Department for Transport

Supporting Recycled Carbon Fuels through the Renewable Transport Fuel Obligation

July 2022

Department for Transport
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Executive summary

Introduction

1. In July 2021, we confirmed our commitment to support recycled carbon fuels (RCFs) under the Renewable Transport Fuel Obligation (RTFO) following a previous consultation, and further reiterated this support in our Transport Decarbonisation Plan and Benefits of Brexit paper. This consultation seeks views on how to ensure that RCFs are sustainable, have suitable eligibility criteria, and an appropriate level of reward.

2. Supporting RCFs through the RTFO will help to maximise the greenhouse gas (GHG) savings that can be achieved under the RTFO. Since its introduction in 2008, the RTFO has set volume-based targets for the supply of renewable fuels for use in UK transport. These targets are met through a certificate trading scheme. In 2020, renewable fuels supplied under the RTFO saved 4.81 million tonnes of GHG emissions. That is the equivalent to the annual GHG emissions of 2.3 million average cars. RCFs can help to meet ambitious and growing RTFO targets, ensuring that the RTFO can continue to make an important contribution to future UK carbon budgets.

3. The transport sector now accounts for the largest share of UK GHG emissions – 24% of domestic emissions in 2020. Therefore, transport decarbonisation is central to the UK's pathway to reduce economy wide GHG emissions and achieve net zero by 2050. RCFs can play a key role in this as a source of low carbon fuel for sectors that cannot be easily electrified such as heavy goods vehicles and aviation. This will complement other policy initiatives set out in the Transport Decarbonisation Plan and Net Zero Strategy.

The need for intervention

4. To date, the RTFO has only supported fuels from renewable sources. RCFs are not classified as renewable fuels as they are made from fossil-derived wastes (e.g. non-recyclable plastic waste or industrial waste gases) that would otherwise be landfilled or incinerated. However, RCFs can provide significant carbon savings compared to traditional fossil fuels like petrol, diesel and kerosene.

5. RCFs will have an important part to play in future carbon budgets as they are a key potential source of sustainable aviation fuel (SAF). However, high costs are

associated with the advanced fuel technologies required for their production, and therefore are not currently delivered at scale to the UK market. Supporting RCFs under the RTFO will increase the range of feedstocks eligible for support and encourage the innovation needed to increase deployment of low carbon fuels in transport sectors that are more challenging to decarbonise, such as aviation and heavy goods vehicles. This will complement our proposed SAF mandate.

6. There are further co-benefits beyond GHG savings to be realised from supporting RCFs under the RTFO. Processing difficult to manage wastes into transport fuel supports the development of a circular economy. Furthermore, UK industry is an early mover in developing and deploying RCF production capacity, supported by grant funding from the Department for Transport (DfT). Revenue support through the RTFO will help to grow this sector, delivering benefits for the UK economy and supporting the Government's levelling-up goals. This domestic production capacity will also support the UK's long-term energy security.

7. To introduce support for RCFs into the RTFO we will need to amend the Energy Act 2004 and lay secondary legislation to amend the RTFO Order 2007. The measure is expected to be part of the forthcoming Transport Bill.

Consultation objective and proposals

8. DfT consulted on supporting RCFs through the RTFO in the 2021 consultation Targeting net zero - next steps for the Renewable Transport Fuels Obligation. The majority of respondents to the consultation agreed that RCFs should be supported under the RTFO. However, there was significant variation in responses on how to implement this.

9. In our response to the consultation, we committed to supporting RCFs while also recognising that some areas would benefit from further consultation. Following additional research and stakeholder engagement, we are consulting on three aspects of RCF policy: 1) criteria for eligibility, 2) ensuring sustainability, 3) level of reward.

Criteria for eligibility

10. In our 2021 consultation, we proposed that two types of RCF feedstocks - refuse derived fuel (RDF) and waste industrial gases - should be made eligible for RTFO support. Respondents to the consultation suggested that this was overly restrictive and provided strong arguments in support of including a wider range of feedstocks. Recognising this, we are now proposing a principles-based approach to feedstock eligibility. This proposal sets out criteria that RCFs would be assessed against to be deemed eligible for reward, including feedstock eligibility and biogenic content requirements. We propose an assessment method similar to that currently undertaken by the RTFO Administrator for determining whether biologically derived waste feedstocks can be considered double counting wastes.

Ensuring that recycled carbon fuels are sustainable

11. The RTFO includes significant safeguards to ensure the sustainability of renewable fuel supported under the scheme. Respondents to the consultation unanimously agreed that to be eligible for support RCFs should be required to meet similar sustainability and environmental standards. There was, however, disagreement about some of the more detailed requirements proposed. This consultation seeks to address and consolidate those comments, and to bring forward proposals to ensure that the RTFO only supports RCFs where they can deliver true and substantial GHG savings while maximising co-benefits and avoiding adverse sustainability outcomes. On that basis, we are now providing refined proposals on the following:

    - a tailored GHG emissions methodology that follows a counterfactual approach, comparing the GHG emissions from RCF production to the most likely alternative fate
    - an ambitious GHG emission savings threshold that ensures that RCFs deliver substantial GHG reductions and remains stringent as the electricity grid decarbonises
    - reporting and verification requirements, including additional sustainability criteria, that will give confidence that RCFs are supplied sustainably

Rewarding the supply of recycled carbon fuels

12. In our 2021 consultation we proposed that RCFs would receive development Renewable Transport Fuel Certificates (dRTFCs) and proposed different reward rates for gaseous and solid feedstocks. Based on consultation feedback, we have reviewed our proposal and now propose to align the treatment of all RCF feedstocks. We propose a level of reward of 0.5 dRTFCs per litre. However, we invite views on whether and why a higher rate of reward should be considered and how this can be achieved sustainably. The proposed 0.5 dRTFC per litre reward rate is lower than for renewable fuels to reflect the fossil-derived nature of RCFs and to minimise risk of diverting recyclable plastics into fuel production.

Next steps

13. We encourage all interested parties to review this consultation and respond to the information in the following sections. Once the consultation concludes, we will review and carefully consider all the responses received. We will then publish a government response in due course, setting out the adopted policies we intend to take forward and implement.

How to respond

The consultation period began on Tuesday 19th July and will run until Monday 19th September. 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 on gov.uk or you can contact LowCarbonFuel.Consultation@dft.gov.uk if you need alternative formats (Braille, audio CD, etc.).

Please send consultation responses to the following email address:
LowCarbonFuel.Consultation@dft.gov.uk

We strongly encourage responses by email. If you are unable to respond via email, we would invite you to please let us know by asking someone to email on your behalf. If none of the above is possible, then we invite you to provide responses to:

Low Carbon Fuels Team
Department for Transport
Zone 1/32 Great Minster House
London
SW1P 4DR

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.

If you have any suggestions of others who may wish to be involved in this process, please contact us.

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.

Confidentiality and data protection

The Department for Transport (DfT) is carrying out this consultation to gather evidence to inform our recycled carbon fuel (RCF) policy. As part of this consultation we are asking for your name and email address. This is in case we need to ask you follow-up questions about any of your responses. You do not have to give us this personal information. If you do provide it, we will use it only for the purpose of asking follow-up questions.

If responding on behalf of an organisation we may also request the following information:

- organisation name and type, for identification
- organisation size, to weight responses accordingly
- organisation country of location, to understand the domestic and international context

This consultation and the processing of personal data that it entails is necessary for the exercise of our functions as a government department. DfT will, under data protection law, be the Controller for this information. DfT's privacy policy has more information about your rights in relation to your personal data, how to complain and how to contact the Data Protection Officer.

As RCF policy has many interactions with other government policy and work, to ensure we develop an effective policy we may share your responses with other government departments, such as the Department for Business Energy and Industrial Strategy (BEIS) and the Department for Environment, Food and Rural Affairs (Defra). We will remove personal details before we share your response with other government departments.

We will not use your name or other personal details that could identify you when we report the results of the consultation. Any personal information you provide will be kept securely and destroyed within 3 years of the closing date.

Consultation principles

The consultation is being conducted in line with the Government's key consultation principles which are available at https://www.gov.uk/government/publications/consultation-principles-guidance.

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

Consultation Co-ordinator
Department for Transport
Zone 1/29 Great Minster House
London SW1P 4DR
Email consultation@dft.gov.uk

1. Introduction

In March 2021, we consulted on introducing support for recycled carbon fuels (RCFs) through the Renewable Transport Fuel Obligation (RTFO). In our July 2021 government response, we committed to support RCFs and we reiterated this commitment in the Transport Decarbonisation Plan and Benefits of Brexit paper. Following this high-level commitment, we are consulting here on how to ensure that RCFs are sustainable, have suitable eligibility criteria, and an appropriate level of reward.

What are Recycled Carbon Fuels?

RCFs are different to renewable fuels in that they are produced from fossil wastes that cannot be prevented, reused, or recycled. Examples of feedstocks include the fossil fraction of municipal solid waste (MSW) (e.g. non-recyclable plastic) and industrial waste gases.

There can be environmental benefits to producing fuels from fossil wastes if they can be more efficiently processed into fuel instead of disposing of them via conventional means, such as landfill or incineration. They can deliver greenhouse gas (GHG) emission savings, as the produced fuel can be used to displace conventional transport fuel.[1]

Many fuels could potentially be produced from RCF feedstocks but there is particular interest in those that could provide drop-in replacements for existing fossil fuels, helping to decarbonise sectors that have fewer alternative decarbonisation options such as electrification. For example, RCFs that are chemically similar to fossil diesel and petrol can be produced and mixed to very high blends to decarbonise heavy goods vehicles. There is also considerable interest in using RCF feedstocks to produce sustainable aviation fuel (SAF). By directing unavoidable fossil wastes towards decarbonising the most challenging sectors, RCFs can encourage the most effective use of waste.

[1] The potential environmental benefits of RCFs are demonstrated in a 2019 research report previously produced to inform this policy. Also see Figure 5.

RCFs and the Renewable Transport Fuel Obligation

Support for fuels under the RTFO is currently limited to renewable fuels (i.e. biofuels and renewable fuels of non-biological origin (RFNBOs)). RCF feedstocks are not currently supported as they are of fossil origin and cannot therefore be defined as 'renewable'.

In March 2021, we consulted on supporting RCFs under the RTFO. We proposed to extend the scope of the RTFO so that suppliers of sustainable RCFs would be able to claim development fuel Renewable Transport Fuel Certificates (dRTFCs). In proposing to include RCFs in the RTFO scheme, we sought views on how such fuels might be included.

There was a large consensus supporting RCF inclusion, and we committed in the Government Response to take forward our proposals to support RCFs made from refuse derived fuel (RDF) and from waste industrial gases, as well as our proposal that support should be limited to RCFs that are of a development fuel type. However, there was significant variation of opinion on how to include RCFs in the RTFO with evidenced arguments brought forward both for and against our proposals regarding feedstock eligibility and biogenic content, the reward rate, and the proposed GHG methodology and threshold. Consequently, after reviewing additional evidence, commissioning further research, stakeholder engagement, and developing alternative proposals, we are now issuing this further consultation to explore how best to support RCFs under the RTFO.

Policy goals and benefits

The primary aim of this policy is as follows:

> *To support RCFs where they can deliver true and substantial greenhouse gas (GHG) savings while maximising co-benefits and avoiding adverse sustainability outcomes.*

The potential benefits of this policy can be further broken down as follows:

1. **Increase GHG savings:** Expanding the RTFO scheme to include RCFs increases the range of feedstocks that can be eligible for support under the RTFO, increasing the total amount of low carbon fuels used overall. This contributes to greater GHG savings, thereby, supporting the main goal of the RTFO and helping to meet net zero targets and carbon budgets.

2. **Support the greater recovery of biogenic wastes for fuels:** Where fossil and biogenic wastes are commingled (e.g. municipal solid waste), this policy will help to make the recovery of the biogenic waste for fuel production viable.

3. **Make effective use of difficult to manage wastes:** Utilising non-recyclable fossil wastes for fuels is, in accordance with the waste hierarchy, preferable to disposal in landfill and can offer benefits compared to incineration in energy from waste (EfW) plants. RCFs can contribute to the UK's circular economy by diverting waste from landfill and supporting advanced development fuel facilities. RCFs have the potential to make an important contribution to net zero goals as they are suitable for producing aviation fuel and 'drop-in' road fuel suitable for heavy goods vehicles – sectors with fewer decarbonisation options.

4. **Support UK SAF production:** As set out in the ten point plan for a green industrial revolution, there is strong appetite across government and industry to rapidly ramp up SAF production, for which RCFs could provide a key feedstock. This policy signals the government's commitment to support the budding advanced fuels industry.

5. **Fuel security:** UK industry is an early-mover in developing RCF production capacity, with several early-stage projects being supported by DfT grant funding such as the £15m Green Fuels, Green Skies competition in 2021/2022 (see Figure 1). By supporting this emerging industry, RCFs can offer an additional stream of domestic fuel production, reducing demand for foreign imports and contributing to the British energy security strategy.

6. **Levelling-up:** Prospective production plants are concentrated in former industrial centres in the North of England and South Wales (see Figure 1), supporting the goals set out in the Levelling Up White Paper.

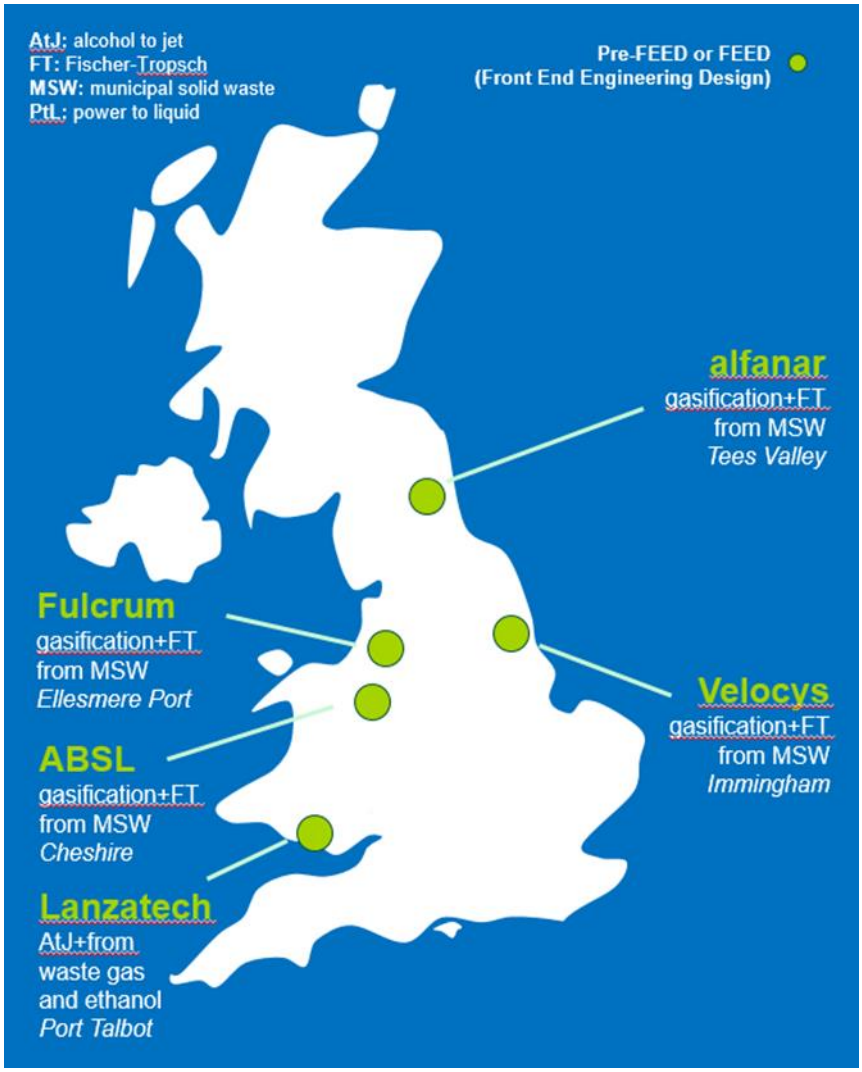

Figure 1 Map of prospective RCF production plant projects receiving support under the Green Fuels, Green Skies competition.

Complementary and interacting government policies

This policy sits alongside several other key government policies and priorities and we are working closely with other government departments to ensure alignment. For example, this policy is designed to reinforce the waste hierarchy (Figure 2) and is aligned with efforts to reduce landfill such as through the landfill tax. The policy is being developed in parallel with the proposed SAF mandate to ensure that support for RCFs under the RTFO assists our ambition to accelerate UK SAF production and use. We are also working closely with the department for Business Energy and Industrial Strategy (BEIS) to align with wider decarbonisation and net zero targets, and interacting policies such as the industrial carbon capture business model. This includes working to ensure that support schemes are effectively targeted and cost-effective, avoiding over-subsidy. Relatedly, a recent consultation on the UK Emissions Trading Scheme (UK ETS) included a call for evidence on expanding the UK ETS to include waste incineration and energy recovery facilities.

This policy will also sit alongside wider policy efforts to reduce overall residual waste arisings, to prevent more plastic specifically from becoming waste in the first instance, and to re-use or recycle more plastic waste where it cannot be prevented. These measures include HMT's Plastic Packaging tax, which came into force on the 1st April 2022, and Defra's waste reforms, including Extended Producer Responsibility for packaging, a Deposit Return Scheme for drinks containers, and consistency in household and business recycling.

On 16 March 2022 Defra published an environmental targets consultation, including on a statutory target required by the 2021 Environment Act to reduce residual waste (excluding major mineral wastes) by 50% from 2019 levels (kg per capita) going to landfill, put through incineration (including EfW incineration), sent overseas for energy recovery or used in energy recovery for transport fuel.

Managing and mitigating risk

While there are considerable environmental benefits to be realised through the introduction of support for RFCs under the RTFO, there are also accompanying risks. The UK will be one of the first countries globally to introduce an incentive scheme of this kind for RCFs and so the risk of unexpected and unforeseen consequences is relatively high. The policy proposals outlined in this consultation have been designed to manage and mitigate risks from known and unknown adverse consequences. Crucially, the proposals have embedded flexibility to allow both industry and government to be responsive to new evidence as well as technological and market developments that change the risk profile.

A 2018 report produced for DfT by E4Tech highlighted several key risks associated with introducing support for RCFs under the RTFO. For example, if the wrong feedstocks are incentivised, production and use of the fuel could lead to increased lifecycle GHG emissions relative to the alternative waste disposal scenario. Non-GHG environmental impacts, such as air pollution, could also result from the production and use of the fuel could cause non-GHG environmental impacts, such as air pollution. The policy proposals in this consultation include a robust counterfactual GHG methodology (Chapter 3), strict feedstock eligibility criteria (Chapter 2) and additional sustainability criteria (Chapter 3) to mitigate and avoid these risks.

Producing RCFs from feedstocks that would otherwise have been landfilled or incinerated is consistent with and reinforces the waste hierarchy (Figure 2) as producing RCFs represents a recovery operation. However, if viable options for using the feedstock exist higher up in the waste hierarchy, such as recycling, then producing RCFs from the waste would undermine the waste hierarchy. Furthermore, if the incentive is too high, the use of a waste feedstock could increase the production of that waste and thereby increase the use of fossil fuels. These considerations are explicitly integrated into the feedstock eligibility criteria proposal (Chapter 2) while the proposed conservative reward rate (Chapter 4) further reduces this risk.

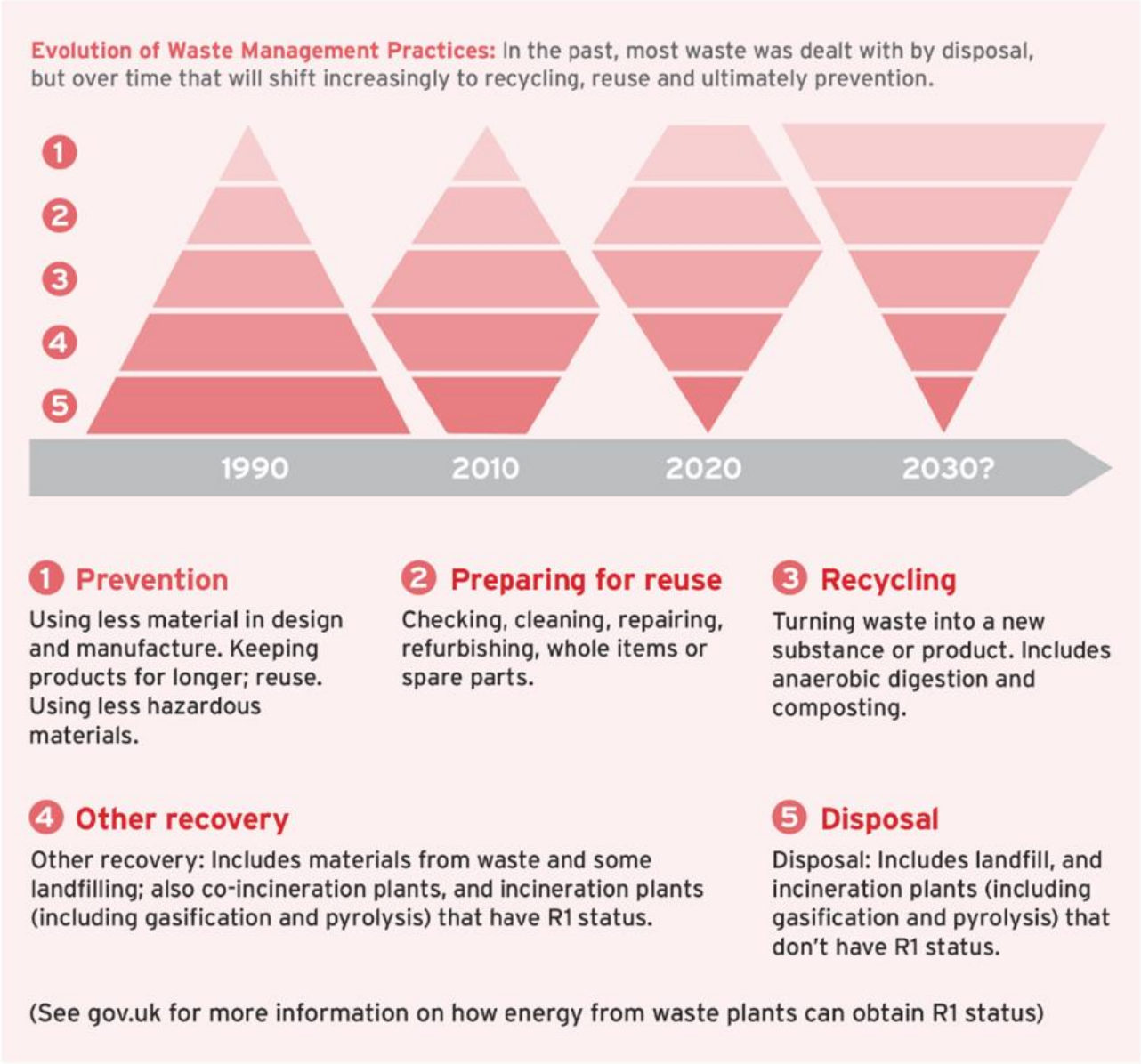

Figure 2 The waste hierarchy (Source: Defra, 2021)

An additional commercial risk exists where investment in this area depends on long-term certainty of supply and support. Whilst large volumes of suitable fossil waste are currently incinerated or landfilled, the long-term availability and sustainability of using fossil waste for fuel production is uncertain. Availability may reduce in the future, as we seek to reduce residual waste arisings. This uncertainty could undermine the commercial viability of RCF production plants. Our policy proposals have been developed to avoid creating uncertainty

for industry while ensuring that sustainability controls are maintained. Alongside the proposals in this consultation, DfT also provides grant funding and is developing policy to support the scale-up of SAF production facilitates, including RCF plants. These initiatives will further support industry to develop and deploy RCF production capacity in the face of uncertainty.

2. Criteria for eligibility

Previous proposals and consultation response

In the 2021 consultation, the government proposed that two types of RCF feedstock would be eligible to claim development Renewable Transport Fuel Certificates (dRTFCs) under the Renewable Transport Fuel Obligation (RTFO) scheme. The two feedstocks were refuse derived fuel (RDF) and industrial waste gases. Where RCFs are produced from solid feedstocks, it was proposed that they should contain at least 25% biogenic content, by energy, to be eligible. It was proposed not to support the fossil-derived component of waste rubber because the level of support available to the renewable component of end-of-life (EoL) tyres under the RTFO was considered sufficient to bring that fuel technology to market.

A wide variety of responses to the consultation were received and a large number of respondents argued that the proposals for eligibility were too narrow. Some respondents also suggested that the 25% biogenic content requirement was unnecessarily restrictive, may disincentivise separation of waste, and could promote deliberate commingling of wastes.

The government recognised the considerable level of concern about some of the existing proposals and therefore committed to look again at the feedstock eligibility requirements, taking into account the suggestions provided by respondents.

Fuel type eligibility

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

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

- hydrogen[2]

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

Where hydrogen is the fuel type produced from an eligible RCF feedstock, substantial carbon capture and storage (CCS) will have to be demonstrated in order for it to meet the development fuel definition and therefore be eligible for support under the RTFO. This was outlined in the previous consultation and is in line with the proposals for biohydrogen also outlined in that consultation.

In the government response to the previous consultation, we outlined in detail the responses received and why we had resolved to include only those RCFs that fall into the already defined development fuels category. As a result, we are not further consulting on these proposals here.

Proposal: Feedstock eligibility

In the 2021 consultation, it was proposed that the following two feedstock types would be eligible for support under the RTFO:

- the fossil component of RDF from the mechanical treatment of municipal solid waste streams, which would be inherently mixed with biological material
- industrial waste process gases containing carbon monoxide, that are only suitable for incineration for energy recovery

A large number of consultation respondents requested a broader definition of eligible RCF feedstocks and a more flexible approach to encourage innovation. Other potential feedstocks highlighted included EoL tyres, non-recyclable plastic and waste gases not containing carbon monoxide.

In response, we have developed an alternative approach which would involve determining feedstock eligibility based on a set of principles. This approach is in line with suggestions made by stakeholders in response to the 2021 consultation.

A principles-based approach to feedstock eligibility

A principles-based approach is already undertaken by the RTFO Administrator for determining whether biologically derived waste feedstocks can be considered double counting wastes. See Chapter 4 of the RTFO Compliance Guidance for more details.

[2] In the 2021 RTFO Consultation, we proposed that where hydrogen is derived from biomethane sources, it would only be considered a development fuel if substantial carbon capture and storage (CCS) is employed.

It is proposed that a broadly similar approach could be taken for determining eligibility of RCF feedstocks for reward under the RTFO. However, because of the distinct nature of RCF feedstocks as non-renewable, there are also differences between the existing process for biogenic wastes and the proposed approach for RCFs.

To be eligible for support as an RCF under the RTFO, the material would be required to meet the RTFO definition of waste[3] and must be a waste that cannot be prevented, reused, or recycled – in accordance with the waste hierarchy.

If the RTFO Administrator has established that the material in question meets the definition of a waste, it is then proposed that the RTFO Administrator would consider the following factors to determine whether the potential RCF feedstock is eligible for support. These are the same factors currently considered for biogenic wastes:

1. The effects of the feedstock on the following (as set out in the Energy Act 2004):

    - carbon emissions
    - agriculture
    - other economic activities
    - sustainable development
    - the environment generally

2. Any alternative uses and alternative disposal outcomes that could have been adopted or used for the relevant residue or waste.

However, unlike for biogenic wastes, the decision taken by the RTFO Administrator would be an absolute one concerning whether or not the feedstock is eligible, rather than whether it would single or double count.

The RTFO Administrator will consider a broad range of evidence in making any determination on the eligibility of a material. It is very unlikely that the material will be considered eligible for support if there is a risk of adverse environmental outcomes. For example, if there is evidence that eligibility of a material might incentivise the increased production of the waste, disincentivise good waste management practices (e.g. separation of waste), or if the material is currently recyclable using best available techniques (BAT). In determining whether a material is recyclable, the RTFO Administrator may also take into account new technological developments anticipated in the short- to medium-term, such as a recycling technology that is proven but not yet scaled-up.

In considering alternative uses and disposal outcomes, a feedstock is unlikely to be deemed eligible if there is a risk that RCF eligibility will divert feedstock from EoL fates with high counterfactual emissions (such as cases where the feedstock would be replaced purely by fossil fuels) or risks undermining the ability of other industries to decarbonise. However, to note, a feedstock that happens to have EoL fates with high counterfactual emissions does not necessarily mean it would be ineligible, if sufficient GHG emission savings can still be demonstrated. Fuel producers are also expected to seek out and maximise the use of feedstocks where they are not already critical to another industry's

[3] As per the RTFO Order: *'waste' means any substance or object which the holder discards, or intends or is required to discard, but does not include any substance or object that has been intentionally modified or contaminated for the purpose of transforming it into a waste.*

decarbonisation efforts. Where this is a potential risk, RCF producers will need to demonstrate to the RTFO Administrator that there is not a risk of diversion.

Question 1: Do you agree or disagree that a principles-based approach should be taken to determining RCF feedstock eligibility?

Question 2: Do you agree or disagree with the proposed criteria? Are there any additional criteria we should consider?

Process for determining eligibility

If a principles-based approach is taken forward, there are different options for determining eligibility of feedstocks based on the above-described criteria.

Note that, after considering the responses to the 2021 consultation, we have already committed to support RDF and industrial waste gases under the RTFO and so regardless of any additional criteria for feedstock eligibility, these two feedstocks will be eligible. Eligibility of further RCF feedstocks would be determined through the processes outlined below.

In line with the treatment of biogenic wastes under the RTFO, RCF feedstocks that have been assessed to be eligible, including RDF and industrial waste gases, will remain eligible unless evidence emerges to indicate that a material should be treated differently. If such evidence emerges, the RTFO Administrator may choose to reassess the feedstock. This may lead to the RTFO Administrator clarifying the definition of the feedstock in question or removing eligibility altogether. Any decisions taken on this will be clearly communicated to and discussed with stakeholders in advance of changes to eligibility.

Option 1 (preferred approach): A rolling assessment

One option is to have a flexible timetable whereby prospective RCF suppliers can submit applications at any time for assessment. This would be consistent with how the RTFO Administrator currently assesses biogenic wastes to determine whether they are double counting wastes and would allow maximum flexibility. Similar to current practice with biogenic feedstocks, any newly assessed feedstocks would be added to the RTFO feedstock list and communicated to RTFO account holders through established channels. If evidence emerges that a previously assessed feedstock might no longer meet the required principles, the RTFO Administrator may decide to reassess it.

It is important to emphasise that while this approach conveys flexibility, the assessment process is still likely to take several months to allow for the necessary consideration by the RTFO Administrator and, if necessary, the commissioning of research and stakeholder consultation to inform the decision. This added flexibility also conveys an increased administrative burden.

Given that this approach is most aligned with current practice followed by the RTFO Administrator for biogenic wastes, this is our preferred approach.

Option 2: Annual assessment

An alternative to Option 1 would be to have an annual assessment process for determining feedstock eligibility. In this case, prospective RCF suppliers would submit applications by a specified date which can then be assessed by the RTFO Administrator with the help of technical research support if necessary. If evidence emerges that a previously assessed feedstock might no longer meet the required principles, the RTFO Administrator may decide to reassess it as part of the annual assessment cycle. This would result in an annually updated list of eligible feedstocks.

An outline of some indicative timelines for this assessment approach is as follows:

1. **31st March, Year X:** Deadline for submitting applications to the RTFO Administrator for inclusion as an RCF feedstock. As with the current process for biogenic wastes, a template application form will be provided by the RTFO Administrator.

2. **April-September, Year X:** The RTFO Administrator commissions necessary research and engages with stakeholders where necessary to consider which applications satisfy the specified criteria.

3. **Before 31st September, Year X:** The RTFO Administrator publishes an updated list of eligible RCF feedstocks for year X+1.

4. **1st January, Year X+1:** Any newly added RCF feedstocks become eligible for development renewable transport fuel certificates (dRTFCs).

This approach would allow flexibility while also creating a clear process and timetable for new feedstocks to be assessed against the principles for feedstock eligibility. Feedstock assessments are likely to require in-depth consideration by the RTFO Administrator, stakeholder engagement, and potentially the commissioning of additional research to ensure any decisions taken are appropriately evidence based – this option would allow time for this to take place. On the other hand, this approach is also fairly rigid and locks in lead times between applications being made and feedstocks becoming eligible.

Question 3: What is your preferred option for determining feedstock eligibility? Please justify your answer and provide supporting evidence where appropriate / available. We also welcome feedback from stakeholders concerning how to best to structure an annual assessment process.

Proposal: Minimum biogenic content requirements

Since the previous consultation we have reviewed our proposal to require that solid RCF feedstocks contain at least 25% biogenic content by energy. We have taken on board feedback that the proposal as originally drafted might disincentivise the segregation of waste and promote the commingling of biogenic and fossil wastes, neither of which would reflect the policy intent of the proposals.

One particular issue relates to the system-boundary over which the biogenic content requirement is applied, as some suppliers are likely to separate MSW on-site at their RCF production plant while others might procure processed feedstock (e.g. from a material

sorting facility). Therefore, considering biogenic content at the factory gate is likely to be inconsistent, while considering biogenic content at the point of processing may disincentivise separation of waste if set at too high a level.

However, we are committed to focus RCF production on the most problematic wastes, and we need to ensure that eligibility under the RTFO does not lock-in waste streams or undermine efforts to increase rates of material and chemical recycling. In reviewing the proposals, we have therefore considered the stakeholder feedback received alongside the need to ensure that our policies promote the waste hierarchy. In doing so, we have identified several other aspects of our RCFs policy through which we can ensure that only non-recyclable material is used in RCF production:

- setting the reward rate at a conservative level, ensuring that the subsidy remains reasonably low in comparison to the price of recyclable plastics (see page 42)
- including in the feedstock eligibility process (see page 20) an explicit principle concerning alternative use (including recyclability) and reassessing feedstocks if the situation changes (e.g. new technologies emerge)
- ensuring that suitable supply-chain assurance is in place through third-party assurance and voluntary schemes to ensure that facilities have processes in place to separate out recyclable material (see page 40)

The above-listed proposals help to ensure that only the desired types of fossil waste are directed into RCF production reducing the need for an explicit biogenic content requirement. However, given the risks associated with this policy and the complexity of the waste management sector, we believe that there may still be a place for a biogenic content requirement in the policy mix. With this in mind, we are seeking stakeholder feedback on two options:

1. Removing (with caveats) the explicit minimum biogenic content requirement.

2. Reducing the biogenic content threshold to a lower level.

Option 1 (preferred approach): Remove the explicit minimum biogenic content requirement

In this option, the explicit biogenic content requirement would be removed. This option is made feasible by the new proposals being brought forward in this consultation concerning feedstock eligibility and the additional sustainability criteria (as mentioned above). However, the RTFO Administrator would still have the option to include a minimum biogenic content requirement in the definition of specific feedstock types if deemed appropriate to ensure that only the most problematic wastes are made eligible for RTFO support. Similarly, when assessing feedstock eligibility, pure and contaminated plastic waste streams would likely be assessed separately. Pure plastics waste streams are less likely to meet the feedstock eligibility criteria and even if accepted, different counterfactuals might be specified due to differences in potential EoL fates.

If pursuing this option, it will be particularly important to ensure stringent sustainability controls are in place through other measures, such as the proposals concerning feedstock eligibility and additional sustainability criteria. Subject to these proposals being taken

forward, Option 1 is our preferred approach for the minimum biogenic content requirements due to its inherent flexibility.

Option 2: Reduce the threshold to a lower level

This option would involve reducing the biogenic content requirement to a lower level, requiring non-gaseous RCF feedstocks to contain at least 10% biogenic content by energy. This lower threshold would help to encourage higher levels of waste separation and act as an additional safeguard to ensure that pure fossil plastic waste streams that could be subjected to chemical or physical recycling are not used for RCF production.

The biogenic content would typically be measured after processing but before conversion into RCF (e.g. at the point of entry into a gasifier) as suppliers will already need to determine the biogenic content of their feedstock at this point to calculate the proportion of the finished fuel that is biofuel and the proportion that is RCF. However, where a producer puts in place processing technologies to separate biogenic material for alternative uses, such as anaerobic digestion, the RTFO Administrator may, on a case-by-case basis, permit the measuring of the biogenic content at an earlier stage in the supply chain for the purposes of meeting the biogenic content requirement.

Question 4: What is your preferred option for the minimum biogenic content requirement? Please justify your answer and provide supporting evidence where available.

3. Ensuring that recycled carbon fuels are sustainable

Introduction and context

The introduction to this document sets out our rationale for introducing support for recycled carbon fuels (RCFs) under the renewable transport fuel obligation (RTFO) based on the environmental benefits they can deliver in comparison to existing end-of-life (EoL) fates for typical RCF feedstocks. However, much like for renewable fuels already supported under the RTFO, positive environmental outcomes are not guaranteed (see page 14). Therefore, the policy framework for RCFs needs to take account of the direct and indirect impacts of using RCF feedstocks for transport fuel and should seek to avoid and mitigate any potential adverse outcomes.

In part, this should be achieved through setting robust eligibility criteria as outlined in the previous section. This chapter outlines additional proposals to ensure that RCFs are produced sustainably, focussing on a refined greenhouse gas (GHG) emissions methodology, alternative proposals for setting the emission savings threshold and new provisions for supply-chain assurance.

In developing these revised proposals, DfT has engaged with stakeholders to establish a robust policy framework that mitigates sustainability risks in a pragmatic way, avoiding unnecessary complexity or uncertainty and leveraging existing approaches where possible.

Greenhouse gas emissions methodology

In the 2021 consultation, we proposed a GHG emissions methodology for RCFs which calculates emissions relative to the alternative ‘counterfactual’ use. This is distinct from the attributional methodology currently used to account for the GHG emissions associated with renewable fuels under the RTFO.

This difference reflects the fundamentally different nature of RCFs, which embody fossil rather than biogenic carbon. When RCFs are burned, fossil carbon is released. As a result, an attributional methodology for calculating the GHG emissions of RCFs would

demonstrate minimal environmental benefits compared to conventional fossil fuels – the environmental benefits of RCFs are realised when conversion of feedstock to RCFs delivers greater carbon savings compared to the counterfactual use (e.g. incineration). Therefore, when assessing RCFs to determine whether or not they deliver environmental benefits, we propose to compare the emissions resulting from the production and use of the RCF to the emissions resulting from the otherwise expected or 'counterfactual' treatment of the feedstock (e.g. incineration).

Due to the counterfactual methodology, where emissions occur in both the counterfactual and RCF use case, they can be cancelled out, simplifying the calculation. This is the case for the embodied carbon emissions from the fossil waste itself. However, many potential RCF feedstocks also deliver 'utility' (such as electricity generation) in their current EoL fate which is lost when the feedstock is used to produce RCFs. Therefore, to ensure a fair and robust comparison is made, the emissions associated with replacing this lost utility must also be accounted for. The logic behind this methodology is shown graphically in Figure 3 and outlined in full in the box below.

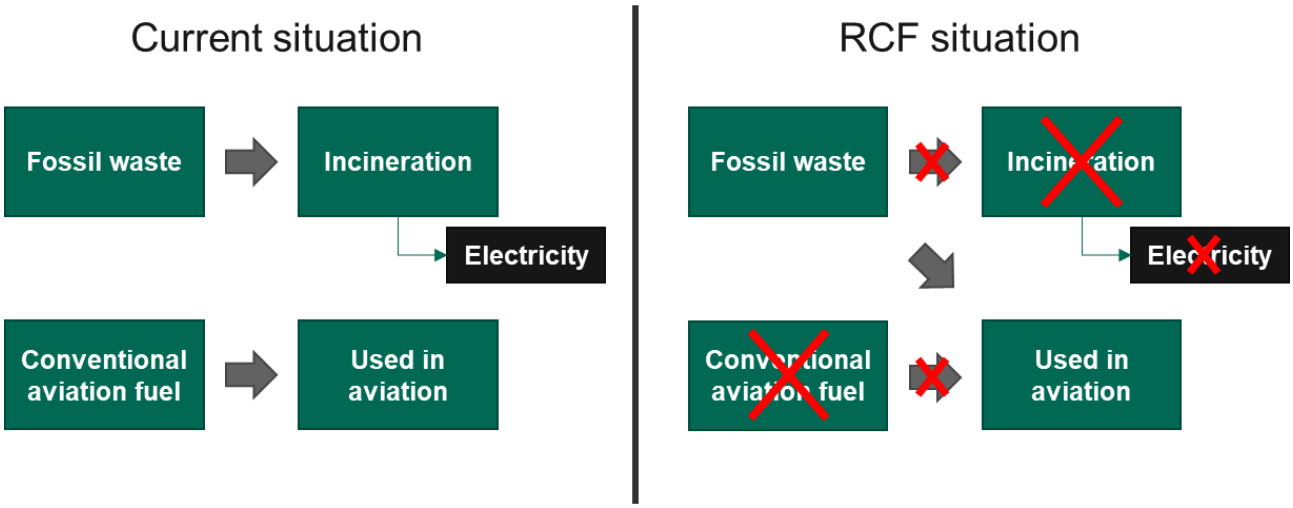

Figure 3 Simplified description of the GHG assessment methodology used to assess RCFs.

RCFs GHG emissions methodology

Under the counterfactual methodology, the GHG emissions from the production and use of RCFs, E, is calculated as:

$E = E_{prod} + E_{td} + E_{disp} - E_{CCS}$

Where:

- E = total emissions from the use of the fuel (gCO_2e/MJ)
- E_{prod} = emissions from production and processing (gCO_2e/MJ)
- E_{td} = emissions from transport and distribution (gCO_2e/MJ)
- E_{disp} = emissions from displaced energy use (gCO_2e/MJ)
- E_{CCS} = emission saving from carbon capture and storage (gCO_2e/MJ)

And

$$E_{disp} = \frac{Ef_e \times E_e}{Ef_{RCF}}$$

Where:

- Ef_e = Efficiency of conversion in counterfactual use (%)
- E_e = Emission factor of the displaced energy in counterfactual (gCO_2e/MJ)
- Ef_{RCF} = Efficiency of conversion to RCF (%)

In the 2021 consultation, over half of respondents agreed with the proposed methodology. Of those who disagreed, arguments against the proposal were generally focussed on specific issues such as the choice of counterfactual and related assumptions such as the efficiency of conversion in the counterfactual use. Respondents both for and against the proposal also asked for further clarification concerning which electricity grid carbon intensities to use and how coproducts and processing emissions should be accounted for. In line with stakeholder feedback, we have focussed in this consultation on addressing these concerns and our proposals to this effect are covered below.

Proposal: Choice of counterfactual

Given that different waste disposal methods can have markedly different carbon intensities, the choice of the counterfactual scenario can have a significant bearing on the overall carbon intensity of an RCF. Additionally, determining the appropriate counterfactual for a given feedstock is complicated by data-scarcity, evolving waste treatment standards, indirect market effects, and variability between countries/regions and over time. Accordingly, a large number of the responses to the previous RTFO consultation focussed on the choice of an appropriate counterfactual and the calculation of displacement emissions from the counterfactual.

In reviewing our proposals, we have sought to develop a GHG methodology that:

- reflects the real carbon implications of producing RCFs as accurately as possible
- relies on data that is both ascertainable and robust
- rewards and promotes sustainable practice
- is as simple and clear as possible

We have investigated three potential options for selecting the counterfactual, which are explored in the subsequent sections:

- Option 1: Single default counterfactual
- Option 2: Aggregate counterfactual
- Option 3: Plant-by-plant approach

Our proposed position with respect to the counterfactual choice, which is set out in full in the subsequent subsections, is as follows:

- EfW (electricity only) should be the default counterfactual for all feedstocks
- for non-gaseous feedstocks, the RTFO Administrator can define an alternative counterfactual during the feedstock assessment process (see Chapter 2), or otherwise revise the methodology following an evidence-based approach due to changes in the counterfactual, such as to take account of heat export and/or carbon capture and storage (CCS) if this becomes appropriate
- for gaseous feedstocks, an alternative counterfactual can be defined at a production plant level and, where necessary, will take place during the development fuel pre-approval process that the RTFO Administrator already undertakes

Analysis

To inform this review, we have revisited previous analysis and commissioned fresh analysis. Figure 4, based on figures from a 2019 E4Tech report produced for DfT, shows a range of EoL fates for potential RCF feedstocks in the UK. We have also investigated the potential GHG implications of different counterfactual scenarios. Assuming production emissions of 15 gCO2e/MJ, we have modelled a range of scenarios for the key potential EoL fates to illustrate the impact on the GHG emissions associated with RCFs. The results of this analysis are presented in Figure 5 with the main assumptions outlined in Table 1 (see Annex B for more details). Where electricity generation is displaced, the 2025 grid intensity projection was used following the Treasury Green Book figures.

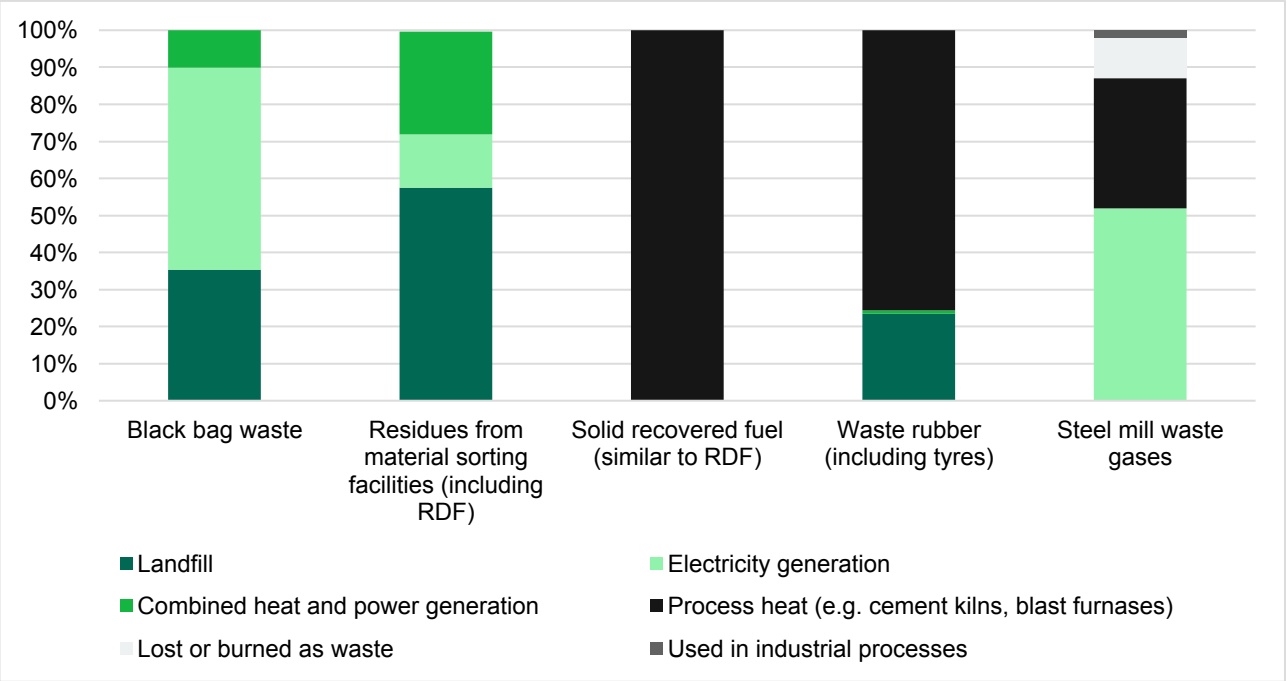

Figure 4 Counterfactual fates for potential RCF feedstocks in the UK (Source: 2019 E4Tech report)

Figure 5 shows that the counterfactual scenario has a significant bearing on the overall GHG emissions. In all cases, lower conversion efficiency of feedstocks into RCF significantly increases the counterfactual emissions per MJ of fuel produced. The emissions associated with replacing energy from waste (EfW) producing electricity only are relatively low in countries like the UK where a significant proportion of the replacement generation capacity is likely to be renewable. On the other hand, where EfW plants also export heat (i.e. combined heat and power (CHP)) they are more efficient, and any heat

not produced and utilised because the feedstock is used for RCF production is likely to be replaced by fossil fuels like natural gas. Similarly, feedstock diverted from process heat applications is likely to be at least partially replaced with fossil fuels such as natural gas or coal resulting in substantially higher emissions.

In the medium-term, CCS is expected to be applied to some waste treatment routes such as EfW (electricity only) plants which would make the comparative GHG savings from RCF use more marginal. However, small GHG savings are still realised relative to the 94 gCO2e/MJ fossil fuel comparator even with a 90% CCS deployment in the counterfactual. Furthermore, it is also possible that CCS could be deployed at RCF production plants. This is not included in the analysis presented here which assumes that there is no CCS utilised during RCF production, but if it were deployed it could significantly improve the relative GHG performance of the RCF route.

Counterfactual	High emissions scenario	Mid-range scenario	Low emissions scenario
Energy from waste (electricity only)	40% RCF conversion efficiency	50% RCF conversion efficiency	60% RCF conversion efficiency
Energy from waste, combined heat and power (CHP)	100% CHP deployment	16% CHP deployment	5% CHP deployment
Process heat	Replacement fuel: 100% coal	Replacement fuel: 88.5% coal, 3.2% gas and 8% biomass	Replacement fuel: 50% natural gas and 50% biomass
Energy from waste, electricity, with CCS	90% CCS deployment	50% CCS deployment	10% CCS deployment

Table 1 Main assumptions for the analysis presented in Figure 5. All scenarios follow the same assumption regarding RCF conversion efficiency as in the EfW (electricity only) counterfactual scenario. See Annex B for more details.

The data and analysis presented in Figure 4 and Figure 5 is subject to high uncertainty due to a limited real world data, particularly with respect to the fate of exported waste. The results are highly dependent on assumptions around the level of deployment of technologies like CHP and CCS in the EfW fleet, and what replacement fuels are used in the case of process heat counterfactuals (see Annex B for more details of the assumptions made).

However, even with this uncertainty, it is possible to conclude that a significant quantity of potential RCF feedstocks are currently used (at least partially) to produce heat (Figure 4). It is also widely accepted that heat decarbonisation is more challenging than electricity decarbonisation. Therefore, any diversion of feedstock from heat applications is likely to lead to more marginal GHG savings compared to diverting purely from EfW (electricity only). It is important that these impacts are taken into consideration when determining the appropriate counterfactual.

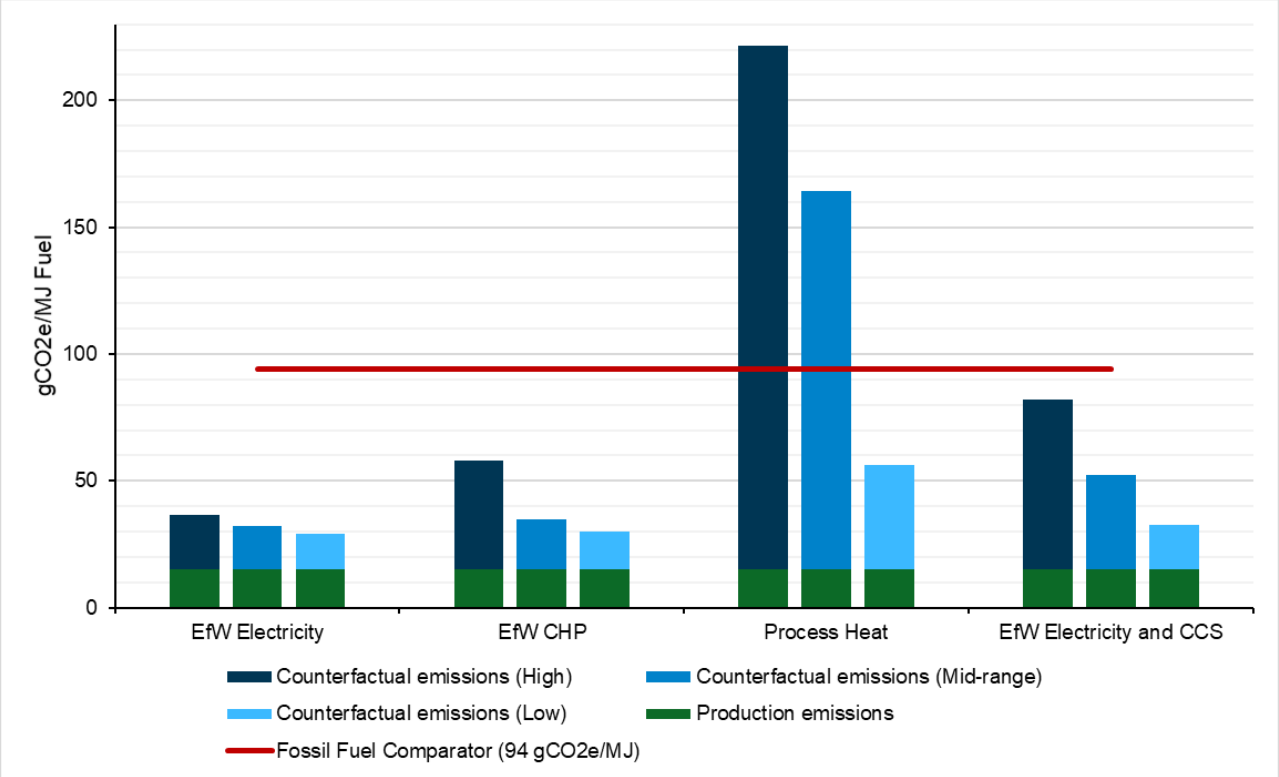

Figure 5 Indicative GHG emissions for RCFs following different EoL scenarios. Where electricity generation is displaced, the 2025 grid intensity projection is used following the Treasury Green Book figures. See Annex B for more details.

Option 1: Single default counterfactual

In the original 2021 consultation, we proposed that the counterfactual selected should be based on the 'next likely' EoL fate for that feedstock. For solid feedstocks, excluding landfill, this is EfW (electricity only).[4] Having this single default position for the counterfactual has advantages. For example, it allows the methodology to be transferable across countries as the grid carbon intensity factor can be substituted with country or region-specific values as appropriate.

However, the most common EoL is not necessarily the 'marginal' EoL from which the feedstock is actually diverted. Figure 4 shows that for many potential RCF feedstocks there is potential that use for RCFs could divert feedstock from heat applications such as EfW (CHP) installations as well as process heat uses (e.g. cement kilns and blast furnaces) leading to more marginal GHG emission savings or even in some cases increasing net GHG emissions Figure 5. In these situations, there is a risk that comparing the emissions to EfW (electricity only) could significantly understate the GHG emissions of RCF use.

In summary, the single default counterfactual, EfW (electricity only), has the benefit of simplicity and relying on easily accessible data but requires a high degree of confidence that the use of feedstock for RCFs is not in reality diverting from an alternative use with greater counterfactual emissions.

[4] The rationale for choosing this counterfactual was explained in detail in the 2021 consultation.

Option 2: Aggregate counterfactual

Another option is to use an aggregate counterfactual where the counterfactual emissions are calculated based on a weighted average of the current EoL fates for a particular feedstock. This was the approach followed in an E4Tech research report previously commissioned by DfT. It requires data on the proportion of each feedstock that follows a particular EoL fate to be calculated alongside emissions factors for each of those fates. The displacement emissions can then be calculated following the equations in the box below.

The use of aggregate counterfactual emissions factors would arguably be the most accurate means of calculating the emissions, but it also has the following drawbacks:

- as with the single counterfactual, the aggregate counterfactual does not necessarily reflect the 'marginal' EoL and it is unlikely that the use of the feedstock will lead to uniform diversion across all EoL fates
- the proportions of different EoL fates vary over time and also between countries and so a different weighting would be needed for each country, or even region

Aggregate counterfactual emissions methodology

The displaced utility from the aggregate counterfactual use (per MJ feedstock) can be expressed as follows:

$$E_{disp}\left[\frac{gCO_2eq}{MJ\ feedstock}\right] = \sum_{i=1}^{n}(E_{utility,i} \times W_i)$$

Where:

- W_i = the proportion of the feedstock currently following the EoL for counterfactual i
- $E_{utility,i} = E_{e,i} + E_{ccs,i}$
- n = the total number of relevant EoL fates

And:

- $E_{e,i}$ is the emission factor of the displaced useful energy in counterfactual i ($gCO2e/MJ_{feedstock}$)
- $E_{ccs,i}$ is the average CCS for counterfactual i ($gCO2e/MJ_{feedstock}$)

The displaced utility per MJ of RCF fuel can then be expressed as follows:

$$E_{disp}\left[\frac{gCO_2eq}{MJ\ fuel}\right] = \frac{E_{disp}\left[\frac{gCO_2eq}{MJ\ feedstock}\right]}{Ef_{RCF}\left[\frac{MJ\ fuel}{MJ\ feedstock}\right]}$$

Where:

- Ef_{RCF} is the conversion efficiency of feedstock into RCF

- accurate data on EoL fates is not always available particularly with respect to the EoL fate for exported feedstock
- any aggregate counterfactual would potentially include landfill, which causes wider environmental problems besides carbon emissions, and there are also uncertainties over the impact on methane emissions

Option 3: Plant-by-plant approach

Finally, a plant-by-plant approach could be taken, whereby the appropriate counterfactual is determined based on where the feedstock is being diverted from for a particular RCF production plant. This would be taken from a snapshot of the historical processing of a particular feedstock prior to its use in an RCF production plant. This would deliver the maximum possible specificity and provides incentive for RCF producers to actively seek out feedstock for which there are limited diversionary impacts.

In reality, as wider Government policy reduces waste volumes (e.g. the newly proposed environmental targets), current EoL fates are not necessarily reflective of the long-term counterfactual, which will likely change over the lifetime of a RCF plant. In the long-term, we anticipate that energy recovery facilities like EfW and RCF plants will absorb an increasing proportion of the remaining residual waste streams. Furthermore, for some feedstocks, particularly those that are currently exported, there is considerable uncertainty concerning their true EoL fate. It is also possible that the use of feedstock for RCF production will have wider, indirect market-based impacts on feedstock supply and demand. These impacts cannot be captured in a plant-by-plant approach.

Preferred approach – single default counterfactual (Option 1) with specific exceptions

On balance, we believe that the approach outlined above in Option 1 and in the previous consultation of having a single default counterfactual for each feedstock remains the most pragmatic option for accounting for the GHG impact of RCFs. Option 2, the aggregate counterfactual approach, has many of the same drawbacks as the single counterfactual while adding considerable complexity and administrative burden. Option 3, the plant-by-plant approach is inappropriate for situations where the feedstock supply is elastic and/or where the feedstock source is likely to vary over time. It would also represent a significant administrative burden for a marginal policy gain.

Further detail on our preferred approach for gaseous and non-gaseous feedstocks is outlined and justified below.

Non-gaseous RCF feedstocks

For non-gaseous feedstocks such as residual wastes, there are strong policy incentives in many countries, including the UK, to encourage, incentivise and oblige the processing of waste feedstocks according to the waste hierarchy. In the UK, organisations that handle waste, such as local authorities, are legally required to manage waste according to the waste hierarchy. The landfill tax further disincentivises disposal. In line with this policy and regulatory framework, it is likely that energy recovery EoL options will become an

increasingly dominant waste management route compared to disposal fates for wastes that cannot be prevented, reused, or recycled.

Therefore, in-line with the previous consultation, we believe that in the medium- to long-term the relevant counterfactuals for waste streams that cannot be prevented, reused or recycled (i.e. those potentially eligible under the RTFO) are likely to be other energy recovery fates such as:

- EfW (electricity only)
- EfW CHP (combined heat and power)
- process heat

If RCF production diverts feedstock from exclusively process heat EoL fates, it is unlikely they would be able to demonstrate sufficient GHG savings to meet the required thresholds and may even lead to increases in overall GHG emissions compared to conventional fossil transport fuels. We believe we can largely mitigate this risk via the proposed criteria in the feedstock eligibility section (page 18) which would exclude RCF feedstocks from eligibility if there is likely to be diversion from fates with high counterfactual emissions. Given these provisions, comparing eligible feedstocks to process heat counterfactuals is unlikely to be necessary or appropriate.

By deduction, we continue to believe that EfW plants are the most appropriate comparator for non-gaseous feedstocks. In the UK, the number of EfW plants actively exporting heat is currently still in the minority[5] and so specifically EfW with electricity export only is proposed to be the default position.

In the medium- to long-term, it is plausible that EfW plants will start exporting heat more widely and/or installing CCS. This would reduce the comparative carbon benefit of using feedstock in RCF production (see Figure 5). Accordingly, we propose that the appropriate counterfactual should be periodically reviewed and revised where necessary to include additional evidence-based factors for heat export and/or CCS if and when this becomes relevant.[6] This is necessary to ensure that the GHG emissions methodology remains accurate and robust while incentivising RCF producers to continuously improve the GHG performance of their own supply chains, making use of the best available techniques (BAT). We note that the proposed GHG methodology enables RCF producers to also use heat export (see section below on co-products) and CCS to improve their GHG performance. Any decisions to include additional factors would be made through stakeholder dialogue with clear communication and appropriate lead times (e.g. coming into force in the following obligation year).

We recognise that future technological and market developments may make additional non-gaseous feedstocks appropriate for RCF use for which the use of EfW (electricity only) as the counterfactual is inappropriate. In such cases, the RTFO Administrator will define an alternative counterfactual and provide associated methodological guidance during the feedstock assessment process (page 18). This might include cases where a

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[5] According to Tolvik's 2020 EfW statistics, 12 out of a total of 54 EfW plants in the UK exported heat totalling 1,651 GWh. This is compared to a total net electricity export of 7,762 GWh.

[6] Indicatively, we would expect to consider the inclusion of additional factors once at least one quarter of EfW plants in the UK have substantial heat export and/or CCS installed.

process heat counterfactual is the most likely EoL fate, but the RCF production route can still demonstrate sufficient savings to meet the GHG emission savings threshold.

Gaseous RCF feedstocks

For gaseous RCF feedstocks, the situation is different in that they generally must be processed at the site at which they arise. For steel mill waste gases, the most common EoL fate is electricity generation (Figure 4) and so we propose that the same default counterfactual of EfW (electricity only) should be used. However, alternative counterfactuals could also be defined for gaseous feedstocks at a production plant level if sufficient evidence is provided – this is appropriate for gaseous feedstocks as, unlike non-gaseous feedstocks, they are typically processed on-site or emitted to the atmosphere. Additionally, suppliers of RCFs produced from industrial gases would be required to demonstrate that heat generation is not displaced by the production of RCFs. If there is evidence that increased heating requirements arise due to the production of RCFs then the RTFO Administrator would consider heat generation to be the counterfactual use. This is proposed to be assessed on a plant-by-plant basis by the RTFO Administrator.

Summary

In summary, our proposed position with respect to the counterfactual choice is as follows:

- EfW (electricity only) should be the default counterfactual for all feedstocks
- for non-gaseous feedstocks, the RTFO Administrator can define an alternative counterfactual during the feedstock assessment process (see Chapter 2), or otherwise revise the methodology following an evidence-based approach due to changes in the counterfactual, such as to take account of heat export and/or CCS if this becomes appropriate
- for gaseous feedstocks, an alternative counterfactual can be defined at a production plant level and, where necessary, will take place during the development fuel pre-approval process that the RTFO Administrator already undertakes

Question 5: Do you agree or disagree with the proposed approach for determining the counterfactual to be used?

Proposal: Use of the grid average carbon intensity for calculating counterfactual emissions

In the 2021 consultation we proposed that the carbon intensity applied to the displaced electricity in the counterfactual, E_e, should be based on the latest published figures for a full reporting year for the average generation of that energy in the country where the feedstock and fuel is produced. In the UK, these figures are published by BEIS each year around June. This means that the most recent figures published at the start of the year are for the year preceding and the average grid carbon intensity figures are based on actual data from two years previous (the methodology is available here). For example, in January 2022, the most recent available grid intensity factors for the UK were from 2019, three years previously.

In the previous consultation responses, several suggestions for alternative approaches were made including using marginal emissions factors (which are generally higher due to more fossil fuels), 20-year averages and current additions to the electricity mix (likely to be lower due to more renewables). We have reviewed the different possible approaches. While marginal emissions factors are now available, they are still under development and are not widely available whereas robust figures for grid average emissions are available in most countries. Comparing purely to additions to the electricity mix is inappropriate as, at least in the near- to medium-term, a reduction in base load provided by EfW plants is likely to lead to an increase in the use of existing gas power plants. Therefore, on balance, we believe that grid average emissions factors are the most appropriate figures to use.

Question 6: Do you agree or disagree that grid average emissions factors for the most recent available year (i.e. the year preceding the year in which the RCF is supplied) should be used as the emissions factor for the displaced energy in the counterfactual?

Proposal: Use of the R1 standard

In our 2021 consultation, we proposed that the efficiency of conversion in the counterfactual use, Ef_e, for EfW (electricity only) should follow the R1 standard with a value of 26%. Several stakeholders disagreed with this choice due to not all UK incinerators currently meeting the R1 standard, a perceived lack of incentive or regulation to encourage incinerators to meet the R1 standard, and the need to take into account power used within the incinerator (so-called parasitic load).

In response to this stakeholder feedback, we have engaged further with stakeholders and with other government departments to further understand the evolving policy framework. For example, all EfW plants in England are regulated by the Environment Agency (EA) and, as part of the environmental permitting process, are required to use the best available techniques (BAT) to maximise energy efficiency. The EA has recently updated energy efficiency requirements as part of their wider BAT conclusions implementation, which are based on meeting a standard of Gross Electrical Efficiency (GEE) that is at least as high, and in most cases higher, than the R1 status requirements. A large majority (currently 32 of 46, according to figures held by the Environment Agency[7]) of EfW plants currently operating under the EA permitting regime now meet the R1 energy efficiency standard: this has been on an upward trend over the last few years and has been achieved without specific regulation. All new build EfW plants should meet R1 by default. Therefore, we continue to see the R1 standard as an appropriate benchmark for EfW plant efficiency.

In addition, we have investigated the parasitic load[8] requirements of EfW plants in the UK. The R1 standard methodology allows EfW plants to include internally circulated heat and electricity to help meet the R1 standard, although any imported heat or electricity is subtracted from the useful power output. Tolvik's 2020 EfW statistics gives the figure for this parasitic load (excluding power import) as averaging 13.7%. Any internally consumed heat or electricity is energy not exported to the electricity grid and so it is not displaced when the waste feedstock is used for transport fuel rather than EfW. Therefore, in order to account for the counterfactual emissions as accurately as possible, we believe that it is

[7] EA data on EfW plants meeting R1 status can be found here.
[8] Parasitic load refers to the energy that is consumed within the EfW plant itself rather than exported.

appropriate to take parasitic load into account when determining the Ef_e factor to be used. Accordingly, we propose to retain the use of the R1 standard as a benchmark, but to revise the 26% figure for Ef_e downwards to 22%[9].

Question 7: Do you agree or disagree that the Ef_e factor for EfW (electricity only) counterfactual should be taken as 22%?

Proposal: Coproducts and processing emissions

In response to the 2021 consultation, several stakeholders raised questions concerning how feedstock processing emissions and co-products would be accounted for under the proposed GHG methodology. We have considered these questions in more detail and outline a proposed position below.

In principle, all emissions should be taken into account where they do not cancel out with the counterfactual use. EfW plants can and do operate with limited processing of the residual waste feedstock. Therefore, any processing required to prepare feedstock for conversion into RCF is likely to be additional and therefore should be taken into account. However, we appreciate that situations vary between feedstocks and specific fuel chains and so we propose that alternative methodological approaches can be followed subject to the agreement of the RTFO Administrator.

Where an RCF production plant produces multiple coproducts (including excess heat or electricity that is exported and utilised), we propose that allocation by energy content should be undertaken, consistent with the current RTFO GHG methodology for biofuels. The factors to be allocated would be E_{disp} and those fractions of E_{prod}, E_{td} and E_{CCS} that take place up to and including the process step at which a co-product is produced.

Question 8: Do you agree or disagree with the proposed methodology for dealing with processing emissions and coproducts? If you disagree please describe an alternative proposed approach and provide any relevant evidence to support the use of this alternative approach.

Proposal: Greenhouse gas emission savings threshold

To be eligible for Renewable Transport Fuel Certificates (RTFCs), suppliers of renewable fuels under the RTFO must meet a minimum GHG emission savings threshold relative to the typical emissions from fossil fuels used in transport. The emission saving is calculated relative to a 'fossil fuel comparator' which from January 2022 onwards has been 94 gCO_2e/MJ. Given the distinct methodology proposed for RCFs (see page 24), it is also appropriate to consider a distinct threshold.

Because of the counterfactual methodology described above, the GHG emissions associated with UK-produced RCFs will automatically decrease - as the UK electricity grid decarbonises, E_{disp} will decrease. We would expect to see similar trends in other countries as they move towards net zero. To ensure that the threshold remains suitably stringent as the grid decarbonises, we propose that the required threshold becomes more stringent with time (i.e. the percentage saving required increases). Without this, RCF production

[9] This is calculated by taking the 26% figure and reducing it by 13.7% to give 22.44%, which rounds to 22%.

facilities would be permitted to reduce their GHG performance (e.g. by switching to a cheaper but more polluting process energy source) as the electricity grid decarbonises, while projects that were previously ineligible for support due to poor GHG performance could later become eligible for support without any underlying improvement in their process.

In the 2021 consultation, we proposed that the threshold would be 55% on introduction, 60% from 2025 and 65% from 2030. This compares to a 65% threshold for new renewable fuel installations under the RTFO. These proposals received a mixed response with some stakeholders arguing for a higher threshold or one aligned with renewable fuels, while others stated that the threshold was too challenging to deliver RCFs, particularly initially. One key issue identified was that if grid decarbonisation does not progress exactly in line with projections, this could cause compliance challenges for RCF producers based on factors that are outside of their control.

To inform our review of this policy we undertook further analysis to explore how the GHG intensity of RCFs following the methodology described earlier in this section is likely to evolve over time. Figure 6 shows three different scenarios for the supply chain and counterfactual emissions (also see Annex B for more details):

- **Scenario 1:** High emissions scenario with comparatively low conversion efficiency to RCF (40%) resulting in higher counterfactual emissions and comparatively high supply-chain emissions (20 gCO2e/MJ)
- **Scenario 2:** Mid-range scenario with 50% conversion efficiency and medium supply chain emissions (15 gCO2e/MJ)
- **Scenario 3:** Low emissions scenario with comparatively high conversion efficiency (60%) resulting in lower counterfactual emissions and comparatively low supply chain emissions (10 gCO2e/MJ)

The projected counterfactual emissions were calculated based on Treasury green book grid decarbonisation projections. In addition, the years indicated on the X-axis of Figure 6 have been increased by three years to account for the fact that actual grid emissions factors are only available at a three year delay (as explained on page 33). The supply chain emissions are also likely to decrease over time as any process electricity they utilise will reduce substantially in carbon intensity.

As shown in Figure 6, the counterfactual emissions associated with RCFs will decrease significantly over the coming years. This reduction will occur without any action or investment required from an RCF producer and therefore we do not think that it is necessary or appropriate for there to be 'grandfathering'[10] of these provisions. Based on this analysis, we have developed two potential options for the GHG emission savings threshold.

[10] 'Grandfathering' in this case would allow existing plants to continue to utilise the GHG emission savings threshold as it was when the plant started operating, with only new installations having to follow the more stringent thresholds.

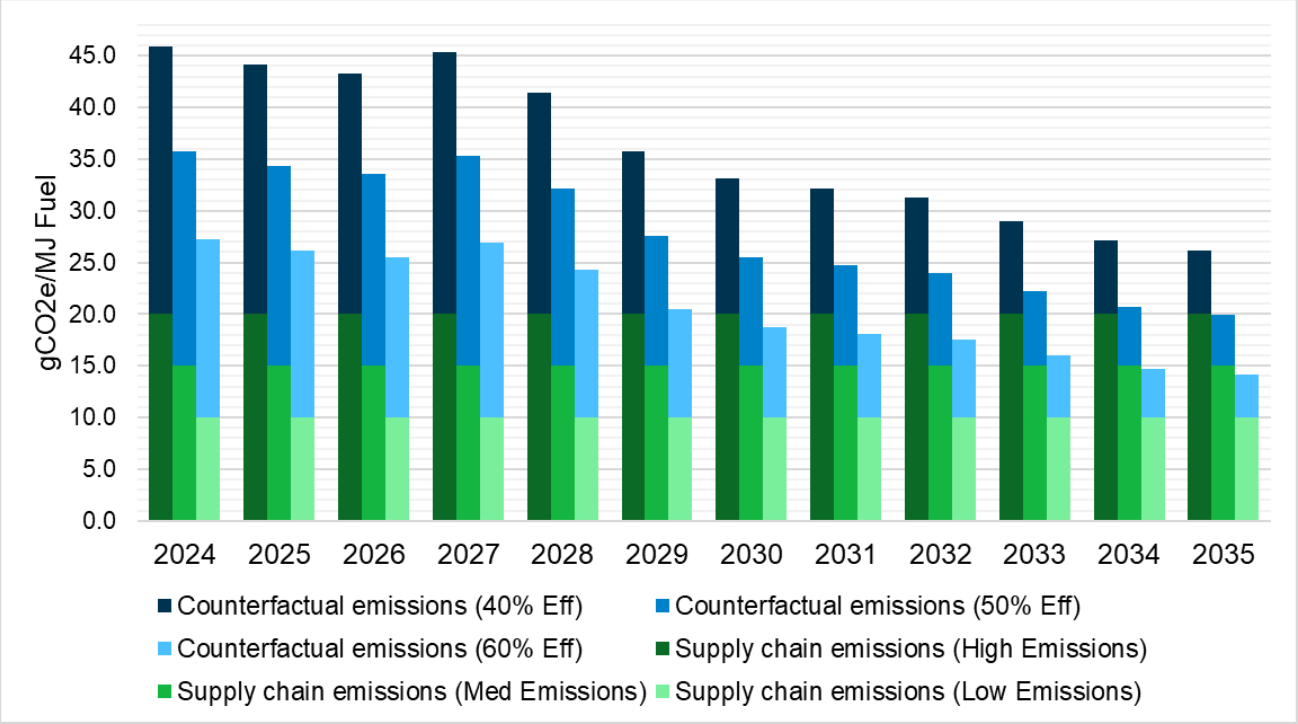

Figure 6 Indicative RCF GHG emissions trajectory based on Treasury green book grid decarbonisation projections.

Option 1 (preferred approach): Tie the GHG threshold trajectory to the grid carbon intensity

In response to feedback from stakeholders, we have developed an approach where the required emission savings threshold would be linked to the actual average emissions factor for the UK electricity grid. This would involve setting a baseline emission savings that RCF producers have to meet and then adding to the maximum permissible carbon intensity a factor calculated in the same way as the E_{disp} factor in the GHG methodology. The relevant threshold would be published by the RTFO Administrator in guidance at the start of each obligation year.

The calculation methodology is outlined in the box below and the projected threshold based on Treasury green book grid decarbonisation projections is indicated by the orange line in Figure 7. Please note that, in practice, the threshold will reflect the actual average UK grid emissions factor for the most recent available year, not the projections.

GHG emission savings threshold linked to UK grid intensity

The maximum carbon intensity would be expressed as follows:

$$CI_{max,y} = (1 - Threshold_{baseline}) \times FFC + \frac{Ef_e}{Ef_{RCF}} \times E_{e,y}$$

The emission savings threshold percentage can then be calculated as follows:

$$\text{GHG Threshold} = \frac{\text{FFC} - \text{CI}_{max,y}}{\text{FFC}}$$

Where:

- $CI_{max,y}$ = the maximum permissible carbon intensity for RCFs supplied in year y (gCO_2e/MJ)
- $Threshhold_{baseline}$ = the baseline threshold that RCF producers are required to meet (%)
- FFC = the fossil fuel comparator for the relevant year (gCO_2e/MJ)
- Ef_e = Standard efficiency of conversion in the counterfactual use (%)
- Ef_{RCF} = Standard efficiency of conversion to RCF (%)
- E_e = Emission factor of the UK electricity grid applicable to year y - the most recent available figure at the start of that year (gCO_2e/MJ)

The proposed standard figures are as follows:

- $Threshold_{baseline}$ = 75%
- FFC = 94 gCO_2e/MJ
- Ef_e = 22% (see section on the use of the R1 standard, page 34)
- Ef_{RCF} = 50%

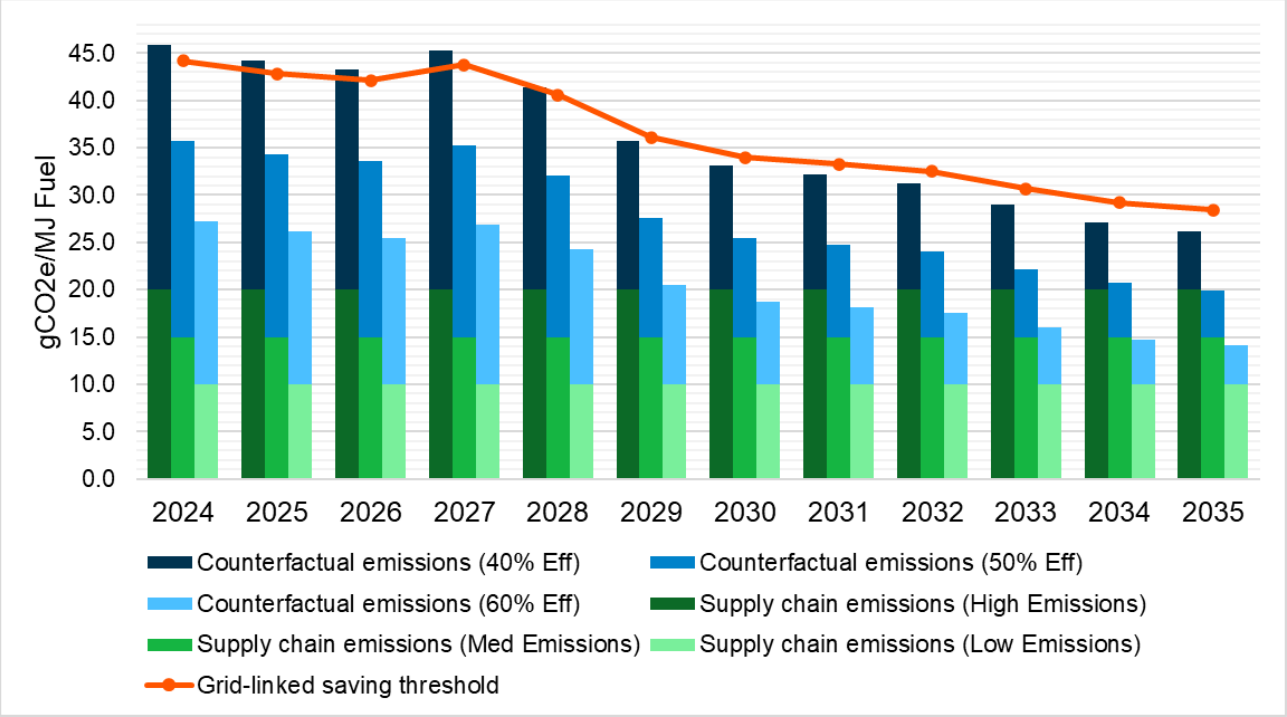

Figure 7 Indicative RCF GHG emissions trajectory from Figure 6 with the maximum GHG intensity implied by the Option 1 overlaid. Note that in this option the emission savings threshold would be responsive to the latest available GHG emissions factors and so will not necessarily exactly follow the trajectory shown.

Although more complicated than a stepped approach (as proposed in Option 2), the benefit of this option is that the emission savings threshold will become more stringent at the same rate that the displacement emissions, E_{disp}, naturally decrease. This means that the effective threshold from the perspective of the factors RCF producers' control – the

direct production emissions – should remain broadly constant. Meanwhile, producers are shielded from uncertainty concerning the rate of decarbonisation of the UK electricity grid - a factor that RCF producers do not control. As such, this is our preferred approach.

Option 2: Retain the stepped GHG threshold trajectory with amendments

In this option, we would retain the stepped approach previously proposed with a 55% threshold increasing to 60% and then 65% over time. In Figure 8, these thresholds have been converted into maximum carbon intensities and overlaid onto the trajectory shown in Figure 6. Figure 8 indicates that if the threshold increases too rapidly, it could outpace the decarbonisation of the grid, particularly in the crucial initial years of RCF eligibility. Therefore, we revised the years that the savings required would increase to best align with the latest expected electricity grid projections. The revised trajectory is as follows:

- 55% from policy initiation
- 60% from 2029
- 65% from 2032

This approach gives RCF producers certainty over what the trajectory will be out to 2032 and beyond, helping to give confidence to producers and investors alike. However, we acknowledge that this approach does not fully resolve the potential issue should grid decarbonisation not progress as expected. Furthermore, Figure 8 indicates that the GHG emission savings threshold could lack stringency in the later years as the UK grid is projected to become almost completely decarbonised.

Question 9: What is your preferred option for the GHG emission savings threshold? Please justify your answer and provide supporting evidence where available.

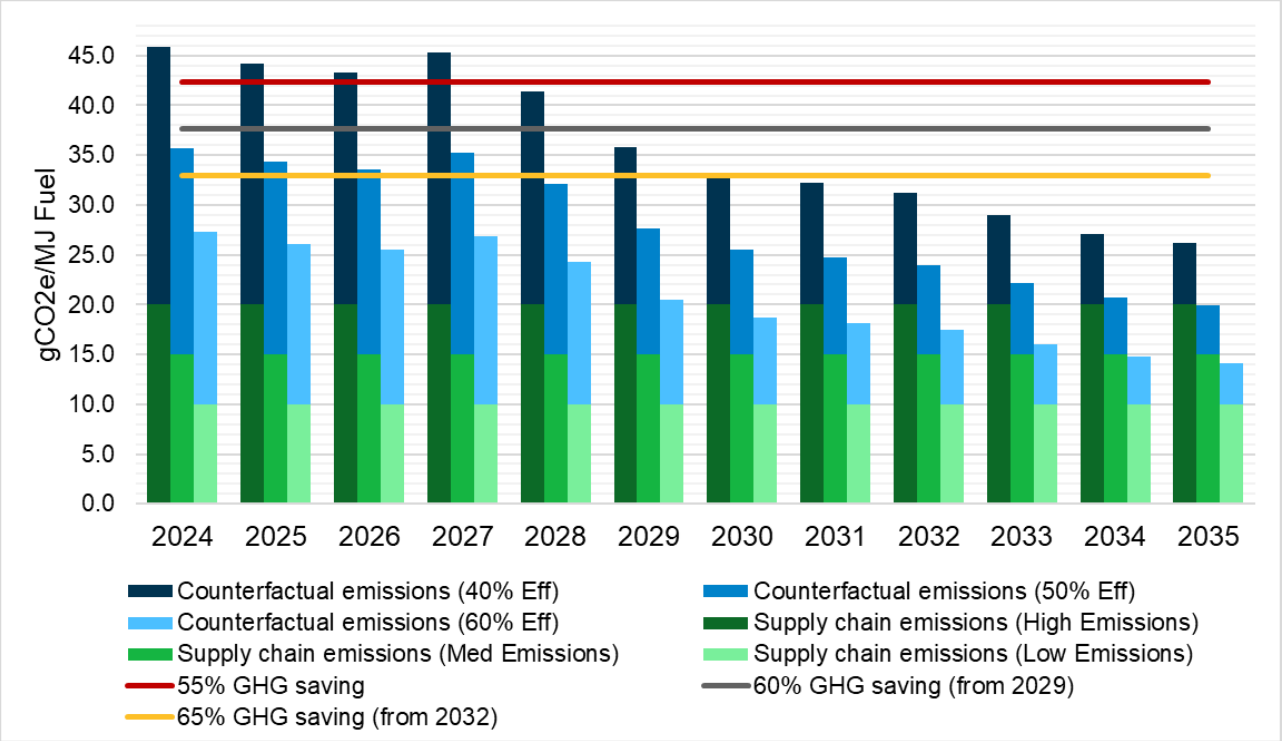

Figure 8 Indicative RCF GHG emissions trajectory from Figure 6 with emission savings thresholds from Option 2 overlaid.

Proposal: Reporting and verification requirements

The RTFO requires that to be eligible to receive RTFCs, consignments of fuel must first have met the following criteria:

- have submitted, or intend to have submitted by the first possible RTFC issuing point, sufficient fuel quantity data, which the RTFO Administrator must have validated
- submit carbon and sustainability information that demonstrates that the fuel has met the sustainability criteria and submit a verifier's assurance report attesting to this
- meet all other stipulations under the RTFO Order, as outlined in Chapters 1, 2 & 5 of the RTFO Compliance Guidance. These include, amongst others: having an account with the Administrator; being the owner of the fuel at the duty point (or equivalent assessment time for fuels that are not subject to duty); having paid all duty that is liable on fuel to HMRC; having supplied the fuel at, or for delivery into, the UK for use in a relevant transport mode.

For RCFs to receive dRTFCs, we are proposing that they, at a minimum, meet the same requirements as are currently specified for renewable fuels (also see the next section on additional sustainability criteria). This requires appropriate documentation and evidence relating to the above to be verified by a qualified third-party and be available for review by the RTFO Administrator as required. For RCFs, like renewable fuels, we propose that the verifier be required to provide a limited assurance opinion.

For most fuel supplied under the RTFO, the main form of evidence is documentation from a recognised voluntary scheme which certifies parties in the supply chain and ensures that the relevant traceability, mass balance, GHG and wider sustainability provisions are being followed. As with renewable fuels, RCF suppliers will be permitted to make use of recognised voluntary schemes where they are available.

Question 10: Do you agree or disagree that the reporting and verification requirements for RCFs should be aligned with renewable fuels currently supported under the RTFO?

Proposal: Additional sustainability criteria

For renewable fuels currently supported under the RTFO, additional sustainability criteria have been introduced to mitigate against wider sustainability risks of renewable fuel production beyond those captured through the GHG methodology. Specifically, where crops, wastes or residues are produced from non-forested land, they must meet the land criteria. From January 2022, the soil carbon criteria and forestry criteria were introduced for agricultural wastes/residues and forestry biomass, respectively. Suppliers can make use of recognised voluntary schemes to help demonstrate compliance with these requirements. See the RTFO Compliance Guidance, Chapter 9 for more details.

As outlined in the introduction (see page 14), there are several risks associated with supporting RCFs that are not related to GHG emissions. Examples include the risk of feedstock being used that should be recycled or that the processing of the feedstock could result in local environmental impacts. We are also mindful that the proposed policy could introduce support for RCFs sourced from a range of locations with differing regulatory

contexts. We therefore propose the following criteria (the 'sustainable waste management criteria') should be met for all consignments of RCFs:

1. Best available techniques (BAT) have been used to maximise separation of waste and extract recyclable material.

2. The process through which the waste feedstock is produced has not been intentionally modified to increase the production of the waste.

3. No adverse local environmental impacts have been caused as a result of sourcing or processing the feedstock.

We recognise that many countries already have existing regulatory frameworks in place to ensure industrial facilities handling and processing wastes meet the proposed criteria. For example, in the UK it is expected that the existing environmental permitting procedures will be sufficient.[11] Therefore, to avoid creating an unnecessary administrative burden, we propose that the above criteria could be satisfied if they are already required by law in the location where the RCF production plant is located. In countries where this is not the case, compliance would need to be demonstrated at the level of individual RCF production plant.

The RTFO Administrator will ask for evidence that the above criteria have been met as part of the existing development fuel pre-approval process. Initial discussions with several voluntary schemes indicate that appropriate standards should be available to demonstrate compliance with these criteria at or shortly after the introduction of this policy. We will work proactively with voluntary schemes to support this and recognise them accordingly.

Where these criteria are not already required and enforced through existing regulations in the locality of an RCF production plant, and in the absence of appropriate voluntary scheme certification, the RTFO Administrator may ask the reporting party to undertake third-party audits to verify that the sustainable waste management criteria have been met. This will be determined on a case-by-case basis.

Further information covering options for demonstrating compliance will be published in the RTFO Guidance, in line with the approach currently taken for the existing land, soil carbon and forest criteria (see Chapter 9 of the RTFO Compliance guidance).

Question 11: Do you agree or disagree that RCF suppliers should be required to demonstrate compliance with the 'sustainable waste management criteria'? If you disagree, please provide alternative suggestions concerning how to mitigate sustainability risks.

[11] Environmental permitting is administered by different public bodies in different parts of the UK. In England it is the responsibility of the Environment Agency, in Northern Ireland the Northern Ireland Environment Agency (NIEA), Natural Resource Wales in Wales, and the Scottish Environment Protection Agency (SEPA) in Scotland.

4. Rewarding the supply of recycled carbon fuels

Previous proposals and consultation response

In our 2021 consultation, we proposed that to be eligible for reward under the renewable transport fuel obligation (RTFO), recycled carbon fuels (RCFs) would have to be categorised as a development fuel. We therefore proposed that RCFs would receive development renewable transport fuel certificates (dRTFCs).

We previously proposed that RCFs made from gaseous feedstocks would be eligible for 1 dRTFC per litre and those made from solid feedstocks would be eligible for 0.5 dRTFCs per litre. Many respondents were opposed to this reward rate, claiming that the rate was too low to deliver RCFs to the market and that there was little case for differential reward between gaseous and solid feedstocks. This is outlined in more detail in the government response to the previous consultation.

Proposal: Revised position on the appropriate reward rate

In reviewing our proposals, we have considered the following underlying principles:

1. As RCFs are produced from non-renewable material and emit fossil carbon to the atmosphere when combusted, we propose that the level of support for RCFs should be lower than for renewable fuels.

2. If possible, the same reward rate should be given regardless of feedstock type, liquid, solid or gaseous.

3. The reward rate should be set conservatively to avoid over subsidy, maximise value for money and reduce the risk of adverse outcomes.

We conducted analysis to compare 0.5 and 1 dRTFC per litre[12] reward rates to relevant gate fees and prices for recyclable plastics (see Annex B for more details). Table 2

[12] Please note that these figures already take account of that fact that development fuels are typically double rewarded under the RTFO. Therefore, the 0.5 dRTFC reward rate equates to 2 x 0.25 dRTFCs per litre equivalent and 1 dRTFC reward rate equates to 2 x 0.5 dRTFCs per litre equivalent.

suggests that at both levels of reward, the RTFO would provide a significant incentive for RCF production and would compare favourably to typical gate fees charged at waste processing centres. At the higher level of reward, the incentive could start to approach a price comparable to difficult-to-recycle plastic.

The cost of the RTFO is borne by fuel suppliers and passed on to the users of these fuels. Therefore, in determining the appropriate reward rate, we must be mindful of maximising value for money. Many RCF feedstocks are likely to be a mixture of biogenic and fossil origin, meaning that the RCF reward is topping up an already substantial subsidy on the biogenic portion (at 2 dRTFCs per litre). The cost-benefit analysis that accompanies this consultation (Annex C) further demonstrates that the higher rate of reward (1 dRTFC per litre) significantly increases the net cost of this policy. Therefore, implementing a higher rate of reward requires a compelling justification and we do not believe that the case has been made for increasing the overall level of reward.

Aspect	Price per tonne of waste feedstock
RCF incentive at 0.5 dRTFCs per litre	£75.05 (£20.06-£241.49)
RCF incentive at 1 dRTFCs per litre	£150.05 (£40.12-£482.98)
Gate fee: Material recovery facility	£43
Gate fee: Energy from waste facility	£93
Gate fee: landfill	£116
Price of high value recyclable plastic	£595-£765
Price of low value recyclable plastic	£255-£340

Table 2 Indicative incentive at 0.5 and 1 dRTFCs reward rate. Typical gate fees and prices for recyclable plastic are provided for context.

In conclusion, we propose to align the treatment of all feedstocks at 0.5 dRTFCs per litre (equivalent to 2 times 0.25 dRTFCs – see footnote 11). This is a reduction in the previously proposed level of support – 1 dRTFC per litre – for gaseous feedstocks. We appreciate that this runs contrary to the level of support requested by some stakeholders in their responses to the previous consultation and we continue to invite further evidence from stakeholders as to why a higher rate of 1 dRTFC per litre is necessary to make RCFs commercially viable. If a case can be made while managing risk, we will consider a higher rate of reward.

In parallel to this policy initiative, it is also important to note that we are exploring options to more widely support the commercialisation of the UK sustainable aviation fuel (SAF) industry, on top of existing and future grant funding programmes and the proposed SAF mandate.

Question 12: Do you agree or disagree with our proposal that all RCFs should be awarded 0.5 dRTFCs per litre of fuel supplied? If you propose a higher or lower level of reward, please provide evidence to support your reasoning.

What will happen next

The consultation period began on Tuesday 19th July and will run until Monday 19th September. A summary of responses, including the next steps, will be published on the DfT website. Paper copies will be available on request.

If you have questions about this consultation, please contact: LowCarbonFuel.Consultation@dft.gov.uk.

Annex A: Full list of consultation questions

Criteria for eligibility

Question 1: Do you agree or disagree that a principles-based approach should be taken to determining RCF feedstock eligibility? [Agree / Disagree / Don't know]

Question 2: Do you agree or disagree with the proposed criteria? [Agree / Disagree / Don't know] Are there any additional criteria we should consider?

Question 3: What is your preferred option for determining feedstock eligibility? [Option 1 / Option 2 / Don't know] Please justify your answer and provide supporting evidence where appropriate/available. We also welcome feedback from stakeholders concerning how to best to structure an annual assessment process.

Question 4: What is your preferred option for the minimum biogenic content requirement? [Option 1 / Option 2 / Don't know] Please justify your answer and provide supporting evidence where available.

Ensuring that recycled carbon fuels are sustainable

Question 5: Do you agree or disagree with the proposed approach for determining the counterfactual to be used? [Agree / Disagree / Don't know]

Question 6: Do you agree or disagree that the grid average emissions factors for the most recent available year (i.e. the year preceding the year in which the RCF is supplied) should be used as the emissions factor for the displaced energy in the counterfactual? [Agree / Disagree / Don't know]

Question 7: Do you agree or disagree that the Efe factor for EfW (electricity only) counterfactual should be taken as 22%? [Agree / Disagree / Don't know]

Question 8: Do you agree or disagree with the proposed methodology for dealing with processing emissions and coproducts? [Agree / Disagree / Don't know] If you disagree please describe an alternative proposed approach and provide any relevant evidence to support the use of this alternative approach.

Question 9: What is your preferred option for the GHG emission savings threshold? [Option 1 / Option 2 / Don't know] Please justify your answer and provide supporting evidence where available.

Question 10: Do you agree or disagree that the reporting and verification requirements for RCFs should be aligned with renewable fuels currently supported under the RTFO? [Agree / Disagree / Don't know]

Question 11: Do you agree or disagree that RCF suppliers should be required to demonstrate compliance with the 'sustainable waste management criteria'? [Agree / Disagree / Don't know] If you disagree, please provide alternative suggestions concerning how to mitigate sustainability risks.

Rewarding the supply of RCFs

Question 12: Do you agree or disagree with our proposal that all RCFs should be awarded 0.5 dRTFCs per litre of fuel supplied? [Agree / Disagree / Don't know] Please provide evidence to support you reasoning for a higher or lower level of reward.

Annex B: Summary of analysis

Question B1: Do you agree or disagree that the assumptions made in modelling the RCF counterfactual emissions are reasonable? [Agree / Disagree / Don't know] lease give reasoning for your answer.

Question B2: Do you agree or disagree that the assumptions made in modelling how the GHG emissions from RCFs will change over time are reasonable? [Agree / Disagree / Don't know] Please give reasoning for your answer.

Question B3: Do you agree or disagree that the assumptions made in modelling the impact of different RCF reward rates are reasonable? [Agree / Disagree / Don't know] Please give reasoning for your answer.

Annex C: Cost-benefit analysis

Question C1: Do you agree or disagree that the assumptions made in the cost-benefit analysis are reasonable? Please give reasoning for your answer.

Question C2: Do you have any evidence on the estimated costs of producing RCFs?