Department for Transport

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Annex B
Targeting net zero - Next steps for the Renewable Transport Fuels Obligation

Cost-benefit analysis
Moving Britain Ahead

March 2021

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Executive summary

1. Climate change is the most pressing environmental challenge of our time. There is a need to limit global warming to well below 2°C and we have legislated to end the UK's contribution to climate change by 2050. This year we will host COP 26 in Glasgow. In December 2020 we committed the UK to reducing economy-wide greenhouse gas emissions by at least 68% by 2030, as stated in the UK's Nationally Determined Contribution, setting a new target on our pathway to net zero by 2050. To achieve this will require rapid and unprecedented action across the UK economy and wider society supported by technology innovation and robust policy frameworks.
2. Low carbon fuels can deliver emissions reductions quickly, and help meet interim carbon budgets on the path to net zero. They will play a key role in reducing emissions from the existing fleet and in transport sectors which cannot currently be easily electrified.
3. Biofuels have been supported in the UK for over a decade principally by the Renewable Transport Fuel Obligation (RTFO). The RTFO commenced on 15 April 2008 and delivers reductions in GHG emissions from fuel used for transport purposes by mandating the supply of renewable fuels.
4. In line with our wider decarbonisation ambitions and net zero commitments, the Department for Transport (DfT) is now seeking views on potential policy measures to accelerate transport decarbonisation.

Increasing the main RTFO obligation

5. We have contemplated a range of policy options for increasing the main RTFO target. These options include raising it by 1.5 percentage points, 2.5 percentage points, five percentage points, or not raising the target at all. Our preferred policy option is to raise the main RTFO target by 2.5 percentage points. This is expected to lead to significant additional GHG emissions savings compared to the current policy, whilst mitigating against risks on the availability of feedstocks which a higher target could bring.
6. The preferred 2.5 percentage point increase to the main RTFO target is estimated to lead to additional discounted costs of approximately £2,475 million over the future period from 2022 and 2032[1] compared to the current RTFO target with no target increase. In return, the target increase is expected to generate around 14.6 MtCO2e over the same period. Using current central carbon appraisal values, this equates to discounted benefits of £1,006m.

[1] Appraisal period used for the RTFO amendments is 2022-2032 (inclusive).

7. The cost of carbon abatement or carbon cost effectiveness[2] (CCE) value is estimated at £170/tCO2e, which is within the expected range of the government's E10 Impact Assessment[3]. This is the cost of achieving the additional carbon savings we expect to be delivered by a 2.5 percentage point increase to the main RTO target.

Increasing the development fuels RTFO obligation

8. Proposed amendments to development fuels in the RTFO include:
   - Making policy changes to hydrogen and renewable fuels of non-biological origin (RFNBOs) such as reviewing the support conditions for biohydrogen and expanding the scope of the RTFO to make RFNBOs used in maritime, rail and non-road vehicles eligible for support; and
   - Expanding the scope of feedstocks eligible to claim rewards under the RTFO, specifically the inclusion of recycled carbon fuels (RCFs), which are fuels produced from fossil wastes that cannot be avoided, reused or recycled.
9. The proposed policy changes are projected to lead to additional estimated GHG emissions savings of between 2.3 to 6.4 MtCO2e across 2022 to 2032. Using current central carbon values, this has a discounted monetised value of between £158 million to £434 million.
10. Unlike GHG emissions savings from amendments to the main RTFO, we do not expect there to be any additional costs associated with the amendments to the development fuels RTFO (dRTFO). This is because the proposed amendments to the development fuels entail widening the scope of fuels eligible for support, and do not impose specific obligations on suppliers to use any of these specific development fuels in place of other development fuels which are already being delivered. We would not typically expect suppliers to shift to using different fuels to meet their obligations if this increases the costs they incur, and so there are projected to be no additional costs from the proposed changes.
11. Our overall CBA modelling from assessing the amendments made to the dRTFO shows that there will be no changes to costs, whilst enabling greater GHG emissions savings to be obtained.

Combined policy changes

12. The combined policy changes are projected to lead to an overall increase in the price of road fuel of up to 0.8 pence per litre[4], including VAT. This range represents the

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[2] The carbon cost effectiveness is the official way the cost of carbon abatement is measured according to government guidance. It is obtained by dividing net present value (NPV) by the total GHG savings in terms of MtCO2e associated with a policy proposal.

[3] £170/tCO2e is within the range of reasonable CCE value estimates we would expect for a carbon reduction scheme. Within the following link, we present CCE values of different carbon reduction schemes (see figure 3, page 10). Our E10 proposal was estimated to have a CCE value of £173/tCO2e, so £170/tCO2e is within the normal expected range.

[4] The price per litre impact to motorists has been deflated to reflect future prices into their real values for 2022 when the appraisal period begins.

potential pence per litre costs associated with the preferred main RTFO target increase option of 2.5 percentage points, under the government's current baseline projection for road transport fuel demand, as set out in the 2019 Energy Emission Projections.

13. Altogether amendments to both the main and dRTFO policies are estimated to produce an additional 16.9-21.0 MtCO2e savings. The annual figures increase over time and are equivalent to the removal of around an additional 1.2 million cars from the road by 2032, based on 2018 averages[5]. Analysis on latest car GHG emissions and environmental impact of the RTFO can be found in our 2019 Renewable Fuel Statistics Report.

[5] We have assumed the 2018 average car GHG emissions figure of 2.10710196170565 tCO2e is constant throughout the 2022-2032 appraisal period.

1. Problem under consideration and rationale for intervention

The RTFO is a significant policy lever for reducing carbon emissions in the transport sector as we progress towards meeting the UK's 2050 net zero goal. Parliament passed legislation in 2019, found here, mandating that the government committed to reducing the UK's net greenhouse gas emissions by 100% by 2050 relative to 1990. This established the 2050 net zero goal.

The carbon budgets are the method by which we track the government's progress towards attaining the net zero 2050 goal. Through the carbon budgets we gain an insight into whether we are successfully on track to meet this target. There are currently five carbon budgets and each one places a restriction on the total amount of greenhouse gases the UK can emit over a five year period. Guidance on the carbon budgets can be found here. Therefore, the RTFO is of paramount importance to ensuring each carbon budget and the 2050 net zero goal is met overall. Amendments to the current RTFO policy legislation are vital in order to maximise the likelihood of meeting these long-term decarbonisation goals.

Renewable fuels are typically more expensive relative to their fossil fuel equivalents, and this applies to development fuels in particular. Therefore, without the RTFO policy mechanism, there would not be the incentive to supply emission-saving renewable fuels into the market. This may compromise our ability to meet carbon budgets.

Whilst the main RTFO has already made a significant contribution to reducing emissions from transport, and is projected to continue doing so, the current target levels may not be sufficient to meet our ambitious decarbonisation goals. The question under consideration in this CBA is to what extent further GHG emissions savings can be generated by increasing the targets and how much additional cost from this would be incurred.

In regards to the development fuels component of the RTFO, they are of particular strategic importance. However, they are novel and research and development is still being undertaken in order to understand how much these fuels can be feasibly supplied into the market. We are not therefore proposing increases to the target at this time but have reviewed which fuels are eligible. Amendments to the dRTFO will increase the eligibility of hydrogen - including to new sectors (including maritime, rail and other non-road applications such as in construction vehicles) - and introduce Recycled Carbon Fuels (RCFs) for the first time. In this CBA we have considered what impact these changes may have on the GHG emissions savings and costs of the development fuel target.

There are some proposed policies in this consultation for which we have not attempted to quantify the costs or benefits. For example, we are proposing specific sustainability requirements for fuels produced from forest biomass and revised emissions saving thresholds. We anticipate that such policy changes would have a positive effect on decreasing GHG emissions, and no significant increase in costs.

2. Cost benefit analysis of an increase to the main RTFO target

Methodology and assumptions

Throughout this section of the document, we outline cost-benefit analysis (CBA) of the proposals to increase the RTFO obligation. The appraisal period we use for this analysis is 2022 to 2032, as this is the period over which the changes are implemented. However, we have included charts and tables which show GHG emissions savings are presented beyond this to 2035, reflecting that the RTFO obligation continues after 2032 (with no end date) and to illustrate how the policy would continue with no further changes. The analysis sets out the costs and benefits of three different options for increasing the RTFO main obligation against a do-nothing baseline.

Option 0 - do nothing. The main obligation would remain at 9.6% throughout the entire period until 2032. This option acts as our baseline against which we can compare the effect of the further three main RTFO target increase options.

Option 1 - 1.5 percentage point increase to the main obligation. This would apply from 2022. This would be an increase from 9.6% in 2021 to 11.1% in 2022 and beyond.

Option 2 - 2.5 percentage point increase to the main obligation. This would apply as a 1.5 percentage point increase in 2022 with an additional 1% increase spread over the period from 2023 to 2032. This means that there would be an increase from 9.6% in 2021 to 12.1% in 2032 and beyond. **This is our preferred option.**

Option 3 - five percentage point increase to the main obligation. This would apply as a 1.5 percentage point increase in 2022 with an additional 3.5% spread over the period 2023 to 2032. This means that there would be an increase from 9.6% in 2021 to 14.6% in 2032 and beyond.

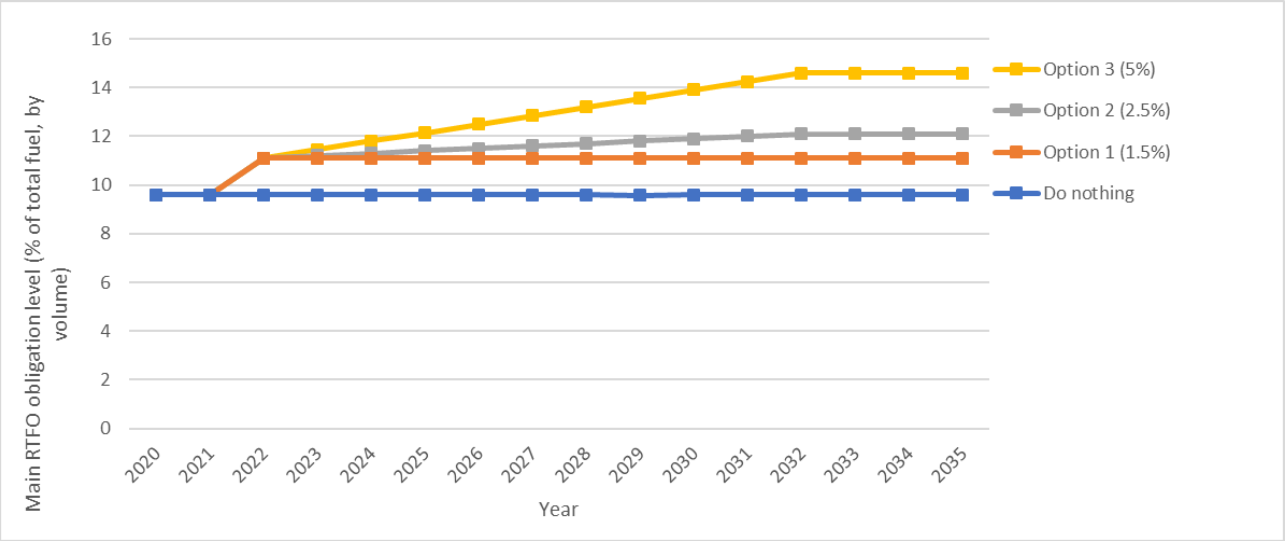


Figure 1 - Chart summarising the main RTFO target percentages under each proposed policy option (2020-2035)

Core assumptions within CBA analysis/modelling

Our options for increasing the RTFO target and CBA analysis takes into account the recent government announcement to raise the buy-out-price from 30 pence per litre to 50 pence per litre. This increase was set in response to increased renewable fuel supply costs and aims to protect against the loss of GHG emissions savings from the RTFO policy should suppliers choose to buy out of their obligation to supply renewable fuel, as set out in the government's RTFO consultation document.

Our core CBA analysis is based on fuel energy demand from the 2019 Energy Emission Projections (baseline EEP). These projections provide the government's best estimate of future demand, given current firm and funded policies.

However, to ensure we capture the impact of future policies to increase the usage of electric vehicles (EV), which would decrease the demand for liquid fuels and therefore reduce the demand for renewable fuels under the RTFO, a sensitivity analysis has also been included for the preferred 2.5 percentage point target increase scenario. Here we examine the impact of further EV ambitions on the costs and benefits outputs of our preferred RTFO policy.

Our CBA analysis also takes into consideration the impact of the rollout of E10 - a petrol with a higher blend of ethanol, which is expected to be introduced in autumn 2021. In keeping with the impact assessment accompanying the government's measures for introducing E10, we project that E10 will displace biodiesel derived from used cooking oil (UCOME) without an increase to the main RTFO targets.

Assumptions on biofuels made within CBA modelling

In order to estimate the costs and benefits of an increase in the main RTFO target, it is necessary to make distinct assumptions about the order in which specific fuels fill the renewable fuel demand under the RTFO.

We assume that in all scenarios, ethanol is the first fuel to be supplied in order to meet the renewable fuel demand under the main RTFO. This is due to the fact that ethanol has historically been the renewable fuel with the lowest RTFC price compared to other

renewable fuels, though we recognise that this may not always be the case when comparing its RTFC price to other renewable fuels in future.

Ethanol is also modelled alongside methanol within our modelling and they are presented together within our analysis. However, ethanol comprises the substantial majority of the ethanol/methanol component within our CBA modelling.

Both ethanol and methanol are assumed to be demand-constrained. In other words, they are assumed to be supplied up to their maximum potential in the baseline. In the case of ethanol, this is limited by the E5 or E10 blend walls. For biomethane is it limited by the number of methane-fuelled vehicles.

After ethanol, FAME UCOME biodiesel is assumed to fill any remaining demand up to the biodiesel blend wall, which is assumed to be 7% of the standard diesel blend (B7) in the model. However, when it comes to increasing the main RTFO target, FAME UCOME biodiesel is assumed to be the first fuel to fill the additional demand. This is because of its cheaper cost relative to other renewable fuels. Hence, FAME UCOME is the first marginal fuel.

After FAME UCOME biodiesel is filled up to the 7% blend wall, drop-in biodiesel is then assumed to continue filling any remaining renewable fuel demand under the RTFO. Drop-in biodiesel can be substituted for conventional fossil fuel with no impact on operational requirements. These can be blended into standard fuels above the blend wall (B7), with the fuel still complying with the same fuel standard as before. The most common biodiesel drop in fuel is hydrogenated vegetable oil (HVO).

Finally, any remaining demand is assumed to be met by high blend biodiesel, which refers to diesel blends which are blended with biofuels at a higher percentage than contained in standard blends (i.e. B7 and E5/E10 - for ethanol) or, above the so called “blend wall”. At or below the current blend wall, vehicles do not need to be adapted to accommodate the biofuel. However, to use high blends some adaptions may be needed. Typical high blends are petrol with up to 20% (E20) or 65% to 85% ethanol (E85) and diesel with up to 30% (B30) or up to 100% biodiesel (B100).

Question 1: Do you think that the marginal fuel is still FAME UCOME biodiesel? Please give reasoning and evidence for your answer.

Question 2: Do you agree that the assumptions made within our modelling are reasonable? Please give reasoning for your answer.

CBA modelling outputs

Outlined below are the key outputs of focus in our CBA modelling. We compare these values for the different policy options against the current RTFO policy (baseline/do-nothing option) across the appraisal period from 2022 to 2032 (which is the period over which the policies are assumed to be implemented). Throughout this document, all modelling values presented for the proposed target increases to the main RTFO refer to additional costs and benefits relative to the do-nothing option, unless specified otherwise - that is, “additional” refers to the extra costs and benefits accrued relative to the do-nothing baseline.

- **Additional costs (£ millions)**
- **Additional GHG emissions savings (MtCO2e)**
- **Additional monetised GHG emissions savings (£ millions)**
- **Net present value[6] (NPV) of RTFO target increase option (£ millions)**
- **Carbon cost effectiveness (or cost of carbon abatement) of RTFO target increase option (£/tCO2e)**

Costs

We use data on the cost of supplying different fuels from Argus Media to estimate the cost of meeting the higher RTFO targets. From Argus, we specifically obtain historical fuel prices of renewable fuels and fossil fuels, and roll these forward for our CBA modelling. As renewable fuels are typically more expensive to supply per litre than fossil fuels, any increase to the RTFO target is expected to result in increased costs for fuel suppliers. It is anticipated that fuel suppliers will then pass these costs on to the motorist through the cost of the fuel. Furthermore, the different energy densities of each fuel have been factored into the calculations.

The steps taken to estimate costs associated with an increase to the main RTFO target were as follows:

- **We first estimated the number of certificates required to meet the new obligation under each one of the main RTFO target increase scenarios.**
- **From there, we calculated how many litres of each specific type of biofuel would be needed to meet the number of certificates under the new obligation. The projected volume of fuels was calculated in line with the assumed hierarchy order of fuels outlined above. Overall, we obtained projected volumes of biofuels across the appraisal period.**
- **Next, we estimated the price-spread difference for each biofuel relative to the fossil fuel it would displace under the main RTFO. We did this using fuel prices data from Argus.**
- **We then multiplied each price spread by the projected volumes of the relevant biofuel under a specific main RTFO target increase option to derive total costs in £ millions.**

The price-spread between renewable fuels and fossil fuels is ultimately what determines the cost of the main RTFO, as the RTFO requires renewable fuels to be supplied whether

[6] Net present value (NPV) - economic appraisal technique whereby discounted costs are subtracted from the discounted benefits of a policy. This resulting figure provides an indication of value for money linked to the policy.

they are more expensive than their fossil fuel equivalent or not. However, it is not possible to predict how the price-spreads between biofuels and fossil fuels will change over time due to market volatility. For the purposes of this cost-benefit analysis, we assume that the price-spreads between biofuels and fossil fuel equivalents remain constant throughout the appraisal period within our modelling. Thus, we make the assumption that the price spreads remain at what they are now. However, we've also tested the sensitivity of these results against low and high price spread figures, to estimate a variety of costs associated with the main RTFO. The mid-price figures have been used to present the overall NPV and CCE figures within the CBA.

Benefits

The benefits arising from increases to the main RTFO target are due to renewable fuels generating lower carbon emissions per litre than their fossil fuel equivalent. The higher the supply of renewable fuels, the higher the GHG emissions savings accrued. The steps which were taken to estimate the carbon savings associated with the higher targets were as follows (the first two steps are the same as the first two steps taken to estimate costs):

- **We first estimated the number of certificates required to meet the new obligation under each one of the main RTFO target increase scenarios.**

- **Next, we then estimated the volume of different renewable fuels which would be supplied under each target increase to meet the new increased number of certificates. This takes account of renewable fuels from wastes which are eligible for double reward as well as gaseous fuels which have a multiplier applied to the RTFCs they are eligible to receive, to reflect their higher energy content relative to liquid fuels.**

- **The carbon emissions of the renewable fuels were then compared to the carbon emissions of the fossil fuel equivalents they displace in order to estimate the GHG emissions savings of the different target increases to the main RTFO target.**

- **This was undertaken for each specific year in the appraisal period to show the estimated annual GHG emissions savings, expressed in MtCO2e.**

The GHG emissions savings were then monetised to equate the savings to a financial value. To do this, the amount of estimated annual MtCO2e benefits was multiplied by the current central carbon price in each year within the appraisal period. As the price of carbon increases throughout time, carbon savings in later years may equate to a higher monetised amount compared to earlier years. Monetising the GHG emissions savings allowed us to calculate the NPV figures associated with each policy option. However, to calculate the CCE values of each policy option, we did not use monetised GHG emissions savings.

Costs and Benefits

After obtaining the costs and benefits within our modelling, these figures were then discounted in line with the HMT green book guidance. We then compare these costs and benefits for the different options, presenting the NPV figures.

Most importantly we provide the costs of carbon abatement figures, expressed as CCE values to give an indication of how cost-effective each policy option is. GHG emissions savings are not monetised here, and are simply left in terms of tCO2e. Hence, CCE values are expressed overall as £/tCO2e.

Results

Overall our results show that implementing any increase to the main RTFO target will lead to an increase in costs and benefits relative to the baseline where the target remains the same.

The CBA modelling results below (see table 1) also infer a trend whereby the CCE value falls slightly as the main RTFO target increases. However, this does not necessarily imply that a higher target will always be more cost-effective in terms of reducing GHG emissions. We believe that the rationale behind why a higher target appears to be more cost-effective is due to the change in the composition of renewable fuels over time as a result of the target increases. We see a rise in the proportion of FAME UCOME biodiesel across the appraisal period, with a simultaneous fall in ethanol. As FAME UCOME biodiesel is more cost-effective than ethanol in terms of how much it costs to deliver GHG emissions savings, a higher RTFO target ultimately leads to a better CCE value overall within our modelling. A lower CCE figure represents better cost-effectiveness.

In spite of the CCE trend we see from our modelling as discussed previously, we believe that any increase to the main RTFO is actually likely to lead to the same or a very similar CCE value in reality. Therefore, we believe all main RTFO target increase options are likely to be broadly equal in terms of cost-effectiveness in the real world. As one way to demonstrate this belief, if we were to apply rounding to the nearest £5 to the CCE values of each RTFO target increase option to reflect the uncertainties associated with such policy changes, then the CCE of each option would amount to the same CCE value of £170/tCO2e. This would affirm our belief that all target increase options would be roughly equal in terms of cost-effectiveness in reality.

	Additional Discounted Costs (£million)	Additional Benefits (MtCO2e)	Additional Discounted Benefits (£million)	Net Present Value NPV (£million)	Carbon Cost Effectiveness (£/tCO2e)
Do nothing	-	-	-	-	-
1.50%	1,896	11.0	761	-1,135	173
2.50% (Baseline EEP)	2,475	14.6	1,006	-1,470	170
2.50% (EV)	1,999	11.7	806	-1,193	171
5.0%	3,924	23.6	1,617	-2,307	166

Table 1 - Discounted central monetised additional benefits, costs, NPV and CCE values of each target increase to the main RTFO relative to the do-nothing baseline

It is likely that the additional costs of supplying renewable fuel are passed on to the motorist through an increase in fuel prices at the pump. We have shown our estimate of

this impact below (see table 2), by converting the overall costs of each policy option to show what they would be in terms of the pence per litre for the price of fuel. Depending on the RTFO target increase, the additional cost to the motorist could amount to a maximum of 1.6 pence per litre, including VAT across the appraisal period. However, for just the preferred 2.5% main RTFO target, we estimate the costs to be between 0.5 and 0.8 pence per litre.

Year	Do nothing	1.50%	2.50% (EEP)	2.50% (EV)	5.0%
2020	0.0	0.0	0.0	0.0	0.0
2021	0.0	0.0	0.0	0.0	0.0
2022	0.0	0.5	0.5	0.5	0.5
2023	0.0	0.5	0.5	0.5	0.6
2024	0.0	0.5	0.6	0.6	0.7
2025	0.0	0.5	0.6	0.6	0.8
2026	0.0	0.5	0.6	0.6	1.0
2027	0.0	0.5	0.7	0.7	1.1
2028	0.0	0.5	0.7	0.7	1.2
2029	0.0	0.5	0.7	0.7	1.3
2030	0.0	0.5	0.8	0.8	1.4
2031	0.0	0.5	0.8	0.8	1.5
2032	0.0	0.5	0.8	0.8	1.6
2033	0.0	0.5	0.8	0.8	1.6
2034	0.0	0.5	0.8	0.8	1.6
2035	0.0	0.5	0.8	0.8	1.6

Table 2 - Potential impacts on the pence per litre cost of fuel from the main RTFO target increases (VAT included)

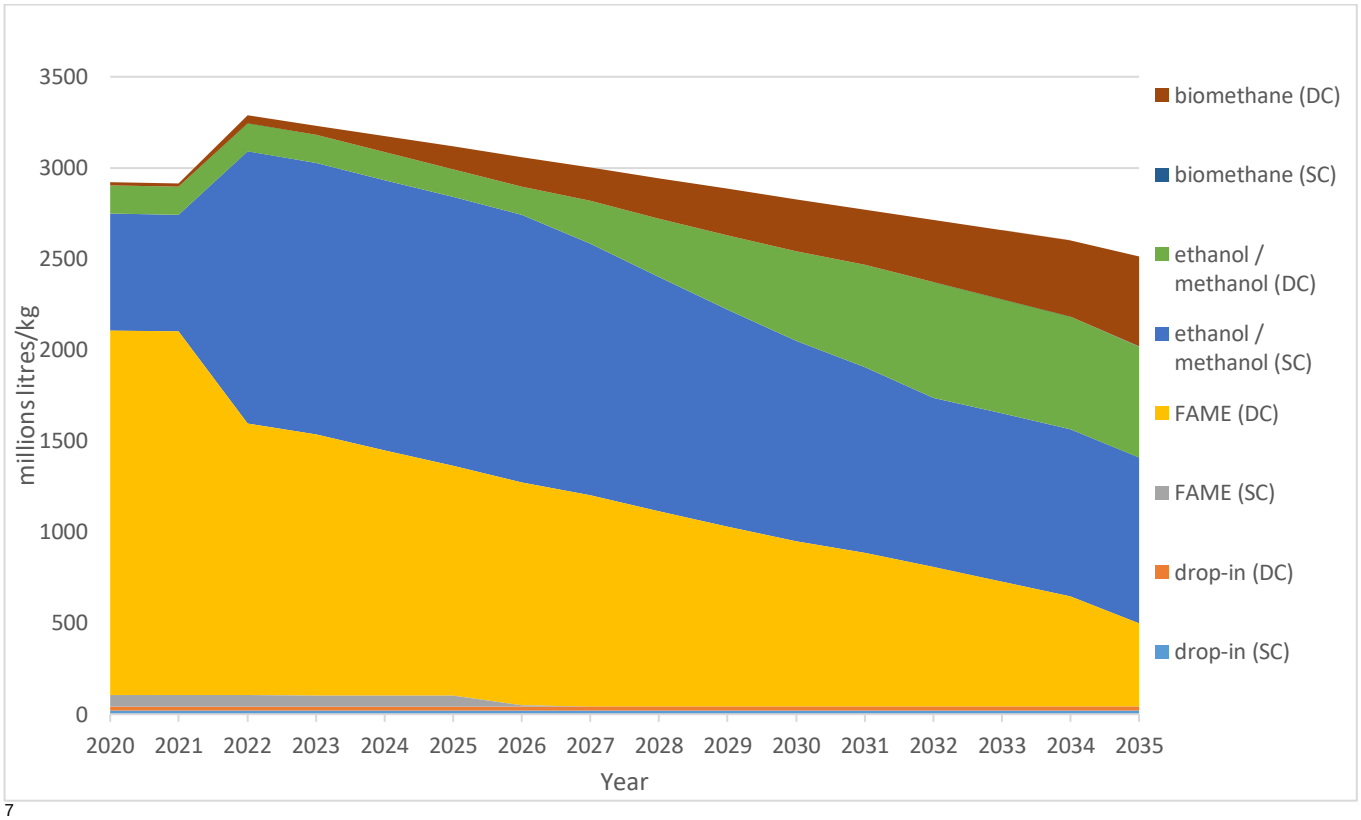
From this point onwards, we discuss the CBA results of each individual main RTFO target increase option, starting with our current policy baseline where there is no target increase.

In terms of GHG emissions savings delivered via the current RTFO policy, in 2019, total overall GHG emissions savings equated to 4.9 MtCO2e. This full year estimate is equivalent to taking approximately 2.3 million cars off the road.

Under the current main RTFO target, in 2032 at the end of the appraisal period, we predict that FAME (DC) and ethanol/methanol (SC and DC) will account for the vast majority of the renewable fuel supply.

FAME (DC) is projected to experience a substantial fall in volume from 2021 to 2022 due to the introduction of the E10 policy, where increased ethanol supply displaces biodiesel. This is reflected below (see figure 2), which also shows an increase in ethanol/methanol (SC) from 2021 to 2022. FAME then continues to fall gradually over the period, in line with the overall decline in fuel demand, and in keeping with our assumptions about the hierarchy of different biofuels. We see biomethane volumes rise over the appraisal period due to the expected increase in vehicles which can use biomethane as fuel; hence causing a rise in overall biomethane demand.

Option 0 – 0 percentage point main RTFO target increase (baseline)



[7]

Figure 2 - Total fuel volume supply under the main RTFO – zero percentage point target increase (baseline)

Option 1 - 1.5 percentage points main RTFO target increase

Option 1 is projected to lead to an additional 11.0 MtCO2e in total across the appraisal period from 2022 to 2032.

Year	MtCO2e
2020	0.0
2021	0.0
2022	1.0
2023	1.0
2024	1.0
2025	1.0
2026	1.0
2027	1.0
2028	1.0
2029	1.0
2030	1.0
2031	1.0
2032	1.0

[7] (SC) refers to "Single-Counted" - fuels which are awarded one RTFC per litre supplied. (DC) refers to "Double-Counted" - fuels which are awarded two RTFCs per litre supplied.

Year	MtCO2e
2033	1.0
2034	0.9
2035	0.9

Table 3 - Additional GHG emissions savings in terms of MtCO2e for 1.5 percentage point RTFO target increase (2020-2035)

Below, we present our estimates of the future discounted costs and benefits, under different carbon values and price-spreads (both fall over time, mainly due to the discounting of future costs and benefits). These reflect the low, central and high figures shown. The overall net present value of the policy (based on our central price assumptions) is projected to be -£1,135 million, and the 1.5 percentage point increase to the main RTFO target is estimated to have a cost per tonne of carbon saved of £173/tCO2e (see table 4).

	Discounted Benefits (£million)			Discounted costs (£million)			Net Benefit (£million)
Year	Low	Central	High	Low	Central	High	Central
2020	0	0	0	0	0	0	0
2021	0	0	0	0	0	0	0
2022	39	77	115	133	210	364	-133
2023	37	76	113	128	202	343	-126
2024	37	73	110	123	194	322	-120
2025	36	71	108	118	186	303	-115
2026	35	69	104	113	178	284	-109
2027	34	67	102	108	171	267	-103
2028	33	66	99	104	164	250	-98
2029	32	64	96	100	157	235	-93
2030	31	62	93	95	150	221	-88
2031	33	65	98	92	144	207	-79
2032	34	68	102	88	139	195	-71
Total Additional Net Benefits (Net Present Value - £million, 2022-2032 Appraisal Period)							**-1,135**
Carbon Cost Effectiveness (£/tCO2e, 2022-2032 Appraisal Period)							**173**

Table 4 - Summary table of discounted benefits and costs, overall net benefits and carbon cost effectiveness for 1.5 percentage point RTFO target increase (2020-2032)

Figure 3 below shows the projected volumes of each fuel type supplied under the main RTFO with a 1.5 percentage point increase.

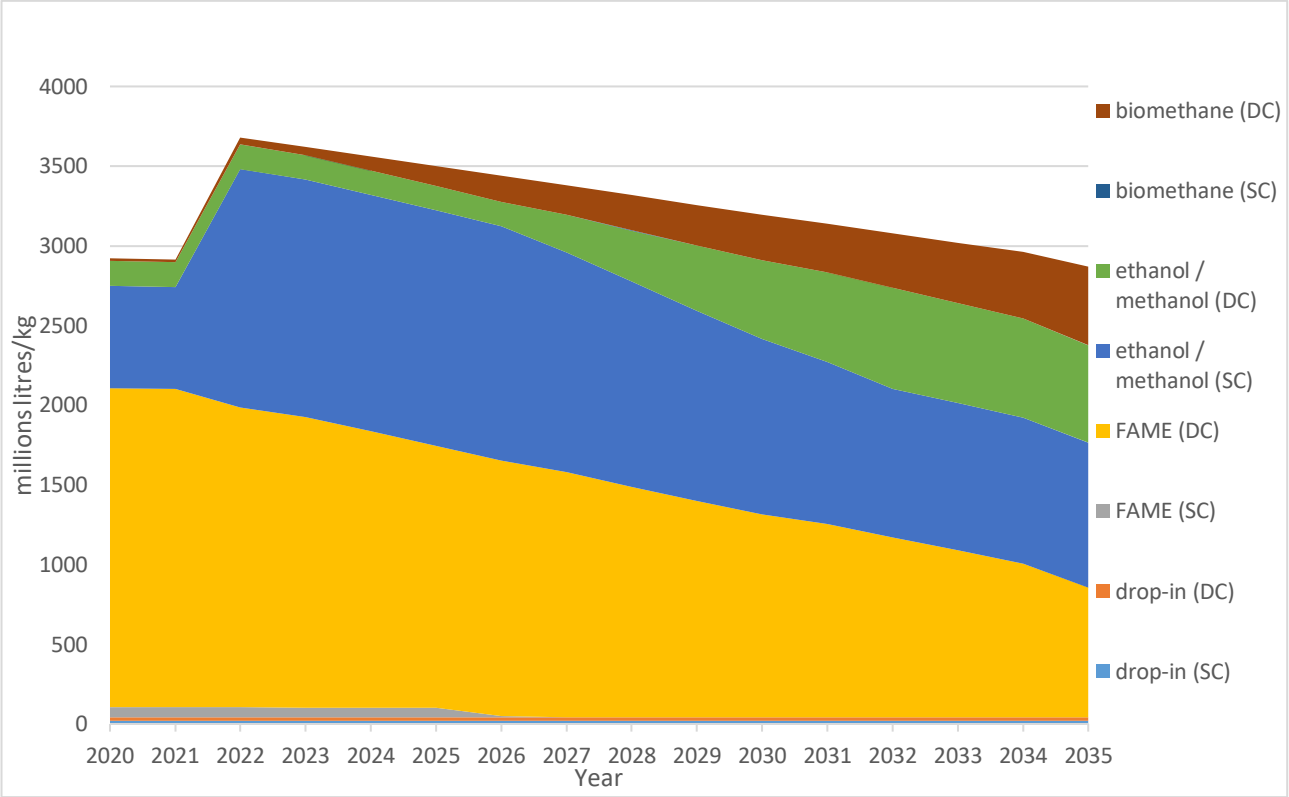


Figure 3 - Fuel volume supply under the main RTFO – 1.5 percentage point target increase

As with the baseline, FAME is projected to fall in line with the decline in fuel consumption, although a greater volume is projected to be supplied over the period under this scenario, to meet the higher target. We also note that ethanol/methanol (DC) grows substantially over the appraisal period, as the crop-cap limits the amount of crop based fuels such as ethanol/methanol (SC) which can be accommodated. This leads to suppliers gradually switching to ethanol/methanol (DC) over time, which is wasted-derived, and will likely bring greater GHG emissions savings.

Option 2 - 2.5 percentage points main RTFO target increase (preferred option)

Because the 2.5 percentage point increase to the main RTFO is our preferred option, we have undertaken additional sensitivity analysis, to assess the discounted benefits, costs, net present benefits and CCE under a higher EV uptake scenario as well as our baseline EEP scenario.

This reflects the fact that the baseline EEP scenario only incorporates current firm and funded policies and does not capture any future policies that will lead to higher EV uptake, which will in turn reduce demand for renewable transport fuels. The higher EV uptake scenario is not a projection of what we think will happen, but simply a scenario of what could happen, and has been developed specifically for the purposes of understanding the impact that a faster uptake of EVs could have on our results. The costs and benefits of the proposed RTFO target increase are expected to lie somewhere in between the baseline EEP and EV scenarios in reality.

Under the EEP baseline, option 2 is projected to lead to 14.6 MtCO2e in total across the appraisal period from 2022-2032. Under the higher EV uptake scenario, option 2 is projected to lead to 11.7 MtCO2e across the appraisal period (see tables 5 and 6).

Year	MtCO2e
2020	0.0
2021	0.0
2022	1.0
2023	1.1
2024	1.2
2025	1.2
2026	1.3
2027	1.3
2028	1.4
2029	1.4
2030	1.5
2031	1.5
2032	1.6
2033	1.6
2034	1.6
2035	1.6

Table 5 - Summary table of additional GHG emissions savings in terms of MtCO2e for 2.5 percentage point RTFO target increase (2020-2035) under baseline EEP scenario

Year	MtCO2e
2020	0.0
2021	0.0
2022	0.9
2023	1.0
2024	1.0
2025	1.1
2026	1.1
2027	1.1
2028	1.1
2029	1.1
2030	1.1
2031	1.1
2032	1.1
2033	1.0
2034	0.9
2035	0.8

Table 6 - Summary table of additional GHG emissions savings in terms of MtCO2e for 2.5 percentage point RTFO target increase (2020-2035) under EV scenario

As expected, the benefits are lower under the higher EV uptake scenario compared to the baseline EEP, as less renewable fuel is expected to be supplied. This is also true of the costs however. Overall the net present value of the policy is projected to be -£1,193 to -£1,470 million, and the cost per tonne of carbon saved is estimated to be £170 to 171/tCO2e (see table 7).

	Discounted Benefits (£million)		**Discounted Costs (£million)**		**Net Benefit (£million)**	
Year	Baseline EEP	EV	Baseline EEP	EV	Baseline EEP	EV
2020	0	0	0	0	0	0
2021	0	0	0	0	0	0
2022	77	69	210	188	-133	-119
2023	81	72	215	192	-135	-120
2024	83	74	220	194	-136	-121
2025	86	75	223	195	-138	-120
2026	88	75	226	192	-138	-117
2027	90	74	228	188	-138	-114
2028	93	74	229	184	-137	-109
2029	94	73	230	178	-136	-105
2030	96	72	231	173	-135	-101
2031	104	73	231	163	-127	-89
2032	114	75	231	153	-118	-78
Total Additional Net Benefits (Net Present Value - £million, appraisal period 2022-2032)					**-1,470**	**-1,193**
Carbon Cost Effectiveness (£/tCO2, appraisal period 2022-2032)					**170**	**171**

Table 7 - Table of additional discounted benefits and costs, total additional net benefits and carbon cost effectiveness for 2.5 percentage point RTFO target increase (2020-2035): Baseline EEP vs. EV scenarios.

Option 2 is projected (under the baseline EEP scenario) to lead to a broadly similar fuel mix to option 1 (see figure 4). The same underlying drivers of these trends apply in both scenarios. However, FAME is projected to account for a greater amount of the fuel mix in option 2 compared to option 1, reflecting the fact that this is used as the marginal fuel to fill the target increase.

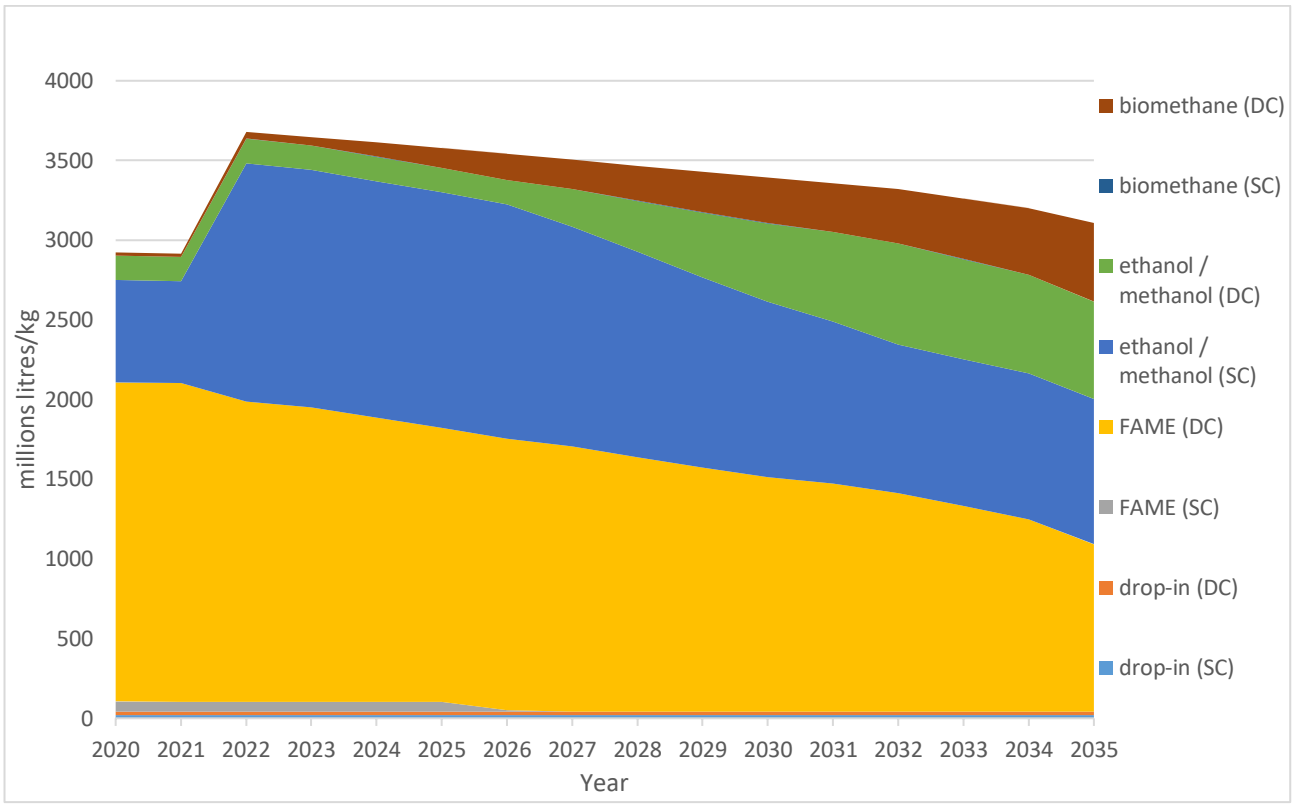


Figure 4 - Fuel volume supply under the main RTFO – 2.5 percentage point target increase (baseline EEP)

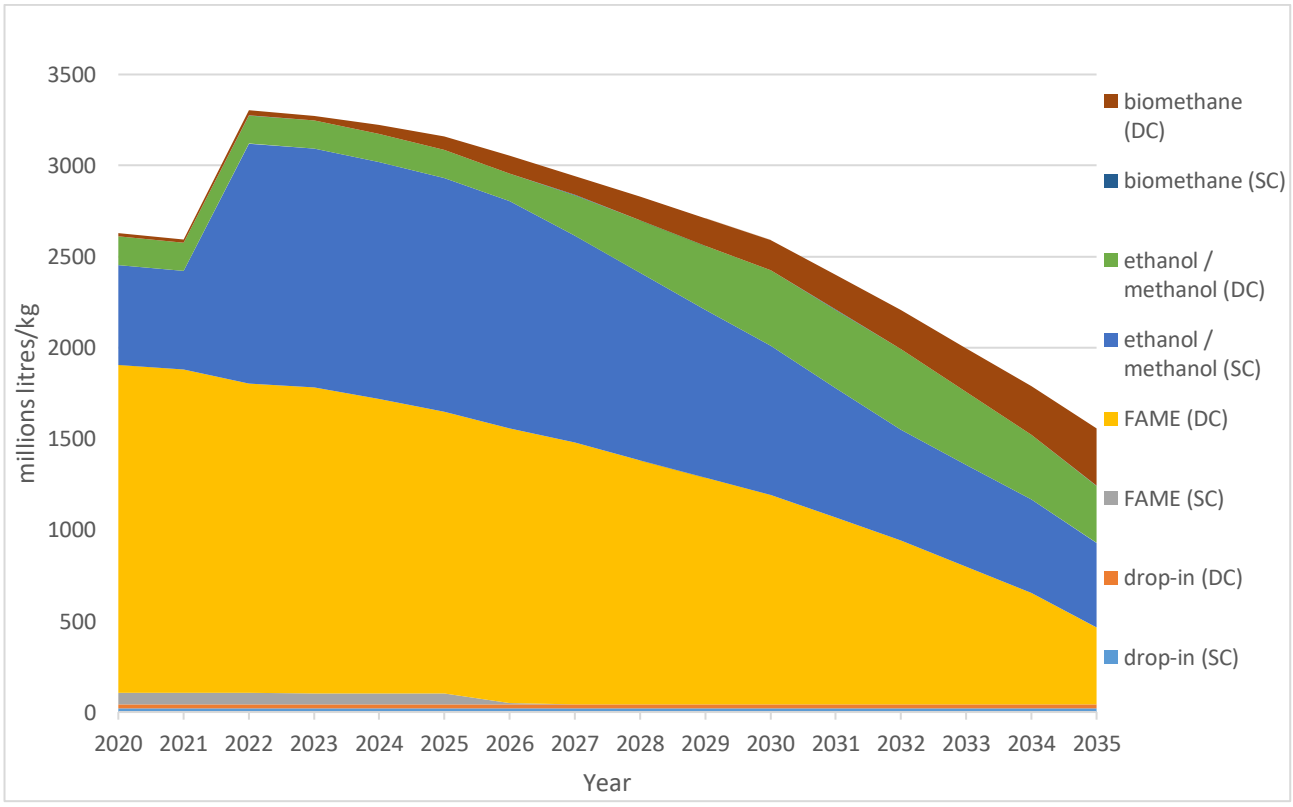


Figure 5 - Fuel volume supply under the main RTFO – 2.5 percentage point target increase (EV)

Option 3 - 5 percentage points main RTFO target increase

Option 3 increases the main RTFO target by five percentage points. It is estimated that this could result in an additional 23.6 MtCO2e across the appraisal period from 2022 to 2032.

Year	MtCO2e
2020	0.0
2021	0.0
2022	1.0
2023	1.3
2024	1.5
2025	1.7
2026	1.9
2027	2.2
2028	2.4
2029	2.6
2030	2.8
2031	3.0
2032	3.2
2033	3.2
2034	3.2
2035	3.1

Table 8 - Summary table of additional GHG emissions savings in terms of MtCO2e for 5 percentage point RTFO target increase (2020-2035)

A five percentage point target increase is predicted to have higher benefits alongside higher costs compared to a 2.5 percentage point target increase (see table 9), with an overall net present value of -£2,307 million - the largest of all the options. The carbon cost effectiveness of this option is estimated to be similar to the other options, at £166/tCO2e overall.

Despite the fact that option 3 achieves the greatest carbon savings, option 2 remains the preferred policy. This is because of the uncertainty surrounding the availability of renewable feedstocks which would be needed to support such ambitious increases to the RTFO target. Further research is being undertaken to better understand the availability of renewable feedstocks, and as the extent of this is not yet fully known, it is felt that implementing a five percentage point RTFO target increase at this stage would be too ambitious. For this reason, a 2.5 percentage point RTFO target is the preferred option at this stage. Further increases to the RTFO targets remain under consideration.

	Discounted Benefits (£million)			Discounted costs (£million)			Net Benefit (£million)
Year	Low	Central	High	Low	Central	High	Central
2020	0	0	0	0	0	0	0
2021	0	0	0	0	0	0	0
2022	39	77	115	133	210	364	-133
2023	46	93	139	158	249	423	-156
2024	54	108	162	180	284	472	-177
2025	62	122	183	201	316	515	-195
2026	67	134	201	219	345	549	-211

	Discounted Benefits (£million)			Discounted costs (£million)			Net Benefit (£million)
2027	74	146	220	235	370	578	-224
2028	79	159	238	249	393	601	-234
2029	85	169	254	262	413	619	-244
2030	88	179	267	274	431	632	-252
2031	101	202	303	284	448	643	-246
2032	114	227	341	293	463	651	-235
Total Additional Net Benefits (Net Present Value - £million, appraisal period 2022-2032)							**-2,307**
Carbon Cost Effectiveness (£/tCO2e, appraisal period 2022-2032)							**166**

Table 9 - Discounted additional benefits and costs, total additional net benefits and carbon cost effectiveness for five percentage point RTFO target increase (2020-2032)

Under option 3 the mix of fuels is projected to be broadly similar to the other options, with FAME (DC) and ethanol/methanol (both SC and DC) accounting for the vast majority of fuels supplied across the appraisal period (see figure 6).

Under option 3, there is a minor increase in the total amount of renewable fuel across the appraisal period.

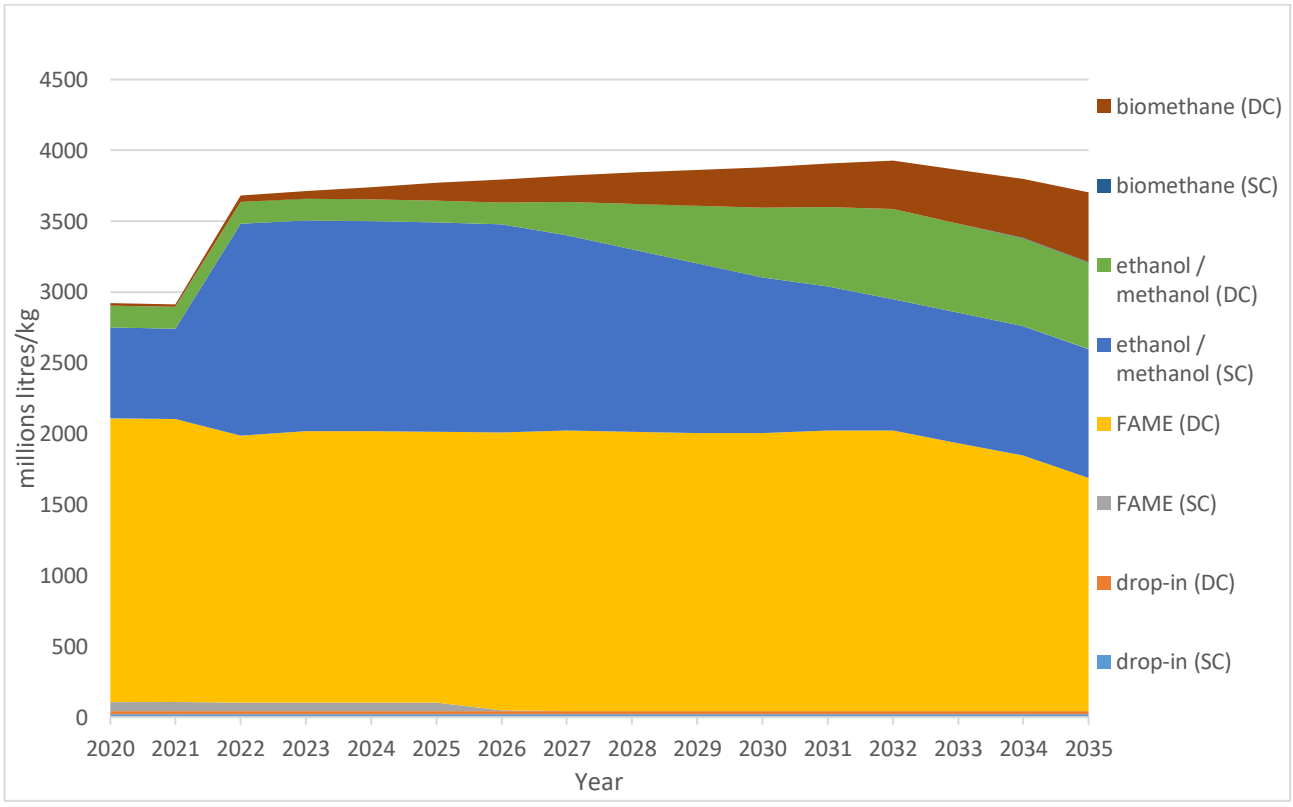


Figure 6 - Total fuel volume supply under the main RTFO – 5 percentage point target

3. Cost-benefit analysis of changes to the RTFO development fuels target

Introduction

In 2019, a development fuel target was introduced to sit alongside the main RTFO target. The purpose was to incentivise the supply of advanced renewable fuels, which are of strategic importance to the UK and which can be used by harder to decarbonise forms of transport such as lorries and aeroplanes. In 2019, the development fuel obligation was set at 0.1% as a share of total fuel by volume. This increases rapidly in the first few years, with further increases until it reaches 2.8% in 2032. The development fuel target then remains at this level in subsequent years unless further legislation is brought forward to change it.

There are two policy proposals affecting development fuels:

- **Expanding the forms of transport in which hydrogen used is eligible for RTFO development fuel support;**
- **Making recycled carbon fuels eligible for RTFO development fuel support**

Details of both of these policies can be found in the consultation document [link].

The RTFO development fuel target has only recently been introduced. This means that there is considerable uncertainty around how much development fuel will be supplied, the mix of fuels that may be supplied and the costs. We have therefore had to make a number of important assumptions in undertaking this analysis. In doing so, the analysis has focussed on understanding the likely costs and benefits of the proposed changes rather than attempting to provide scenarios for future development fuel supply.

Methodology and assumptions

Development fuels costs and the buy-out price

Like the main RTFO, the development fuels RTFO (dRTFO) also operates as a certificate trading mechanism. Development renewable transport fuel certificates (dRTFCs) are issued to suppliers of renewable transport development fuel and these can be used to demonstrate that an obligated supplier has met their obligation. Alternatively, suppliers can pay a fixed sum for each litre of fuel for which they wish to ‘buy out’ of their obligation. The buy-out price for development fuels currently stands at a fixed level of 80p/litre.

Fuel suppliers are likely to use this buy-out option when the cost of producing or buying development fuels exceeds the buy-out price. This buy-out option forms an important safety net by capping the costs which can be incurred, thereby preventing the cost of this policy disproportionately impacting motorists.

Because there is significant uncertainty about future development fuel prices, for the purposes of this work we have assumed that the additional cost of supplying all development fuels is 80 pence per litre throughout the period under analysis. This equates to the maximum incentive available through the RTFO to supply development fuels, as set by the buy-out price. The cost of development fuels should not go above this level, because suppliers would choose to pay the fixed 80 pence per litre to buy out of their obligations rather than supply fuels which were more expensive. The cost of supplying development fuels may be lower than this, but in the absence of data to reliably estimate what the actual costs of these fuels will be, this assumption ensures that we do not underestimate the possible costs.

Furthermore, in the earlier years of the appraisal period, we would expect a very high number of firms to actually buy out of their obligation to supply development fuels due to high costs of supplying these fuels which may approach or exceed the 80 pence per litre buy-out price. Therefore, using the buy-out price to approximate the costs of the dRTFO in earlier years is a reasonable assumption. In the later years of the appraisal period, there may be fewer occurrences of firms buying out of the development fuels obligation, but we have no feasible way to predict to what extent that may happen. Hence, we have used the buy-out price to approximate the cost of the dRTFO all the way through the appraisal period.

Baselines

When analysing the main RTFO obligation, we created a baseline supply scenario based on the RTFO targets being met, and the assumed hierarchy of fuels set out which was based on knowledge of main RTFO fuels such as the cost of RTFCs of specific renewable fuels. This approach was not possible for development fuels, due to insufficient data and evidence on the fuels used to meet the development fuels target.

Because of this uncertainty in future development fuel supply, we have developed two baselines to illustrate a wide range of possible GHG emissions savings from the proposed policy changes. Neither scenario is intended to represent a likely outcome, rather two extremes of the range of possibilities.

Baseline 1 – buy-out baseline.

In this baseline scenario, no development fuel is supplied under the current policy and all suppliers buy out of their development fuel obligation. We refer to this as the ‘buy-out baseline’.

For each policy compared against this baseline, all fuel supplied as a result of the proposed changes is additional, bringing additional GHG emissions savings to the policy.

Baseline 2 – 100% road fuel from municipal solid waste (MSW).

In this baseline scenario, we assume that the entire development fuels target is met using one 'typical' development fuel - a drop-in diesel equivalent road fuel made from MSW with a carbon intensity of 32 gCO2e/MJ. This fuel was chosen as it is not subject to demand constraints - i.e. as much as can be produced would be usable in the market.

For each policy compared against this baseline, all fuel supplied as a result of the proposed changes is assumed to displace this baseline fuel. This means that whether there is an increase or decrease in GHG emissions savings from the proposed policies will depend on whether the GHG emissions savings of the added fuel is higher or lower than that of the baseline fuel (i.e. road fuel from MSW).

Policy proposals and assumptions

The two policy proposals, outlined below, were assessed against each baseline above.

Proposal 1 – An increase in hydrogen eligibility.

We are proposing to amend the RTFO so that renewable hydrogen used in maritime, rail and non-road mobile machinery applications is eligible for dRTFCs. Renewable hydrogen used in road vehicles is already eligible from dRTFCs, so this is not included in these figures, and has not been included in the baselines for the reasons set out above.

Exactly how demand for, and supply of, renewable hydrogen will expand in the coming years is highly uncertain, but we have based our figures on estimates given to us by industry.

Proposal 2 – Introducing support for recycled carbon fuels (RCF) under the dRTFO.

We are proposing to make certain types of recycled carbon fuels eligible for dRTFCs.

It is proposed that RCFs produced from solid feedstocks (such as municipal solid waste (MSW)) are awarded 0.5 dRTFCs per litre, and RCFs produced from gaseous feedstocks (such as waste industrial gases) are awarded one dRTFC per litre.

The amount of recycled carbon fuels supplied is likely to be primarily determined by the production capacity. We have based our assumptions on views obtained from the industry. We have assumed that the RCFs being produced are a mixture of road fuel (40%) and aviation fuel (60%). We have assumed that fuels produced from MSW are biofuel (60%) and RCF (40%). We have further assumed that some plants are not dependent on RCF eligibility to begin production i.e. these plants' biofuels appear in the development fuel baseline already.

Methodology

As stated above, for the purposes of this CBA we have assumed that the cost of supplying all fuels to meet the development fuel RTFO is equal to the buy-out price (80 pence per litre). The total costs associated with the baselines and the policy proposals are calculated by multiplying the buy-out price (80p/litre) by the number of dRTFCs needed to fulfil the development fuel obligation.

Benefits for the policy proposals were obtained by calculating the GHG emissions savings we would expect to see from a dRTFC for each possible development fuel available to suppliers. As part of this, we account for double reward rules whereby development fuels receive two dRTFCs for every one litre equivalent supplied. The GHG emissions savings for each dRTFC were then scaled up by the number of dRTFCs we estimate would be

obtained for each fuel under the different scenarios. This provides the total MtCO2e each year under each policy proposal and baseline scenario.

These carbon saving benefits are then monetised and discounted in line with the HMT green book. This is done over the same time period of 2022-2032 which was used for appraising costs and benefits under the main RTFO.

Results

Below summarises each of the different policy options (hydrogen eligibility/RCF eligibility/both policies combined) applied to the two baselines in order to produce six different policy proposal scenarios for development fuels (see table 10). Within the following section, the additional benefits and costs of each of these six scenarios are presented and discussed.

Because supplier choices over hydrogen are assumed to be independent of their choices over RCFs (and vice-versa), the costs and benefits of the combined policies are simply the sum of the costs and benefits of the individual policies (e.g. the costs and benefits of scenario 3a are simply the sum of scenarios 1a and 2a).

	Proposal 1- hydrogen	**Proposal 2- RCF**	**Both proposals combined: hydrogen + RCF**
Baseline 1 (100% Buy-Out)	Scenario 1a	Scenario 2a	Scenario 3a (Scenario 1a + 2a)
Baseline 2 (100% Road MSW)	Scenario 1b	Scenario 2b	Scenario 3b (Scenario 1b + 2b)

Table 10 - Summary labelling all six development fuels RTFO policy proposal options

Costs

Because we have assumed that the cost of supplying all development fuels is equal to the buy-out price, the costs associated with both baselines are the same, and implementing either or both policy proposals results in no additional costs.

This conclusion that there are no additional costs from our proposals comes from our specific cost assumptions. If the cost of hydrogen or RCFs was greater than the cost of buy-out or the cost of alternative fuels then fuel suppliers could choose not to supply them. This is because we assume suppliers will choose to supply fuels into the market with the lowest costs. We make the assumption that they will never choose to supply more expensive fuel options if cheaper alternatives are available. As long as these assumptions hold, there should be no additional costs from our proposals. This also means that the hydrogen and/or RCF eligibility amendments to the dRTFO which we are suggesting will yield no change to costs compared to the current dRTFO policy. Our amendments will simply widen the scope of development fuels available for dRTFCs under the RTFO.

Benefits

We present visually below the GHG emissions savings that could be accrued by supplying additional quantities of hydrogen and/or introducing RCFs into the market via our proposals. The charts represent additional GHG emissions savings relative to the savings

which would be delivered by the existing development fuels RTFO policy under our baseline scenarios.

The fact that the additional savings are positive in all three options demonstrates the fact that hydrogen and RCFs are estimated to have lower GHG emissions than both (i) their fossil fuel equivalents (under the 100% buy-out baseline, where suppliers buy out of their development fuel obligations entirely and supply fossil fuels instead), as well as (ii) Road MSW (under the 100% road MSW baseline). Consequently, displacing either fossil fuels or road MSW with hydrogen and/or RCFs is projected to result in higher emission savings under the RTFO.

As expected, the estimated additional benefits of the policies are always higher when assessed against the 100% buy-out baseline, compared to the 100% road MSW baseline. This is because road MSW already provides GHG emissions savings relative to fossil fuels, which are supplied at 100% within the buy-out baseline.

The additional GHG emissions savings as a result of the dRTFO policies are seen to be relatively small. However, there may also be wider, indirect benefits that are not captured in our analysis, such as promoting an industry which could lead to an even greater production of development fuels. Benefits such as these have not been included within our modelling.

Option 1- Hydrogen eligibility policy proposal (scenarios 1a and 1b)

Extending support for hydrogen is projected to result in steadily rising GHG emissions savings from 2021 under both scenarios 1a and 1b, with a sharp increase in savings between 2024 and 2025 under the buy-out baseline.

This sharp increase in benefits reflects evidence from industry which suggests that there will be an approximate doubling of hydrogen dRTFCs for rail and Non-Road Mechanical Machinery (NRMM) modes of transport between 2024 and 2025. In 2025 we expect that the maritime transport sector will begin to demand hydrogen. Industry has indicated that there will be two ferries in Scotland which will begin to operate using hydrogen. In 2025, we also anticipate the start of a 100 vehicle hydrogen heavy goods vehicle (HGV) trial, which will translate into an additional demand of 11kg of hydrogen per vehicle within the trial. This combination of demands in 2025 will result in an increase in the amount of hydrogen supplied, and ultimately a projected increase in the additional benefits arising from hydrogen from 2025 onwards.

There is expected to be comparatively modest increases in GHG emissions savings each year from 2025, with additional benefits plateauing from 2028 onwards. This trend reflects a lack of available evidence to suggest hydrogen demand will likely rise past 2028. In the absence of such evidence, we have judged that holding benefits constant past 2028 was the most appropriate assumption for the purposes of our CBA modelling.

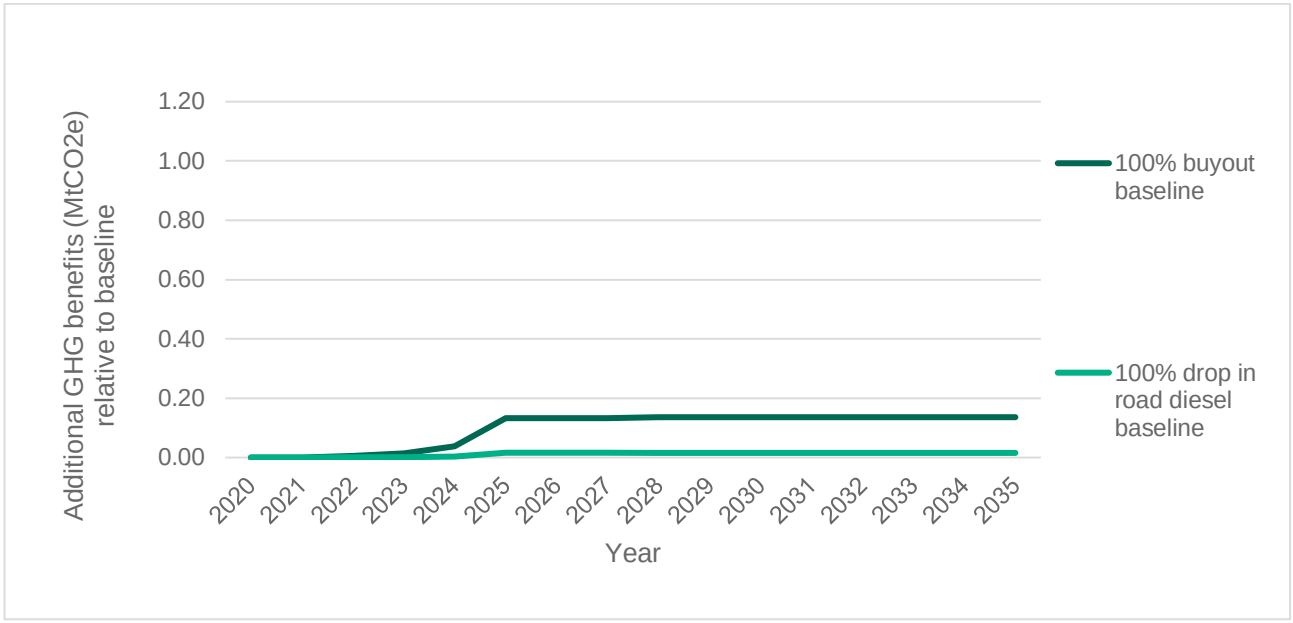


Figure 7 - Additional GHG emissions savings from scenarios 1a and 1b under option 1 hydrogen eligibility policy proposal presented relative to both baselines

Option 2 - RCF policy proposal (scenarios 2a and 2b)

The RCF eligibility policy proposal is assumed to be introduced from 2023, with a steady increase in RCF dRTFCs being redeemed over the appraisal period. This results in additional savings which grow steadily over time.

It is assumed that two of the development fuel plants already established will continue to operate regardless of our proposals, but that one specific plant will not commence operation unless the policy is implemented. In addition, we assume these plants will deliver drop-in fuel for existing vehicles. As such, unlike hydrogen, RCFs are limited by supply production and not according to demand.

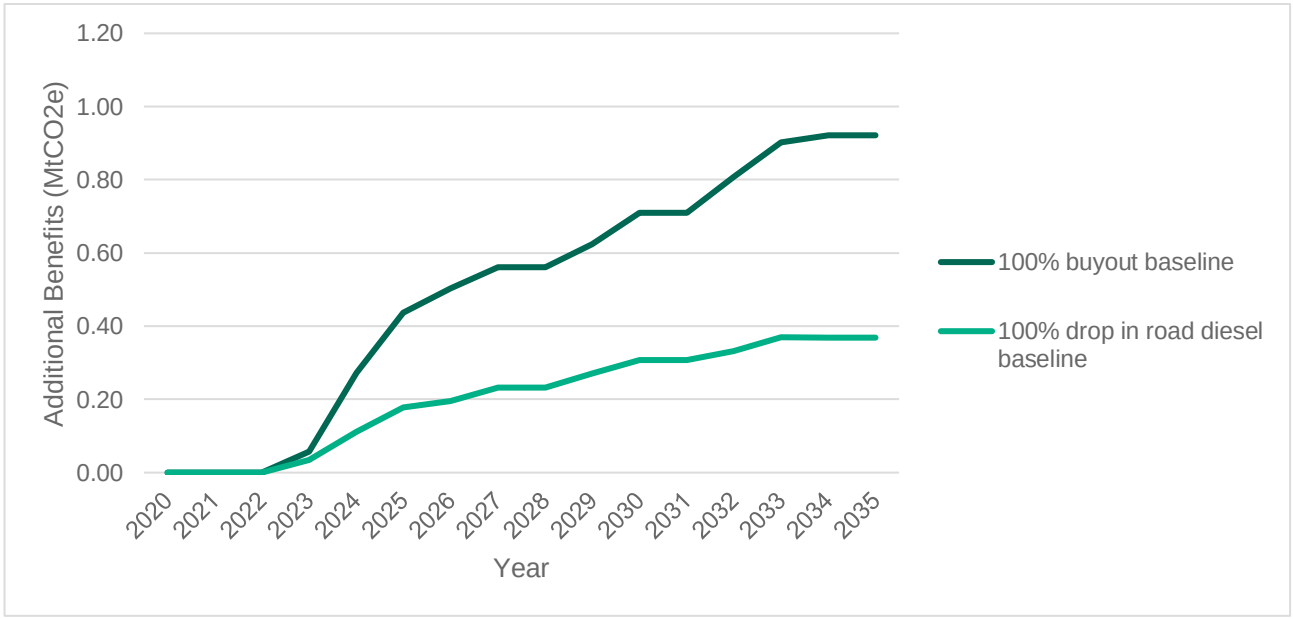


Figure 8 - Additional GHG emissions savings from scenarios 2a and 2b under option 2 RCF eligibility policy proposal relative to both baselines

Option 3 - Combined policy proposals (options 3a and 3b)

The chart below shows the combined effect of both the hydrogen eligibility proposal (option 1) and the RCF eligibility proposal (option 2), assessed against both baselines. The profile of the estimated benefits closely mirrors what we found for option 2 - reflecting the fact option 2 accounts for the majority of the estimated benefits, and the fact the benefits from the two proposals are assumed to be additive.

Combined we estimate that the two development fuels policies will lead to additional GHG emissions savings of between 2.3 and 6.4 MtCO2e. This equivalent to benefits of £158 million to £434 million using discounted, central carbon values (see table 12).

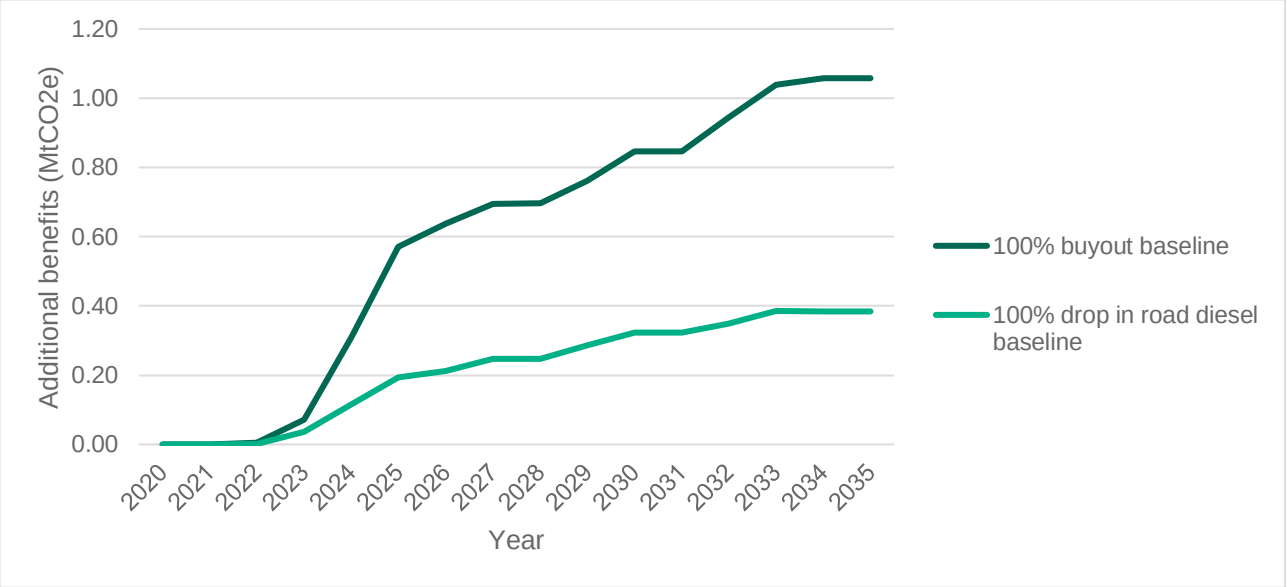


Figure 9 - Additional GHG emissions savings from scenarios 3a and 3b under option 3 of the combined development fuels policies (hydrogen and RCF eligibility) relative to both baselines

Year	Additional Benefits (MtCO2e)					
	100% buy-out baseline			100% Road MSW baseline		
	↑ Hydrogen eligibility	↑ RCF	Combined	↑ Hydrogen eligibility[8]	↑ RCF	Combined
2020	0.0	0.0	0.0	0.0	0.0	0.0
2021	0.0	0.0	0.0	0.0	0.0	0.0
2022	0.0	0.0	0.0	0.0	0.0	0.0

[8] GHG savings under this policy option are not technically zero, but are small in terms of MtCO2e. As GHG savings figures are presented to two decimal places, savings appear as if they are zero in our modelling when in fact they are not.

Year	Additional Benefits (MtCO2e)					
	100% buy-out baseline			100% Road MSW baseline		
	↑ Hydrogen eligibility	↑ RCF	Combined	↑ Hydrogen eligibility[8]	↑ RCF	Combined
2023	0.0	0.1	0.1	0.0	0.0	0.0
2024	0.0	0.3	0.3	0.0	0.1	0.1
2025	0.1	0.4	0.6	0.0	0.2	0.2
2026	0.1	0.5	0.6	0.0	0.2	0.2
2027	0.1	0.6	0.7	0.0	0.2	0.2
2028	0.1	0.6	0.7	0.0	0.2	0.2
2029	0.1	0.6	0.8	0.0	0.3	0.3
2030	0.1	0.7	0.8	0.0	0.3	0.3
2031	0.1	0.7	0.8	0.0	0.3	0.3
2032	0.1	0.8	0.9	0.0	0.3	0.3
2033	0.1	0.9	1.0	0.0	0.4	0.4
2034	0.1	0.9	1.1	0.0	0.4	0.4
2035	0.1	0.9	1.1	0.0	0.4	0.4

Table 11 - Summary table of additional benefits (MtCO2e) for development fuel policies (2020-2035)

These benefits have been monetised using the government's current central carbon values, and a summary of the monetised benefits and costs for each individual option, relative to the two baselines can be found below (see table 12). As highlighted, we expect that there will not be any additional costs from these proposals, for the reasons already outlined.

Year	Additional costs of each scenario (£million)	Monetised Additional Benefits central estimate (£million)					
		100% buy-out baseline			100% Road MSW baseline		
		↑ Hydrogen eligibility	↑ RCF	Combined	↑ Hydrogen eligibility	↑ RCF	Combined
2020	0	0	0	0	0	0	0
2021	0	0	0	0	0	0	0
2022	0	0.4	0.0	0.4	0.1	0.0	0.1
2023	0	1.1	4.2	5.3	0.1	2.6	2.7
2024	0	2.7	19.6	22.4	0.3	8.0	8.3
2025	0	9.3	30.8	40.2	1.1	12.5	13.6
2026	0	9.2	34.8	44.0	1.1	13.5	14.6
2027	0	9.0	37.9	46.9	1.0	15.6	16.7
2028	0	9.1	37.6	46.7	1.1	15.5	16.6
2029	0	8.9	40.9	49.8	1.0	17.8	18.8
2030	0	8.7	45.5	54.3	1.0	19.7	20.7
2031	0	9.2	47.8	57.0	1.1	20.7	21.7
2032	0	9.7	57.3	67.0	1.1	23.6	24.7
Total (Appraisal Period 2022-2032)	**0**	**77.4**	**356.4**	**433.8**	**8.9**	**149.5**	**158.4**

Table 12 - Summary table of discounted additional benefits and costs for development fuel policies (2022-2032)

4. Combined policies

In this section we combine the costs and benefits from our main RTFO target increases with the costs and benefits of our proposals for development fuels, to show the overall effect of the full RTFO consultation proposals.

We have combined the central estimates of the impact of increasing the main RTFO target by 2.5 percentage points with the central estimate of the combined impact of our hydrogen and RCF eligibility proposals (compared against the two development fuels baselines). A table depicting the additional costs and benefits of the combined impacts is shown below.

Dev. Fuel Policy Option	Dev. Fuels Baseline	Main RTFO Target Scenario	Additional Savings (MtCO2e)	Additional Savings (£million)	Additional Costs (£million)
Combined (Hydrogen and RCF eligibility)	100% buy-out	2.5%	21.0	1,440	2,475
Combined (Hydrogen and RCF eligibility)	100% Road MSW	2.5%	16.9	1,164	2,475

Table 13 - Summary table of central, discounted additional benefits and costs for the combined (hydrogen and RCF eligibility) development fuel policies and the 2.5 percentage point target increase to the main RTFO under baseline EEP

Altogether, our CBA modelling estimates that implementing our proposals could lead to additional GHG emissions savings of between 16.9 to 21.0 MtCO2e. This amounts to a monetised benefit equal to £1,164 million to £1,440 million, and compares to additional costs from the combined reforms of around £2,475 million in costs. In terms of the 2.5 percentage point increase to the main RTFO, this is likely to deliver substantial GHG emissions savings, albeit at greater costs which will translate into likely raised fuel prices which motorists will have to pay. We estimate this will be equivalent to 0.8 pence per litre. Specifically, regarding amendments to the dRTFO, there will be greater GHG emissions savings with no change to the cost compared to the current policy.

5. Full list of questions

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

1. Do you think that the marginal fuel is still FAME UCOME biodiesel? Please give reasoning and evidence for your answer.

2. Do you agree that the assumptions made within our modelling are reasonable? Please give reasoning for your answer.