UKPIA Response to Consultation on developing the UK SAF Mandate

Targets and price support for SAF

Q1: Which 2025 target option strikes the right balance between ambition and deliverability? Do you have any evidence to support your position?

UKPIA's view is that **option 1**, low, is the only achievable trajectory currently, for four reasons:

Firstly, the timescale of the legislative process as it currently stands is extremely short, with the legislation expected, but not guaranteed, to conclude before the start of 2025. This gives no time for suppliers to understand the legislative requirements, to commission any necessary blending systems and to procure suitable SAF which will meet the mandate requirements. From the DfT modelling for the UK, in the low feedstock availability assumptions scenario, only option 1 is feasible in 2025. Even under the high feedstock availability scenario, option 3 is not feasible in 2025.

Secondly, while this would be lower than the approach taken by the European Union (EU), who are setting a 2% target in 2025 [1] the EU target has no limitations on the use of HEFA. Setting a similar trajectory with the additional cap in place does not create a level playing field with closely located geographical competitors.

Thirdly, while the use of Municipal Solid Waste (MSW) as a Recycled Carbon Fuel (RCF) has been approved for use as a SAF component in avtur through the ASTM process, other RCFs such as those derived from tyre pyrolysis oil or waste plastic have not been approved to date. We note that a response to the recent consultation on recognising RCFs under RTFO [2] (and SAF under the same primary powers) is expected soon which would give much needed clarity to low carbon fuel suppliers.

Though UKPIA welcomes the recent announcements on the establishment of a UK clearing house for SAF, this work is still to commence and is likely to take a minimum of three years to approve potential SAF pathways to ensure compliance with ASTM D7566[3], The pathways for the use of RCFs are therefore significantly limited in the early years of the SAF mandate scheme.

An analysis by ICF [4] highlights that the current announced capacity covers less than half of the projected UK SAF demand in 2030.

Additionally, setting a higher target for 2025 is likely to lead to suppliers paying the financial penalties associated with a missed obligation, or "buying out", ultimately increasing the costs to the aviation industry for no environmental benefit and so not meeting the stated policy objective. The 10% SAF target in 2030 which was announced in 2022 provides the required ambition to the industry to support SAF production in the short term. The practicalities of project finance, design and construction are the limiting factors not the mandate targets prior to 2030.

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[1] https://www.fuelseurope.eu/publications/publications/refuel-eu-aviation

[2] https://www.gov.uk/government/consultations/supporting-recycled-carbon-fuels-through-the-renewable-transport-fuel-obligation

[3] https://www.astm.org/d7566-22.html

[4] https://www.icf.com/insights/transportation/deploying-sustainable-aviation-fuel-to-meet-climate-ambition

Q2: Would you find it acceptable if the trajectory from 2025 to 2030 was set at an ambitious level and this led to high levels of buy-out and increasing costs to consumers?

UKPIA's vision is to transform and shape an energy-secure, low-carbon fuels future for the UK that benefits everyone[5]. We would ask whether it is acceptable for aviation consumers to effectively pay additional costs for greenhouse gas (GHG) reductions that have not taken place. In our view buy-out payments represent a policy failure, and we remain keen to continue to work with other stakeholders to ensure that the policy is a success and that buy-outs do not occur.

The setting of targets needs to provide a clear trajectory for decarbonisation providing certainty for investment in SAF production, and downstream supply infrastructure. Increasing targets to a level which cannot be physically met through scalable and available technology, investment and construction timescales will lead to obligated companies "buying out". Experience with the RTFO, particularly for development fuels [6]suggests that the buy-out costs borne by fuel suppliers will be passed through the supply chain an ultimately to consumers.

Therefore, setting targets that are unachievable leading to buy-out increases the cost to the aviation industry, and consumers with no benefit to the policy objective of reducing aviation GHG emissions. There needs to be transparency for consumers if the government is taking this approach.

There also needs to be a recognition that the UK aviation industry does not operate in isolation. To compete at a global level, the UK aviation industry needs to be competitive with other jurisdictions, particularly in the EU. Therefore, higher costs such as those created by an unrealistic and overly ambitious SAF mandate trajectory may lead to the UK aviation industry losing ground to international competitors.

Q3: Do you have any comments on the post 2040 proposal to legislate for targets continuing at the 2040 level, with the plan to update these when better data is available?

UKPIA **agrees** with the policy intent of setting a trajectory that provides certainty for investment. However, any targets in the post 2040 timeframe should align with those of the EU, to ensure a level playing field with our close international competitors.

It is politically very difficult to reduce targets once they have been set, even in the face of evidence that they are not achievable. Reducing targets in the future can also have an impact on investor certainty – both now for SAF and future UK investments across all industries. Therefore, increased targets post 2040 should not be set at this time.

Any increases in targets, including those of 2040 need to be set based on a sound review of available and achievable technologies and feedstocks. There also needs to be a lead time so that the supply chain, including potential SAF production plants, can adapt to the increases. Updates to trajectories for the medium-term future should be revised regularly to reflect the most up-to-date understanding of the sector and the actual progress.

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[5] https://www.ukpia.com/

[6] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1063075/renewable-transport-fuel-obligation-annual-report-2020-print-version.pdf

Q4: What increasing trajectory to 2040 do you think strikes the right balance between ambition and deliverability? Do you have any evidence to support your position?

In UKPIA's view, **option 1**, low is the only currently achievable trajectory.

The trajectories being developed must be based on sound science and achievable, while providing some degree of ambition. The pathways should not rely on "silver bullet" technology and be technology neutral. The low feedstock scenarios in the DfT modelling for the UK show large shortfalls against the obligation through to 2040.

The assumptions made in the "High Ambition" and "High Ambition with breakthrough on SAF" may not be achievable based on current projections. While option 2, medium is consistent with the "high ambition" scenario of 50% by 2050 and is broadly consistent with the current EU Proposals which call for 63% by volume by the same date, the EU have no limitations on the use of HEFA to meet the mandate. Setting a similar trajectory with the additional cap in place does not create a level playing field with closely located geographical competitors.

While the use of MSW as a RCF has been approved for use as a SAF component in avtur through the ASTM process, other RCFs such as those derived from tyre pyrolysis oil or waste plastic have not been approved. We note that a response to the recent consultation on recognising RCFs under RTFO (and SAF under the same primary powers) is expected soon which would give much needed clarity to low carbon fuel suppliers.

Though UKPIA welcomes the recent announcements on the establishment of a UK clearing house for SAF, this work is still to commence and is likely to take a minimum of three years to approve potential SAF pathways under ASTM 7566 and may not be granted after that process concludes. The use of RCFs to meet future obligations should therefore not be assumed now.

The significant amount of feedstock required in these two scenarios needs to be viewed as part of the wider transition to low carbon fuels. This needs to be considered as part of the development of the Low Carbon Fuel Strategy being carried out through 2022 and 2023, as well as part of the BEIS (and now DESNZ) Biomass strategy. In addition, the use of "Power to liquid SAF" technology needs to be proven at scale and consistent with available low carbon electrical power to form a material part of the Net Zero strategy,

It is politically very difficult to reduce targets once they have been set, even in the face of evidence that they are not achievable. Setting a higher target up to 2040 is likely to lead to suppliers buying out, ultimately increasing the costs to the aviation industry for no environmental benefit and so not meeting the stated policy objective.

Q5: Do you have an alternative trajectory option you would prefer to see, and do you have evidence to support this?

Any trajectory for SAF must be based on sound science and be achievable, while providing some degree of ambition. The pathways should not rely on "silver bullet" technology and be technology neutral.

While the use of MSW as a RCF has been approved for use as a SAF component through the ASTM process, other RCFs such as those derived from tyre pyrolysis oil or waste plastic have not been approved.

Though UKPIA welcomes the recent announcements on the establishment of a UK clearing house for SAF, this work is still to commence and is likely to take a minimum of three years

to approve potential SAF pathways and may not be granted after that process concludes. The use of RCFs to meet future obligations should therefore not be assumed now.

The aromatics blend limitations in the existing aviation specifications may also limit the amount of SAF components that can be added and need to be considered in the setting of any trajectories. Multiple models and reports by the ICCT[7] SkyNRG[8], ICF[9], and ATAG [10] call to attention that significant development work is still required for the Alcohol to Jet (AtJ) [11] and Fischer Tropsch (FT) [12] pathways. The SAF mandate consultation has expressed concerns about HEFA being diverted from the road transport fuel sector to aviation and so has proposed a HEFA cap on SAF production. This may have unintentional consequences for UK SAF production as it would inhibit the only viable technology pathway production in the UK in the short term.

Even without a cap currently in place, the ICF analysis showed that the current announced UK SAF production capacity would only meet less than half the demand in 2030. Therefore, the SAF mandate, if imposed in its current form, will equate to a UK SAF sector requiring to import over half of the UK demand, exposing the UK to volatile international markets and driving up costs for consumers.

If a HEFA cap is in place, it is important that it is initially set at a sufficiently high level for early industry deployment of SAF technology. In UKPIA and ICF's view, a HEFA cap will be highly unlikely to 'squeeze-out' other SAF production technologies before 2030.

HEFA feedstocks not only include tallow and UCO, but also other suitable feedstocks such as sustainable cover crops, and the role of these feedstocks needs to be recognised. Input feedstocks should meet rigorous sustainability performance criteria and verified in doing so via robust certification processes, but no feedstock that can do this should be excluded.

The ICF Report also highlighted a discrepancy between the ICF and SAF mandate consultation models on the availability of SAF feedstock. In detail, the ICF report highlighted the SAF mandates consultations' large uncertainty range and higher central scenario values in the modelled municipal solid waste and wood residue feedstock availability compared to the ICF model. However, the mandate modelled waste Fats, Oils and Greases (FOGs) to be less available than other industry models. UKPIA is keen to understand why and how DfT came to these conclusions that show a significantly more optimistic view on wood residue and MSW availability compared to a more pessimistic outlook on FOG availability, which is inconsistent with predictions made by industry.

Q6: Would you find it acceptable if the trajectory from 2030 onwards was set at an ambitious level and this led to high levels of buy-out and increasing costs to consumers?

UKPIA's vision is to transform and shape an energy-secure, low-carbon fuels future for the UK that benefits everyone. We would ask whether it is acceptable for aviation consumers to effectively pay additional costs for greenhouse gas (GHG) reductions that have not taken

[7] hhttps://theicct.org/publication/estimating-sustainable-aviation-fuel-feedstock-availability-to-meet-growing-european-union-demand/

[8] https://nordicelectrofuel.no/wp-content/uploads/2021/08/SkyNRG-Market-Outlook-on-SAF-Background-Analysis-JUL-2021.pdf

[9] https://www.icf.com/insights/transportation/deploying-sustainable-aviation-fuel-to-meet-climate-ambition

[10] https://www.atag.org/

[11] https://chemistry-europe.onlinelibrary.wiley.com/doi/am-pdf/10.1002/cssc.201801690

[12] https://ntrs.nasa.gov/api/citations/20120000727/downloads/20120000727.pdf

place. In our view buy-out payments represent a policy failure, and we remain keen to continue to work with other stakeholders to ensure that the policy is a success and that buy-outs do not occur.

The setting of targets needs to provide a clear trajectory for decarbonisation providing certainty for investment in SAF production, and downstream supply infrastructure. Increasing targets to a level which cannot be physically met through scalable and available technology, investment and construction timescales will lead to obligated companies "buying out". Experience with the RTFO, particularly for development fuels suggests that the buy-out costs borne by fuel suppliers will be passed through the supply chain and ultimately to consumers.

Therefore, setting targets that are unachievable leading to buy-out increases the cost to the aviation industry, and consumers with no benefit to the policy objective of reducing aviation GHG emissions. There needs to be transparency for consumers if the government is taking this approach.

There also needs to be a recognition that the UK aviation industry does not operate in isolation. To compete at a global level, the UK aviation industry needs to be competitive with other jurisdictions, particularly in the EU. Therefore, higher costs such as those created by an unrealistic and overly ambitious SAF mandate trajectory may lead to the UK aviation industry losing ground to international competitors.

Q7: Do you agree with where we have set our HEFA cap upper and lower bounds (upper bound is highest HEFA uptake modelled under the mandate, lower bound is no HEFA in the mandate)? Do you have any evidence to support this?

UKPIA **does not agree** with the setting of a HEFA cap.

The fact that the SAF mandate is proposed as an energy / GHG reduction scheme should incentivise non-HEFA pathways.

It is not clear why aviation should receive differential treatment from ground fuels. This approach picks winners and is not technology neutral. This approach is also inconsistent with the approach taken in other SAF obligation schemes internationally, such as ReFuelEU Aviation [13] which have no limit on the usage of HEFA in their schemes.

Given the fact that the UK imports around 80% of its low carbon fuel [14], the imposition of a UK only HEFA cap for SAF will only result in the imports being diverted to jurisdictions where HEFA is accepted. It will not change the global use of HEFA in the aviation sector. The introduction of a unilateral HEFA cap into the UK scheme is likely to increase costs for UK based aviation, ultimately increasing the costs to the aviation industry for no environmental benefit and so not meeting the stated policy objective.

We note from the responses to the prior consultation on the SAF mandate that there was no consensus from stakeholders on the application of a HEFA cap [15]. We would therefore ask that this lack of a strong stakeholder consensus be considered in the development of the SAF mandate, rather than the unilateral application of the cap that is being proposed.

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[13] https://www.consilium.europa.eu/en/press/press-releases/2023/04/25/council-and-parliament-agree-to-decarbonise-the-aviation-sector/

[14] https://www.gov.uk/government/statistics/renewable-fuel-statistics-2022-fourth-provisional-report/renewable-fuel-statistics-2022-fourth-provisional-report

[15] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1100050/sustainable-aviation-fuels-mandate-summary-of-consultation-responses-and-government-response.pdf

Further, given the unilateral UK approach to a HEFA cap, it is possible that the UK HEFA SAF plants could export their products to other jurisdictions such as the EU. While this would benefit UK companies, it also has the effect of reducing UK resilience [16] for no meaningful environmental benefit.

Q8: Do you agree that we should try to limit the diversion of feedstocks from difficult-to-decarbonise road transport modes, as much as possible?

UKPIA **does not agree** with this approach.

Difficult-to-decarbonise sectors exist in both the aviation and ground fuel sectors. It is not clear why aviation should receive differential treatment from ground fuels. This approach picks winners and is not technology neutral.

Policies, and their overall contribution to UK decarbonisation should be aligned in such a way that diversion is determined by the markets rather than targeted policy in specific departments. Given the associated technical issues, alternatives are more likely to emerge in road fuels which will ultimately benefit the aviation sector; for example, the transition from Hydrogenated Vegetable Oil (HVO) to SAF.

The approach being proposed is inconsistent with the approach taken in other SAF obligation schemes internationally, such as ReFuelEU which have no limit on the usage of HEFA in their schemes.

The introduction of a unilateral HEFA cap into the UK scheme is likely to increase costs for UK based aviation, risking its ability to compete at an international level.

The development of other SAF pathways will be encouraged by the proposed GHG based policy which will incentivise higher GHG savings by providing greater support for SAF with higher GHG savings if negative emissions are supported (see our response to question 45).

Q9: At what level do you think a HEFA cap should be set to balance mandate deliverability with road transport decarbonisation?

We have discussed the proposed approach in our response to Q8; UKPIA does not agree that a HEFA cap is appropriate and that its likely outcome is to reduce the deliverability of all options except the lowest ambition scenario outlined in the consultation (other than by buy-outs).

Therefore, we do not think that a HEFA cap should be set at any level within the UK SAF mandate.

[16] https://www.gov.uk/government/publications/energy-security-bill-factsheets/energy-security-bill-factsheet-core-fuel-resilience

Q10: At what level do you think a PtL mandate should be set to strike the right balance between ambition and deliverability? Do you have any evidence to support your choice, in particular considering low carbon electricity and hydrogen production, as well as carbon capture requirements?

UKPIA **does not agree** that a PtL mandate should be set at this stage.

The SAF mandate should be technology neutral, and not pick winners as appears to be the case for the proposed treatment of PtL. The fact that the SAF mandate scheme is set as an energy / GHG based scheme should incentivise its use.

As mentioned in the consultation document, PtL technology is still in development and needs to be proven at scale. As we indicate in previous responses, any trajectory including a PtL sub-target needs to be deliverable and not reliant on "silver-bullet" technology.

Under the RTFO, setting a "development fuel" sub-target, even with a higher "buy-out" price has not led to the development and investment in these fuels. It has led to a widespread "buy-out" by suppliers, effectively increasing costs for consumers without any policy benefits. There is a risk that creating a SAF PtL sub-target will create a similar issue with this scheme. We agree with the comments in the consultation document in this regard. Option 4 would incur very significant levels of buy-out under the SAF mandate scheme, ultimately increasing the costs to the aviation industry for no environmental benefit and so not meeting the stated policy objective.

The low carbon electricity requirements for PtL are enormous, and the need, and incentivisation for them cannot be considered in isolation. There needs to be a coherent UK-wide government strategy of how the increased UK electrical demand will be managed, given the increases in demand for EV charging, heating and industrial use predicted through the energy transition. The current waiting time for new low carbon electricity supplies to be connected to the grid is 15 years [17], which needs to be considered in the setting of any policies including those of the SAF mandate.

In UKPIA's view there should be no widespread use of PtL in the aviation sector until the UK grid is fully decarbonised and issues with curtailment [18] can be effectively managed. Widespread deployment of PtL for aviation would be inefficient and unnecessary and therefore not in the UK's best interest when considered as a whole.

Even if principles of additionality are applied, the fact that the rest of the UK grid still has emissions means that there is scope of reduce GHG emissions in a more efficient manner than the aviation sector. However, we recognise that this is an issue for wider debate as part of a coherent UK-wide energy strategy.

Q11: In which year do you think it would be most appropriate for a PtL mandate to start and how quickly do you think ambition should ramp up?

UKPIA **does not agree** that a PtL mandate should be set at this stage.

As mentioned in the consultation document, PtL technology is still in development and needs to be proven at scale. As we indicate in previous responses, any trajectory including a PtL sub-target needs to be deliverable and not reliant on "silver-bullet" technology.

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[17] https://committees.parliament.uk/committee/62/environmental-audit-committee/news/195090/mps-call-for-grid-improvements-and-affordable-household-loans-so-more-can-join-the-solar-revolution/

[18] https://renewablesnow.com/news/uk-wind-curtailment-cost-in-past-two-years-put-at-gbp-806m-787668/

Under the RTFO, setting a "development fuel" sub-target, even with a higher "buy-out" price has not led to the development and investment in these fuels. It has led to a widespread "buy-out" by suppliers, effectively increasing costs for consumers without any policy benefits. There is a risk that creating a SAF PtL sub-target will create a similar issue with this scheme. We agree with the comments in the consultation document in this regard. Option 4 would incur very significant levels of buy-out under the SAF mandate scheme, ultimately increasing the costs to the aviation industry for no environmental benefit and so not meeting the stated policy objective.

The low carbon electricity requirements for PtL are enormous, and the need, and incentivisation for them cannot be considered in isolation. There needs to be a coherent UK-wide government strategy of how the increased UK electrical demand will be managed, given the increases in demand for EV charging, heating and industrial use predicted through the energy transition. The current waiting time for new low carbon electricity supplies to be connected to the grid is 15 years, which needs to be considered in the setting of any policies including those of the SAF mandate.

In UKPIA's view there should be no widespread use of PtL in the aviation sector until the UK grid is fully decarbonised and issues with curtailment can be effectively managed. Even if principles of additionality are applied, the fact that the rest of the UK grid still has emissions means that there is scope of reduce GHG emissions in a more efficient manner than the aviation sector. However, we recognise that this is an issue for wider debate as part of a coherent UK-wide energy strategy.

We note that the EU are planning on introducing a PtL sub-target in their SAF mandate. While UKPIA is keen for as much alignment between the UK and international SAF schemes as possible, other relevant factors may mean that it is not appropriate for the UK to introduce the PtL sub target at this time. For example, the associated grid development is different between the UK and the EU [19] with different decarbonisation timescales.

If a PtL sub target is introduced when the UK is fully decarbonised, then UKPIA supports the lowest possible target and if PtL is economic given the Carbon Intensity based design of the policy, then PtL can count towards the standard mandate.

Q12: Do you agree or disagree with the proposed use of the medium buy-out price of £2 per litre or £2,567 per tonne for the main mandate, and do you have any evidence to support your response?

UKPIA supports the use of a buy-out under the SAF mandate scheme.

It is a difficult balance to set the buy-out level. If the buy-out is too low, then it does not incentivise the decarbonisation objective. If it is too high, then it risks increasing costs for UK aviation and the competitiveness of the sector. UKPIA requests that the detail behind the analysis of the buy-out options be shared to allow a meaningful discussion on how they should be set, including the assumptions on future fossil aviation fuel prices.

The setting of the buy-out at the medium option based on the DfT modelling, while attempting to balance these factors, leaves producers whose costs are at a "pessimistic" level from having no margin for their business. This makes it difficult to produce a viable business case for investment, reducing the likelihood of investment in UK SAF production. Therefore buy-

[19] https://www.nationalgrid.com/stories/engineering-innovation-stories/why-electricity-interconnection-between-europe-and-uk

out prices should include the ability for manufacturers to make a suitable return on their investments; the reward should be commensurate with the commercial and technical risks of this new and largely unproven technology.

The SAF mandate "buy-out" price provides the basis for one potential income stream for SAF producers. However, it needs to be recognised that other potential income streams are available outside of that. For example, companies gasifying MSW [20] may look to sequester the associated carbon dioxide (supported by the CCUS business model [21]) and provide high purity hydrogen (supported by the low carbon hydrogen business model [22]) rather than combine CO and H2 to form SAF. Overall, this process can even produce negative GHG emissions. Therefore, the buy-out price must also be evaluated in the context of alternative options available to SAF producers through other government transition incentive schemes.

The buy-out price should also be compared with those proposed by other major international schemes such as ReFuelEU. This ensures a level international playing field, and that UK aviation can continue to remain competitive.

Q13: Do you agree or disagree with the proposed use of the medium buy-out price of £2.75 per litre or £3,525 per tonne for the PtL mandate, and do you have any evidence to support your response?

UKPIA **disagrees** with the setting of a separate mandate for PtL, and therefore does not agree with the setting of a separate buy-out price for the PtL obligation.

The SAF mandate should be technology neutral, and not pick winners as appears to be the case for the proposed treatment of PtL. The fact that the SAF mandate scheme is set as an energy / GHG based scheme should incentivise it's use.

As mentioned in the consultation document, PtL technology is still in development and needs to be proven at scale. As we indicate in previous responses, any trajectory including a PtL sub-target needs to be deliverable and not reliant on "silver-bullet" technology.

Under the RTFO, setting a "development fuel" sub-target, even with a higher "buy-out" price has not led to the development and investment in these fuels. It has led to a widespread "buy-out" by suppliers, effectively increasing costs for consumers without any environmental benefits. There is a risk that creating a SAF PtL sub-target will create a similar issue with this scheme. We agree with the comments in the consultation document in this regard. Option 4 would incur very significant levels of buy-out under the SAF mandate scheme, ultimately increasing the costs to the aviation industry for no environmental benefit and so not meeting the stated policy objective.

The low carbon electricity requirements for PtL are very significant, and the need, and incentivisation for them cannot be considered in isolation. There needs to be a coherent UK-wide government strategy of how the increased UK electrical demand will be managed, given the increases in demand for EV charging, heating and industrial use predicted through the energy transition. The current waiting time for new low carbon electricity supplies to be connected to the grid is 15 years, which needs to be considered in the setting of any policies including those of the SAF mandate.

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[20] https://www.ctc-n.org/technologies/gasification-waste

[21] https://www.gov.uk/government/publications/carbon-capture-usage-and-storage-ccus-business-models

[22] https://www.gov.uk/government/publications/hydrogen-production-business-model

In UKPIA's view there should be no widespread use of PtL in the aviation sector until the UK grid is fully decarbonised and higher efficiency technologies prioritised. Even if principles of additionality are applied, the fact that the rest of the UK grid still has emissions means that there is scope of reduce the UK's overall GHG emissions in a more efficient manner than through the aviation sector. However, we recognise that this is an issue for wider debate as part of a coherent UK-wide energy strategy.

If a PtL sub-target is set, then as explained in our response to question 12 - based on HMG's own modelling, setting of the buy-out at the medium option, leaves producers whose costs are at a "pessimistic" level from having no margin for their business. This makes it difficult to produce a viable business case for investment, reducing the likelihood of investment in UK SAF production. Therefore buy-out prices should include the ability for manufacturers to make a suitable return on their investments; the reward should be commensurate with the commercial and technical risks of this new and largely unproven technology.

Q14: Do you agree or disagree with the proposal that a buy-out mechanism should be a permanent feature of the mandate?

UKPIA **agrees** that the buy-out needs to be a permanent feature of the mandate.

As outlined in the consultation, there are valid reasons such as supply chain or feedstock availability issues that may mean that it is not possible to supply the obligated SAF volumes in any one year leading to the need to buy-out.

If a buy-out option is not available and given the fact that the UK imports approximately 60% of its aviation fuel, then the UK fuel supply industry may have no option but to not supply the fossil aviation fuel if the corresponding SAF is not available. This would have major impacts for UK resilience, with impacts for the UK aviation industry and for the wider UK economy.

A buy-out has been used effectively in the RTFO for many years, achieving the intended policy objective and providing the required "safety valve" for fuel suppliers in the event of supply issues, while ensuring fuel supply resilience. This has been reviewed, with the buy-out increasing in January 2021 from 30p/l to 50 p/l [23]to continue to incentivise the right use of low carbon fuels.

Q15: Do you agree or disagree with the information we could include in our reviews? Is there anything you feel we haven't considered but should?

UKPIA **largely agrees** with the information list included in the consultation response.

There is no recognition of the impact of the UK SAF mandate on the wider UK aviation industry. This needs to be considered to ensure that the UK aviation industry remains competitive at an international level.

Nor is the impact considered upon the UK heating kerosene supply chain, which at the refinery level, is often the same infrastructure. UK refiners are prudent commercial operators and may weigh the continued supply into such markets against the cost of installing additional infrastructure. If there is insufficient margin, or it becomes loss-making, then markets may be exited.

[23] https://www.gov.uk/government/consultations/increasing-the-renewable-transport-fuel-obligation-buy-out-price-for-biofuels-suppliers/increasing-the-renewable-transport-fuel-obligation-buy-out-price-to-ensure-continued-greenhouse-gas-savings

Developments in international SAF policy such as those in the EU or the US also need to be considered in the UK review, again to ensure that UK industry remains competitive. This is especially important as UK SAF may be exported into other jurisdictions such as the EU or the US, which is consistent with the HMG industrial strategy [24] and plan for growth[25]. There needs to be a consistent approach taken with regards to certification for these including the EU and CORSIA [26] to enable a level playing field for UK manufacturers.

One consequence of the different eligibility criteria of the EU mandate for SAF content is that UK companies may choose to only make SAF eligible for the support under the EU mandate and export it, to claim EU certificates. This will avoid the HEFA cap and will be cheaper to produce, due to the lower SAF content.

Finally, developments in aviation fuel standards including the work pf the UK clearing house and ASTM need to be considered in the reviews to ensure that UK policy remains achievable and not leading to obligated suppliers having no technical option other than having to buy-out.

Q16: Do you agree or disagree with our proposed flexible approach to review timelines?

UKPIA **agrees** with approach.

It is similar to that used within the RTFO which has been successfully demonstrated over many years.

Eligible fuels and sustainability criteria

Q17: Do you agree or disagree that low carbon avgas, low carbon ammonia and low carbon hydrogen aviation fuel, should be eligible for incentives without being subject to obligation providing they meet the sustainability criteria?

UKPIA **agrees in principle** that low carbon avgas, low carbon ammonia and low carbon hydrogen aviation fuel, should be eligible for incentives providing that they meet the sustainability criteria.

We also support the proposal that the supply of fossil aviation fuels other than avtur will not be subject to an obligation at this stage. We believe that any low carbon avgas, low carbon ammonia, and low carbon hydrogen aviation fuel that does not meet the sustainability criteria should not be subject to an obligation either.

Under the RTFO, low carbon fuel used in the aviation and maritime sectors was also eligible for incentives if it met sustainability criteria. The primary legislation (the Energy Act 2004 [27]) used to underpin the secondary RTFO legislation meant that if these low carbon fuels did not meet the sustainability criteria, then they became obligated at the same level as their fossil equivalents.

This created a “double jeopardy” issue for fuel suppliers, who are likely to have paid a higher price for these fuels, often from 3rd party companies and may be liable for even higher costs in the event they did not meet the sustainability criteria, potentially outside of their control.

[24] https://www.gov.uk/government/topical-events/the-uks-industrial-strategy
[25] https://www.gov.uk/government/publications/build-back-better-our-plan-for-growth
[26] https://www.icao.int/environmental-protection/CORSIA/Pages/default.aspx
[27] https://www.legislation.gov.uk/ukpga/2004/20/contents

In the event, this issue created little to no incentive to providing low carbon fuels for the aviation or maritime sectors.

If the same issue is prevalent in the SAF mandate, through the use of similar statutory powers then it is likely that the same problem will occur, and there will be little use of low carbon avgas, low carbon ammonia and low carbon hydrogen in aviation fuel under the SAF mandate scheme.

This issue needs to be addressed if this policy objective is to be realised. We would be happy to discuss this issue further with the DfT Low Carbon Fuels Unit.

Q18: Do you agree or disagree that the definition of aviation fuels should include relevant technical specifications?

UKPIA **does not agree** that the "definition of aviation fuels" should include relevant technical specifications.

Effectively this means that unelected experts in the relevant standards panels have the ability to set legal requirements without an oversight from the legal or political system. Original Engine Manufacturers (OEMs) and fuel suppliers work closely to define what fuels are deliverable and acceptable for use in aircraft.

A range of acceptable aviation fuel standards such as Chinese, Russian, or Canadian specifications are used in addition to the UK (DEFSTAN 91-091) and US versions (ASTM D7566). If the requirements to meet MOD and ASTM standards apply to fossil aviation fuels and not just SAF, this could lead to unintended consequences such as a fuel being acceptable by the aircraft OEM (e.g., meeting the Canadian specification), but does not meet the definition of aviation fuel in the UK, and therefore could be acceptable to OEMs, but would not incur an obligation.

However, aligned with the previous information from HMG and in this consultation (page 47), UKPIA does agree that only "certified SAF" that meets the UK DEF STAN 91-091 and US ASTM D7566 specification should be eligible for incentives under the SAF mandate and count towards the mandate obligation". This is different to the question posed i.e., that the "definition of aviation fuels" should include relevant technical specifications.

UKPIA believes that these globally recognised standards play a vital role in ensuring aviation safety and by including the requirement that only SAF meeting these MOD and ASTM standards will be eligible for certificates, will act as a deterrent (or at least not an incentive) for SAF production and use from fuels which may not have had the due diligence necessary for aviation use, that these standards ensure.

In line with the approaches taken in developing the SAF mandate, this approach is consistent with the RTFO development fuel definition of "A fuel that can be blended such that the final blend has a renewable fraction of at least 25% whilst still meeting BS EN: 228 (for petrol, as revised or reissued from time to time) [28] or BS EN: 590 [29] (for diesel, as revised or reissued from time to time)." However, we recognise that this approach has also limited available options for suitable development fuels and may have limited certain technologies to only those which would have met the required GHG reduction thresholds.

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[28] https://knowledge.bsigroup.com/products/automotive-fuels-unleaded-petrol-requirements-and-test-methods-5/standard

[29] https://knowledge.bsigroup.com/products/automotive-fuels-diesel-requirements-and-test-methods-7/standard

Q19: Do you agree or disagree with the proposed definition of HEFA? If not, please provide an alternative definition.

UKPIA **disagrees** with the proposed definition of HEFA.

UKPIA would like to make a significant clarification to this question. A proposal for the "definition of HEFA" is not made in the consultation document, rather, the proposal made is "that the HEFA cap applies to any fuel using a segregated oil or fat as a feedstock, where a segregated oil or fat is defined as "a material that is capable of being used as a transport fuel directly, after extraction, or after conversion by transesterification, into a usable fuel, irrespective of any blend wall limits on use". This is a proposal for the definition of the "HEFA feedstock that will be capped", not a "definition of HEFA".

UKPIA does not support defining "HEFA" in UK legislation as this could have inconsistencies and unintended consequences related to aviation fuel quality standards.

If HMG proceeds with a "HEFA cap", we do, however, support the proposal to define the "HEFA feedstocks that will be capped" as per the consultation document: "the HEFA cap applies to any fuel using a segregated oil or fat as a feedstock…" as this is consistent with HMG's stated intention of this cap to "limit the diversion of feedstocks from difficult-to-decarbonise road transport modes".

Q20: Do you agree or disagree with the proposed definition of fuels that will be eligible for PtL certificates to be redeemed against the PtL obligation?

UKPIA **does not agree** that a PtL mandate should be set at this stage.

However, if a PtL sub obligation is used, UKPIA agrees with most of the proposed definition of fuels that will be eligible for PtL certificates as outlined in the consultation document. However, we believe the wording of the requirement that "the input CO_2 has not been deliberately produced for the sole purpose of creating a fuel" needs to be changed, as it could be interpreted that e.g., the CO_2 produced in a SAF production process falls into this category.

UKPIA believes this is not the intention proposed in the SAF mandate consultation. If the proposed form of words is used then this would lead to illogical and inefficient SAF project design, where the CO_2 produced in a SAF plant is capture and stored, whilst CO2 from e.g., flue gases from power generation could be used as a feed to the PtL SAF process. We suggest more careful wording to ensure CO_2 produced in routine transport fuel production processes (new or existing- e.g., refineries) are not excluded.

Q21: Do you agree or disagree that the SAF mandate should adopt the criteria concerning additionality for RFNBOs that aligns with the RTFO?

UKPIA **agrees** that the SAF mandate should adopt the criteria concerning additionality for RFNBOs that aligns with the RTFO.

There should be consistency of approach between the RTFO and the SAF mandate as far as possible to provide a level playing field between the two schemes, and this includes the treatment of RFNBOs.

Q22: Do you agree or disagree that additionality rules should be introduced for nuclear power that follow the same principles as those currently applied to RFNBOs in the RTFO?

UKPIA **agrees** that additionality rules should be introduced for nuclear power that follow the same principles as those currently applied to RFNBOs in the RTFO.

There should be consistency of approach between the RTFO and the SAF mandate as far as possible to provide a level playing field between the two schemes, and this includes the treatment of RFNBOs.

Q23: Do you agree or disagree that, where hydrogen is used as a feedstock, eligibility should be limited to biohydrogen derived from wastes or residues and electrolytic hydrogen derived from renewable and nuclear power (when legal powers allow)?

UKPIA **disagrees** that where hydrogen is used as a feedstock, eligibility should be limited to biohydrogen derived from wastes or residues and electrolytic hydrogen derived from renewable and nuclear power.

There are currently no laboratory methods available to analyse and verify the source of the hydrogen in the SAF itself. This is in contrast to carbon, which can use C14 analysis to indicate the renewable content present.

This is not a technology neutral approach and excludes low carbon hydrogen derived a source using CCUS ("blue" hydrogen), which is supported by the BEIS Low Carbon Hydrogen Business Model and Low Carbon Hydrogen Standard. It therefore limits the availability of low carbon hydrogen and increases the costs of SAF in the UK.

The Energy Act 2004 should therefore be amended in the same way as has been used for the treatment of Recycled Carbon Fuels (RCFs) to allow blue hydrogen to be eligible for incentives under both the SAF mandate scheme and the RTFO. As the consultation document describes, analysis by HMG and the Climate Change Committee has previously indicated methane reformation with CCUS to have among the lowest levelized costs of all low carbon hydrogen production routes. This proposed eligibility criterion therefore limits the availability of low carbon hydrogen and increases the costs of SAF in the UK.

Q24: Do you agree or disagree that the contribution of energy content from hydroprocessing should be calculated?

UKPIA **agrees** with the way in which the contribution of energy content from hydro processing should be calculated. As articulated in the consultation document, if this is not done, specific SAF pathways would then be treated differently.

There should be consistency of approach between the RTFO and the SAF mandate as far as possible to provide a level playing field between the two schemes, and this includes the treatment of low carbon fuels. We note that, under the RTFO, FAME receives 100% recognition as a low carbon fuel. This is even though the methanol used in the esterification process may be fossil in origin. The different treatment for SAF presented in the consultation compared to the treatment of FAME is a significant inconsistency and is not a technology neutral approach.

UKPIA suggests that the way in which FAME is treated under the RTFO is reviewed when appropriate to ensure consistency of approach of the two policies.

Q25: What level should the maximum carbon intensity threshold be set to maintain high sustainability credentials while ensuring enough flexibility to allow a wide range of SAF to be developed? Please provide evidence to support your answer.

UKPIA recommends that the maximum carbon intensity threshold should be set at 10%, to align with CORSIA requirements. Together with the removal of restrictions on the source of hydrogen, these less stringent requirements may mitigate the risk of SAF plant development being slowed down due to the competition for finite design and construction resources for CCS, hydrogen and SAF projects and waiting times for enhanced grid connections to provide the renewable electricity needed to produce renewable hydrogen.

If this is not possible out of the three options proposed, then we would prefer a maximum carbon intensity threshold of 40%, in the early years of the SAF mandate as technology and feedstocks develop. This is divergent from the thresholds established under the RTFO; however, the technology readiness is very different and there is a need for greater international, rather than UK, consistency in the SAF scheme.

The scheme proposed is a GHG based scheme, which incentivises the greatest GHG savings. SAF that has a high carbon intensity will offer little benefit for fuel suppliers in the meeting their obligation, and so be of significantly lower value. It is therefore unlikely that any high carbon intensity SAF will be used in the UK due to the way that the scheme is structured.

Q26: Do you agree or disagree that the minimum carbon intensity reduction should be increased over time? If so, how should it evolve?

The scheme proposed is a GHG based scheme, which incentivises the greatest GHG savings. SAF that has a high carbon intensity will offer little benefit for fuel suppliers in the meeting their obligation, and so be of significantly lower value. It is therefore unlikely that any high carbon intensity SAF will be used in the UK due to the way that the scheme is structured. However, an initial lower threshold could “kick start” the industry and mitigate the risk of SAF plant development being slowed down as discussed in the consultation document and in our response to question 25.

There needs to be clarity on any changes to the maximum carbon intensities over time to provide certainty for investors in UK SAF production plants, and for fuel suppliers. This includes “grandfathering” rules where appropriate, so that existing plants are not penalised. Any changes to carbon intensity limits needs should be communicated as soon as possible (ideally at the start of the scheme) and with sufficient notice to allow for adaptions to be considered.

Q27: Do you agree or disagree that the GHG methodologies used in the RTFO should be adopted in the SAF mandate?

UKPIA **agrees** that the GHG methodologies used in the RTFO should be adopted in the SAF mandate. However, we would like to see the methodology for RCFs outlined in the RTFO guidance as soon as possible.

There should be consistency of approach between the RTFO and the SAF mandate as far as possible to provide a level playing field between the two schemes, and this includes the treatment of low carbon fuels. This includes the use of defaults (including disaggregated defaults), recognising that these may need to be established in the future as pathways develop.

Q28: Do you agree or disagree that only disaggregated default values will be provided for downstream emissions while the rest of the SAF lifecycle will require the use of actual GHG values?

For clarity, our understanding is that this question asks if a DfT defined hybrid approach between default and actual GHG values is acceptable, with emissions upstream of final transport and distribution based solely on actual emissions rather than allowing default GHG values.

A strong majority of UKPIA members disagree with this approach.

There should be consistency of approach between the RTFO and the SAF mandate as far as possible to provide a level playing field between the two schemes, and this includes the treatment of low carbon fuels. Default GHG emission values for all appropriate emissions up to the point of final dispatch should be considered to provide a level field for all available technologies and this is the case in the RTFO. However, the default values should consider the production pathways involved to ensure that lower GHG emission technologies are incentivised. One member recommends that if default values are provided then they should be conservative, to avoid unintended consequences.

The use of default values should be the main option for suppliers throughout the GHG emission calculation, with an option to use actual values if accurate and available.

We also suggest that an international expert panel is created to maintain and update guidance and default values going forward, such that there is a dynamic process for amendments. We note that such a process/panel is being considered by the IMO for marine fuel with a decision expected in the July MEPC. This may be of interest to HMG for the development of this area of SAF mandate policy.

Q29: Please provide evidence to inform which default values should be provided by DfT for downstream emissions.

Default values have been developed by GREET [30] and CORSIA [31] and may be used for emission calculations. These also provide consistency of approach with international competitors, preventing market distortions.

Q30: Do you agree or disagree that upstream and operational emissions should be included for nuclear power generation at the point of delivery? If yes, please provide evidence of what figure could be used for the default value.

There should be consistency of approach between the RTFO and the SAF mandate as far as possible to provide a level playing field between the two schemes, and this includes the treatment of low carbon fuels. All appropriate emissions up to the point of final dispatch should be considered to provide a level field for all available technologies.

[30] https://www.energy.gov/sites/default/files/2022-06/hfto-june-h2iqhour-2022-argonne.pdf

[31] https://www.icao.int/environmental-protection/CORSIA/Documents/CORSIA_Eligible_Fuels/ICAO%20document%2006%20-%20Default%20Life%20Cycle%20Emissions%20-%20June%202022.pdf

Involved parties.

Q31: Do you agree or disagree that the Secretary of State should be the Administrator, with responsibility delegated to a DfT administration unit?

UKPIA **agrees** that a government body should be the Administrator. However, it is not for UKPIA to agree, or disagree on who that should be as that is a decision for government.

However, we advise that there should be consistency of approach between the RTFO and the SAF mandate as far as possible to provide a level playing field between the two schemes. The structure of the administrator within the DfT low carbon fuels team also needs to be carefully considered to ensure that consistency of approach continues between the two schemes.

Q32: Are there any additional powers or duties beyond those outlined above that the Administrator should be granted?

UKPIA **agrees** that the list of those outlined in the consultation is appropriate, being based on those already granted to the RTFO administrator.

There should be consistency of approach between the RTFO and the SAF mandate as far as possible to provide a level playing field between the two schemes. The structure of the administrator within the DfT low carbon fuels team also needs to be carefully considered to ensure that consistency of approach continues between the two schemes.

We recognise that the list of powers may be amended as the SAF mandate develops and this is part of the natural evolution of the schemes based on experience.

Q33: Do you agree with the assessment time for avtur being set at the duty point? Please provide evidence to support alternative approaches.

UKPIA **agrees** that the assessment time for avtur should be set at the duty point.

UKPIA asks that the regarding the duty point being the assessment time for avtur is carefully considered to prevent any unintended consequences, as the supply chains can be highly complex and company specific.

Kerosene is most usually now supplied from a refinery or import terminal as a dual grade, meeting the quality requirements of both avtur (unmarked for use as avtur) and heating kerosene (which is marked for heating use)[32].

The marking of kerosene for home heating use can occur downstream of the refinery or import terminal and by third parties such as distributors [33]. This marked kerosene cannot be subsequently used in the aviation sector.

To avoid creating an unintended obligation on the heating kerosene, there needs to be an appropriate process in place for obligated suppliers to net off the kerosene that is marked downstream of the refinery or import terminal. This process should manage the risks in an appropriate way, to mitigate fraud risk whilst not imposing a significant burden on fuel suppliers through the supply chain.

[32] https://www.blackridgeresearch.com/glossary/What-is-DPK-Dual-Purpose-Kerosene-Definition-Meaning
[33] https://www.gov.uk/guidance/using-rebated-fuels-in-vehicles-and-machines-excise-notice-75

We understand that the HMRC accounting in the HO10 form [34] for dual purpose kerosene, marked kerosene and avtur can be appropriately used to ensure that the correct obligations are applied. Discussions with the DfT Low Carbon Unit and UK Oil Industry Taxation Committee (UKOITC) members have indicated that the 3 lines on the HO10 provide this clarity; line 546 is used for DPK, line 600 is used for heating kerosene, and line 601 is used for avtur.

However, we would encourage the DfT to continue to work with suppliers through the implementation phase of the SAF mandate to ensure that this continues to be the case and for a robust system put in place to manage the interaction between kerosene supply and aviation fuel supply.

A mass balance approach must be used to ensure that all qualifying low carbon fuels supplied in dual purpose kerosene can be recognised and rewarded under the SAF mandate scheme. If this is not allowed, then it risks the current dual purpose kerosene supply chain, with companies potentially withdrawing from the marked kerosene market. This has significant implications for the supply to users, including those in the domestic heating market.

Q34: Do you agree that the duty point is the most suitable assessment time for renewable avgas?

UKPIA **agrees.**

For renewable avgas, the duty point is the most suitable assessment time for renewable avgas, due to the simpler supply chain involved and the lack of alternatives downstream of the duty point than for avtur.

Q35: Do you agree that the point of retail sale is the most suitable assessment time for hydrogen? Please provide evidence to support alternative approaches.

UKPIA has limited expertise in this area so cannot comment in detail on this proposal.

The market for hydrogen in aviation has yet to develop. This includes the appropriate taxation regime for its use as an aviation fuel. Given the state of the technology this would seem to be a possible place to start but may be changed as the technology develops. We would therefore ask that suitable review points to be included to ensure that the assessment time for hydrogen continues to be appropriate.

Q36: Do you agree with the end point of the chain of custody being the 'point of no return' of the relevant fuel?

UKPIA **agrees in principle** that the end point of the chain of custody should be the 'point of no return' of the relevant fuel.

However, we would ask for clarification on how this would work in practice so that we can understand the detail and so provide better feedback on this question. In particular, we would like to understand how normal transportation losses [35] are considered in the reconciliation process. We would be happy to discuss this in more detail with the DfT Low Carbon Fuels team.

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[34] https://www.gov.uk/guidance/report-excise-duty-on-fuel-removed-from-warehouse-ho10

[35] https://www.intechopen.com/chapters/77067

Q37: Do you agree with the use of a 370 tonne (approximately 450,000 litre volume) threshold under which conventional avtur is not obligated within the mandate? If not, please provide an alternative and any evidence to support this.

UKPIA **agrees** with this approach.

There should be consistency of approach between the RTFO and the SAF mandate as far as possible to provide a level playing field between the two schemes.

Q38: Do you agree or disagree that the obligation period should run for a one-year period and on a calendar year basis?

UKPIA **agrees** with this approach.

There should be consistency of approach between the RTFO and the SAF mandate as far as possible to provide a level playing field between the two schemes.

Q39: Do you agree or disagree with dates for which actions must be completed following the end of the obligation period?

UKPIA **agrees** with this approach.

There should be consistency of approach between the RTFO and the SAF mandate as far as possible to provide a level playing field between the two schemes.

Q40: Do you agree or disagree that the calculation of each supplier's obligation to supply SAF should be determined on the basis of energy?

UKPIA **broadly agrees** with this approach. However, clarity is needed on how the volumes of fossil aviation fuel translate supplied translate into energy terms.

Aviation fuel is typically supplied into the market on a volumetric (i.e., litres) rather than an energy basis.

To provide a level playing field and reduce the administrative burden on suppliers we would therefore strongly request that default calorific values (i.e., MJ / litre) are used to convert volumes of fuel onto an energy basis. Requiring suppliers to use measured, rather than default values significantly increases the administrative burden on suppliers and including significant amounts of laboratory testing. Default values also avoid the obligation calculations being dependent on the test methods used (including their accuracy) as well as removing human factors such as laboratory technician training and experience.

This is a similar approach taken to fossil fuel greenhouse gas emissions, where a fixed default value for gCO2 / MJ is used. We would ask that default values are fixed for the duration of the SAF obligation, providing clarity and certainty on the obligation calculation methodology over the long term.

Q41: Do you agree or disagree with the calculation of certificates set out above?

UKPIA **agrees** with the calculation of certificates as set out above.

Q42: Do you consider there to be any potential issues with fraud adopting a continuous approach compared to a banded approach?

UKPIA does not see any additional potential issues with fraud in adopting a continuous approach compared to a banded approach. The continuous approach may also reduce potential fraud risk by ensuring that low carbon fuels are rewarded appropriately without the complications associated with the banded approach. Under a banded approach, fuels which are close to the boundary limits may be incorrectly assigned to a preferential category, for example by rounding the carbon intensity down.

A banding approach may have unintended consequences such as SAFs which fall on the wrong side of a band being exported, where they can claim a higher reward, rather than used in the UK. It may also disincentivise ongoing reductions in GHG savings, as these are not rewarded if the SAF remains within the same band (which would not be the case in a continuous approach).

Q43: Do you agree or disagree with the calculation of the carbon intensity factor?

UKPIA **agrees** with the calculation methodology for the carbon intensity factor.

Q44: Is 26.7 gCO2/MJ an appropriate assumption for the average carbon intensity of SAF? Please provide any available evidence if suggesting an alternative value.

The reference point needs to be carefully considered alongside the buy-out price, as both will have significant weighting on project economics. The reference point should be fixed for the duration of the SAF mandate.

A strong majority of members agree that 26.7 gCO2/MJ is an appropriate prediction for the average carbon intensity of SAF, if the targets are all set on the same basis (i.e., assuming a 70% reduction on an 89 gCO2/MJ fossil default basis, which is consistent with the ICAO regulations). However, the fossil comparator for RFNBOs under the RTFO is 94 gCO2/MJ, creating a policy difference between the two schemes and we would welcome clarification on how this can be addressed.

UKPIA does not have any available evidence for an alternative value.

Q45: In your view, should GHG reductions from CCS be rewarded under the SAF mandate? If so, should the reward extend to net negative emissions (i.e., less than 0 gCO2e/MJ on a lifecycle basis), or should these be supported by an alternative GGR policy or a combination of policies?

Yes, UKPIA strongly supports that GHG reductions from CCS should be rewarded under the SAF mandate.

The stated policy objective of the SAF mandate is to reduce GHG emissions. Negative emissions are real GHG reductions, so the mandate policy reward for such reductions should be commensurate. If the policy (designed to reward GHG savings) provides strong incentives to install CCS in SAF plants, this is because GHG savings are high. Artificial GHG savings boundaries stifle technology potential and real GHG savings.

If net negative emissions are not rewarded, it could create artificial break points on project economics, rather than allowing developers to optimise projects for the greatest GHG

reduction. This could lead to relatively low cost GHG savings to society being missed if project/operating costs are not rewarded by the associated GHG credits.

GHG savings should be achieved at the lowest cost to society (as ultimately the costs are likely to be passed on to aviation customers as described in the consultation document and from experience with the RTFO).

Rewarding net negative emissions could maximise the GHG savings from a given amount of feedstock, driving resource optimization. Feedstock availability is likely to be a key limitation as recognised in several of the feedstock cases in the consultation document.

Net negative emissions are already recognised in the EU under the RED (e.g., emission savings from soil carbon accumulation via improved agricultural management).

Net negative emissions will be needed to achieve the target of net zero emissions by 2050 to offset any positive emissions remaining at this time.

Reward for net negative emissions under the SAF mandate should be allowed as it can then directly drive the demand for SAF. If net negative emissions are solely incentivised under a different policy this disconnects the drive to reduce carbon intensity of SAF from the demand for SAF which may ultimately hinder the decarbonisation of aviation. Rewarding negative emissions solely under a different policy such as the ETS potentially introduces price uncertainty, as the price of CO2 is set by the market and can move up and down with time. Project economic certainty is key for the large levels of investment required for such nascent technology.

The consultation document appears to raise concern that there will be a strong incentive to install CCS in SAF plants (to potentially reduce abatement costs) and receive certificates for high GHG emissions reductions, and that this could reduce the total volumes of SAF supplied. UKPIA does not understand or agree with this concern as the stated policy objective of the SAF mandate is to reduce the GHGs of aviation fuel / transport, not to simply maximise SAF volume. The proposed GHG based policy and methodology for rewarding SAF with lower carbon intensity supports GHG emissions reductions, not SAF volume maximisation, therefore introducing such distinctions for CCS or negative emissions would be inconsistent.

The consultation document raises a potential concern that SAF pathways with greater potential for CCS and in particular negative emissions could be excessively rewarded such that they push other pathways out of the market. Treating SAF using CCS or produced by technology that can achieve negative emissions differently to other SAF pathways is not a technology neutral approach and therefore does not produce a level playing field in the reduction of GHGs and may stifle innovation. An alternative potential outcome for such pathways is that this could enable more GHG emissions reduction opportunity, which could then allow higher GHG targets for the same volume of feedstock, rather than pushing other pathways out of the market as the consultation document suggests.

We recognise the complexities in determining how, for example, imported fuel produced using CCS abroad is accounted for and rewarded under the mandate, however such complexities should not take priority over the SAF mandate policy objective of reducing GHG emissions.

The SAF mandate should recognise the true GHG emissions of fuels, including recognition of available technologies such as CCS. However, we recognise that the UK government does not support incentivisation under multiple schemes (such as the CCUS Business Models under DESNZ and the SAF mandate scheme under the DfT).

We would therefore ask that suppliers be able to choose which scheme they are rewarded under, and for the emissions claimed under the SAF mandate scheme to be appropriate to this reward.

We agree however that further work in this area is required, as both CCS and SAF technologies develop over time. We would also be happy to discuss this with the DfT Low Carbon fuels team in more detail.

Q46: Do you agree or disagree with the steps taken by the Administrator and the supplier to discharge the obligation at the end of a period?

UKPIA **agrees** with the steps taken by the Administrator and the supplier to discharge the obligation at the end of a period.

These steps, and timings are consistent with the approach taken under the RTFO and have been successfully used over several years. This commonality of approach with the RTFO should include a deadline after which SAF certificates can no longer be revoked to allow certainty of suppliers as the surrender of certificates approaches,

Q47: Do you agree or disagree with the approach to calculating the HEFA cap?

As per our response to Q7 and Q9, UKPIA disagrees with the setting of a specific HEFA cap under the SAF mandate scheme.

There should be no HEFA cap in the SAF mandate scheme.

It is not clear why aviation should receive differential treatment from ground fuels. This approach picks winners and is not technology neutral.

This approach is also inconsistent with the approach taken in other SAF obligation schemes internationally, such as ReFuelEU which have no limit on the usage of HEFA in their schemes.

The introduction of a unilateral HEFA cap into the UK scheme is likely to increase costs for UK based aviation, risking its ability to compete at an international level.

HEFA feedstocks not only include tallow and UCO, but also other suitable feedstocks such as sustainable cover crops, and the role of these feedstocks needs to be recognised. Input feedstocks should meet rigorous sustainability performance criteria and verified in doing so via robust certification processes, but no feedstock that can do this should be excluded.

However, if a HEFA cap needs to be set, UKPIA also disagrees with the approach to its calculation. The proposed calculation appears to be different to the crop cap calculation used in the RTFO, which is a simple sub-target based on the percentage of fossil fuel sold. The approach proposed in the SAF mandate consultation appears to suggest that the cap is based on the percentage of SAF used, creating uncertainty for fuel suppliers on what the cap is, potentially until the end of the obligation period. Given the policy intent for HEFA is like that of the crop cap, it would be preferable to mirror the RTFO approach and have a simple percentage of the fossil aviation fuel defined by the DfT in any single reporting period. We understand from discussions at the Jet Zero Council SAF Delivery group meeting on the SAF mandate consultation on the 7th of June that this is the case, but we would welcome confirmation of this.

Q48: Do you agree or disagree with the approach to paying the buy-out amount when a supplier does not wholly discharge its obligation?

UKPIA **agrees** with this approach.

It is consistent with the approach taken under the RTFO and have been successfully used over several years.

UKPIA agrees that a buy-out mechanism is an important part of the SAF mandate proposal. If a buy-out option is not available and given the fact that the UK imports approximately 60% of its aviation fuel, then the UK fuel supply industry may have no option but to not supply the aviation fuel if the corresponding SAF is not available. This would have major impacts for UK resilience, with impacts for the UK aviation industry and for the wider UK economy.

We also do not support additional penalties over and above paying the buy-out amount – such as "rolling over" the omitted volume (energy) to successive years. As explained in our response to question 14 and as outlined in the consultation document, there are valid reasons such as supply chain or feedstock availability issues that may mean that it is not possible to supply the obligated SAF volumes in any one year leading to the need to buy-out. The last few years have shown the wide-reaching effects of unpredicted global events such as the Covid pandemic, and a buyout mechanism is an appropriate "safety valve" measure to include in legislation to manage the impacts of such events. If the omitted volume is "rolled over" into successive years, it would only exacerbate supply chain or feedstock availability issues. The RTFO has proved to be successful at using the buy-out price to manage the incentive to supply physical renewable fuels.

Submitting claims and reporting and fulfilling obligation

Q49: Do you agree or disagree with the approach to creating and closing accounts?

UKPIA **broadly agrees** with the approach to creating and closing accounts.

While we recognise that some verification steps are required to prevent fraud, these can be burdensome and time consuming for suppliers.

Where the same companies are already obligated under the RTFO and have already been verified and set up with accounts, these should be transferred over to the SAF scheme. There should not be the need for these established companies to pass the full verification requirements when setting up a SAF account.

The normal verification requirements would apply for new companies who are not RTFO registered when they are looking to set up an account.

Q50: Do you agree or disagree with the approach to submitting claims?

We **agree** with the approach to submitting claims.

It is consistent with the approach taken under the RTFO and have been successfully used over several years.

However, clarity is needed on the requirements for "submitting evidence on the amount of fuel supplied to the UK aviation market" as this will be on a volumetric (litres) or mass (kg or tonne) basis, not an energy basis. Additionally, since fuel can be intra-nationally and internationally sold as "dual purpose kerosene", it is not always possible to be able to demonstrate that such SAF has been supplied to the UK aviation market, since it can be

diverted later down the fuel supply chain. Greater clarity over how to manage this scenario is sought.

This clarity is required to ensure that all suppliers understand the data and evaluation they need to undertake to meet their reporting requirements. Ideally this would be covered in a guidance document in a similar way to that used under the RTFO, recognising that it may be amended from time to time as appropriate.

We would also ask that the timetable for the issuing of SAF certificates mirrors that of the RTFO, under which RTFCs are issued within a month (assuming that the application is valid), rather than "as soon as possible". The timely issuing of certificates is an important aspect of a successfully operating scheme for fuel suppliers.

Q51: Do you agree or disagree with the approach to reporting, demonstrating compliance with and verifying the carbon and sustainability information?

UKPIA **agrees** with the approach to reporting, demonstrating compliance with and verifying the carbon and sustainability information.

It is consistent with the approach taken under the RTFO and have been successfully used over several years. This includes the recognition of appropriate voluntary schemes under the SAF mandate schemes, to reduce the administrative burden on industry.

Q52: Do you agree or disagree that the Administrator should validate fuel amount information?

UKPIA **broadly agrees** that the Administrator should validate fuel amount. However, we would request clarification that the validation is between the SAF data, and the HMRC data rather than verification of the HMRC data itself (which is the current approach under the RTFO)

Q53: Do you agree to disagree to the powers granted to the Administrator to validate fuel amounts where information is not checkable against HMRC data?

UKPIA **broadly agrees** that these powers should be granted to the Administrator to validate fuel amounts where information is not checkable against HMRC data. However, we would expect that given the nature of the aviation fuel business, most volume data would be covered by HMRC data, and these powers would not be used to a significant extent.

However, the level of evidence verification required should be consistent with other information such as carbon and sustainability information, i.e., ISAE 3000 (or an equivalent standard)

Q54: Do you agree or disagree with the approach to transfer of certificates?

UKPIA **agrees** with the approach to the transfer of certificates.

It is broadly consistent with the approach taken under the RTFO and have been successfully used over several years.

Q55: Do you agree or disagree that excess certificates can be used to fulfil the obligation in the following period? If so, do you agree or disagree with the proportion of the obligation that the excess certificates can fulfil?

UKPIA **agrees** that excess certificates can be used to fulfil the obligation in the following period.

UKPIA **agrees** with the proportion of the obligation that excess certificates can fulfil in future years.

It is consistent with the approach taken under the RTFO and have been successfully used over several years.

Q56: Do you agree or disagree that excess PtL certificates can be used to fulfil the main obligation?

As discussed in more detail in our responses to Q10, Q11 and Q20, UKPIA **does not agree** that a PtL mandate should be set at this stage.

As mentioned in the consultation document, PtL technology is still in development and needs to be proven at scale. As we indicate in previous responses, any trajectory including a PtL sub-target needs to be deliverable and not reliant on “silver-bullet” technology.

However, if a PtL sub-target is set, UKPIA agrees that excess PtL certificates can be used to fulfil the main obligation.

It is consistent with the approach taken under the RTFO with regards to development fuels which can be redeemed against the main target.

Interactions with other domestic and international policy

Q57: Do you agree or disagree with the proposed approach to align mandate multiple incentives rules as much as possible with the RTFO?

UKPIA **broadly agrees** with the proposed approach to align mandate multiple incentives rules as much as possible with the RTFO.

However, the consultation is unclear on the link between the proposed SAF mandate scheme and the UK ETS scheme for aircraft, with operators being excluded from claiming credits under their UK ETS obligations. This is being addressed as part of the Refuel EU aviation proposals, including the potential for dual certificates being issued which cover both schemes.

This link needs to be addressed in the UK scheme as a matter of urgency with clear guidance provided. One option could be for aircraft operators to be able to provide evidence of the SAF they have used, as well as confirmation that the SAF has not been claimed in other jurisdictions to decrease their UK ETS obligations in addition to fuel suppliers meeting their SAF mandates.

Q58: Does the risk of tankering as a result of the SAF mandate justify the introduction of a minimum uplift requirement? Please provide supporting evidence if available.

UKPIA **agrees** that the risk of tankering because of the SAF mandate justifies the introduction of a minimum uplift requirement.

This is consistent with the approach taken in the EU under ReFuelEU who have introduced tankering requirements as discussed in the consultation document to ensure SAF, and fossil aviation uptake within their jurisdiction.

A failure to provide a consistent approach with the EU risks trade distortions created by the unequal cost frameworks.

Enforcement

Q59: Do you agree or disagree with the approach to revoking certificates?

UKPIA **agrees** with the approach to revoking certificates and particularly welcomes the clear definitions and speeding up of the process.

It is consistent with the approach taken under the RTFO and have been successfully used over several years. However as discussed in our response to Q46, this commonality of approach with the RTFO should include a deadline after which SAF certificates can no longer be revoked to allow certainty of suppliers as the surrender of certificates approaches,

Q60: Do you agree or disagree with the reasons for receiving penalties and the approach to issuing penalties?

UKPIA **broadly agrees** with the with the reasons for receiving penalties and the approach to issuing penalties; these are consistent with the approach taken under the RTFO.

As has been seen historically with the RTFO, due to the size and reputational impact of non-compliance it is extremely unlikely that obligated suppliers would incur penalties.

Q61: Which penalty values do you consider to be high enough to be a deterrent but proportionate to the infringement?

As outlined in our response to Q61, as has been seen historically with the RTFO, due to the size and reputational impact of non-compliance it is extremely unlikely that obligated suppliers would incur penalties.

UKPIA's view is that, given the lack of fraudulent activity in the RTFO, same approach be taken. This includes the penalty of 2 x the buy-out price where the infringement relates to gaining a certificate, or £50,000 for fixed penalties.

Calls for evidence:

1. We welcome any further evidence on feedstock availability for SAF production. In particular, any evidence which takes into account:

- The feedstock availability worldwide required to meet planned SAF production, and competing demands with other sectors

- The need for feedstocks in other sectors and the GHG emissions savings and cost impact that any displacement could have

- Evidence from producers on any feedstock agreements they have and the amount of feedstocks they may have access to.

Several reports are available on this subject; we have also referenced them in our response to the main consultation and we repeat the references below for convenience.

SkyNRG market outlook
https://nordicelectrofuel.no/wp-content/uploads/2021/08/SkyNRG-Market-Outlook-on-SAF-Background-Analysis-JUL-2021.pdf

ICCT feedstock availability
https://theicct.org/publication/estimating-sustainable-aviation-fuel-feedstock-availability-to-meet-growing-european-union-demand/

ICF feedstock availability
https://www.icf.com/insights/transportation/deploying-sustainable-aviation-fuel-to-meet-climate-ambition

ICF Roadmap for the Development of the UK SAF Industry
https://www.sustainableaviation.co.uk/wp-content/uploads/2023/04/Sustainable-Aviation-SAF-Roadmap-Final.pdf

Concawe Aviation: technologies and fuels to support climate ambitions towards 2050
https://www.concawe.eu/publication/aviation-technologies-and-fuels-to-support-climate-ambitions-towards-2050-2/

UKPIA Future of Mobility Report
https://online.flippingbook.com/view/609189063/

2. The Department would welcome data from respondents to improve the evidence base used to calculate the appropriate HEFA cap level, such as data on the availability of feedstocks for HEFA and the rate of deployment of technology globally.

As we discuss in our response to Q9, UKPIA disagrees with the imposition of a HEFA cap under the UK SAF mandate.

Information provided in the sources provided under Q1 of the Call for Evidence provides information on feedstock including information on the various feedstock types available, including HEFA.

HEFA feedstocks not only include tallow and UCO, but also other suitable feedstocks such as sustainable cover crops, and the role of these feedstocks needs to be recognised. Input

feedstocks should meet rigorous sustainability performance criteria and verified in doing so via robust certification processes, but no feedstock that can do this should be excluded.

3. The Department would welcome data from respondents to improve the evidence base used to calculate the appropriate buy-out price, such as price data and/or projections of cost per tonne of SAF produced for different technologies.

The recent Concawe report on SAF contains relevant information on projected SAF costs and the impact on aviation pricing.

https://www.concawe.eu/publication/aviation-technologies-and-fuels-to-support-climate-ambitions-towards-2050-2/

4. The Department would welcome evidence on the use of blue hydrogen in SAF production:

- Existing industry plans to use blue hydrogen in SAF production

Investment in blue hydrogen is a key enabler for UKPIA members, who are extremely active in the area. Links to recent announcements on blue hydrogen are attached below. These may have links to SAF production in the future but are currently limited by the recognition for blue hydrogen in the RTFO (and SAF mandate) due to the prevailing legislation including the Energy Act 2004. We recognise that similar issues exist for RCFs and nuclear electricity in the Energy Bill currently progressing through parliament and ask that blue hydrogen is recognised in a similar way to "kick-start" the UK SAF industry.

Essar, Fulcrum BioEnergy and HyNet

https://www.essaroil.co.uk/news/low-carbon-project-at-stanlow-secures-government-backing/

https://www.fulcrum-bioenergy.com/northpoint

bp and the East Coast Cluster

https://www.bp.com/en_gb/united-kingdom/home/were-backing-britain/carbon-capture-storage.html

p66 and VPI-Immingham

https://www.phillips66.com/newsroom/uk-decarbonization-project-backed-by-phillips-66-gets-funding-boost/

Exxon and the Solent Cluster

https://www.exxonmobil.co.uk/community-engagement/key-locations/fawley-operations/fawley-hydrogen-project/project-ambitions

Valero and the South Wales Industrial Cluster

https://www.rwe.com/en/research-and-development/hydrogen-projects/south-wales-industrial-cluster/

Petroineos and the Acorn Cluster

https://www.theacornproject.uk/

UKPIA and our member companies continue to work closely with the Department for Energy Security and Net Zero (DESNZ) to progress projects including those supported by the Low Carbon Hydrogen Business Models.

- How the capital and operational costs of blue hydrogen compares to proposed eligible hydrogen production routes and the impact this would have on the price of SAF

Available information suggests that Green Hydrogen is up to three times more expensive than blue hydrogen.

https://www.forbes.com/sites/jimmagill/2021/02/22/blue-vs-green-hydrogen-which-will-the-market-choose/

https://www.pcienergysolutions.com/2022/07/20/colors-of-hydrogen-economics-of-green-blue-and-gray-hydrogen/

The impact that this will have on the SAF price will depend on the technology route and feedstocks being used. Given the state of the available technology it is difficult to answer this question in detail.

- How the use of blue hydrogen versus proposed eligible hydrogen production routes will impact production capacity and whether eligibility of blue hydrogen is required to meet UK SAF targets

UKPIA cannot comment on this question in detail.

However, given the fact that blue hydrogen may be available before green hydrogen at the significant scale required for SAF production, allowing blue hydrogen (even if for a set initial period) may help “kick-start” the UK SAF production industry.

Further information on this topic was discussed at the House of Commons Science and Technology Committee and published in December 2022.

https://committees.parliament.uk/publications/33292/documents/180198/default/

- How the use of blue hydrogen versus proposed eligible hydrogen production routes will impact lifecycle carbon intensity of resultant SAF

This is an extremely complex question and strongly dependant on the carbon intensity of the low carbon electricity for green, and the CCUS technologies used for blue hydrogen.

To ensure a level playing field, we would support the use of both the blue and green hydrogen that met the Low Carbon Hydrogen Standard developed by DESNZ being recognised as suitable for SAF production.

https://www.gov.uk/government/publications/uk-low-carbon-hydrogen-standard-emissions-reporting-and-sustainability-criteria

The SAF mandate is being proposed as an Energy / GHG reduction scheme, and a maximum carbon intensity is being proposed. These two proposed design elements of the SAF

mandate scheme this should reward the use of lower carbon hydrogen in the scheme and prevent high carbon hydrogen being used at all.

5. The Department would welcome evidence of any circumstances in which the proposed assessment time for avtur could cause compliance challenges.

Kerosene is most usually now supplied from a refinery or import terminal as a dual grade, meeting the quality requirements of both avtur (unmarked for use as avtur) and heating kerosene (which is marked for heating use).

https://www.blackridgeresearch.com/glossary/What-is-DPK-Dual-Purpose-Kerosene-Definition-Meaning

The marking of kerosene for home heating use can occur downstream of the refinery or import terminal and by third parties such as distributors. This marked kerosene cannot be subsequently used in the aviation sector.

To avoid creating an unintended obligation on the heating kerosene, there needs to be an appropriate process in place for obligated suppliers to net off the kerosene that is marked downstream of the refinery or import terminal. This process should manage the risks in an appropriate way, to mitigate fraud risk whilst not imposing a significant burden on fuel suppliers through the supply chain.

We understand that the HMRC accounting in the HO10 form for dual purpose kerosene, marked kerosene and avtur can be appropriately used to ensure that the correct obligations are applied. Discussions with the DfT Low Carbon Unit and UK Oil Industry Taxation Committee (UKOITC) members have indicated that the 3 lines on the HO10 provide this clarity; line 546 is used for DPK, line 600 is used for heating kerosene, and line 601 is used for avtur.

However, we would encourage the DfT to continue to work with suppliers through the implementation phase of the SAF mandate to ensure that the use of the three separate lines above continues to be the correct approach and for a robust system put in place to manage the interaction between kerosene supply and aviation fuel supply.

A mass balance approach must be used to ensure that all qualifying low carbon fuels supplied in dual purpose kerosene can be recognised and rewarded under the SAF mandate scheme. If this is not allowed, then it risks the current dual purpose kerosene supply chain, with companies potentially withdrawing from the marked kerosene market. This has significant implications for the supply to users, including those in the domestic heating market.

6. The Department would welcome evidence of the impact of CCS on lifecycle GHG savings that can be achieved by SAF, including the potential for negative emissions.

Information on this topic was provided to HMG in October 2021 and a link to this information can be found below.

https://committees.parliament.uk/writtenevidence/40496/pdf/

A paper produced in the US National Renewable Energy Laboratory (NREL) provides further information on this topic; a link is attached below.

https://www.nrel.gov/news/program/2021/from-wet-waste-to-flight-scientists-announce-fast-track-solution-for-net-zero-carbon-sustainable-aviation-fuel.html

The SAF mandate “buy-out” price provides the basis for one potential income stream for SAF producers. However, it needs to be recognised that other potential income streams are available outside of that. For example, companies gasifying MSW may look to sequester the associated carbon dioxide (supported by the CCUS business model) and provide high purity hydrogen (supported by the low carbon hydrogen business model) rather than combine CO and H2 to form SAF. Overall, this process can even produce negative GHG emissions. Therefore, the buy-out price must also be evaluated in the context of alternative options available to SAF producers through other government transition incentive schemes.