Unite the Union Response to the Department for Transport Consultation: - Sustainable Aviation Fuel Revenue Certainty Mechanism: Approach to Industry Funding

1. Introduction

1.1. This submission is made by Unite, the UK's largest trade union with over one million members across all sectors of the economy, including manufacturing, financial services, transport, food, agriculture, construction, energy, utilities, information technology, service industries, health, local government and the not-for-profit sector. Unite also organises in the community, enabling those who are not in employment to be part of our union.

1.2. Of particular interest to this consultation Unite represents 64,000 members who work directly for the airports, airport suppliers, civil aviation industry and their suppliers. Unite additionally also represents members in the aerospace industry, military aviation, oil and gas and fuel processing industries to name but a few.

1.3. Unite has been a longstanding advocate of Sustainable Aviation Fuels (SAF) highlighting the advantages of these often drop in alternative fuels. These are clearly the only option available for carbon reductions for long haul flights without investments into indirect carbon reductions through the use of offsetting investment into direct air capture technologies. Unite particularly welcomes the advent of fuels which should significantly reduce the volume of particulates produced by aircraft engines for both improvements into ground air quality but also due to the improvements in the reduction of condensation trail transformation into additional cloud cover which results in the phenomena known as radiative forcing.

1.4. Unite is, however, very concerned over the potential greenwashing of some of these drop-in solutions. Where, for example the Carbon Dioxide (CO_2) from a gas fuelled power station is utilised as the source of carbon in the creation of a synthetic crude oil, from which is refined a synthetic kerosene, who pays for the ultimately released CO_2. The CO_2 should not be double counted as a reduction in this scenario as it is ultimately additional greenhouse gas emissions (GHG) from a fossil fuel source. Similarly, the use of imported SAF derived from Brazilian palm oil production is unacceptable.

1.5. Some would argue that even SAF derived from hydrogenated esters and animal fats (HEFA) should also not be utilised as a result of the use of animal products. Aside from the vegetarians and animal welfare concerns, this is ultimately a waste product which would otherwise rot and produce methane (CH_4) a secondary and more powerful greenhouse gas. Provided that the animal is not specifically grown for its animal fats and as long as this is therefore a truly waste product then Unite has no objections to the use of HEFA fuels.

1.6. Unite would hope that these fuels will be self-funded by the industry but is concerned that due to the lack of investment so far, the current price of SAF is so high that it will deter the industry from buying the fuel through the fears associated with the loss of passenger revenue if they have to pass on this cost. If this happens in the UK this will result in a drop

of energy security for all long-range international air transported freight[1], especially perishable produce that would not survive a long sea voyage or journey by rail, or other surface transport from nations that rely on exports by air to markets. Once hydrogen aviation is more commonplace[2], it is possible for flights to occur without emitting any greenhouse gasses.

1.7. Air transport has made it possible for a fruit that was growing on a tree or in some foreign land one day, can be on our supermarket shelves the next. Some may question the sustainability of that business model but in most cases the costs associated with heating and artificially recreating the environment for that plant to grow here are several times more that the emissions from the flight. SAF makes it possible to maintain access to the world's economies with a carbon footprint that can be almost zero.

1.8. A further advantage of SAF over JetA1 kerosene is the lack of impurities resulting in far more energy from the same amount of fuel and combined with blended wing designs

2. Consultation Questions

Q1. Do you agree or disagree on the proposed approach to place a levy on aviation fuel suppliers? If you disagree, why?

2.1. Unite agrees with the proposed approach to place a levy on aviation fuel suppliers provided that the revenue raised is hypothecated supporting the development of the development of UK produced SAF solutions.

Q2. Are there any other suitable options for funding a revenue certainty mechanism through the aviation industry? And why?

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[1] According to the 2020 UK Government GHG conversion factors the emissions per 1,000 km of a kg of cargo excluding any radiative forcing (as SAF should reduce radiative forcing to zero) is approximately 0.59953 kgCO_2e https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2020 therefore a kilo of fruit produced naturally in North Africa ≈ 2,000 km away would release 1.19 kgCO_2e. According to a 2016 study into UK greenhouse grown soft fruits the lighting needs to be on for between ten hours and 17 hours in the winter and heating on and available constantly to maintain the perfect growing conditions to maximise yield. While thermostatically controlled heating is used the heating requirements depend on the fruits grown and of course the volume of air that is being utilised. https://projectblue.blob.core.windows.net/media/Default/Horticulture/Publications/Understanding%20energy%20influences%20for%20UK%20soft%20fruit%20production.pdf CO_2 can also be self-supplied, from an engine or boiler on site, where the flue gases contain significant levels of carbon dioxide. Production of say strawberries can require ≈290 kWh/m^2 pa which at the then UK conversion rate of kW to 0.23314 kgCO_2e meant that the yield would need to be in excess of 5.1 kg per m^2 to be less polluting. This does not include the costs of watering, fertilizers and other soil enrichment to which in itself can be very environmentally polluting. As yields increase and the carbon footprint of horticulture improves this may change and equally as aviation moves to zero carbon aviation this may swing the balance the other way. While this raises the question about eating more seasonally and locally -v- international trade what is clear moving towards zero carbon aviation opens up new and sustainable markets for our goods.

[2] There are several designs for zero aviation aircraft one was launched by a US company called JetZero who are in a USAF supported programme to create the next generation of blended wing air-tanker, air-freighter and passenger aircraft. The design will be 50% more fuel efficient than current aircraft according to testing so far using a 1/3 scale model which can operate using SAF or liquid hydrogen. The Airbus ZEROe project concluded that using a hydrogen hybrid engine such an aircraft could have an operational range of ≈ 3,000km with a hydrogen fuel cell option having half that effective range based on their designs.

2.2. Unite, would caution against placing too much of an additional financial burden on airlines as they already operate within very fine margins despite the multimillion pond nature of this industry. Far too many airlines have collapsed or have had to be substantially reorganised especially since the pandemic.

2.3. Given the price differential between SAF options and traditional Jet A1 kerosene, and the various blends, Unite would hope more can be done to encourage the use of SAF from UK producers in order to provide price guarantees and security of supply. Today the price of SAF is currently set at **£4.70 per litre** for the main SAF obligation. In the UK, Jet A1 fuel typically costs around **£1.09 per litre**[3] excluding VAT. This illustrates the need for support to encourage change, as the price differential will currently increase the fuel bill by more than 4.3 times. In any airline the cost of fuel is normally higher than their renumeration bill so such an increase will result in substantial increases in the price of a ticket or a kilo of air freight if matters stay the same.

Q3. Do you agree with the proposed definition of aviation fuel suppliers?

2.4. **Unite believes that while having a lower limit on the definition an aviation fuel supplier[4] might encourage corporate games**, by setting up shell subsidiaries avoid the payment of levies, at the defined level it should create just enough of an administrative headache to discourage the practice if the wish to sell traditional aviation fuel to airlines.

Q4. How would you like the government to work with industry on the detailed design for a levy?

2.5. **Unite would have prefer the government to not just consult the industry on the design of this levy but also talk to the trade unions too to ensure that any actions taken do not result in unwarranted redundancies.** Ideally Unite would have liked to see investment by the UK government to ensure the security of fuel supplies and the delivery of a Just Transition to enable workers to migrate as the industry moves away from fossil fuel sources of aviation kerosene.

2.6. The need for a Just Transition is in Paris Agreement[5] as it was recognised for there to be a transition from a high carbon economy to one which is sustainable, there is a need to discover a source of skilled staff and plug the holes in the economy brought about by the mass redundancies caused by industrial shut downs. If a way can be derived to identify the required skills and fill gaps in the skills base by providing the training for the displaced workers, then the industry should have the workforce it requires. Failure to invest in a Just Transition will only result in higher costs on the state, skills shortages and the destruction of communities as has happened as a result of coal mine closures.

2.7. **Unite therefore feels that should any subsidy be involved to assist in the establishment of a SAF supply chain, then the companies must be compelled to invest in skilled apprenticeships, respect trade union rights around recognition and access and commit to collective bargaining.**

2.8. Considerable revenue funding streams are now being promised, however, nothing appears to be done to secure the workforce to run each new facility. Even if the facility is

[3] Based on the typical market prices for Jet A1 on 30/03/2025

[4] a supplier owning 15.9 terajoules (TJ) or more of aviation turbine fuel

[5] From the UNCCC COP15 talks in Paris when a historic position was reached where the world agreed to act and limit global warming to no more than 2.0ºC of global warming above the preindustrial average and ideally no more than 1.5ºC of warming.

going to be operated by AI and robots, there still needs to be the workforce to produce the equipment and maintain it. Unite feels the provision of the necessary skilled staff is a missing component from the wider industrial strategy debate.

Q5. What further considerations on the proposed approach would you like to raise at this stage?

2.9. In an ideal world, Unite would have liked to have seen intervention to prevent the closure of the Grangemouth oil refinery[6] saving thousands of jobs across the refinery and in the supply and distribution chain. While Unite recognises the need to reach net zero we do not support closures without there being a plan in place to support the workforce[7]. The vast majority of methodologies utilise the Fischer Tropsch method of synthetic crude oil production from a combination of carbon monoxide and hydrogen gasses. This synthetic crude has to be cracked in the same way as fossil crude but unlike fossil crude, the remaining fractional distillates which are not required can also be used as the source of carbon for the process to start again. The only missing component is the supply of hydrogen and the facilities to produce the synthetic crude from sustainable sources of carbon.

2.10. While hydrogen could be obtained via electrolysis[8] or via pyrolysis[9] reducing the need for grey or blue hydrogen[10], the Carbon, to be sustainable needs to be obtained via: -

- Direct air capture[11]

[6] Unite has been campaigning on this since the news of the closure emerged below is a link to the latest Unite campaign page. https://www.unitetheunion.org/news-events/news/2025/february/unite-takes-grangemouth-campaign-to-scottish-labour-conference-in-glasgow-sharon-graham-unite-general-secretary-calls-on-labour-to-change-course-and-save-the-jobs-at-the-grangemouth-refinery

[7] https://www.unitetheunion.org/campaigns/oil-and-gas-no-ban-without-a-plan

[8] The most common way to extract hydrogen without releasing any greenhouse gasses = Green hydrogen

[9] Pyrolysis is where you heat a substance until the compound breaks into its component parts. Passing methane from anaerobic digestion through a bath of molten metal can break the bonds leaving black carbon powder and what has been termed Turquoise hydrogen gas. The remaining black carbon powder, that is not absorbed into the metal, can then be used in multiple ways. As carbon fibre, as soil enrichment on farms, as industrial diamonds or as carbon nanotubes for space age materials for example. Critically pyrolysis creates no greenhouse gasses even if fossil fuel stocks are utilised providing an opening for the current oil and gas industry to find an alternative markets. Hydrogen can be separated from other gasses using metals to create metal hydrides which when separated using heat release pure hydrogen, meaning any un reacted gas can be recycled.

[10] Blue hydrogen is created in the same way as Grey hydrogen, where natural gas is separated from methane by passing it through super critically hot steam. The steam reacts and separates hydrogen and CO_2 gas. Gray hydrogen either captures some of the CO_2 for use in things like fire extinguishers but most it is released into the atmosphere with the unreacted methane and the steam. Blue hydrogen adds onto the existing process flues a carbon capture facility, normally using amides to extract the CO_2 for deposit into a Carbon Capture Utilisation and Storage (CCUS) facility. Sadly, this only removes the CO_2 not the unreacted methane or other greenhouse gasses and pollutants.

[11] This process uses large fans to collect huge volumes of the atmosphere in order to pump it normally through an amine solution in a process called Direct Air Capture (DAC). The amine forms a weak bond with the CO_2 which can be broken with the application of a little heat. The captured CO_2 can then be placed in disused gas and oil wells, ideally injected with powdered basalts so the CO_2 and basalt react to create Limestone. Or the gas can be injected into basalts aquifers. See details of this and how this is being commercially used by looking at the https://climeworks.com/plant-orca

- CO_2 extraction from sea water[12], (from the use of seawater[13] after it is used as a cooling agent at a nuclear power station for example).
- the use of farmed crops on otherwise unproductive land[14] or areas of the seabed[15].
- from the potential use of municipal waste including waste cooking oil
- Captured CO_2 from Biomass to energy facilities
- and as highlighted the use of otherwise waste fractional distillates from the synthetic oil cracking process.

2.11. While the incineration of municipal waste and biomass currently is filling in for the lost generational capacity of coal, these plants are producing far more greenhouse gasses than coal per kWh. Carbon Capture utilisation and storage needs to be a priority from each of these new sources of electrical power for them to become a potential carbon sink. Unite welcomes efforts at aviation sustainability but would not wish to see an era when only the rich can afford to fly due to spiralling fuel costs to or from the UK.

2.12. In 2010 Solena and British Airways proposed to create the first European Municipal waste to SAF facility in the Thames that would consume 500,000 tonnes pa of waste – ideally using high carbon materials – in order to convert them into liquid bio-jet fuel[16]. IF the Government of the day been brave enough to support this project, we could have seen all of the BA Fleet at London City Airport operation on SAF[17] today and avoided putting the 500,000 tonnes of waste either into landfill or into a waste incineration Combined Heat and Power (CHP) facility. The major issue with CHP plants is the huge volume of greenhouse gasses released that makes the burning of waste far more polluting than coal.

2.13. There are numerous ways to produce SAF and every one would turn a product that would otherwise go to waste into something which can reduce the radiative forcing from civil aviation to zero by removing the conversion of particulate matter ladened fossil fuel condensation trails into ones where the level of particulate matter is next to nothing. The higher calorific value would further reduce emissions by providing more energy per litre of fuel meaning less fuel needs to be carried for the flight, reducing the weight which again reduces the amount of fuel needed.

2.14. Unite and its parent unions have been supporting the development of SAF since 2008 and feels frustrated that we are not as far forward on this path that we should have been.

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[12] https://www.sciencedirect.com/science/article/abs/pii/S0025326X24012785

[13] By using low or zero carbon electricity sea water can be converted to Hydrochloric Acid (HCl) and Sodium Hydroxide (NaOH). By increasing the acidity using the HCl and the filtering out to CO_2, The extracted NaOH can then be added to reduce the acidity of the surrounding sea waters improving the environment for aquatic life and creating a platform for more CO_2 removals. Around 150 times more CO_2 per litre of sea water can be removed that can be found in every litre of air processed using DAC Both methods rely on electricity or waste heat to work, and this needs supply chain issue needs a solution.

[14] See this article on the use of *Camelina sativa* for example https://www.aerosociety.com/news/camelina-sativa-the-saf-wonder-weed/

[15] See the article on farmed seaweed and algae to SAF https://tinyurl.com/yr3xmdy4

[16] https://www.letsrecycle.com/news/the-solena-and-ba-bio-jet-fuel-project/#:~:text=Jeff%20Cooper%2C%20of%20the%20International,converted%20to%20a%20liquid%20fuel.

[17] According to the plans 500,000 tonnes of wastes equates to 1170 barrels of SAF, 630 barrels of Synthetic naphtha, 20 GWh of electricity for the grid and heating for the local community. Best of all there are no piles of ash to disposes of as everything would have been consumed.

2.15. Unite hopes the UK can continue to transfer goods and people to the globe and maintain our place on the world stage. This will not be possible using conventional kerosene due to its adverse impacts on the environment and will only be possible using SAF or hydrogen internationally due to market rules over minimum SAF content in the fuels used[18]. Although the UK Sustainable Aviation Fuel (SAF) mandate, aims to increase SAF use, with a target of 10% of UK jet fuel being SAF by 2030 and 22% by 2040, requiring 1.2 million tonnes of SAF annually by 2030, there is no mandate over where it is manufactured. The UK has slipped significantly behind on global SAF production and currently is heavily reliant on imports to reach targets.

2.16. Unite believes that without financial support the UK aviation industry will suffer a similar fate as the current electricity market where we need to pay one of the highest costs globally for supplies[19]. It is due in part to this disparity in energy costs as to why UK SAF production industry needs help to preserve the security of supplies.

2.17. The Committee on Climate Change (CCC) has made it clear that there will probably be a shortage of hydrogen[20] with the majority of that produced in the UK going for use in the energy sector. Without access to enough SAF the aviation industry will have no choice but to use existing kerosene and offset these emissions through the purchase of carbon extraction and sequestrations using nature based and industrial Direct Air Capture with CCUS[21]. Therefore, support is needed to UK production to secure the supply lines of SAF at a reasonable price or the use of this transport mode may end up only affordable to those rich enough to buy tickets excluding the masses from their 2 weeks in the sun and UK industry/commerce from access to air travel. Unite feels that hypothecation of any funds raised to assist in the transition to UK SAF would create a wide range of knock-on benefits.

2.18. The CCC uses a balanced pathway in their report that predicts that by 2040 UK SAF will meet 17% of aviation fuel demands[22], yet in order to meet the EU requirements the mix needs to be at least 40% SAF by 2040 building to 70% by 2050. Clearly the ambitions required for UK SAF need amending. As highlighted the price is currently set **is £4.70 per litre for the main SAF** obligation. Jet A1 fuel in the **UK typically costs around £1.09 per litre[23]** excluding VAT. Clearly with such a price disparity there is a huge financial cost to any airline adopting the fuel which many will not be able to afford. Therefore, while the price needs to be high to encourage new entrants to produce SAF the users also need the fuel at a price which will not bankrupt them. The use of any moneys raised from the levy could be used to bridge the gap and encourage a faster increase in the amount of SAF use in the blend.

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[18] The European Unions ReFuelEU Aviation Regulation has set a minimum supply mandate for Sustainable Aviation Fuels (SAF) in Europe, starting with 2% in 2025 and increasing to 70% in 2050 for example.

[19] UK electricity supply costs are in the top four globally. Our grid connection charges are twice that of the United States of America and four times that of South Korea. This is due in part to 12 years of under investment by the Tories during their term in office; the privatised nature of the energy sector and the ineffective nature of the UK Regulator Ofgem.

[20] https://www.theccc.org.uk/publication/the-seventh-carbon-budget/#:~:text=Hydrogen%3A%20by%202040,in%20surface%20transport .

[21] The UK aviation industry believes that it may be the customer who pays for over 60% of all captured carbon in order to keep flying.

[22] https://www.theccc.org.uk/publication/the-seventh-carbon-budget/#:~:text=Sustainable%20aviation%20fuel,shipping%2C%20remains%20unclear.

[23] Based on the typical market prices for Jet A1 on 30/03/2025

3. Conclusion

3.1. **Unite welcomes these measures but cautions against increasing the burden on the UK airline too much when it comes to the price differential between the price of Jet A1 and SAF.** In all instances the combined costs of carbon offsets and fossil sourced JetA1 kerosene needs to be priced higher than a migration to SAF to drive the market toward greater SAF production. **Reliance on imported SAF and hydrogen is a mistake for which the economy will pay dearly.**

3.2. **Unite would wish that any levy placed against fossil sourced JetA1 kerosene producers is hypothecated for use in support for the UK SAF production industry.** At least initially the production of SAF may be seen as a risk by some producers especially as there are uncertainties over the availability of Green or Turquoise Hydrogen, to ensure the net zero carbon emission goals.

3.3. **Unite would also like to be consulted with respect to the design of the levy in order to minimise any negative impact on skills and staffing.** If there is no support for any aspect of an industry then the need for a proper Just Transition programme to be instigated will be now, thus preserving any transferable skills and not leaving anyone behind. This is unlike the situation that has happened at Grangemouth, in the UK coal industry, in steel. Mass redundancies were prevented at the Ratcliffe-on-Soar power station through the combined efforts of trade unions and management[24].

3.4. The civil aviation industry is still recovering from the COVID-19 pandemic shut down of the industry that caused so many companies to fail. **Unite hopes that with careful planning despite European Union warnings of a £2 trillion price tag to meet their climate goals for aviation that the financial burden on UK aviation is minimised thus preserving an industry that has helped the UK economy weather many a global economic crisis.**

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[24] When the Radcliffe on Sour power station closed ending over a hundred years of coal fuelled electricity production, workers were able to change their careers with the smallest amount of disruption thanks to five years' work by management and the trade union. https://www.tuc.org.uk/blogs/last-uk-coal-plant-closes-and-successfully-redeploys-workforce