definition from 2017/18 and beyond
New chain installations definition	means a chain of installations in respect of which production of renewable transport fuel in one or more of the installations begins on or after 1st January 2017	means a chain of installations in respect of which production of renewable transport fuel in one or more of the installations begins on or after 6th October 2015
Old chain installations definition	means a chain of installations in respect of which production of renewable transport fuel in at least one of the installations was taking place on 23rd January 2008	means a chain of installations in respect of which production of renewable transport fuel in at least one of the installations was taking place on 5th October 2015

- 3.16 We propose to further amend the RTFO Order to require that biofuel produced in old installations, as redefined above, must deliver 35% greenhouse gas emissions savings if supplied before 1 January 2018, and 50% greenhouse gas emissions savings if supplied on or after 1 January 2018.
- 3.17 Biofuel produced in new installations, as redefined, must deliver 60% greenhouse gas emissions savings under these threshold changes.

- 3.18 These changes are necessary to ensure that the sustainability criteria in the RTFO Order are aligned with the criteria in the ILUC Directive.
- 3.19 Biofuels which do not meet the mandatory sustainability criteria in the schedule to the RTFO Order, including the minimum greenhouse gas savings threshold, will not be eligible for reward under the RTFO and will not count towards our RED targets. As is currently the case, biofuel supplied which fails to meet the mandatory sustainability criteria will be treated as fossil fuel and continue to count towards a supplier's obligation.

## 4. Operational changes

### Removal of buy-out fund recycling

We are proposing to end the recycling of the buy-out fund. Instead any monies collected by the Administrator would be paid into the Consolidated Fund.

This is necessary to ensure that the UK's obligation to supply biofuel under the RTFO is aligned with the approach across the EU in respect of new state aid rules.

The changes to buy-out fund recycling are not included in the proposals being consulted on, they are set out here for information only. This is to enable suppliers and producers time to prepare for the introduction of the changes to the operation of the buy-out fund.

- 4.1 The RTFO Order allows suppliers to buy-out of their obligation to supply renewable transport fuel or meet that obligation by surrendering RTFCs. This important flexibility protects consumers, as it ensures that should the price of biofuels reach a point where it will have a significant impact on prices for the end users of fuel then obligated suppliers can buy-out.
- 4.2 The RTFO Order sets out that where the buy-out option is used, the Administrator calculates the buy-out fund total and distributes it amongst those suppliers that have either redeemed, or surrendered, RTFCs in the obligation year in which the buy-out was paid. This redistribution of the buy-out fund among compliant suppliers is commonly known as 'recycling'.
- 4.3 The buy-out price, of 30 pence per litre, is set at a level which provides a commercial incentive to meet the obligation in the RTFO by redeeming certificates. This would continue to be the case and there would continue to be a buy-out option.
- 4.4 There has been no buy-out fund in the last four RTFO obligation years. Further it is our understanding that the option to buy-out under the RTFO has not been exercised to date on a commercial basis. We also anticipate that suppliers' commercial and financial plans will not be negatively affected by the removal of buy-out recycling.
- 4.5 The recycling mechanism for the buy-out engages state resources and therefore state aid rules apply. EU Member States must ensure state aid schemes (which the RTFO with buy-out recycling currently is) do not provide aid for crop derived biofuels where there also exists a fuel blending obligation.
- 4.6 Removing the recycling of the buy-out fund therefore ensures the UK's obligation to supply biofuel under the RTFO is consistent with EU state aid rules.
- 4.7 Removal would mean there is no longer any fiscal incentive to surrender RTFCs, as opposed to using these in a subsequent obligation year or trading them. As a consequence we would remove the provisions in the Order on surrender of RTFCs.

- 4.8 These changes are intended to take effect from 15 April 2017. There will be no recycling of monies paid into any buy-out fund arising from obligation year 2017/18 or subsequent obligation years. Should the changes be made after 15 April 2017, i.e. within obligation year 2017/18, there will also be no recycling of monies paid into any buy-out fund arising from obligation year 2017/18. Any buy-out monies received will instead be paid into the consolidated fund.

## Calendar year reporting and changes to deadlines

We propose to amend the RTFO obligation period so that it runs on a calendar year basis and amend the deadlines associated with reporting and compliance accordingly.

This change is necessary so that we can align the mechanisms required to meet the targets under the Renewable Energy and Fuel Quality Directives. Under this proposal suppliers will still be able to claim Renewable Transport Fuel certificates on a monthly basis, and we do not propose to shorten the timelines for suppliers to provide information to the Administrator.

- 4.9 At present, the RTFO obligation period runs from the 15 April to 14 April. As set out in table 9 below we are proposing a shortened obligation year from 15 April 2018 to 31 December 2018, and thereafter the obligation year will run on a calendar year basis from 1 January to 31 December.
- 4.10 For illustrative purposes the changes to key legislative deadlines are set out in the table below and also reflect our proposals to end the recycling of the buy-out and surrendering of RTFCs from the start of the obligation period 2017/18. The proposals do not affect the operation of carry over, beyond restrictions proposed in the next section on carry over of RTFCs into 2020. However, it should be noted that 2018 would be a short year. As a result the total volume of fuel required to meet the obligation would be lower, and therefore the total number of RTFCs that could be carried over to meet the obligation would also be lower, although the carry over percentage would continue to be 25% of a supplier's obligation.

**Table 9 Illustrative changes to RTFO reporting deadlines**

<b>Date and relevant article(s) in RTFO Order</b>	<b>Obligation year. 15th April 2017 - 14th April 2018</b>	<b>Short obligation year. 15th April 2018 - 31st Dec 2018</b>	<b>2019 and beyond 1st Jan-31st Dec</b>
Beginning of obligation period (4(3)(a))	15/04/17	15/04/18	01/01/19
End of obligation period (4(3)(a))	14/04/18	31/12/18	31/12/19
Deadline for application for an RTFC (and hence last date to submit a verifiers opinion) 16(3) and 16B(3)	14/08/18	01/05/19	01/05/20
Deadline for the Administrator to notify supplier of intent to revoke	11/09/18	31/05/19	31/05/20

<b>Date and relevant article(s) in RTFO Order</b>	<b>Obligation year. 15th April 2017 - 14th April 2018</b>	<b>Short obligation year. 15th April 2018 - 31st Dec 2018</b>	<b>2019 and beyond 1st Jan-31st Dec</b>
an RTFC (28 days before the date in 20 (4) (c) (ii))			
Deadline for the Administrator to revoke an RTFC 20 (4) (c) (ii)	16/10/18	05/07/19	05/07/20
Deadline to notify reasons for revocation to RTFC holder 20 (5)	23/10/18	12/07/19	12/07/20
Deadline for RTFC holder to request reconsideration of revocation decision 20 (7)(a)	06/11/18	26/07/19	26/07/20
Deadline for the Administrator to reconsider a revocation 20 (8)(b)	15/11/18	18/08/19	18/08/20
Last date after which failing to inform Administrator within 20 days that data is incorrect gives rise to liability for a civil penalty 23 (5)	16/11/18	05/08/19	05/08/20
Final date by which, if court proceedings have not been disposed of, the Administrator will determine the buy-out payment distribution 22 (6)(c)	15/11/18	Deleted	Deleted
Specified date for suppliers (redemption of certificates deadline) 4(3)(b) and 21(4)	29/11/18	10/09/19	10/09/20
Deadline for supplier to make a buy-out payment 21(8)	10/01/19	10/10/19	10/10/20
Deadline for supplier to surrender a certificate for a share of the buy-out fund 22(2)(b)	10/01/19	Deleted	Deleted
Deadline for Administrator to calculate total sum of buy-out fund 22(2)(d)	10/02/19	Deleted	Deleted
Administrator able to include late payments into the buy-out fund after deadline for calculating total 22(2)(e)	10/02/19	Deleted	Deleted

4.11 The proposed changes to the obligation period and reporting year are necessary to ensure we meet our duties under article 22 of the RED and Annex III of Directive 2015/652 (which sets out the reporting requirements for the amended FQD) to report information on fuel and energy supplied in the UK.

4.12 Every two years we report to the European Commission on the fuel and energy placed on the market in the UK and our progress in meeting the targets. The



deadline for the final report, which will need to indicate whether the UK has met its renewable energy target in 2020, is 31 December 2021.

- 4.13 Moving the RTFO to a calendar year provides us with greater certainty that we can report accurately against the targets in the RED.
- 4.14 The change also aligns RTFO reporting with the reporting required under the Motor Fuel Greenhouse Gas Reporting Regulations which operates on a calendar year basis, and is intended to reduce the administrative burden on suppliers who currently have to provide the same information to different timescales.
- 4.15 We intend to continue to allow RTFCs to be claimed on a monthly basis but bring forward the key reporting and compliance deadlines in the RTFO Order. Whilst we are proposing a 1 January to 31 December obligation year, we also want to minimise disruption for suppliers and maintain alignment of supplier reporting to HMRC. To this end, it will still be possible for deferment traders to be notified of reporting periods on a mid-month basis.

**Q 34 Do you think there will be any negative consequences as a result of changing the RTFO obligation period to a calendar year?**

**If so, please provide evidence to support your answer.**

## Carry over of Renewable Transport Fuel Certificates in 2020

We propose to prohibit the carry over of RTFCs from the 2019 to the 2020 obligation years. This is to ensure that we meet the requirement set out in the RED that 10% of energy supplied in transport shall be from renewable sources in 2020. RTFCs issued in 2019 will however be eligible for carry over into the 2021 obligation year.

- 4.16 The RTFO Order allows obligated suppliers to meet up to 25% of their obligation with Renewable Transport Fuel Certificates (RTFCs) issued in the preceding obligation year. This use of RTFCs from the previous obligation year is also known as 'carry over'.
- 4.17 The UK must meet the target set in the RED for 10% of transport energy to be supplied from renewable sources in 2020. Only fuels supplied in 2020 can be counted towards that target.
- 4.18 With carry over rules as they are now under the RTFO suppliers could meet up to 25% of their RTFO obligation with RTFCs carried over from 2019. As a consequence up to 25% of the UK's domestic obligation for renewable transport fuel in 2020 would not count as renewable energy supplied in 2020 for the purpose of meeting the RED target.
- 4.19 There is a risk, therefore, that a high level of carry over of RTFCs issued for fuel supplied in 2019 to fulfil the obligation in 2020 could result in the UK failing to meet the target. That is unless the proposed 2020 obligation level is also further increased to ensure the 10% target for transport in the RED is met with carry over in place. This increase would be in the range of either 15% (to reflect current carry over under the RTFO) to 25% (to reflect the maximum carry over permitted currently).

- 4.20 If we were not to increase the obligation further and make no modification to carry over, there would be a risk that the UK would fail to meet its target in the RED, if there are fluctuations in the RTFC market. For example should the cost of acquiring RTFCs in 2019 be significantly less than in 2020, it would be reasonable to assume there would be a higher carry over of RTFCs into 2020 from 2019, and a lower carry over of RTFCs from 2020 into 2021, as a result there would be a lower volume of renewable transport fuel actually supplied in 2020 than might be expected to meet the UK's RTFO obligation and a shortfall in meeting the RED target.
- 4.21 Restricting or removing the use of carry over from obligation year 2019 would mitigate the risk of insufficient renewable fuel being supplied in 2020 to meet the RED without having to increase the RTFO obligation further than proposed. There are several options to manage this risk. In assessing these options we have considered the extent to which reducing the flexibility afforded to suppliers may increase both costs and the risk of failing to meet the mandatory RED target for 10% of transport energy to be supplied from renewable sources by 2020. Table 10 below summarises the options considered. Option 4 is our preferred option.

Table 10 Changes to carry over in 2020

Options	Flexibility for suppliers	Risk of increased costs	Risk to meeting the RED target, under supply of renewables
0. No change - carry over permitted as now, obligation reaches 9.75% in 2020.	High flexibility as now.	No risk of additional costs from obligation; potentially high costs from EU infraction proceedings.	High risk of under supply in year 2020.
1. Carry over permitted as now but the obligation is increased by a further 15% or 25%.	High flexibility as now.	Very high increased costs due to increased obligation. Mitigated slightly by flexibility.	Low risk of under supply in year 2020.
2. Reduce carry over into 2020 to 15% but the obligation is increased by a further 15%.	Reduced flexibility.	High risk of increased costs due to increased obligation	No significant risk of under supply in year 2020
3. No carry over into 2020, and no carry over out of 2019.	No flexibility.	Higher risk to costs due to very limited flexibility.	No significant risk of under supply in year 2020.
4. No carry over into 2020, supplier can carry out of 2019 into 2021 instead. Carry over into 2021 remains capped at 25%.	Some reduced flexibility.	Some risk of increased costs.	No significant risk of under supply in year 2020.

4.22 We intend to minimise the risk of failing to meet our transport targets in the RED and retain, as far as possible, flexibility for suppliers in meeting their obligation under the RTFO.

- 4.23 We propose to do this by prohibiting the carry over of RTFCs from the 2019 obligation period into the 2020 obligation period, option 4 in table 9 above. Under that option, we will permit RTFCs issued in both 2019 and 2020 to be carried over into obligation year 2021. This will mean that in meeting their obligation in 2021 suppliers will be allowed to use a combination of RTFCs earned for fuel supplied in 2019 and 2020, but, as now, this carry over will be limited to meeting a total of up to 25% of their obligation in 2021.
- 4.24 We anticipate that allowing carry over of RTFCs from both 2019 and 2020 into 2021 will ensure that the value of biofuel supplied in 2019 is not written off, and that retaining the total cap on carry over at 25% into 2021 will ensure that the market for biofuels in that year is not adversely impacted. It also allows us to retain flexibility for suppliers in meeting the obligation through carry over without the need to make additional increases (in the region of 15-25%) to the obligation level in 2020.

**Q 35 Do you agree with the proposal in option 4 to prohibit the carry over of RTFCs into 2020, and also allow RTFCs from 2019 to be carried over into 2021?**

**Q 36 Do you prefer any of the other options in Table 9, or have alternative suggestions?**

## Review clause

We propose to amend the duty to keep the obligation level under review to ensure the requirements in the Renewable Energy Directive (RED) are met. That duty is currently in Article 4A of the RTFO Order. As we are setting a trajectory to meet our transport target in 2020 it is no longer required.

- 4.25 Given the legitimate concerns about the real greenhouse gas emissions savings of certain crop based biofuels due to indirect land-use change when the RTFO was amended in 2011, we did not set a trajectory to meet the RED through increases to the obligation level for biofuel supply.
- 4.26 Instead an obligation was placed on the Secretary of State to keep that obligation level under review to ensure the requirements of the RED in respect of transport will be met.
- 4.27 This obligation is specifically about reviewing progress towards meeting the 10% target. Under current Government policy the RTFO Order is already subject to mandatory five year reviews, including a public consultation. The most recent of these reviews was published in 2014.
- 4.28 As set out in chapter 1 of this consultation, we propose increases to the obligation level to meet the target set by the RED to have 10% of the energy used in transport from renewable sources by 2020. Setting an obligation to supply renewable fuels out to 2030 will also provide long term certainty to industry, whilst ensuring an ongoing contribution to UK Carbon Budgets (set under the UK Climate Change Act 2008).

4.29 The proposals in chapter 1 are intended to deliver our commitment to meet the 2020 targets under the RED for the supply of renewable energy in transport and will provide some long term certainty for the biofuel supply chain. As a consequence we propose to remove article 4A(2)(a) of the Order, which obliges the Secretary of State to keep the obligation level under review to meet the 2020 targets for transport energy use in the RED. The mandatory five year reviews will not be affected by this change.

**Q 37 Do you agree that the specific duty to review the obligation level to ensure we meet the RED 2020 targets for transport is no longer required and should be removed?**

**Please provide evidence as to why you agree or disagree.**

# 5. Civil penalties

## Minor changes to the Administrator's civil penalty powers

We are proposing to extend the Administrator's power to issue civil penalty notices in the Order under the following circumstances:

- instances where a supplier fails to discharge their new obligations in respect of the sub-target for development fuels; and
- where a supplier has failed to ensure that information and evidence provided is accurate in respect of new fuels which we propose should be eligible for reward under the RTFO.

The purpose of these amendments is to ensure effective enforcement of the RTFO scheme. The changes are not included in the proposals being consulted on, they are set out here for information only. This is to enable suppliers and producers time to prepare for the introduction of the changes to the operation of the civil penalties regime.

- 5.1 As set out in chapter 1 we are proposing to amend the RTFO to require suppliers to meet a sub-target for development fuel. This will require the introduction of a new class of 'development RTFCs' (labelled accordingly to distinguish them) issued to fuels qualifying as 'development fuels'.
- 5.2 Currently the Administrator has powers to issue a civil penalty where a supplier fails to meet their obligation. That obligation may be met by acquiring RTFCs or paying a buy-out price. The Administrator will also need to be able to apply effective penalties should a supplier fail to meet (or buy out of) the new development fuels sub-target.
- 5.3 As set out in chapter 2, we are also proposing some key changes to expand the types of fuels which may be eligible for reward under the RTFO to include renewable avtur and renewable avgas used in aviation, and renewable fuels of non-biological origin (RFNBOs), including hydrogen.
- 5.4 Currently, the Administrator of the RTFO scheme has powers to issue civil penalties in order to ensure the accuracy of information and evidence provided in support of RTFC applications. The Administrator will also need to be able to ensure the accuracy of information provided in support of applications for development RTFCs and RTFCs issued for new eligible fuels.

### Current powers to issue civil penalties

- 5.5 At present the Order provides that the Administrator can issue civil penalty notices in a number of circumstances. These include where a supplier:

- fails to apply for an RTF Account and/or fails to discharge its obligation under the Order (Article 23(2)),
- fails to supply a verifier's report in respect of renewable transport fuel supplied (Article 23(2A)),
- fails to provide information and/or ensure the accuracy of information provided in respect of the volume, energy content, and sustainability of fuels supplied (Article 23(3) and 23(5)),
- fails to ensure that information, and the declaration, are provided in support of a RTFC (Article 23(3) and 23(5)) and/or,
- fails to ensure the accuracy of the information provided to the Administrator in respect of a proposed revocation of an RTFC (Article 23(3) and 23(5)).

### **Proposed changes to powers to issue civil penalties**

- 5.6 We propose to make minor changes where necessary to expand the circumstances in which the Administrator may issue civil penalties under the Order. This includes instances where a supplier fails to discharge their new obligations in respect of the sub-target for development fuels. The changes are necessary to ensure the new obligation in respect of the sub-target for development fuels is binding. We also need to make some minor consequential changes to the civil penalty powers in the Order, to ensure the current civil penalty powers extend to information and evidence provided in respect of new eligible fuels.
- 5.7 These changes are not a departure from how the RTFO scheme operates and would mirror the civil penalty process applicable to the current obligation. As such the maximum civil penalty charge for failing to discharge the new obligation in respect of the development fuels target, or for failing to provide new information which may be required by the Administrator is proposed to be set at the lesser of £50k or 10% of turnover. This is in line with the current limits in the Order.
- 5.8 Similarly, we also propose that the Administrator is able to issue civil penalties where information and evidence provided by those applying for an RTFC is inaccurate in respect of the new eligible fuels which we are proposing through this consultation may be rewarded under the RTFO scheme.
- 5.9 Under the current Order where a supplier has gained, or attempted to gain, one or more RTFCs by failing to provide accurate information, the civil penalty amount is the lesser of 10% of turnover or an amount equivalent to twice the value of the buy-out under the Order, which is currently 30 pence per litre. The same will apply in respect of RTFCs for new eligible fuels and development fuels.
- 5.10 It will continue to be the case that civil penalties are recoverable as civil debts. Outstanding payments would have interest applied to that debt at a rate of 5 percentage points above the base rate of the Bank of England and interest will be calculated on a daily basis.
- 5.11 It would also continue to be the case that suppliers would have the right to lodge an objection with the Administrator and the right of appeal to the relevant court. The grounds for appeal would, as is the case now, be that the recipient of a civil penalty is not liable to pay or that the civil penalty amount is too high.
- 5.12 The proposal is not expected to increase the costs or burdens associated with compliance with the Order beyond those already set out in the cost benefit analysis.

# 6. Further potential for low carbon transport fuels

## Decarbonising transport: strategic vision

- 6.1 The decision to leave the EU means we now have the opportunity to look afresh at how we can act to further reduce the climate change impact of the transport fuels we use in the UK. We have designed the approach outlined in this consultation to meet the needs of our country. We want a smart, efficient approach focused on delivering the outcomes we all want to support low carbon transport and a strong economy.
- 6.2 In addition to the proposed changes to the Order, the Department is considering ways in which transport can be decarbonised more widely. Analysis of decarbonisation in transport consistently points to long term challenges for areas that are particularly difficult to electrify, notably road freight and, to an even greater degree, aviation. Shipping and non-road mobile machinery (e.g. tractors) are also areas which face decarbonisation challenges.
- 6.3 Advanced low carbon fuels suitable for these sectors will be essential in helping drive decarbonisation.
- 6.4 In 2014, the Department's call for evidence on advanced fuels sought views and data on their potential and whether there was any need for additional Government support. Stakeholders recommended:
  - An additional support mechanism for advanced and more sustainable fuels;
  - Policy changes to provide more certainty to suppliers;
  - Adding support for some fuels from fossil waste to the RTFO;
  - Support for low-carbon fuels in the shipping and aviation sectors.
- 6.5 Analysis for achieving UK Carbon Budgets for CB4 (2023-27), and CB5 (2028-2032) also illustrates the need for low carbon transport fuels to contribute to achieving carbon reductions. The Climate Change Committee's advice for achieving CB5 identifies the main opportunities for reducing transport emissions through the 2020s as being more efficient conventional vehicles, increased penetration of electric and plug-in hybrid vehicles and biofuels.
- 6.6 The freight sector is one of the more challenging areas to decarbonise. Gaseous fuels including biomethane offer one opportunity, with some additional benefits for air quality compared with diesel. These benefits are already recognised for tax purposes, where a significantly lower road fuel duty rate applies to road fuel gases.



### **Proposals in this consultation start us on this path**

- 6.7 The measures outlined in this consultation go some way to addressing these longer term challenges.
- 6.8 The proposed 'development fuels' sub-target will provide greater incentives for priority renewable fuels that need the greatest initial support. Qualifying fuels would include renewable hydrogen, renewable aviation fuel and fuels which can exceed today's 'blend walls' in normal petrol and diesel sold in forecourts. Our proposals would also ensure that these fuels would be derived from wastes and meet the waste hierarchy to ensure they are sustainable – as such they have the potential to deliver excellent greenhouse gas savings.
- 6.9 Inclusion of incentives for aviation fuels in the RTFO is an important first step towards developing this sector. There has been significant investor interest in renewable aviation fuels from waste based, sustainable sources in recent years, and inclusion in the RTFO could provide the necessary catalyst to turn plans and visions into reality.
- 6.10 Subject to addressing concerns around 'methane slip' in certain types of gas-fuelled trucks, the development fuels target could also include biomethane. With limited options available to decarbonise heavy goods vehicles, this could be an important fuel for improving the CO<sub>2</sub> performance of the road freight sector whilst at the same time helping to tackle air quality challenges in cities by reducing diesel usage.
- 6.11 Making a long term commitment to these novel technologies would provide an important market signal for investors and provide a platform for UK investment, growth and jobs.

### **But we recognise there is more work to be done**

- 6.12 The RTFO has proved effective in getting renewable fuels into the road fuels market. As a market based mechanism, fuel suppliers determine where to deploy the fuel most cost effectively, benefitting consumers by minimising the additional costs associated with renewable fuels.
- 6.13 To date, market experience indicates that the most cost effective routes to deploy biofuels are low level blends in the mainstream fuel market (E5 in petrol and B7 in diesel). The additional costs of biofuel supply are consequently distributed evenly across the general fuel supply and there is an ongoing market pressure to minimise costs.
- 6.14 But looking ahead, as we approach the limits at which biofuels can be blended with fossil fuels, towards 2020 and beyond there may be additional benefits to deploying a greater proportion of renewable fuels in HGVs, buses and other captive fleets where there are limited options for electrification.

### **Reducing carbon emissions in freight**

- 6.15 The Department is currently reviewing emission reduction opportunities in the freight sector following advice from the Climate Change Committee for setting Carbon Budget five. One area of focus is the use of renewable fuels in HGVs, where a range of abatement measures are being appraised.
- 6.16 The evidence base on the cost effectiveness, CO<sub>2</sub> abatement potential and wider impacts of policy options is currently being developed. It has been informed by initiatives such as the Low Carbon Truck Trial, which has supported the use of

biomethane and waste based biodiesel in trucks and is capturing data on the economic, environmental and operational performance of alternative fuels. We are also considering the potential role of fuel efficiency measures such as 'efficient driving' (also known as 'eco driving') and retrofit technologies in reducing HGV emissions. Further evidence received from this consultation will feed into the freight review appraisal and help inform policy decisions on the RTFO and potentially other policy measures in this area.

- 6.17 As with other areas of Government policy, identifying measures that can deliver objectives cost-effectively is critical. For example, fuel duty incentives have in the past proved highly effective in changing behaviour, but revenue foregone (i.e. the difference between actual earnings and what could have been achieved without fees, expenses or lost time) from such measures can be significant and potentially undermine overall cost-effectiveness.

**Q 38 When we leave the EU, what further opportunities should we consider to develop our low carbon transport fuels policy framework and related policies? Please explain why.**

**Q 39 What is the potential in the UK for the use of biofuels (waste derived biomethane and biodiesel etc.) as fuel for HGVs?**

**Q 40 What are the key barriers to wider deployment of biofuels in the HGV sector?**

**Q 41 What should be the role of Government / industry in addressing these barriers?**

**Q 42 Do road freight operators and freight fuel suppliers welcome initiatives to promote the use of biofuels into freight?**

**Q 43 Will the fuel industry deploy biofuels directly into road freight in the period to 2020 at the obligation level set out in this consultation (9.75% in 2020)?**

**Q 44 How can the Government cost effectively promote biofuels in the road freight sector?**

**In each case please provide evidence to support you answer.**

# Annex A: Cost benefit analysis

See separate document

# Annex B: Consultation principles

The consultation is being conducted in line with the Government's key consultation principles which are listed below.

## **A. Consultations should be clear and concise**

Use plain English and avoid acronyms. Be clear what questions you are asking and limit the number of questions to those that are necessary. Make them easy to understand and easy to answer. Avoid lengthy documents when possible and consider merging those on related topics.

## **B. Consultations should have a purpose**

Do not consult for the sake of it. Ask departmental lawyers whether you have a legal duty to consult. Take consultation responses into account when taking policy forward. Consult about policies or implementation plans when the development of the policies or plans is at a formative stage. Do not ask questions about issues on which you already have a final view.

## **C. Consultations should be informative**

Give enough information to ensure that those consulted understand the issues and can give informed responses. Include validated assessments of the costs and benefits of the options being considered when possible; this might be required where proposals have an impact on business or the voluntary sector.

## **D. Consultations are only part of a process of engagement**

Consider whether informal iterative consultation is appropriate, using new digital tools and open, collaborative approaches. Consultation is not just about formal documents and responses. It is an on-going process.

## **E. Consultations should last for a proportionate amount of time**

Judge the length of the consultation on the basis of legal advice and taking into account the nature and impact of the proposal. Consulting for too long will unnecessarily delay policy development. Consulting too quickly will not give enough time for consideration and will reduce the quality of responses.

## **F. Consultations should be targeted**

Consider the full range of people, business and voluntary bodies affected by the policy, and whether representative groups exist. Consider targeting specific groups if appropriate. Ensure they are aware of the consultation and can access it. Consider how to tailor consultation to the needs and preferences of particular groups, such as older people, younger people or people with disabilities that may not respond to traditional consultation methods.

#### **G. Consultations should take account of the groups being consulted**

Consult stakeholders in a way that suits them. Charities may need more time to respond than businesses, for example. When the consultation spans all or part of a holiday period, consider how this may affect consultation and take appropriate mitigating action.

#### **H. Consultations should be agreed before publication**

Seek collective agreement before publishing a written consultation, particularly when consulting on new policy proposals. Consultations should be published on gov.uk.

#### **I. Consultation should facilitate scrutiny**

Publish any response on the same page on gov.uk as the original consultation, and ensure it is clear when the government has responded to the consultation. Explain the responses that have been received from consultees and how these have informed the policy. State how many responses have been received.

#### **J. Government responses to consultations should be published in a timely fashion**

Publish responses within 12 weeks of the consultation or provide an explanation why this is not possible. Where consultation concerns a statutory instrument publish responses before or at the same time as the instrument is laid, except in exceptional circumstances. Allow appropriate time between closing the consultation and implementing policy or legislation.

#### **K. Consultation exercises should not generally be launched during local or national election periods.**

If exceptional circumstances make a consultation absolutely essential (for example, for safeguarding public health), departments should seek advice from the Propriety and Ethics team in the Cabinet Office.

Further information is available at  
<https://www.gov.uk/Government/publications/consultation-principles-guidance>

If you have any comments about the consultation process please contact:

Michael Wright  
Department for Transport  
Great Minster House

33 Horseferry Road  
London  
SW1P 4DR  
[LowCarbonFuel.Consultation@dft.gsi.gov.uk](mailto:LowCarbonFuel.Consultation@dft.gsi.gov.uk)

# Annex C: Consultation response form

See separate document