Department for Transport

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Ref: 18/P/5118/OUT

13 August 2021

Head of Planning
North Somerset Council
Town Hall
Walliscote Grove Road
Weston-super-Mare
BS23 4EJ

Dear Donald Davies and Jo Walker,

Thank you for your letter of 23 July to the Aviation Decarbonisation Division at the Department of Transport. I am replying as the Deputy Director for the Division.

We have considered the points you have raised in your letter. We do not agree that the Jet Zero Consultation and supporting Evidence and Analysis document provide insufficient information for consultees to respond.

In parts of your letter, you have requested information. We have concluded that this information is 'environmental information' as defined in regulation 2(1) of the Environmental Information Regulations 2004 (EIR) and those requests have been dealt with under the EIR.

We identified 41 queries in your letter, of which 33 were requests for environmental information. We have provided our response to each query in the table provided at Annex A as well as a response regarding each request for environmental information.

Some of the environmental information requested has been provided in Annexes B, C, D and E. Some is provided electronically at: https://www.gov.uk/government/consultations/achieving-net-zero-aviation-by-2050 and this is indicated in Annex A.

In respect of several requests (which, for identification, we have numbered 4, 6, 11, 12, 15, 17, 18, 22 and 23, in Annex A), no bespoke analysis was carried out for the consultation, and therefore in reliance on regulation 12(4)(a) we are unable to provide the requested information as we do not hold it.

In respect of a query regarding future carbon prices (which we have numbered 4.2 in Annex A) the information is not held by the Department, and therefore in reliance on regulation 12(4)(a) we are unable to provide the requested information as we do not hold it. However, this information may be held by a different department and we have provided information regarding how you may contact that department in the response in Annex A.

Representations

You are entitled, under regulation 11 of the EIR, to make representations to the Department in relation to a request for environmental information, if it appears to you that the Department has failed to comply with a requirement of those regulations in relation to the request.

Appeals procedure

If you are dissatisfied with the way we have responded to or handled your requests, you have the right to ask for an internal review. This should be submitted within two calendar months of the date of this letter and addressed to the FOI Advice Team at FOI-Advice-Team-DFT@dft.gov.uk.

Please remember to quote the reference number above in any future communications.

If you ask for an internal review and are still not content with the outcome, you have the right to apply directly to the Information Commissioner for a decision. The Information Commissioner can be contacted via her online form: https://ico.org.uk/make-a-complaint/official-information-concerns-report/official-information-concern/.

In view of your request, made in the context of the Bristol Airport planning appeal inquiry and in the interests of transparency, I am copying this letter to Mark Boulton at the Planning Inspectorate for dissemination to interested parties.

We would be pleased to discuss in more detail should you wish to do so.

Yours sincerely

Holly Greig

Annex A – Table of responses

Query No.	Query	Response
1.1	Please provide any and all **impact assessments** of the costs and benefits of the options considered in the Consultation paper which have been undertaken	The department does not hold this information. The request is accordingly refused under regulation 12(4)(a) of the Environmental Information Regulations 2004. No impact assessment has been carried out to accompany this consultation.
1.2	Please could you provide any and all **copies of documentation** explaining why this has not been done notwithstanding the requirements of the Consultation Principles?	See email dated 3 June 2021 at Annex B. An impact assessment was not deemed appropriate or possible at this stage given the consultation is on a broad strategy for achieving net zero aviation rather than setting out detailed policy proposals. Should they be required, the department will carry out impact assessments to accompany subsequent consultations on policy proposals to achieve the goals of this strategy.
2	In the event that **other scenarios** have been assessed, please provide any and all documentation setting out such assessment.	No other scenarios were assessed as part of the analysis feeding into the Jet Zero Consultation. Since that analysis was completed, we have conducted sensitivity analysis on a hybrid option between our Scenario 1 and Scenario 2 options where there is a higher uptake of Sustainable Aviation Fuel (SAF) in 2050. The purpose of this analysis was to understand the potential emissions impacts of additional SAF uptake. Please see Annex C for more detail on this analysis.

3	Please provide full details of **the assumptions adopted in the "policy off"** baseline including the assumptions adopted regarding the capacity of each airport included in the assessment.	This information has been published on the consultation site. You can find this here: https://www.gov.uk/government/consultations/achieving-net-zero-aviation-by-2050
4.1	Please provide any and all analysis undertaken which examines the likely scale and/or nature of the uncertainty surrounding the values to use when modelling **future carbon prices**	The department does not hold this information. The request is accordingly refused under regulation 12(4)(a) of the Environmental Information Regulations 2004. No analysis has been undertaken examining the likely scale and nature of uncertainty surrounding future carbon values. The use of carbon values in the analysis supporting the consultation followed the department's current transport appraisal guidance.
4.2	Please provide any and all modelling undertaken of **future carbon prices.**	The department does not hold this information. The request is accordingly refused under regulation 12(4)(a) of the Environmental Information Regulations 2004. No modelling has been undertaken on future carbon values. This information may be held by the Department for Business, Energy and Industrial Strategy, whose address is 1 Victoria Street, London SW1H 0ET. Information requests can be submitted to foi.requests@beis.gov.uk. That department has not published revised carbon values.
4.3	Please indicate when the review on the value the	The Department for Business, Energy and Industrial Strategy is the government department responsible for reviewing and publishing

	government places on changes in carbon emissions will be concluded?	carbon values. The Department for Transport is unable to comment on the timing of this work.
4.4	Please confirm that the adoption of a Jet Zero policy will await the outcome of and have regard to the conclusions of such a review?	It would be improper to determine the outcome of the consultation and timing of that now. Consultees are welcome to provide views on the assumptions around carbon values in their response to the consultation.
4.5	In the event that you confirm that the adoption of a Jet Zero policy will precede the outcome of and will not have regard to the conclusions of such a review, please explain why it is appropriate to adopt new policy without regard to any change in value the government places on changes in carbon emissions which takes account of the adoption of the 6th carbon budget, the commitment to net zero and the inclusion of international aviation emissions therein.	For the reason outlined above in response to query 4.4, we cannot confirm this.

4.6	Scenarios 1 and 2 have been conducted assuming the BEIS central carbon value. Contrary to paragraph 2.18, the consultation papers do not appear to contain an exploration of (sic) using the existing BEIS high carbon values in scenarios 1 and 2. Please provide any and all analysis which examines the potential impact of placing a higher value than the BEIS central carbon values for scenarios 1 and 2.	The department does not hold this information. The request is accordingly refused under regulation 12(4)(a) of the Environmental Information Regulations 2004. We have not modelled scenario 1 and 2 with a high carbon price. The results of this modelling would fall within the range of scenarios we have tested. As can be seen in the emissions wedge charts for scenarios 1 and 2, and scenarios 3 and 4, included in the consultation documents, the high carbon price has a minimal impact on overall emissions reductions compared to the central carbon price. We can infer from this that applying a high carbon price to scenarios 1 and 2 would also have a minimal impact.
5	At paragraph 3.8 of the "evidence and analysis" document, the demand assumption of 60% growth on 2018 levels is adopted resulting in growth of 273 million terminal passengers in 2018 to 466 million in 2050. Scenario 2 is also based upon the same level of growth over the same timescale. However, the	The passenger growth rates stated in the evidence and analysis document of 60% for Scenarios 1 and 2 and 58% in Scenarios 3 and 4 represent the passenger growth between actual 2018 passenger numbers and modelled 2050 passenger numbers. At paragraph 3.8, the passenger numbers referenced reflect modelled 2018 and 2050 passenger numbers. The aviation model uses a base year of 2016, and therefore there is some discrepancy between modelled passenger numbers and actual passenger numbers between 2016 and 2020. Passenger demand increases have been quoted against 2018 levels (rather than the model baseline of 2016) for comparison against demand figures suggested by the CCC, which were presented as increases on 2018 figures. We have published the modelled annual

	charts produced in the Evidence and Analysis are the graphs unambiguously use a baseline of 2016. A 60% growth from 268mppa in 2016 would imply 430mppa based on 2016. Given this ambiguity, **please clarify whether a base of 2018 or 2016 has been used in the assessment undertaken.**	passenger numbers for each scenario on the consultation site which can be found here: https://www.gov.uk/government/consultations/achieving-net-zero-aviation-by-2050.
6	The Council is keen to understand the extent to which this has been taken into account in updating the 2017 DfT forecasts of passenger demand forecasts. Please provide any and all assessment which has been undertaken as to the likely implications of increased fares in the forecasting which has been undertaken for all scenarios examined.	The department does not hold this information. The request is accordingly refused under regulation 12(4)(a) of the Environmental Information Regulations 2004.No bespoke analysis of the impact of market-based measures on fares has been undertaken for this consultation. The assumed carbon price is an input to the demand module of the aviation model. The passenger demand forecasts underpinning each scenario therefore reflect the likely impact of the assumed carbon price on fares and resulting impact on passenger demand. More detail on the methodology of the aviation model can be found in the UK aviation forecasts publication linked to in the Evidence and Analysis document: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/878705/uk-aviation-forecasts-2017.pdf

7	In Making Best Use of Existing Runways (2018) a number of tables were produced …. The equivalent information is not provided within the Jet Zero consultation material. Please provide for each scenario that has been considered (including any that are additional to the four outlined in the consultation papers) for each year to 2050 for which analysis was conducted: a. The number of forecast passengers; b. The number of atms; c. The forecasts carbon emissions.	We have published this data on the consultation site here: https://www.gov.uk/government/consultations/achieving-net-zero-aviation-by-2050
8	In order to understand the extent to which the analysis undertaken has taken account of growth and expansion since the publication of MBU and in order to determine whether the Council agrees that the capacity assumptions	The airport capacity assumptions have been published on the consultation site. This can be found here:https://www.gov.uk/government/consultations/achieving-net-zero-aviation-by-2050

	represent a “reasonable upper bound”, it is necessary to see the assumptions adopted. This is also highly relevant to the consideration of cumulative impact assessment for the purposes of the planning inquiry referred to above. Please provide any and all information regarding the capacity assumptions included in any modelling undertaken (including that which has been undertaken but which is not presented in the consultation papers).	
9	Please confirm the Council’s understanding that, the statement in paragraph 4.1 set out above is to be read, in the light of paragraph 4.3, as confirming that the Government has not produced any forecasts which prove that aviation net zero can be met by 2050 with future capacity	We have not produced official forecasts. Our illustrative scenarios suggest net zero could be achieved (if the challenges we have outlined for each scenario are overcome) with future capacity assumptions consistent with Making Best Use policy and the Airports National Policy Statement.

	assumptions consistent with Making Best Use policy and the Airports National Policy Statement; rather it has produced some illustrative pathways.	
10	Please can we be provided with the Fleet Mix Model that has been utilised in in any modelling/assessment work undertaken (including that which has been undertaken but which is not presented in the consultation papers).	The request for information is manifestly unreasonable under regulation 12(4)(b) of the Environmental Information Regulations 2014. Providing the information sought would incur an unreasonable cost and would unreasonably divert resources. The Fleet Mix Model (FMM) is one element of the DfT Aviation Modelling suite. It is largely a downstream model in the overall modelling suite but interacts with other modules within the framework. As a result of this, as well as idiosyncrasies with running the model, the FMM is not in a format suitable for sharing and would be unlikely to be of use to the council if provided in isolation. Packaging the model for release would require an unreasonable number of working hours. Due to these factors we consider that the exception under regulation 12(4)(b) to be engaged. It should also be noted that development of the next version of the FMM is underway and the version discussed here will be superseded. The foregoing matters were also considered in reaching a decision with respect to the public interest under regulation 12(1)(b) (if, in all the circumstances of the case, the public interest in maintaining the exception outweighs the public interest in disclosing the information). We recognise that, under the public interest balancing test, there is a

		general presumption in favour of disclosure, as required by regulation 12(2). Whilst in principle there may be appreciable public interest in members of the public being able to confirm for themselves that the structure of the FMM and its data inputs are suitable to justify reliance on the outputs of that model, that interest is significantly diminished if the practical reality is that disclosure, owing to the intrinsic characteristics of the model, would not produce that result. The number of working hours to package the model for release in order to produce that result is such that the public interest in disclosure is outweighed by the public interest in safeguarding and appropriately applying public resources for the public benefit. That is particularly so when it is observed that the model has been independently peer reviewed (giving the public some assurance in any event of the justification for relying on the model) and where there is no foreseeable future benefit in creating the package (for example, in allowing it to be provided to other members of the public in future) given that the version of the model is to be superseded. Therefore, after consideration of the factors in favour of disclosing the information and applying the exception in regulation 12(4)(b), we have reached the view that in relation to the FMM, the public interest in maintaining the exception outweighs the public interest in disclosure. The independent peer review of the FMM is published online and can be found here: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/653876/a-review-of-the-dft-aviation-fleet-mix-model.pdf.

		Detail on the FMM methodology used in the Jet Zero Consultation can be found on page 48 of UK Aviation Forecast 2017 publication, <https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/878705/uk-aviation-forecasts-2017.pdf. In summary, the FMM predicts types of aircraft that will service future demand. This is achieved by taking the base year age distribution of UK Air Traffic Movements by a specific aircraft type and forecasting changes to that composition with assumptions around aircraft type retirement age and the split of new aircraft entering the fleet each year. The speed of retirement and the type of aircraft are the main determinants of the carbon emitted. In contrast to provision of the entire FMM, the cost associated with providing detail of specific input assumptions or an analysis of FMM outputs may be reasonable. For example, we could provide the forecasted fleet by year produced by the FMM, if the intention is to understand the underlying assumptions driving the CO_2 forecast. The council is asked to provide more particulars in relation to this request.
11.1	The CCC in its pathway to 2050 adopted the assumption that "the fuel efficiency per passenger of aviation is assumed to improve at 1.4% per annum …. All four scenarios in the "Evidence and Analysis"	The department does not hold this information. The request is accordingly refused under regulation 12(4)(a) of the Environmental Information Regulations 2004. We have not made any separate assessment of the ATA research. We would welcome views on this through responses to the consultation. As a point of clarification, only three of the scenarios in the Evidence and Analysis document assume the 2.0% pa (2017-2050) average annual efficiency improvement. In Scenario 1: Continuation of current

	paper assume a 2.0% pa (2017-2050). … based on: a. the optimistic scenario from ATA research; and b. the ICAO “aspirational goal.” … Please provide any and all assessments or information relating to the assessment of likelihood of the “high-risk” technologies coming forward to the extent and on the timescale assumed in the ATA Optimistic scenario.	trends, the assumption is 1.5% pa (2017-2050) as shown in Figure 1 in the Evidence and Analysis document.
11.2	Please provide any and all documents or information which explains why it is considered appropriate to reject the approach recommended by the CCC of 1.4% efficiency growth.	We do not reject the CCC’s approach. The CCC use the same ATA evidence we have used. The CCC’s 1.4% and our 1.5% / 2% are **not** input assumptions, they are calculated average annual efficiency improvement rates based on the same input assumptions from the ATA research in our modelling suite. The difference is that the CCC calculated their 1.4% average annual improvement rate from a 2018 base, and we calculated ours from 2017 base. In some of the CCC’s exploratory scenarios they assume 2.1% average annual fuel efficiency improvements, equivalent to the 2.0% per annum assumed in our scenarios 2-4.
11.3	Please provide the documentation which the	As per question 11.2, our 2% efficiency growth assumption is not based on ICAO’s aspirational goal, it is based on the ATA commissioned

	Government understands provides the evidential basis for ICAO adopting an aspirational goal of 2% efficiency.	research. We have therefore not considered the evidential basis for the 2% goal in our analysis.
11.4	In the event that the answer to the previous request is that there is none, please provided any and all documentation which explains why Government considers it appropriate to adopt an unevidenced aspiration as the foundation for policy making in relation to Jet Zero.	Our 2% efficiency improvement assumption in scenarios 2, 3 and 4 is based on ATA research – it is not based on the ICAO aspirational goal. The fact that ICAO have adopted that as their aspirational goal is a useful and relevant piece of evidence and a helpful 'sense check'.
12.1	Please provide any and all assessments undertaken which examine the likelihood of airlines being able to afford to invest in modernising their fleets at sufficient speed given the ongoing disruption cause by the Covid-19 pandemic.	The department does not hold this information. The request is accordingly refused under regulation 12(4)(a) of the Environmental Information Regulations 2004. This has not been undertaken. We would welcome views on this through responses to the consultation.
12.2	Please provide any and all assessments undertaken which examine the likelihood of aerospace	The department does not hold this information. The request is accordingly refused under regulation 12(4)(a) of the Environmental Information Regulations 2004. This has not been undertaken. We would welcome views on this through responses to the consultation.

	sector being able to afford to invest in creating the necessary aircraft advancements on the timescale necessary to deliver a 2% annual efficiency target.	
13	Please provide any and all documents which appraise the likelihood and/or risks associated with the adoption of an assumption that 30% of fuel demand will be met by Sustainable Aviation Fuel.	The department does not hold this information. The request is accordingly refused under regulation 12(4)(a) of the Environmental Information Regulations 2004. No detailed appraisal has been undertaken on the likelihood and/or risks associated with SAF uptake assumptions specified in the scenarios. Within the Evidence and Analysis document, there is reference to the challenges associated with the scenarios. In the recent SAF mandate consultation, there is further discussion on potential future SAF uptake rates and the associated risks and challenges. The SAF mandate consultation can be found here: https://www.gov.uk/government/consultations/mandating-the-use-of-sustainable-aviation-fuels-in-the-uk
14	The Government's response to the UK Renewable Transport Fuels consultation concluded that the RTFO should be increased by 5 percentage points in the period up to 2032, only a portion of which may be SAF.	The department does not hold this information. The request is accordingly refused under regulation 12(4)(a) of the Environmental Information Regulations 2004. No assessment has been undertaken on this. The SAF mandate consultation proposes that SAF cannot be eligible under both the mandate and the RTFO.

	Please provide any and all assessments or documents which consider the extent to which that obligation of 14.6% is consistent with the investment required an attainment of 30% of aviation fuel demand being met by SAF in 2050 as assumed scenarios 2 and 4 in the Jet Zero consultation.	
15.1	Paragraph 2.8 of the Evidence and Analysis document states: “The costs of SAF are high and uncertain. …. Based on a range of evidence, we estimate the abatement costs of SAF to currently be broadly in the range of £200-600/tCO2. Please specify the documents that constitute the “range of evidence” referred to in paragraph 2.8 [of the evidence and analysis document]	The sources of evidence on the costs of SAF that we have drawn on in this analysis are those referenced in paragraph 2.8 of the Evidence and Analysis document. These are: • World Economic Forum (2020) *Clean Skies for Tomorrow: Sustainable Aviation Fuels as a Pathway to Net-Zero Aviation*, available at http://www3.weforum.org/docs/WEF_Clean_Skies_Tomorrow_SAF_Analytics_2020.pdf • ICCT (2019) *The cost of supporting alternative jet fuels in the European Union*, available at https://theicct.org/sites/default/files/publications/Alternative_jet_fuels_cost_EU_20190320_1.pdf These sources are widely quoted – for example in both the Destination 2050 and Waypoint 2050 reports (cited in the Evidence and Analysis document). Other sources of evidence that we have seen support the broad range quoted in the document, include: • CCC (2020) *Sixth Carbon Budget*, available at https://www.theccc.org.uk/publication/sixth-carbon-budget/

		• De Jong et al. (2015) *The feasibility of short-term production strategies for renewable jet fuels – a comprehensive techno-economic comparison*, available at : https://onlinelibrary.wiley.com/doi/epdf/10.1002/bbb.1613?saml_referrer • International Renewable Energy Agency (IRENA), *Innovation Outlook, Advanced Liquid Biofuels* (2016), Available at: https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2016/IRENA_Innovation_Outlook_Advanced_Liquid_Biofuels_2016.pdf
15.2	Please provide any and all assessment(s) undertaken relating to the estimate of abatement costs of SAF.	The department does not hold this information. The request is accordingly refused under regulation 12(4)(a) of the Environmental Information Regulations 2004. We did not undertake an internal assessment of the abatement costs of SAF for the Jet Zero Consultation. The department has subsequently undertaken some analysis on abatement costs for the SAF mandate consultation. This has been summarised in Annex D. We would welcome views on this topic through responses to the consultation.
15.3	Please provide any and all assessments undertaken which examine the implications for abatement costs of SAF as a result of a scaling up of production.	The department does not hold this information. The request is accordingly refused under regulation 12(4)(a) of the Environmental Information Regulations 2004. We have not undertaken an assessment examining the implications for abatement costs of SAF as a result of scaling up of production. We would welcome views on this through responses to the consultation.

16	Please provide any assessment undertaken which contains an assessment of the likely fall in costs of SAF production in the UK by 2050.	We have not undertaken any assessment of this ourselves – we have only seen the external estimates of this provided by World Economic Forum as referenced in the Evidence and Analysis document.
17	Please provide any and all assessments undertaken which examine the likelihood of the challenges identified in paragraph 3.14 [of the evidence and analysis paper] being overcome and thus the likelihood of this scenario being plausible.	The department does not hold this information. The request is accordingly refused under regulation 12(4)(a) of the Environmental Information Regulations 2004. This has not been undertaken. We would welcome views on this through responses to the consultation.
18	Please provide any and all assessments undertaken which examine the likelihood of the challenges identified in paragraph 3.17 [of the evidence and analysis paper] being overcome and thus the likelihood of this scenario being feasible.	The department does not hold this information. The request is accordingly refused under regulation 12(4)(a) of the Environmental Information Regulations 2004. This has not been undertaken. We would welcome views on this through responses to the consultation.
19	Please provide the analysis referred to together with any and all assessments	The department does not hold this information. The request is accordingly refused under regulation 12(4)(a) of the Environmental Information Regulations 2004. There is no separate analysis here to

	undertaken which examine the likelihood of the availability in 2050 of measures to off-set aviation emissions.	provide – in paragraph 2.19 as referenced, we have referred to research by the Royal Society and Royal Academy of Engineering that suggests there could be up to 125 Mt removals in 2050. Similarly, the CCC[1] suggest that an upper bound of around 110 Mt of removals may be available annually by 2050.The highest level of residual emissions in our scenarios are 36 Mt in Scenario 1, which leads us to infer that based on current research, and the expected demand for removals across other sectors as set out by the CCC in their sixth carbon budget report, there would be sufficient removals to offset the residual emissions from aviation.
20	At paragraph 2.21 the Evidence and Analysis paper states: "In order to achieve the CCC's proposed demand limit of a 25% increase in passenger numbers on today's levels by 2050, our modelling suggests a carbon price substantially higher than £600/t could be necessary." Please provide the modelling referred to and any and all documents which examine the carbon	The analysis referred to is based on an older run of the aviation model, which assumed a £600/t carbon price. The other assumptions feeding into this older model run are not consistent with the Jet Zero Consultation scenarios and therefore the results cannot be directly compared. The results of this model run showing the impact on passenger numbers can be found in Annex E. The justification for the use of this analysis is set out in Annex E. The department does not hold this information. The request is accordingly refused under regulation 12(4)(a) of the Environmental Information Regulations 2004. There is no additional analysis or assessment for the carbon price consequences of capping demand.

[1] https://www.theccc.org.uk/wp-content/uploads/2019/05/Net-Zero-Technical-report-CCC.pdf

	price consequences of capping demand.	
21	Please provide any and all assessment(s) undertaken which demonstrate that “technologies” would be incentivised to reach net zero 2050 before carbon prices reach a level at which capping demand would be justified.	The department does not hold this information. The request is accordingly refused under regulation 12(4)(a) of the Environmental Information Regulations 2004. There is no additional analysis or assessment for this. The conclusion in paragraph 2.21 of the Evidence and Analysis document is based on the evidence in paragraphs 2.8 and 2.11 of that document which shows estimated abatement costs for SAF and zero-emission aircraft which are less than the £600/t carbon prices.
22.1	“This analysis suggests that capping demand may not be necessary to reduce emissions to levels which can be offset by GGRs to achieve net zero (such as the level suggested by the CCC’s Balanced Net Zero Pathway, 23 Mt in 2050). There is much uncertainty however, and clearly there could be many combinations of technology improvements, GGR costs and demand growth which would achieve net zero.”	Paragraph 2.22 refers to the analysis in Chapter 3 of the Evidence and Analysis document which shows potential scenarios for in-sector aviation emissions out to 2050. As outlined in our earlier response to query 19, we are aware of research that suggests there are sufficient removals technologies to offset residual emissions in aviation based on the scenarios set out.

	Please provide the analysis referred to	
22.2	Please provide any and all analysis undertaken which examines different combinations of technology improvements, GGR costs and demand growth to achieve net zero	The four scenarios outlined in the Evidence and Analysis document consider different combinations of technologies and carbon prices (the latter of which results in different levels of demand). In all scenarios, we assume the residual emissions need to be offset by removals in 2050. We haven't undertaken any analysis looking at capping demand in any way other than the application of a carbon price. We also haven't included any analysis incorporating different costs of GGRs. There are no additional analytical scenarios we have modelled apart from the four mentioned in the Evidence and Analysis document, and the hybrid scenario described in our response to query 2 and as shown in Annex C.
22.3	Please provide any and all analysis undertaken which explains why any particular combination of technology improvements, GGR costs and demand growth is preferred over another.	The department does not hold this information. The request is accordingly refused under regulation 12(4)(a) of the Environmental Information Regulations 2004. This has not been undertaken. We would welcome views on this through responses to the consultation.
23	Please provide any and all documents or information which explains the extent to which the assessments undertaken (whether published in the Jet Zero consultation or otherwise) allows for offsetting as a	The department does not hold this information. The request is accordingly refused under regulation 12(4)(a) of the Environmental Information Regulations 2004. No assessment has been undertaken as part of the Jet Zero Consultation on the extent to which CORSIA offsets could be used to meet UK carbon budgets. No assumption about CORSIA offsets was made as part of the Jet Zero Consultation illustrative scenarios.

	result of the CORSIA scheme.	
24.1	Please confirm that the Jet Zero consultation does not propose to set a sectoral target for the aviation sector for the 6th Carbon Budget period.	The Department for Business, Energy, and Industrial Strategy's Net Zero Strategy (announced as part of the Government's response to the Committee on Climate Change's 2020 Progress Report to Parliament) will set out the Government's cross-economy Carbon Budget Six delivery plan. The Jet Zero Consultation does not seek views on sectoral targets relating to the Sixth Carbon Budget.
24.2	If the contrary is the case and the Jet Zero consultation does propose to set a sectoral target for the aviation sector for the 6th Carbon Budget period, please: a. identify what the aviation sectoral target is for the 6th Carbon Budget; b. provide the evidence is relied upon to support the identification of that target during that period; c. provide any and all assessment(s) undertaken which establish the likelihood of that target being met; and	In the light of the response to the preceding query, this query does not fall to be answered.

	d. the assumptions regarding airport capacity growth included in any such assessment.	
24.3	If it is the case that the Jet Zero consultation does not propose to set a sectoral target for the aviation sector for the 6th Carbon Budget period, then given the duty contained within section 13(1) of the Climate Change Act 2008: a. Please explain when is the Government intending to consult on the appropriate sectoral target for the aviation sector to adopt for the 6th Carbon Budget Period; and b. Please provide any and all documentation or information which explains the methodology to adopt in considering	The Department for Business, Energy, and Industrial Strategy's Net Zero Strategy (announced as part of the Government's response to the Committee on Climate Change's 2020 Progress Report to Parliament) will set out the Government's cross-economy Carbon Budget Six delivery plan. Regarding query 24.3b., the Government has set out its support for airports making best use of their existing runways in its policy statement *Beyond the horizon: The future of UK aviation - Making best use of existing runways* (MBU). MBU remains the Government's current policy and continues to have full effect in planning decisions. As stated in footnote 39 of the Jet Zero consultation, MBU continues to have full effect in relation to planning decision-taking. MBU sets out that for most environmental concerns, the government expects these to be considered as part of the local planning process. However, MBU also makes clear that there are some important environmental elements, such as carbon emissions, which should be considered at the national level. The potential carbon emissions created by airports making best use of their existing runways are considered in MBU. Planning law requires that applications for planning permission be determined in accordance with the development plan, unless material considerations indicate otherwise.

	whether plans for airport capacity expansion comply with the 6th Carbon Budget target in the absence of an adopted sectoral target.	MBU forms part of the overall framework of planning policy for airport development. Other statements of government policy may be material when deciding applications. It is for the decision-maker to determine the appropriate weight to attribute to relevant policy according to the stage of preparation, and other factors. Further policy and guidance on planning decision-making can be found in the National Planning Policy Framework.
25	Please provide any and all documents/assessments demonstrating that the consultation process has had regard to the potential application of the precautionary principle.	The department does not hold this information. The request is accordingly refused under regulation 12(4)(a) of the Environmental Information Regulations 2004. Consultees are able to respond to the consultation providing their views on how the precautionary principle could apply to the proposals that are the subject of the consultation. The proposals are aimed at reducing or offsetting emissions of carbon dioxide, and it is not evident that the means to give effect to the proposals create a threat of environmental damage, justifying the application of the principle.

Annex B: Correspondence on the requirement for an Impact Assessment (relating to query 1.2)

Hi [text redacted],

Given this is a consultation on a strategy rather than specific policy proposals, we don't think there is any requirement for an impact assessment. We've actually already consulted [text redacted] on our evidence & analysis doc and he seemed fine with that and it not being an impact assessment so I think we're covered.

Thanks,
[text redacted]

[text redacted], Aviation Decarbonisation and Markets Analysis, Department for Transport [text redacted]
Post to: Great Minster Hse, 33 Horseferry Rd, London, SW1P 4DR
From: [text redacted]
Sent: 03 June 2021 16:53
To: [text redacted]
Subject: FW: Consultation number

Hi [text redacted],

Do you know anything about impact assessments and whether we might need one for the consultation?
I'm turning to you on the advice of the BRU but if you're not the right person don't worry!

Thanks,
[text redacted]

[text redacted], Aviation Decarbonisation Division, Department for Transport [text redacted]
From: [text redacted]
Sent: 03 June 2021 15:19

To: [text redacted]>
Cc: ImpactAssessments <ImpactAssessments@dft.gov.uk>
Subject: RE: Consultation number

Hi [text redacted],

[text redacted]

Impact assessment requirement
I'd recommend speaking to your analysts, some impact assessment may be useful to guide policy development. Whether you *need* one, is dependent on what stage of consultation this is. If this is more of a Green Paper/Call for Evidence (i.e. you will do a future consultation on the exact changes you want to make at a later date), then an impact assessment can be done at this stage. If this is the last time you'll consult before going ahead and making the changes, an impact assessment is important and should only not be done in very specific circumstances (it may delay implementation of the policy). It does also vary with exactly what you're doing, and who's impacted, generally they're only needed where there's requirements being placed on business.

Do let me know which stage you think you're at on this.

[text redacted]

Thanks,

[text redacted]

[text redacted], Better Regulation, Department for Transport
[text redacted]

Annex C: Additional emissions scenario considered (relating to query 2)

Scenario description: Sensitivity analysis exploring a variation of the 'Continuation of current trends' scenario, with a more optimistic SAF uptake. The resulting emissions are in between those of the 'Continuation of current trends' and 'High ambition' scenarios, thus are covered by the original range of scenarios presented in the consultation.
Assumptions:

- All assumptions are as in 'Continuation of Current trends', except for uptake of SAF
- SAF uptake assumed to reach 6% of total fuel demand by 2035, and 15% by 2050

Results:

Terminal passengers and ATMs are as in 'Continuation of current trends'

Table 1. Emissions savings from each measure and residual emissions (tonnes CO_2)

Year	Demand impact of carbon pricing	Fuel efficiency improvements	SAF	Residual emissions
2016	0	0	0	34,916,390
2017	5,063	0	0	34,957,169
2018	6,698	0	0	36,409,610
2019	10,747	0	0	36,645,378
2020	14,657	0	0	36,522,644
2021	233,358	0	61,006	36,153,577
2022	444,718	0	127,741	35,975,914
2023	442,940	0	202,612	36,099,525

2024	760,185	0	286,026	36,232,581
2025	1,025,804	0	376,421	36,139,635
2026	1,019,557	0	478,578	36,224,531
2027	1,904,301	0	613,200	37,517,107
2028	1,406,796	0	764,757	38,586,120
2029	1,470,562	0	928,403	39,228,599
2030	1,625,399	249,736	1,100,770	39,413,625
2031	1,742,911	498,990	1,279,977	39,204,966
2032	1,818,306	772,477	1,480,109	39,054,643
2033	1,938,819	1,076,759	1,698,151	38,824,943
2034	2,111,941	1,405,385	1,943,566	38,674,521
2035	2,006,798	1,832,427	2,203,626	38,317,765
2036	2,245,167	2,356,209	2,421,552	37,795,555
2037	2,480,409	3,061,529	2,609,378	36,914,865

2038	2,629,342	3,986,918	2,799,494	36,171,314
2039	2,761,404	4,999,805	2,987,404	35,483,348
2040	2,750,712	6,089,007	3,171,524	34,823,518
2041	3,150,244	6,758,071	3,391,614	34,568,172
2042	3,289,469	7,762,416	3,589,988	34,124,982
2043	3,487,677	8,268,137	3,829,915	34,055,866
2044	3,728,923	8,992,710	4,048,840	33,801,731
2045	3,958,801	10,161,931	4,266,350	33,539,401
2046	4,146,833	11,189,577	4,465,557	33,152,479
2047	4,354,955	11,996,482	4,677,331	32,864,989
2048	4,215,483	13,127,211	4,900,827	32,656,627
2049	4,691,616	13,846,944	5,122,801	32,436,898
2050	5,027,512	14,426,646	5,337,928	32,177,251

Annex D: Abatement costs of SAF (relating to query 15.2)

Based on the range of sources listed in response to request 15.1, the analysis for the SAF mandate consultation used the following central estimates of production costs over time for different SAF pathways.

	Central production cost £/tonne, 2020 prices						
Fuel type	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
HEFA	976	876	823	799	782	770	760
Gas-FT	1,325	1,316	1,138	1,106	1,078	1,044	1,012
AtJ	1,683	1,429	1,292	1,251	1,214	1,181	1,151
PtL	2,731	1,828	1,397	1,194	1,056	964	894
Pyrolysis	2,716	2,607	2,503	2,403	2,307	2,214	2,126
Other (non-ASTM approved) pathways	4,720	4,532	4,350	4,176	4,009	3,849	3,695

Using these central estimates results in an (undiscounted) abatement cost of SAF of £230-260/t on a direct emissions basis, and £270-305/t on a lifecycle emissions basis (2020 prices), across the 5 scenarios considered in the SAF mandate consultation (see this consultation for more detail on the scenarios assumed).

These figures fall within the range previously quoted in paragraph 2.8 of the Evidence and Analysis document. Further sensitivity analysis considering higher SAF production costs and more conservative price decreases over time has not been carried out yet but will likely result in abatement costs closer to the upper end of the broad range quoted in the Evidence and Analysis document.

Annex E: Demand under a carbon price reaching £600/tCO_2 (relating to query 20)

Scenario description: An old model run which used the BEIS central carbon price until 2035, then increased linearly to £600/t (2018 prices) in 2050.
Caveat: These figures were not presented in the consultation as this analysis is from an older model run which is not directly comparable to the model runs done for the consultation scenarios due to slightly different assumptions on Heathrow expansion phasing, however we are confident that the findings are still appropriate to draw conclusions from.

Results:

	£600/tCO2 carbon price in 2050 run		BEIS high carbon price run used for Jet Zero consultation scenarios 3 & 4 (reaching £231/tCO2 in 2050) – for comparison	
Year	**Terminal passengers**	**Runway ATMs**		
2016	266,630,773	2,119,086	266,630,773	2,119,086
2017	271,391,101	2,169,457	270,511,191	2,150,496
2018	273,626,940	2,169,844	272,557,103	2,166,319
2019	275,374,427	2,172,880	275,208,164	2,172,345
2020	277,616,574	2,179,346	276,054,140	2,170,816
2021	278,926,101	2,178,832	275,866,241	2,162,167
2022	283,353,275	2,201,996	279,577,688	2,179,882

2023	287,806,985	2,232,144	284,313,445	2,200,636
2024	292,706,383	2,261,937	289,099,159	2,232,168
2025	297,921,660	2,289,874	292,344,568	2,251,759
2026	302,817,849	2,303,731	295,038,579	2,255,627
2027	311,190,566	2,338,152	303,212,423	2,280,135
2028	319,979,778	2,372,976	312,692,256	2,325,335
2029	326,912,861	2,396,896	319,955,001	2,353,925
2030	334,772,319	2,429,950	328,479,538	2,391,465
2031	340,890,334	2,458,832	335,713,936	2,424,846
2032	347,733,312	2,488,849	341,876,136	2,452,058
2033	353,039,881	2,503,652	346,994,733	2,466,586
2034	360,683,152	2,534,857	354,378,528	2,494,346
2035	370,157,743	2,587,291	361,076,465	2,531,202
2036	371,918,115	2,592,677	368,295,392	2,569,866

2037	375,039,974	2,615,604	372,916,257	2,599,779
2038	379,141,786	2,639,133	379,399,991	2,638,658
2039	383,495,686	2,666,369	387,689,610	2,693,812
2040	387,227,530	2,685,247	395,345,643	2,733,401
2041	391,567,328	2,721,366	401,682,889	2,783,623
2042	395,379,405	2,741,962	407,930,743	2,827,402
2043	397,570,980	2,759,673	414,357,448	2,858,485
2044	400,921,225	2,779,329	420,481,530	2,894,553
2045	404,951,277	2,815,040	426,415,225	2,938,496
2046	409,963,214	2,832,669	433,798,172	2,981,355
2047	413,604,939	2,867,816	440,645,545	3,016,000
2048	418,229,124	2,897,559	447,772,535	3,074,020
2049	421,761,849	2,917,145	454,266,243	3,104,006
2050	425,506,529	2,943,267	460,869,776	3,150,229

From actual 2018 passenger levels (291 million), this is an increase of 46% by 2050. This is above the CCC's recommended passenger increase of 25% on 2018 levels, which would be equivalent to around 364 million passengers in 2050. We have not explored what level of carbon price would be needed to limit demand to this level, but it is clear that it would need to be significantly higher than £600/t, which is at the upper end of estimates of the abatement costs for aviation technologies.