Communities Against Gatwick Noise Emissions (CAGNE)
Gatwick Airport Northern Runway project DCO application
PINS Reference Number: TR020005

SUBMISSIONS ON BEHALF OF CAGNE
POST-EXAMINATION (9 June 2025)

INTRODUCTION

1. These submissions are made by Communities Against Gatwick Noise Emissions ("CAGNE") in response to the Secretary of State's Minded To Letter ("MTL") and in response to the Applicant's post-examination submissions of April 2025 (C3-015 series).

2. On 21st May 2025, CAGNE wrote to the Secretary of State outlining its procedural fairness concerns in relation to the ongoing evolution of the Applicant's proposed draft development consent ("DCO") post-Examination. Those submissions are not repeated here but are maintained and provided at Appendix 1. In short, central issues have not properly been considered as part of the formal Examination, and in these unusual circumstances a reopening of the Examination and further full consultation is required for a lawful decision.

3. These further post-Examination submissions on behalf of CAGNE address the following:
    a. Response to new requirements:
        i. **Noise requirements** – submissions on the revised requirements by expert consultants Suono are appended at Appendix 2.
        ii. **Surface transport requirements** – submissions on the revised requirements by expert consultants Sterling Transport Consultancy are appended at Appendix 3.

b. Other matters:

i. **Climate change**.

ii. **Air quality** – submissions highlighting serious omissions from the Examining Authority's ("ExA") report by expert consultants Kalaco (formerly Air Pollution Services ("APS")) are appended at Appendix 4.

iii. **Wastewater**.

iv. **National Landscapes**.

v. **Policy**.

vi. Regulation 598 Consultation.

NOISE

4. Submissions on the revised noise requirements by Suono are provided at Appendix 2. These should be read alongside Suono's January 2025 post-examination submissions (C2-065).

5. Suono explain that while, in some respects, the ExA's proposed approach to the requirements represents an improvement on the Applicant's original proposals, the revised draft DCO would still fail to comply with national aviation noise policy and would fail to address key errors in the Applicant's noise assessment.

6. Suono also set out that the Environmental Statement must be updated to account for the new requirements, thresholds and information that make up the reasons why the ExA is recommending approval. This updated information would then also need to be consulted upon and considered as part of reopening the Examination, to ensure fairness to all parties.

SURFACE TRANSPORT

7. Submissions on the revised surface transport requirements by Sterling are provided at Appendix 3. These should be read alongside Sterling's January 2025 post-examination submissions (C2-065).

8. In summary, Sterling supports the principles underlying the ExA's rewrite of requirement 20 but reiterates that the Applicant's surface access management and mitigation package remains inadequate.

OTHER MATTERS

Climate Change

9. The Secretary of State is asked to read in full CAGNE's concluding submissions on climate change matters (REP 9-223 at §§42-57). However, the following matters require further comment in light of the Applicant's latest submissions.

(i) Non-CO2

10. Within its Closing Submissions (REP 9-223), CAGNE explained that in light of the evidence heard throughout Examination, the only lawful approach to assessing the environmental impacts of the Northern Runway Proposal ("NRP") would be to take into account non-CO2 emissions. Despite recognising the inevitability of such impacts, the Applicant has consistently refused to provide information on non-CO2 emissions within its Environmental Statement ("ES").

11. The ExA was clearly correct to take into account non-CO2 emissions in coming to a conclusion on the overall climate impacts of the NRP. The correct legal approach, in light of *R (Finch) v Surrey County Council and others* [2024] 4 All ER 717; [2024] UKSC 20 ("*Finch*"), was to apply a causal analysis and the precautionary approach to determine whether non-CO2 impacts were required to be assessed, as part of the Environmental Impact Assessment ("EIA") obligations, in order to describe the direct and indirect effects on the climate. Given that it is not just likely but certain that non-CO2 impacts have a warming effect (a certainty reinforced by developments which have occurred after the Examination), the causal test is passed and non-CO2 impacts are required to be assessed. The ExA took a qualitative approach, which was both lawful and justified at the time of the Examination.

12. However, the Secretary of State should go further and adopt a quantitative rather than merely a qualitative approach to non-CO2. Matters have moved on since the ExA produced its Report. There is increasing global recognition that harmful non-CO2 emissions are manifestly capable not only of qualitative but also quantitative assessment.

13. First, both the ExA and the Secretary of State in the Luton decision accepted that it is methodologically possible to assess the extent of non-CO2 emissions. This acceptance was correct. Unfortunately, the Secretary of State in the Luton decision relied on a number of matters irrelevant to legal causation to exclude the assessment of non-CO2 emissions (the unlawful approach is now subject to legal challenge). The Secretary of State should not repeat the same unlawfulness in relation to the decision concerning Gatwick. Non-CO2 emissions are plainly effects of the NRP, which can be contextualised in the same way as scope 3 emissions. The assumption of, and reliance on, future controls is directly contrary to *Finch*, which precludes reliance on the assumption that other pollution control regimes will address an impact as a basis for excluding assessment of that impact (see, especially, §108).

14. Second, on 26 February 2025, CAGNE wrote to the Secretary of State (PID-009) to explain that the Climate Change Committee ("CCC"), the UK's independent statutory body on climate change, had published its advice on the Seventh Carbon Budget (2038 – 2042) (the "7CB Report")[1]. The 7CB Report evidenced a change in the CCC's approach to non-CO2 effects. The 6CB Report emphasised uncertainties around these emissions. While the 7CB Report still accepts that there are uncertainties, it nevertheless takes a different approach. It states that non-CO2 effects likely make up the dominant part of the UK aviation sector's contribution to current global warming (p.79); estimates the expected increase of non-CO2 effects by 2040 (p.226); includes them as a key indicator for the aviation sector (Figure 7.6.3, p.228); and concludes that, overall, the effect of non-CO2 emissions is warming and that their impact lasts for 10-20 years (Box 7.6.3, p.231). The CCC has used global warming potential ("GWP") values to convert emissions of non-CO2 into their CO2 equivalent (p.132), which is a methodology open to the Secretary of State if that is preferred to the use of a multiplier

[1] https://www.theccc.org.uk/wp-content/uploads/2025/02/The-Seventh-Carbon-Budget.pdf

– CAGNE's position is that either methodology could lawfully be chosen. The CCC's change in position provides further support for demanding a quantitative approach.

15. It is important to observe that the scientific understanding of non-CO2 emissions was first brought to the attention of policymakers and the public in a 1999 special report, published by the Intergovernmental Panel on Climate Change ("IPCC"), on 'Aviation and the Global Atmosphere'.[2] Even accounting for uncertainty, that report found that the impact of aviation on radiative forcing over the period 1992 to 2050 would likely be two to four times greater when non-CO2 effects were accounted for than if aircraft CO2 was considered alone (pp. 8-9, section 4.8). Over the intervening 17 years, the science has improved considerably, and it is now absolutely clear that non-CO2 aviation emissions have a net warming effect on the climate. It is also established with a high degree of confidence that this effect is larger than that of CO2 aviation emissions. A proper precautionary approach, compliant with the legal obligations under the precautionary principle,[3] (and now reflected in both the CCC's approach and the developments addressed below) can no longer rely on "*uncertainties*" to avoid assessment and consideration of non-CO2 emissions, particularly given the methodological approaches now available.

16. Thirdly, as of 1st January 2025, aircraft operators under the purview of the EU Emissions Trading Scheme ("ETS") are now obliged to monitor and report non-CO2 effects (by way of Implementing Regulation (EU) 2024/2493). In February 2025, the European Commission published "Guidance on the Monitoring, Reporting, and Verification (MRV) of Non-CO2 aviation effects".[4] The Guidance provides a clear methodology by which emitters can themselves monitor and determine non-CO2 impacts. Again, this supports a quantitative approach.

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2 [redacted]

3 See *Afton Chemical Ltd v Secretary of State for Transport* [2011] 1 CMLR 16 at §61. The precautionary principle requires the policymaker "*to make a reasonable assessment, using the best scientific evidence*", which has to happen before considering what action to take, as waiting to achieve scientific certainty could "*increase the risk of damage occurring or could worsen the potential damage*": see the articulation of the precautionary principle in the Environmental Principles Policy Statement, which accurately summarises the legal position.

4 [redacted] provided at Appendix 5

17. Fourthly, the December 2024 update to the National Planning Policy Framework ("NPPF") now makes expressly clear at §163 that "*[t]he need to mitigate and adapt to climate change should also be considered in preparing and assessing planning applications, taking into account the full range of potential climate change impacts*" (emphasis added). The full range clearly includes non-CO2 emissions.

18. In light of this evolving global recognition of the assessability of non-CO2 impacts and changes to national policy, the Secretary of State should adopt a quantitative approach, as proposed by, *inter alia*, AEF and NEF throughout the Examination. As the ExA accepted in their Report (at §8.4.29), the lack of a settled methodology does not prevent the use of a valid methodology, particularly in circumstances where the Applicant accepts that non-CO2 impacts will occur and will have some radiative forcing effect.

19. In summary given the scientific consensus around the significant impact of non-CO2 emissions from aviation, the ExA were wholly correct to conclude these could not be left out of account. However, following the close of the Examination, further evidence points in favour of going beyond a qualitative approach and requiring a quantitative approach to assessment.

(ii) Assessment of Significance

20. The Applicant has critiqued the ExA's approach to assessing overall greenhouse gas emissions, alleging that the ExA did not realise that the figure of 3.4% provided by the Applicant as the emissions share of the Sixth Carbon Budget emissions was for the whole airport.

21. First, the Applicant's allegation is plainly wrong: §8.5.12 of the ExA's Report shows the ExA was fully aware that the figure related to the entire airport's emissions. The ExA referred properly to a figure provided by the Applicant, so it sits ill for the Applicant to allege this is a serious error.

22. Second, the Applicant fails to read the ExA's Report as a whole. It is incorrect to assert that the ExA "*relied on*" the 3.4% figure when concluding that the 5% indicative

threshold in the IEMA Guidance was "*likely to be reached for the project as a whole*" (§8.4.109). In fact, the ExA took a much more nuanced approach:

a. At §8.4.106, the ExA cited the Applicant's 3.459% figure, but then set out a number of matters which the Applicant's assessment excluded;
b. At §8.4.109, the ExA set out that interested parties ("IP") had raised "*considerable doubts about the Applicant's assessment that the Project would result in a 3.439% contribution in the Sixth Carbon Budget.*". The ExA accepted those concerns – a matter of judgment correctly open to the ExA on the facts;
c. The ExA then did the best it could, in light of the information available, and took an overall qualitative approach to come to a determination about the likelihood that the 5% indicative threshold would be reached for the NRP as a whole (see §8.4.109, and the reiteration and summary in §8.5.12);
d. §8.5.10 puts it beyond doubt that the ExA did not simply apply the Applicant's figure, because it explicitly reiterates "*our doubts regarding the Applicant's assessment of the contribution of the Proposed Development to the Sixth Carbon Budget and carbon targets*" when coming to the other assessment provided for in the IEMA Guidance as to whether a greenhouse gas ("GHG") impact will be major or moderate adverse (see the Box 3 significance criteria, which consider whether a project's GHG emissions make a meaningful contribution to the UK's trajectory towards net zero). See also §8.5.13.

23. Accordingly, the ExA did not simply apply the Applicant's figure, but rather came to an overall qualitative approach. Given the uncertainties around future aviation emissions, non-CO2 effects (at that point), and the UK's net zero trajectory, the ExA took a properly precautionary approach. This is also precisely what the IEMA Guidance recommends where there are difficulties contextualising against carbon budgets or a net zero trajectory (caused here, for example, by the legal obligation on the ExA to take into account the full climate impacts, including upstream and downstream emissions and non-CO2 impacts). The IEMA Guidance provides that, in such circumstances, "*a more qualitative or policy-based approach to contextualising emissions to evaluate significance may be necessary*." (pg 28).

24. In any event, even had the ExA used the Applicant's figure to compare the emissions from the airport post-NRP as a whole against the national carbon budget, rather than

comparing the incremental increase from the NRP in isolation against that budget, this would have taken a reasonable cumulative approach. As the NRP unlocks existing capacity, as well as changing the scale of the airport overall, altering demand levels and airline behaviour (such as aircraft choice) across the entire operation, it would have been appropriate for the ExA to take the total airport's emissions into account when seeking to assess the overall significance of the scheme. That approach would ensure that the cumulative and enabling effects of the project were not artificially minimised. The new runway is not a standalone asset; it is the catalyst for a step-change in airport emissions.

(iii) Carbon Cap

25. On the noise and transport issues, the ExA concluded in their Report that the environmental impacts of the NRP justified imposition of tighter requirements mitigating the effects.

26. However, while the ExA concluded that the NRP would also bring about significant GHG impacts, the ExA did not propose inclusion of the carbon cap requested by multiple parties throughout the Examination (see CAGNE's final submissions on the carbon cap at REP 10-039 §8-11).

27. The December 2024 NPPF is clear at §161 that "*[t]he planning system should support the transition to net zero by 2050 and take full account of all climate impacts …. It should help to: shape places in ways that contribute to radical reductions in greenhouse gas emissions*…." (emphasis added). This provides clear policy justification for such a cap.

28. As recorded at §8.4.73 of the ExA's Report, the reason the Applicant contended there was no need for a climate cap was that the Applicant suggested at the time of the Examination that the NRP's GHG emissions would not be significant. Given the ExA's conclusions on significance, there is now no justification – even on the Applicant's own case – for failing to impose a carbon cap requirement to mitigate those impacts.

Air Quality

29. Submissions on the ExA's wholly inadequate approach to air quality impacts are provided by expert consultants Kalaco at Appendix 4. Kalaco identify that the ExA's Report failed to address CAGNE's key arguments on air quality, particularly as regards the uncertainties associated with the Applicant's modelling. The ExA's Report is materially deficient, failing to provide adequate reasoning on a principal important issue between the parties. Kalaco emphasise again that the Applicant's modelling – particularly in relation to road traffic emissions – was not fit for purpose. Furthermore, Kalaco explain that the ExA's concerns about the Applicant's predicted traffic levels were not reflected in their conclusions on predicted air quality impacts (representing an inconsistent approach).

30. Throughout the Examination, Kalaco (formerly APS) provided detailed analysis of fundamental flaws in the Applicant's air quality modelling. Due to these flaws, Kalaco (APS) identified that requirements should be imposed on the DCO as regards an air quality monitoring strategy and an air quality action plan to protect human health (see e.g. REP8-145). This technical evidence has effectively been ignored by the ExA in their Report.

Wastewater

31. On wastewater, CAGNE's consistent position that a phased requirement is necessary has now, belatedly, been accepted by the Applicant (see CAGNE's Closings REP 9-223 §§58-70 explaining why phasing is necessary).

32. While requirement 31 represents an improvement on the previous drafting, CAGNE maintains its concerns with the unlawful tailpiece that remains. In short, requirement 31 is still unacceptable, insofar as it allows the Applicant to resile from building the onsite wastewater treatment works in the event that some alternative private agreement is reached with Thames Water outside the Examination process. As set out in some detail at REP7-129 and REP8-143, that approach is not a lawful one.

33. Furthermore, CAGNE considers an amendment is needed to requirement 31 to ensure dual runway operations cannot commence until the wastewater facility is fully operational.

National Landscapes

34. The Applicant's post-Examination response on the amended duty in section 85 of the Countryside and Rights of Way Act 2000 has incorrectly applied the approach of the High Court in *New Forest National Park Authority v MHCL & Anor* [2025] EWHC 726 (Admin). Mould J concluded at §86 that the amended duty required the decision-maker to "*consider whether the proposed development will leave unharmed the natural beauty, wildlife and cultural heritage of the National Park*" (emphasis added).

35. The NRP would not leave the relevant protected landscapes "unharmed". As set out in the Applicant's own response at C3-015 Annex 4, both the ES Chapter 8 and Natural England concluded there would be "minor adverse effects" on the Surrey Hills AONB, Kent Downs AONB and South Downs National Park. "Minor" adverse effects do not represent "no harm" and do not equate to "conserving". As such, contrary to the Applicant's submissions, there is a need for the Applicant to address these effects to satisfy the amended duty.

36. Furthermore, CAGNE does not consider that the Applicant's funding proposals for light monitoring and reporting (via the Dark Skies Reserve) would properly "leave unharmed" the natural beauty, wildlife and cultural heritage of the protected areas, given the light and noise pollution that it is accepted would arise. More is required to ensure the duty is properly met.

Policy

37. As to policy matters, the ExA's Report concluded that the provision of a second runway at Gatwick would comply with national airports policy. CAGNE maintains that amounts to both a misinterpretation and misapplication of national policy. The Secretary of State is invited to consider in full the points made by CAGNE in its Closing

Submissions (REP 9-223 §§4-36), which explain that the NRP does not comply with national policy on airport expansion.

Regulation 598 Consultation

38. As regards Article 6 of EU Regulation 598/2014, criterion (d) states that any consultation should be "*organised in a timely and substantive manner*" and that IPs should have "*at least three months prior to the adoption of the new operating restrictions to submit comments*". For the reasons set out in Appendix 1, CAGNE does not consider that a decision to grant a revised DCO without further substantive assessment (including reopening of the Examination) would encompass a consultation organised in a "*timely and substantive manner*". Furthermore, all IPs will need the opportunity to comment on any final iteration of the proposed DCO requirements.

CONCLUSIONS

39. The Secretary of State's revised requirements represent a clear improvement on the scheme put forward by the Applicant at the Examination. However, they still do not make what remains a policy non-compliant and environmentally damaging scheme acceptable. Furthermore, as set out in Appendix 1, the process of evolving the scheme post-Examination has resulted in procedural unfairness, requiring reopening of the Examination for a lawful decision to be taken.

9 June 2025

Communities Against Gatwick Noise Emissions (CAGNE)

Gatwick Airport Northern Runway project DCO application

PINS Reference Number: TR020005

SUBMISSIONS ON BEHALF OF CAGNE

21 May 2025

Introduction

1. In advance of the 9th June 2025 deadline, Communities against Gatwick Noise and Emissions ("CAGNE") has conducted an initial review of the Applicant's April 2025 submission in response to the Secretary of State's Minded To Letter ("MTL"). Following that review, CAGNE is concerned that the proposed approach gives rise to procedural unfairness and material prejudice to interested parties ("IPs"). Without prejudice to the procedural issues raised in these submissions, CAGNE will also be responding substantively to the Applicant's April 2025 submissions by 9 June 2025.

Post-Examination Events

2. In light of the recommendations of the Examining Authority ("ExA") to refuse the proposal put forward by the Applicant and examined by the ExA ("the First Scheme") but to approve an alternative proposal with tighter environmental controls ("the Second Scheme"), the Secretary of State understandably considered it necessary to seek further input from both the Applicant and IPs.

3. The Applicant has responded by proposing a third version of the development consent order ("DCO") ("the Third Scheme"), with a further untested set of requirements.

4. The environmental issues to which these evolving requirements pertain – namely noise and surface access – are fundamental issues to the determination of the application. They go to the very heart of the planning balance. However, the Third Scheme has not

been examined by way of the usual process. As such, there has been very little scope for evaluation, analysis or testing by any IPs (or their appointed experts), and none by the ExA, contrary to what would be expected had these changes occurred during the course of the Examination itself.

5. In particular, the ExA required a number of hearings to deal with noise and surface transport issues. CAGNE instructed expert witnesses to attend and participate in those hearings. The Third Scheme was not tested at all by the ExA at those hearings: it was simply not even a potential option at that stage.

6. The Applicant's Cover Letter to the Secretary of State in response to the MTL expressly states (emphasis added):

> "*We propose **detailed changes** to the position we put forward at application*"

7. There has been no formal Change Request. Nonetheless, PINS' Guidance on Change Requests usefully states as follows:

> "*When can a change request be accepted?*
> *[…]*
> *The Examining Authority will consider if there is sufficient time remaining in the examination process to examine the changed application. Whether sufficient time remains will depend on the complexity of the issues arising from the proposed change. For example:*
>
> > *the extent to which the change would generate new or different likely significant environmental effects* […]"

8. The Third Scheme now proposed by the Applicant clearly has the potential to generate new or different likely significant environmental effects. It is being proposed not simply towards the end of the Examination process, but even later – once that process has already been concluded.

Submissions

9. The High Court in *R (Holborn Studios Ltd) v LB Hackney* [2017] EWHC 2823 (Admin), held that there are two limitations on changes to a planning application. First, the substantive limitation: does what is proposed amount to a substantively different proposal? Secondly, the procedural limitation: would the change result in procedural

unfairness or substantial prejudice to any other party? Against the background of multiple hearings dealing specifically with noise and transport issues, at which a wide range of experts attended, a six-week paper-based consultation on a brand new proposal following the closure of the entire Examination is procedurally inadequate and unfair. As such, there is conflict with the second limb of *Holborn* studios.

10. CAGNE also notes that the application is Environmental Impact Assessment ("EIA") development supported by an Environmental Statement ("ES"), and as such is subject to the requirements of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 ("the IEIA Regulations").

11. Reg. 7 of the IEIA Regulations provides that an ES in respect of an EIA development should include, *inter alia*:

> "7. *A description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment and, where appropriate, of any proposed monitoring arrangements (for example the preparation of a post-project analysis). That description should explain the extent, to which significant adverse effects on the environment are avoided, prevented, reduced or offset, and should cover both the construction and operational phases*."

12. The Applicant's ES does not address the Third Scheme at all. As such, the ES does not include *"[a] description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects*" that is relevant to the final proposed scheme. Any change to the ES would also necessitate a full further consultation in accordance with the IEIA Regulations, and to ensure the vital, effective, public participation required by the Regulations: *Finch v Surrey County Council* [2024] PTSR 988 at §§18-21.

13. Accordingly, CAGNE invites the Secretary of State, as a matter of urgency, to re-consider the approach taken to the proposals. Now that the Applicant has chosen to advance the Third Scheme, at the very least the Secretary of State should require the Applicant to update the key chapters of the ES, including the description of the development, on which there should be full further consultation. In other circumstances, additional environmental information can be read alongside the existing ES, but the detailed nature of the changes made to produce the Third Scheme are such that an

update to the ES is required, to avoid confusion and allow for proper public participation.

14. The Secretary of State should, additionally, consider whether fairness requires the re-opening of the examination on the topics of noise and surface access. The Secretary of State is confronted with a set of circumstances that has not previously arisen during the determination of an NSIP application. In other examinations, applicants have engaged on the issues and addressed the ExAs' concerns during the process. This Applicant chose intransigence. The result was the ExA's recommendation of refusal of the Applicant's First Scheme, with the alternative of the tighter environmental controls in the Second Scheme should the Secretary of State take a different view on the planning balance. Faced with the ExA's recommendation of refusal (wholly predictable, given the Applicant's approach to the ExA's concerns), the Applicant has now chosen to propose the Third Scheme, without a change request. In those circumstances, if the Secretary of State is minded to allow the Applicant to progress the Third Scheme, CAGNE submits that fairness requires the re-opening of the examination on the topics of noise and surface access. While this will result in delays and expense, that is the consequence of the Applicant's failure to address the issues during the examination process which, exceptionally, the Applicant is being allowed to make good after the close of the examination.

21 May 2025

Note

Title	Noise Review of Applicant's Response to SoS's Letter		
Project	Gatwick Airport DCO		
Reference	28AD.NT.12.1	**Author(s)**	BHo
Date	3 July 2025	**Reviewer**	VC

Overview

1. The Secretary of State (SoS) published a letter on 27th February 2025 that she is 'minded to' grant planning permission for Gatwick Airport's DCO alongside the Examining Authority's (ExA) Report.

2. The ExA's Report states that without any changes, their recommendation would be to refuse the application, but with suitable, substantial, changes in place, granting the application could be supported. Noise matters are included within the proposed changes.

3. The Applicant submitted additional information on 24th April 2025 in response to the 'minded to' letter. The SoS has invited comments on the additional information.

4. This note sets out our response covering the ExA's noise proposals and the Applicant's response, highlighting where national aviation noise policy is not being met and where errors continue to not be dealt with.

ExA's Proposals and Conclusions

5. With regards to noise, the ExA conclude the following at section 6.5 of their report (ExAR):

> *6.5.1. With regard to aircraft noise, we conclude that the Applicant has not met the requirements of ANPS paragraph 5.53 with respect to the assessment of aircraft noise and ANPS paragraph 5.60 with respect to the avoidance of significant noise effects and the minimisation of adverse noise effects from aircraft noise. As a result, we ascribe moderate weight to the issue of noise and vibration against the making of the Order in the form represented by the Applicant's final dDCO [REP10-004].*
>
> *6.5.2. Subject to our proposed modifications to Requirements R1, R15, R16, and R18, and schedules 11 and 14 in the rDCO as detailed in Chapter 22 being accepted, having had due regard to the ANPS the NNNPS and other important and relevant matters, we conclude that neutral weight should be given to the issue of noise and vibration in the overall planning balance of the Proposed Development.*

6. In summary, the noise changes which bring about the planning weight reduction relate to:

- Air and ground noise Lowest Observable Adverse Effect Levels (LOAEL),
- Air and ground noise Significant Observable Adverse Effect Levels (SOAEL),
- Air noise contour area limits; and
- Noise Insulation Scheme.

7. How these changes affect the ExA's conclusions are set out in section 23.2 of the ExAR:

23.2.4 The Applicant's draft Development Consent Order (dDCO) would introduce a wider range of controls than the existing position. In our view under the dDCO moderate levels of harm would be caused to matters of GHG emissions, traffic and transport, and noise, along with a little harm to matters relating to the water environment and health and wellbeing. In this scenario the harm that the Proposed Development would cause would outweigh the benefits and on that basis we recommend refusal.

23.2.5. By contrast, the recommended Development Consent Order (rDCO) would introduce a wide range of detailed planning controls on the operation of the Proposed Development, such that harm levels would be reduced in matters of traffic and transport and controlled in relation to noise, the water environment and health and wellbeing. Additional benefits would also result from good design. Under this scenario the benefits of the Proposed Development would outweigh harm and we recommend approval. Should the SoS be minded to accept our recommendation it should be noted that not all of the proposed changes in the rDCO have been shared with the Applicant or other Interested Parties.

8. It is therefore clear that the ExA's proposed noise changes contribute to the ExA finding the proposed development acceptable. We understand that it is on this basis of the various proposed changes that the SoS is minded to grant permission.

9. We have reviewed the ExAR and have concerns about how the ExA have arrived at their conclusions as to how their proposed changes would lead to the scheme becoming acceptable. These concerns are set out in each of the below sections, alongside our own views as to the merits of the Applicant's responses.

Air Noise

LOAEL Thresholds

10. The Applicant has set out in Annex 2[1] the difference between their proposed day and night-time LOAELs and those proposed within the ExAR, replicated in the table below.

Table 1 Adverse Effect Level Thresholds

	LOAEL		SOAEL	
Party	**Daytime, dB $L_{Aeq,16hour}$**	**Night-time, dB $L_{Aeq,8hour}$**	**Daytime, dB $L_{Aeq,16hour}$**	**Night-time, dB $L_{Aeq,8hour}$**
Applicant	51	45	63	55
ExA	45	40	54	48

11. The ExA's proposed thresholds are materially lower than those presented by the Applicant. This would lead to a substantial increase of the relevant threshold noise contour area, encompassing materially more dwellings and other noise-sensitive receptors.

12. The ExA conclude that their proposed thresholds for LOAELs are the most appropriate. The ExAR states at section 6.5.55:

[1] Annex 2: Applicant's response on requirement 18 (receptor based mitigation)

We agree with the Applicant that values need to be assigned to these metrics corresponding to LOAELs and SOAELs so that adverse and significant adverse effects on human receptors would be identified and addressed as required by policy at ANPS paragraph 5.68.

13. Drawing these matters together points to the ExA holding the view that LOAELs must be set to identify and address adverse effects, which is a policy requirement, with LOAEL thresholds clearly stated.

14. However, the ExA has not required the Applicant to produce any information to quantify the extent of adverse effects nor how they should be addressed. There is no information within the application documents that sets out where the LOAEL noise contours at these recommended thresholds fall, nor how many dwellings, population or noise-sensitive buildings are contained within them. It is insufficient to derive a new threshold requiring significant additional analyses and then to include that new threshold within one's decision making, with no knowledge of the outcome of those analyses.

15. It is not clear how LOAEL thresholds that are different to those used in the assessment can be proposed at this stage without it being a clear reason for refusal. There is a complete absence of evidence within GAL's documentation of noise effects at the proposed thresholds, so no assessment or critical review can be undertaken or decision made on the acceptability of any impacts.

16. Paragraph 143 of the SoS' 'minded to' letter states:

'The Secretary of State is currently minded to agree with the ExA that the thresholds for LOAEL and SOAEL should be [as per the ExA's recommendations set out in Table 1 above]'

17. If these ExA-proposed LOAELs are to be taken as the relevant thresholds for Gatwick Airport, then the noise chapter and associated appendices of the Environmental Statement should be updated, accompanied by a full further consultation.

18. If the ExA-proposed thresholds are not progressed, there is clear benefit in undertaking another full consultation, due to the amount of time given to LOAELs during the examination. This is perhaps highlighted best by the matters highlighted within Appendix A of REP8-145, which were not covered in detail during the examination and give rise to serious concerns with regards to noise effects related to the scheme, namely:

- Lack of up to date environmental statement noise chapter;
- Details of implementing the noise insulation scheme;
- errors within the fixed mechanical plant noise assessment; and
- myriad issues within the ground noise assessment, including missing noise results and noise contours.

Air Noise Limits

19. The Applicant has set out in their response letter[2] and in Annex 1[3] why they take the proposed noise contour area limits to be inappropriate. The Applicant's position is as follows, taken from section 1 of their response letter:

The ExA has suggested modifications to GAL's proposed Requirement 15 such that the area within the 51dB daytime air noise contour, which must not be exceeded from the first to the fifth year of dual runway operations, is 125km^2, rather than the 135km^2 suggested by GAL.

[2] Response to the Secretary of State's letter, dated 24th April 2025
[3] Annex 1: Applicant's response on requirement 15 (air noise limits)

GAL would be more willing to accept the proposed limitation of the 51dB noise contour area to 125km^2 if required by the SoS, if it can be shown to be based on evidence which was before the examination and is correctly reasoned. As explained in Annex 1, we consider that the ExA has mis-understood the basis of GAL's case and has therefore incorrectly applied the "original DCO central case" for fleet transition. This case was created pre-pandemic and was therefore updated during the Examination to a new 'Updated Central Case' using the latest available fleet transition information. The original central case is therefore no longer correct or valid.

20. There are multiple points raised above which we deem require a response. These are dealt with in turn.

Submitted Information

21. The Applicant submitted their DCO application documents in August 2023. Noise documents are dated July 2023. Within these noise documents, such as APP-039, the Applicant includes both the 'Central Case' and 'Slower Transition Fleet' forecasts.

22. Within Table 14.3.1 of APP-039, the Applicant states:

The ATM forecasts used for the modelling of noise in the future are based on estimates of how the fleet will transition based on assumptions around airlines' fleet procurement programmes and business models. The 'central case' used in the noise assessment is based on what is considered today to be the most likely rate of fleet transition. However, there is uncertainty around this, particularly following the global COVID-19 pandemic and the financial impact of this on the airlines. Therefore, noise modelling has also been carried out for a 'slower transition fleet' based on ATM forecasts in which the rate of fleet transition is delayed by about five years and which would result in higher noise levels than the central case for the same periods.

23. The Applicant notes that the Central Case has uncertainty around it, as there is with any forecast, but still chooses to present it in 2023, several years after the main impacts of the pandemic. In fact the Applicant was sufficiently confident in the Central Case that it is defined as the 'core case' for the purposes of the Environmental Statement, as confirmed in REP4-004 (and APP-031):

1.13 The rate at which airlines are able to equip with new aircraft ("fleet transition") is dictated by many factors and is outside of the control of the airport. Accordingly, whereas the Central Case is the 'core case' for the purposes of the ES, a 'slow fleet transition case' was considered as a sensitivity case to assess the potential for higher aircraft noise and other emissions if fleet transition was delayed. In ES Chapter 6: Approach to Environmental Assessment [APP-031], paragraph 6.3.49 states:

"In the 'Slow Fleet Transition' sensitivity case the rate of transition of Gatwick's airline fleet to newer generation aircraft is assumed to be slower than in the core forecasts. This sensitivity case has the same number of passenger and aircraft movements as in the core forecasts. This sensitivity test forecast is used to assess the potential for higher aircraft noise and other emissions".

24. The Applicant's position is therefore contradictory in that, in their view, the information was sufficiently correct to submit as a core case and to be reviewed by all parties, but at the same time, so totally incorrect that it could not form the basis of noise limits or even be considered as relevant.

Use of Core Case for Limits

25. On 15th May 2024, some eight months after submitting the Central Case, the Applicant released REP4-004, setting out an Updated Central Case. Within REP4-004, the Applicant states:

1.2.2 This Updated Central Case, discussed in this ES Addendum, is now considered by the Applicant to represent the most likely rate of fleet transition. Whilst this is the case, it is nonetheless still the case that the SFT case remains valid, and in the Applicant's view continues to reasonably represent the potential for global and market events to slow the rate of fleet transition. Accordingly, it remains the case that the Updated Central Case and the SFT case in combination present the 'worst case scenario' for all ES topics, and the basis on which they do so is explained in this ES Addendum.

26. The analysis within REP4-004 compares the Updated Central Case to both the original Central Case and the Slower Transition Fleet. If the original Central Case was no longer relevant, there is no need to retain it for comparison purposes. Yet the implication when reading all of the Applicant's noise documentation is that the original Central Case is achievable in noise terms. The Applicant was unwilling to update APP-039 (the noise chapter of the ES), further highlighting that the original Central Case information contained is relevant.

27. The Slower Transition Fleet and Updated Central Case may well be the 'worst case scenario', but this does not define the basis on which noise limits should be derived. As stated in the Overarching Aviation Noise Policy Statement 2023 (our emphasis):

*The impact of aviation noise must be mitigated as much as is practicable and realistic to do so, limiting, and **where possible reducing**, the total adverse impacts on health and quality of life from aviation noise.*

28. It is clearly possible to reduce aviation noise impacts using the core case provided by the Applicant. This is precisely what has been included within the recent Luton Airport DCO decision. The ExAR for the Luton Airport DCO states at 3.18.230:

The ExA considers that use of the core case noise contours as argued for by the JHA would set more challenging noise Limits for the Applicant and incentivise use of quieter technology and operating methods. The ExA considers that this would also contribute to meeting the objective of NPPF (paragraph 191a) to "mitigate and reduce to a minimum potential adverse impacts resulting from new development". To address this, the ExA included a new Requirement securing core growth noise contours

Limit Values

29. The Applicant states that the value of 125 km^2 has not been presented for consideration within the application documents. Upon further review, Table 14.9.6 of APP-039 does state 126 km^2 rather than 125 km^2 for the extent of the LOAEL noise contour and on this basis we would consider the following update to be appropriate.

Table 2 Air noise limits

Air noise contour	Enclosed area from the first to the fifth year of dual runway operations (km^2)	Enclosed area from the sixth year of dual runway operations (km^2)	Enclosed area from the eleventh year of dual runway operations (km^2)
51 dB $L_{Aeq,16hour}$	~~125~~ 126	125	114
45 dB $L_{Aeq,8hour}$	142	135	126

Receptor Based Mitigation

30. In Annex 2, the Applicant continues to take the position that ambient noise should factor into the criteria for the Noise Insulation Scheme, despite this not being the case at other airports:

4.14 The Applicant welcomes the JLA's acceptance that a property should only be eligible for noise insulation if the combined air and ground noise level is above the ambient noise level. As noted in its further submissions the Applicant would, if the SoS concludes that ground noise must be included in the NIS, undertake an extensive road traffic noise modelling exercise to quantify ambient noise.

4.15 Failing to account for ambient noise in the final requirement would not meet the test of reasonableness.

31. As we set out in our initial SoS response in January 2025 (Suono Note 28AD.NT.10.0), were Gatwick to not include premises where ambient noise levels are in line with the thresholds proposed (51 dB $L_{Aeq,16hour}$), the above figure suggests that over 90% of all premises might not be eligible.

32. It is unacceptable to omit more than 90% of premises on the basis that they already experience some level of noise.

33. Indeed, should these premises already benefit from noise mitigation and insulation measures installed, then Gatwick would not need to improve on them if they already meet the proposed specification. The same outcome would therefore be reached without excluding premises which are not already insulated as well.

34. This approach could potentially also miss properties that could easily benefit from insulation against aircraft noise. For instance, a property next to a road that is busy during the daytime may have acoustically upgraded windows to the living room to the front, but not to bedrooms to the rear of the property. The same property could also see a material benefit from an acoustically upgraded ceiling in bedrooms, minimising aviation noise where possible.

35. Other airports have not adopted a criterion excluding properties from their noise insulation schemes because the community response to noise has been found to be based on absolute noise levels from aircraft only. This includes Luton Airport's scheme agreed in 2025, Stansted Airport's scheme agreed in 2021, and London City Airport's scheme agreed in 2024, to give but a small number of examples.

36. Ambient noise levels have been found to not affect the response to absolute noise levels from aircraft only – this conclusion is reached from the CAA's CAP1506: Survey of Noise Attitudes and CAP1767: An investigation into the influence of background ambient noise levels on attitudes to aircraft noise, as well as multiple other studies. It is therefore a reasonable requirement for an airport's noise insulation scheme.

Ground Noise

37. We have made extensive criticisms of GAL's ground noise assessment throughout the examination. The topic is largely absent from the ExAR, which we consider to be an important shortcoming.

38. There are two key points to highlight here. The first is how ground noise is covered in the Luton Airport ExAR, summarised succinctly in paragraphs 475 and 476 (our emphasis):

475. The Secretary of State notes that some Interested Parties questioned why ground noise was only modelled and were of the view that ground contour drawings were contradictory in terms of lowest observed adverse effect level ("LOAEL"– the level above which adverse effects on health and quality of life can be detected) and SOAEL levels [ER 3.18.180]. Noting the Applicant's response and that its approach to ground noise modelling was agreed with the Joint Host Authorities [ER 3.18.182], ***the Secretary of State is satisfied that separate noise modelling of different noise sources is supported*** *by the World Health Organisation and*

WebTag guidance. Like the ExA, the Secretary of State has not seen any specific evidence to suggest that the ground noise contour drawings contradict themselves [ER 3.18.183].

*476. The Secretary of State is aware that **the ES includes details of the ground noise modelling approach, assumptions and limitations and provides model outputs**. Like the ExA **the Secretary of State is satisfied that the Applicant has provided appropriate ground noise modelling outputs** [ER 3.18.183] and in reaching this conclusion, has considered that the Joint Host Authorities agreed with the Applicant's approach to ground noise modelling, assessment and compensation. **The ExA concluded that the modelled ground noise outputs provided in the ES were sufficient for the purposes of decision making** [ER 3.18.185]. **The Secretary of State concurs**.*

39. From the above it is clear that decision making has to consider the topic of ground noise in an appropriate manner, which has not occurred at Gatwick. We do not take the information provided by GAL to be consistent in any way with the above, nor do we take the ExA's consideration to be sufficient.

40. The second key point is that the SoS and ExA have, perhaps inadvertently, disagreed with the Applicant's ground noise assessment methodology. Paragraph 142 of the SoS's letter states:

142. The Secretary of State is minded to agree with the ExA that the Applicant's choice of metric of daytime and nighttime LOAELs in the form of LAeq 16h and LAeq 8h for the average summer day as defined in CAP 1731 and she is further minded to agree that given the importance of the metrics in the consideration of aircraft noise effects, the CAP 1731 definitions should be set out in the DCO…

41. The Applicant has not modelled the average summer day metric within their ground noise assessment, but rather the 100% mode summer day metric. These are clearly distinct indices in aviation noise modelling, do not directly correlate to each other and produce results covering different areas (and therefore different dwellings).

42. A follow on to this point is that the SoS is minded to base air noise limits from the Central Case forecasts (an approach which we agree with), but the ground noise assessment only considers the Updated Central Case.

43. Taking into account the above, even if the ExA or SoS were minded to find the scant ground noise evidence on the wrong forecasts provided by GAL to be acceptable, all of the Applicant's evidence is simply presented using the wrong index and must be given little to no weight if paragraph 142 above is followed.

44. There is therefore a need to update the noise chapter and associated appendices, accompanied by a full further consultation. This update should include new assessment by the Applicant to ensure their methodology correlates to what is being proposed by ExA and SoS.

45. Without this update, there is no possibility of identifying significant adverse effects from whichever scheme is being progressed.

Fixed Plant Noise

46. While this is a more minor issue compared to air or ground noise, the Luton Airport SoS Report does state in paragraph 450:

…the Secretary of State agrees with the ExA, who was satisfied that the amended fixed plant noise management plan would avoid significant adverse effects and can be relied upon for the purpose of decision making…

47. There is no reference to plant noise within the ExAR. Given that we have highlighted in the examination that there appear to be basic errors in the Applicant's fixed plant noise assessment (such as section 3 of REP2-070), it is not clear how this noise source has been determined to not have a significant adverse effect.

48. Despite being a more minor issue, it does highlight what we consider to be another shortcoming of the ExAR, where the themes of missing information and identified errors within the Applicant's noise documents have not been addressed, nor required to be remedied.

Conclusions

49. The Secretary of State (SoS) published a letter on 27th February 2025 that she is 'minded to' grant planning permission for Gatwick Airport's DCO alongside the Examining Authority's (ExA) Report.

50. The ExA's Report states that without any changes, their recommendation would be to refuse the application, but with suitable, substantial, changes in place, granting the application could be supported. Noise matters are included within the proposed changes.

51. The Applicant has submitted additional information in response to the 'minded to' letter, in large part pushing back on the proposed noise changes.

52. This note sets out where national aviation noise policy is not being met and where errors continue to not be dealt with.

53. There is a clear need for the noise chapter and associated appendices of the Environmental Statement to be updated to account for new requirements, thresholds and information that make up the reasons why the ExA is recommending approval. This updated information would then also need to be consulted, to ensure fairness to all parties.

CAGNE: Gatwick Airport DCO Post Examination Response to Secretary of State - Surface Access Comments

Sterling Transport Consultancy Limited

1. These comments have been prepared by Sterling Transport Consultancy who have been retained as CAGNE's surface access advisor throughout the examination phase of the DCO determination.

2. The 27th February 2025 minded to grant letter (MTGL) from the SoS and the ExA recommendation report creates a number of issues for CAGNE to consider and respond to.

3. The basic premise that the ExA can recommend a DCO which in effect overrides the DCO examined requires further consideration as does the question of whether the now recommended DCO (the rDCO) actually provides sufficient protection in respect of surface access. A further question will be the application of ***Finch*** and the ExA view that the scheme carbon emissions "would not be capable of meaningful assessment".

4. In terms of surface access, CAGNE representations have consistently indicated that:

    - The level of detail provided by the applicant is insufficient to fully determine the surface access implications of the development.

    - The commitments made by the applicant in terms of rail mode share are not supported by a suitable contractual structure nor are they fully funded. The late addition of a rail related funding source (the Rail Enhancement Fund) is not adequate to bring about the mode share required under rDCO and acknowledged as deliverable in the MTGL.

    - In terms of the commitments offered for transport by bus, the ExA report concludes that *"…Applicant adopted an initiative taking approach to the necessary improvements to the bus and coach network and that this would be secured as part of the SAC in the Recommended DCO*." CAGNE has in previous representations highlighted the inadequacy and uncertainty inherent in this approach.

5. The MTGL sets out a clear expectation on the applicant to accept that the validity of the environmental assessment is, in part, dependant on the predicted mode shares for surface access being implemented as a condition precedent to the operation of

the development proposed by the DCO application. This aligns with CAGNE's concerns and the need for an enhanced framework to secure surface access commitments should the development be finally approved. The finding of the ExA that *"…..the evidence within the Transport Assessment that it is likely that there could still be significant congestion at key locations and that the predicted congestion would affect a larger area than just the two terminal roundabouts"* is seen by CAGNE as significant. In essence the ExA is clear that the surface access interventions proposed by the applicant do not, as required by policy and on environmental grounds, mitigate the adverse impact of the development. This should be a matter for the SoS to assess fully in her final determination.

6. The MTGL indicates that the surface access proposals will be subject to separate scrutiny, monitoring and reporting outside of the existing Airport Surface Access Strategy process as identified by the ExA and as proposed by the applicant. Whilst in planning terms it is entirely correct that the application development must "consume its own impacts", the disconnect between (i) the monitoring against the current access strategy and (ii) the monitoring of the DCO surface access impacts and commitments through a parallel but disconnected regime, offers a real prospect of no clarity being provided on whether targets have been met or otherwise. This may be a technicality in the round, but given the level of funding that is proposed to be deployed in response to the meeting or otherwise of targets through the DCO commitments, only the following will satisfy the level of certainty required:

    - A clear baseline position on surface access mode share and volumes prior to the DCO development being brought on stream.

    - A mechanism to transparently identified additional trips (both aviation and surface access) caused by the DCO development.

    - A reporting regime that removes any possibility of 'double counting' or avoidance of trips caused by the DCO development.

7. Only if these three requirements are met should the SoS be capable of determining if the surface access approach to "monitor and manage" impacts is satisfactory or otherwise. The ExA rewrote the rDCO to accommodate greater control through the Requirement 20 for surface access management. The SoS in the MTGL confirms that she prefers the ExA's approach to that of the applicant. CAGNE is supportive of the principles that the rewrite of Requirement 20 has been based upon, but reiterates that the surface access management and mitigation package is inadequate given the conclusion of the ExA recorded in paragraph 5, above.

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8. In the light of the SoS's initial view on the control of surface access, CAGNE makes the following comments on the applicant's post examination position on Requirement 20 and surface access funding post examination. We believe that certain matters sought to be raised by the applicant are highly pertinent to the SoS's final determination of the DCO application.

9. CAGNE remains of the view that the applicant's proposed approach to the "monitor and manage" proposition for surface access is flawed. Their post examination submission explicitly rejects any concept of capping the starting point for mode share as a pre-requisite for the development coming into operation. In terms the applicant indicated *"….that the ExA's form of requirement was unjustified, unnecessary and unprecedented and proposed an alternative requirement that restricted passenger car parking as an alternative form of assurance that car travel to the airport would be constrained as necessary to ensure compliance with the Applicant's Surface Access Commitments".* The applicant appears from a straightforward reading of their submission to imply that the benchmark starting point for the environmental impacts as set out in their Environmental Statement is irrelevant. This is clearly not the case; it is difficult to reconcile the applicant's current stance with the detailed analysis conducted by their advisory team for the Environmental Statement which explicitly sets out a baseline position at opening, an unmitigated environmental impact analysis and an assessment of the "with mitigation" environmental impacts.

10. The applicant also seeks to make comparison to other airports' surface access performance *"...the applicant wishes to re-emphasise to the SoS that London Gatwick has consistently out-performed other major UK airports over the last 10-15 years"*. To CAGNE's view the determination of DCO approval for the proposed development is not a comparative, competitive, exercise based on the airport's surface access past performance against other aerodromes of a similar status to Gatwick. Rather the SoS is required to consider only if the applicant can demonstrate (or otherwise) the impacts and mitigation proposals advanced in the determination process. We have grave concerns that the applicant's attempt to engender such a flawed approach to the SoS is symptomatic of their view of surface access management as an afterthought or a "nice to have".

11. The applicant further seeks in its post examination submission to link the provision of surface access improvements and mitigation to funding issues and, again, to the wider context of UK aviation investment. Notwithstanding the comments below on surface access management and mitigation funding it is clear to our thinking that the applicant, as a private sector investor, would take a final view on any investment made post determination of the DCO. Simply trying to claim that the mitigation required is unaffordable should not sway the SoS's determination of the application.

Indeed, it demonstrates in our view the closed approach that the applicant has pursued in terms of surface access issues where cost limitation to satisfy investors is central to the approach to surface access management and mitigation as opposed to what is necessary on environmental and operational grounds.

12. CAGNE has previously commented in its examination submissions that the applicant's approach to surface access commitments, and the supporting mitigation should the proposed interventions fail to deliver the mode shares predicted, is flawed and insufficient.

13. This concern remains and becomes more pertinent to the SoS's determination of the application in light of the observations made in respect of the applicant's most recently stated position on surface access matters. A capped fund approach to mitigation appears to be solely related to investment issues as opposed to a genuine attempt to provide an additional layer of certainty to the mode share outcomes being secured.

14. Finally, we note that rail industry has signalled its agreement in the final days of the examination to work with the applicant to secure revisions to services and capacity of rail services and infrastructure to meet the additional demands placed upon it by the application's surface access impacts. This commitment to 'work together' offers no contractual mechanism that the SoS can rely on to determine that the applicant will have the rail capacity available it predicts would be required to mitigate its surface access impacts.

15. Given the current fluid status of rail industry structures a commitment to "work together" is meaningless and not binding on any new organisations that emerge post the government's restructuring programme. The SoS should therefore disregard the apparent agreement which has no substance. The potential way forward for the SoS is therefore to include a new requirement in any approved DCO requiring the applicant to secure, prior to the commencement of operation of the development, a meaningful, contracted and fully funded enhancement to rail services to the levels claimed in the application.

3 June 2025

Note: Gatwick Airport Northern Runway Project

Client[1]**:** CAGNE

Reference: APS_S1043B_1

Date: 16 May 2025

Rev.	Date	Description	Prepared	Reviewed	Authorised
01	16/05/2025	Issued	KL	CH	KL

1. Introduction

1.1. Kalaco (formerly Air Pollution Services) were commissioned by CAGNE to review the air quality assessment associated with the Gatwick Airport Northern Runway project (NRP).

1.2. Following the refusal, CAGNE has commissioned Kalaco to review the Examining Authority's (ExA) report.

2. Background

2.1. The Airports NPS is clear that airports should be assessed against the air quality objectives and limit values (as does the NPPF), ignoring the fact that these standards are widely accepted to be insufficiently protective of human health, and there are no standards covering ultra-fine particles (UFPs). One of the problems of having standards in legislation is that the planning system does not respond to new health evidence quickly when, as now, there is no political will to do so. Air quality has improved significantly since 2019 when the NPS was published, but air quality remains a significant health issue which is largely ignored in the planning system. In 2024 the EU adopted a new air quality directive containing substantial lower air quality limit value to those used in the UK to be achieved by 2030.

2.2. The NPPF also states that "*Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement*". The NPS is less convincing on the need to improve air quality, stating "*The Secretary of State will need to be*

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satisfied that the mitigation measures put forward by the applicant are acceptable, including at the construction stage".

3. Response to the ExA's report

3.1. It is extremely disappointing that the ExA's report did not address CAGNE's arguments on air quality, particularly the uncertainties associated with the air quality modelling.

3.2. The ExA raised concerns about the reliability of the Applicant's transport assessment, specifically the assumptions used in the future baseline. They acknowledged that a larger change in traffic would result in a larger change in air quality. However, they then concluded that the predicted total concentrations would remain unchanged from those reported in the Environmental Statement (ES). This conclusion appears illogical: if emissions (e.g. from traffic) change, then pollutant concentrations—and thus air quality—would also be expected to change.

3.3. Despite this inconsistency, the ExA ultimately agreed with the Applicant's conclusion that there would be no significant residual effects on air quality.

3.4. It is also notable that none of the ExA panel members appear to have expertise in air quality, with backgrounds primarily in noise and planning. Similarly, while local authorities (LAs) were advised by an established air quality consultancy, it is unclear whether the individual providing that advice had sufficient expertise in air quality modelling. Local authorities themselves are not typically specialists in this area and may not fully understand the uncertainties inherent in such assessments.

3.5. The modelling used—particularly in relation to road traffic emissions—was not fit for purpose in estimating pollutant concentrations. The assessment relied almost entirely on the assumption that future pollutant levels would fall well below current air quality objectives and limit values. While this may be a reasonable expectation, it does not reflect the latest medical evidence, which suggests health effects can occur even at lower concentrations. Furthermore, the assessment did not adequately quantify the effects on air quality, which is necessary to justify and implement appropriate mitigation measures. The absence of an appropriate assessment on the air quality health effects has lead to the absence of appropriate mitigation measures.

3.6. The uncertainty surrounding the future baseline must be considered alongside the modelling uncertainties highlighted in CAGNE's representations. Predicting future conditions inherently involves increasing uncertainty over time. This is especially relevant given that new measures—such as increased 'drop-off/pick-up' charges—could alter traffic patterns in ways that have not been assessed.

3.7. Given these uncertainties, which the ExA appears to have overlooked, we believe it is appropriate for a major development such as the NRP to adopt **health-based air quality targets** and implement an **Air Quality Action Plan**. This plan should include regular reviews and include a mechanism for enforcement to ensure it remains effective in light of evolving scientific understanding, particularly regarding health impacts at lower pollutant levels.

MRV non-CO_2 data collection Guidance for Aircraft Operators

This document provides an initial guidance to Aircraft Operators relating to the collection of data for the Monitoring, Reporting, and Verification (MRV) of Non-CO_2 aviation effects, before NEATS[1] is made available

February 2025

[1] Commission IT tool: Non-CO_2 Aviation Effects Tracking System (NEATS)

Contents

1 Introduction

This guidance document aims to support aircraft operators in aligning and complying with the non-CO_2 MRV requirements. It is part of a series of documents provided by the Commission services for supporting the implementation of the MRV. These are listed below.

In addition, in December 2024, number of events took place (workshop and trainings) related directly to how stakeholders can undertake the MRV (the presentations and recordings are available on the Commission's website[2]).

This guidance takes into account discussions within meetings with multiple stakeholders and experts, as well as comments received through the open public consultation on the amending act (Implementing Regulation (EU) 2024/2493) of the "Monitoring and Reporting Regulation" (Implementing Regulation (EU) 2018/2066). The amending act is referred hereinafter as **"the Regulation"**. It was published on 23 September 2024, and it contains the key elements and definitions for the operationalisation of the monitoring and reporting of non-CO_2**.**

	Document name	Date
1	Initial MRV explainer: A system for airlines to monitor, report and verify non-CO_2 effects of aviation A step-by-step guide for airlines	June 2024
2	Commission Implementing Regulation (EU) 2024/2493 of 23 September 2024 amending Implementing Regulation (EU) 2018/2066 (consolidated act here)	September 2024
3	Non-CO_2 monitoring plan template (as part of the overall monitoring plan covering both CO_2 and non-CO_2)[3]	February 2025
4	Responses to Frequently Asked Questions (FAQs)	February 2025
5	**MRV guidance document**	**February 2025**
6	Reference set of technical specifications (RSTS)	to come (February-March 2025)

[2] https://climate.ec.europa.eu/eu-action/transport/reducing-emissions-aviation_en#events

[3] under Documentation > Monitoring and Reporting Regulation (MRR): Guidance and templates.

1.1 Aim of the guidance document

The guidance provides information for aircraft operators on how to undertake the MRV. It describes what data aircraft operators can collect, how they can collect it and in what format it can be stored and uploaded to the Commission IT tool - **Non-CO_2 Aviation Effects Tracking System** (hereinafter, **"NEATS"**).

The guidance builds on the monitoring plan shared by the Commission, which aircraft operators fill in to inform Competent Authorities on how they plan to monitor the emissions.

1.2 Context

The MRV begins on 1st January 2025. It will make use of NEATS, to be provided by the Commission in due course of 2025 to aircraft operators, accredited verifiers and Competent Authorities for the purpose of facilitating the MRV. This IT tool connects all the data and models required to calculate the non-CO_2 impact. It also aims to facilitate the upload of *Primary data* (see definition here under), but it does not seek to be incorporated in flight management systems (FMS) or to create protocols, or equivalent, to allow for the collection of monitored in-flight data in the first place.

Once NEATS is made available by the Commission, the current guidance will be completed and refined to account for the specific functionalities in NEATS.

The current unavailability of NEATS does not prevent the MRV to start. In absence of NEATS, and in line with requirements in Article 56b(6) of the Regulation, the aircraft operators must monitor, at the minimum (*Primary data*), their flight information, as well as the aircraft properties on a per flight basis.

Once NEATS is available, the non-CO_2 impact can be fully computed retroactively by the tool without input from aircraft operators, using **"*Secondary data*"** sourced from external sources (e.g. EUROCONTROL) by NEATS. In this case, only the flight information (e.g. call sign) provided by NEATS should be checked by the aircraft operator to ensure consistency between actual flights that took place and sourced call signs by NEATS. The *Secondary data* in NEATS includes also 4D flight trajectory data, weather data from external sources, and conservative default values on specific data sets such as fuel, engine, and aircraft properties. An aircraft operator may want to provide own data and replace the default values with more precise values on fuel flow, aircraft properties, and engine identification derived from their own tracking systems monitored throughout the year, or from other sources. Hereafter, we call the aircraft operator provided data "***Primary data***".

There are two types of data of relevance for the MRV.

- ***Primary data*** is data that is measured and/or monitored and/or defined and recorded data directly by the aircraft operator (e.g. actual flight trajectory, engine identifiers, aircraft mass along the trajectory, fuel flow, fuel properties). *Primary data* is reputed more precise from what can be provided through NEATS (Secondary data),
- ***Secondary data*** is the data provided by NEATS, without input of the aircraft operator.

The MRV is developed to allow aircraft operators to fully monitor, through NEATS, their non-CO_2 impacts based on the *Secondary data* which reduces the burden to deliver *Primary data*. This means an operator can comply with the MRV without needing to provide any *Primary data* as such, once NEATS is made available.

The Regulation allows to make use of third-party IT tools in place of NEATS. Any such tool must first be approved by the Commission. In the course of 2025, the Commission will provide a description of the process through which such tools can be approved so that it can be used by aircraft operators to compute their non-CO_2 impact.

The legislation also refers to an update on the Accreditation and Verification Regulation (AVR) to ensure non-CO_2 emissions reporting can be verified. More information on the provisions of the AVR (update of the AVR is underway, to be finalised in Q2 2025, as planned) with details on verification will be provided in the updated MRV guidance document, once NEATS is made available, and where needed in specific guidance on the verification.

2 MRV guidance

2.1 Overview of MRV cycle

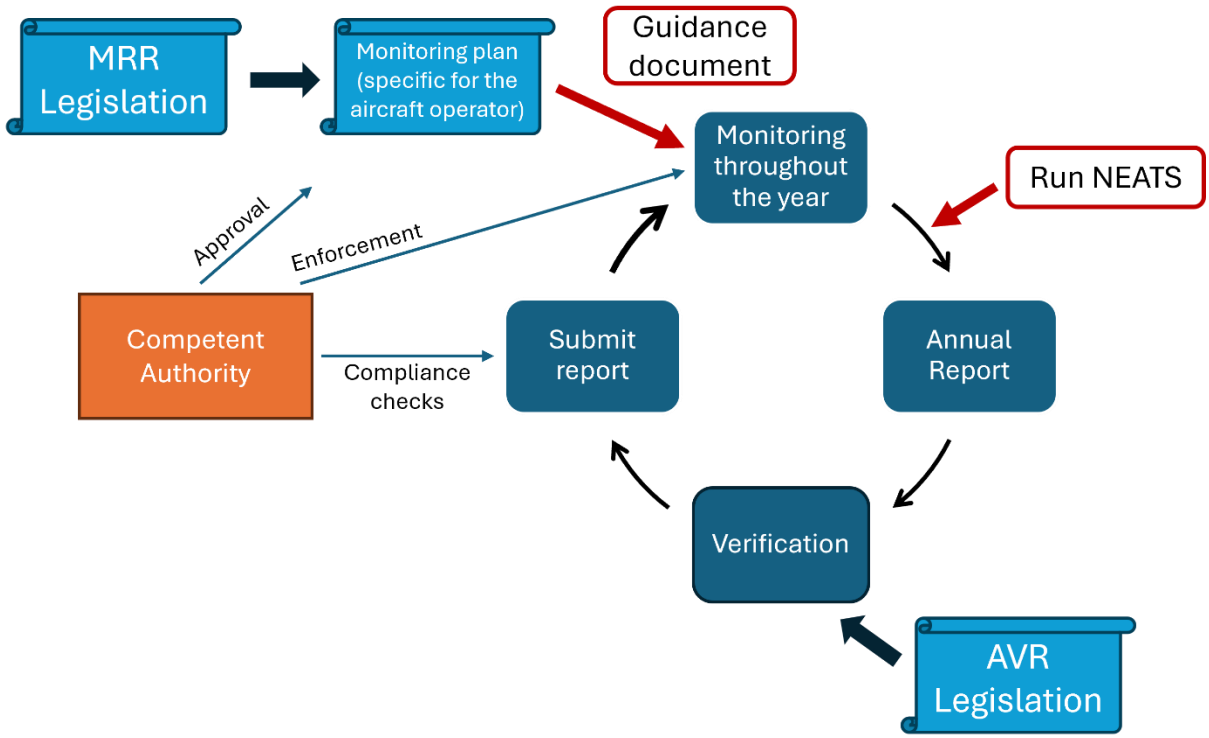

***Figure 1**:Principle of the MRV compliance cycle, adapted from the MRR Guidance document*

Starting January 1st, 2025, aircraft operators are obliged to monitor and report the non-CO_2 climate impacts of their flights, reporting them to the Competent Authority by March 31st of the following year. The procedural steps and deadlines of the non-CO_2 MRV align with the existing EU ETS obligations for CO_2. As part of the MRV, aircraft operators need to fill in a monitoring plan and to submit it for approval to the Competent Authority. Monitoring plans for non-CO_2 effects are integrated with the CO_2 into the same monitoring plan, where non-CO_2 is additional sheet, thus simplifying the administrative processes.

The monitoring plan serves as a support document for aircraft operators to plan the data they intend to monitor and how to monitor it throughout the year. Within the monitoring plan, aircraft operators have to decide whether they gather *Primary data* and if so, how they do so.

With the monitored data, NEATS streamlines the reporting exercise referred to in Article 68(5) of the Regulation. The tool automatically generates the XML table referred to in Annex X, Section 2a(9) of the Regulation at the end of each reporting year, minimising administrative burden associated with reporting. Once the report is complete, as for CO_2, verifiers will review and validate the annual CO_2(e) per aircraft operator. After submission of the verification report, the Competent Authority will conduct a compliance check.

2.2 Scope of the MRV

Aircraft operators must monitor the non-CO_2 aviation effects occurring from 1 January 2025, from the activities performed by aircrafts equipped with jet engines (e.g. turboprops are excluded from the MRV), enabling the calculation of a CO_2 equivalent (CO_2(e)) per flight. The aircraft operators should report those non-CO_2 aviation effects once a year. However, to facilitate the start of the MRV for non-CO_2 effects, in 2025 and 2026, while the reporting may cover all routes, such reporting shall only be required in respect of routes involving two aerodromes located in the European Economic Area (EEA) (this covers also flights to and from outermost regions), and routes from an aerodrome located in the EEA departing to Switzerland or to the United Kingdom. In respect of 2025 and 2026, the reporting of non-CO_2 aviation effects taking place from other flights is possible.

Firstly, the monitoring plan requires a decision on the geographic scope of the operations conducted by the aircraft operator.:

- Reduced scope: limited to intra-EEA flights and to Switzerland and United Kingdom.
- In-between geographical scope: includes the reduced scope and a selection of extra-EEA flights. The aircraft operators should select the routes they wish to monitor on top of the intra-EEA scope and describe this in the monitoring plan.
- Full geographical scope: covers the reduced scope as well as flights outbound from and inbound to the EEA.

Secondly, the monitoring plan requires aircraft operators to specify the IT tool they wish to use to determine the non-CO_2 effects. For the emissions of the year 2025, only NEATS will be made available. For reporting emissions of subsequent years, the aircraft operators will have the choice between:

- NEATS,
- Commission-approved other IT tools, if such are available,
- combination of NEATS and a Commission-approved other IT tools, if such are available.

As subsequent step in the monitoring plan, the aircraft operator must select the method they will use to calculate their non-CO_2 emissions. Only aircraft operators classified as small emitters as defined in Article 55(1) of the Regulation may choose Method D.

Aircraft operators must then decide whether they would like to provide any *Primary data* within the tool.

NEATS can provide all required data for the MRV automatically, using *Secondary data* sources, including default values, though this may lead to an overestimation of overall non-CO_2 impacts of the monitored flights. Aircraft operators are therefore encouraged to actively monitor and make use of as much relevant *Primary data* as possible.

2.3 NEATS *Primary data* requirement

This section provides instructions for operators on the *Primary data* required for Methods C and D of the NEATS tool. The process flowcharts and explanations below outline the *Primary data* that aircraft operators can collect throughout the year and provide to NEATS. Once NEATS is in place, an updated guidance document will be provided.

Calculation methods

Depending on whether the aircraft operator is a small emitter or not, Methods C and D are used to determine the non-CO_2 emissions. Methods A and B, which are not described here, apply to the monitoring of CO_2 emissions.

- **Method C: Weather-based approach** (MRV Default)
  Mandatory for non-small emitters, as defined in Article 55(1) of the Regulation, this method utilizes flight information, trajectory data, aircraft properties, fuel properties and enhanced weather data. The key feature of Method C is that the climate impact at a specific time and location is calculated based on the actual weather information for that time and location.
- **Method D: Simplified climatological location-based approach**
  Developed for small emitters, as defined in Article 55(1) of the Regulation, this method relies primarily on in-flight location-related data such as flight information and trajectory data. It also incorporates basic weather data and aircraft properties. Small emitters may opt to use Method D, or alternatively, apply different methods for different aircraft types.

These methods require different datasets and engage distinct climate modules within the NEATS tool. More information on the models applied within each method will be provided within the *Reference set of technical specifications* (RSTS) document.

Flight information, flight trajectories, aircraft properties and weather data are always needed (*Secondary* or *Primary data*) in Method C and Method D (in Method D, weather data is not explicitly included for climate effect calculation). For Method D, data on fuel properties is optional, while aircraft performance (monitored fuel flow, etc.) is optional for both methods. While some data items are easier to gather, others require more elaborated approach, and this guidance aims to support this process.

2.4 Method C

Flowchart

Figure 2. illustrates the flowchart showing Method C of the NEATS modelling process for aircraft operators. The options for providing fuel flow are described in more detail in Figure 3. The flowchart structure is divided per type of data.

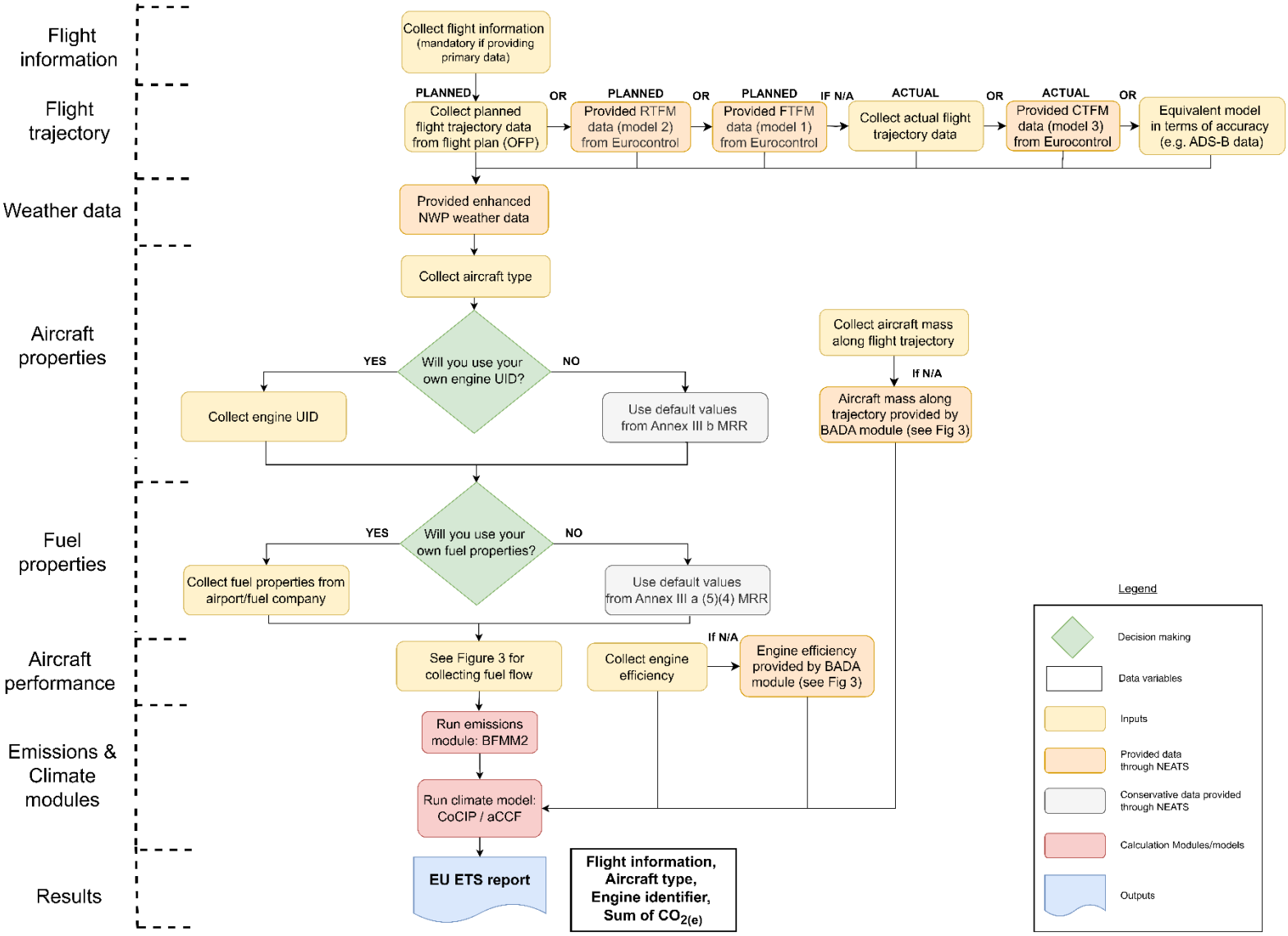

***Figure 2**: Flowchart for Method C*

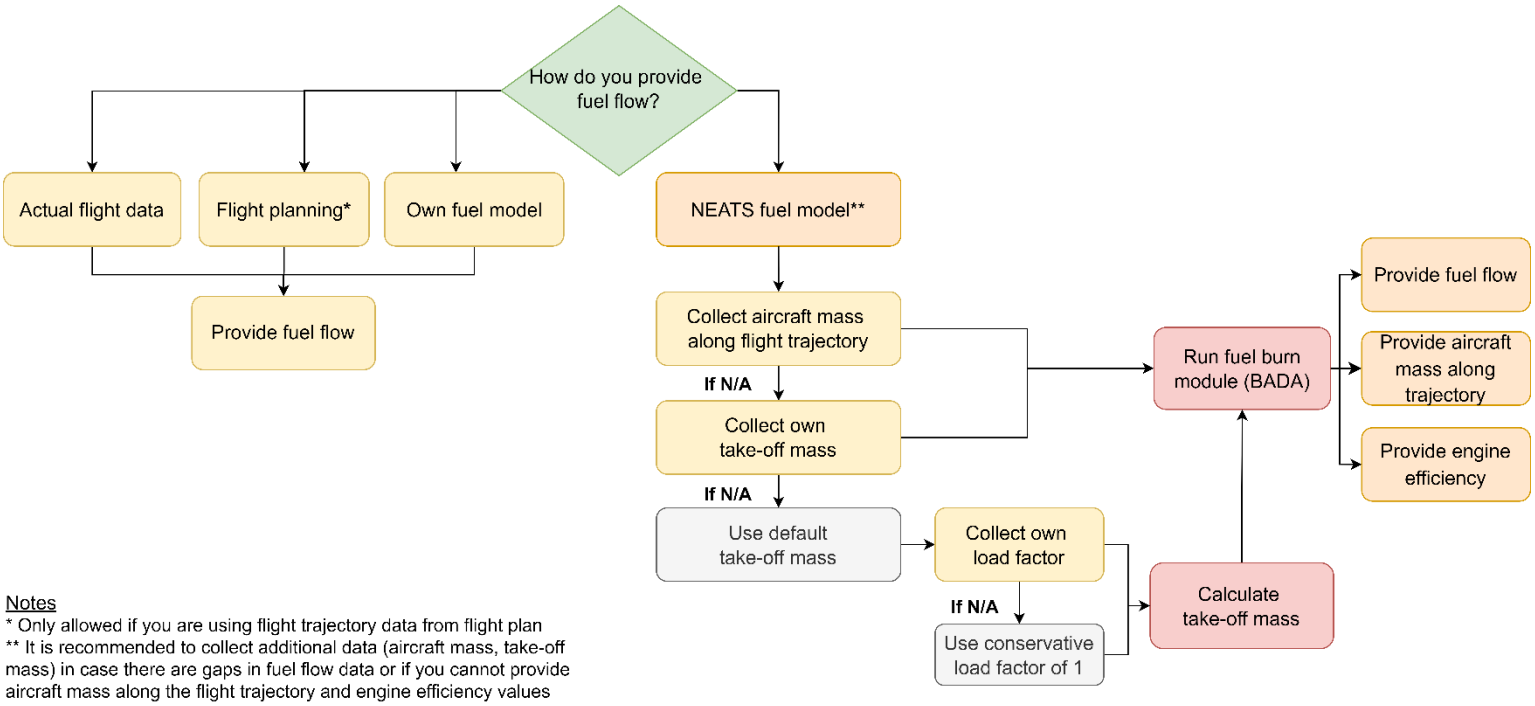

***Figure 3**: Fuel flow options*

Explanation on inputs

For Method C, aircraft operators are recommended to record and monitor the following sets of *Primary data* (if they don't monitor *Primary data*, *Secondary data* is provided by NEATS, once the tool is made available):

Data sets	Data variables	Primary data possible source	*Secondary data*, including default values
Flight information (Mandatory if providing *Primary data*)	Flight number	Flight plan (OFP)	N/A
	Day and time (Departure and Arrival)		N/A
	Departure airport		N/A
	Arrival airport		N/A
Flight Trajectory	4D flight trajectories	Flight plan (OFP)	From EUROCONTROL: RTFM[4], or equivalent. If not available the FTFM[5], or model of equivalent accuracy (e.g. ADSB), shall be used as default.

[4] Regulated Tactical Flight Model
[5] Filed Tactical Flight Model

Weather data	Numerical Weather Prediction (NWP) model weather data	NEATS only	N/A
Aircraft properties	Aircraft type	Flight plan (OFP)	N/A
	Engine UID	Aircraft registration	See Annex IIIb of the Regulation
	Aircraft mass (along the trajectory)	Performance	Base for Aircraft Data (BADA) model output
	Aircraft take-off mass (as alternative to aircraft mass along the trajectory)	Flight plan (OFP)	BADA Maximum take-off mass
	Load factor (as alternative to take-off mass)	Flight plan (OFP)	1
Fuel properties	Hydrogen per carbon ratio	Airport services/fuel provider	See Annex III a (5)(4)
	Aromatic content		
	Net calorific value		
	Sulphur and Naphthalenes		
Aircraft performance	Fuel Flow	Actual fuel flow, Flight plan or own fuel burn model	BADA model output

Flight information data

To avoid discrepancies in the completeness of flights as provided by NEATS, all aircraft operators applying the MRV need to always check the correctness of the flight information provided in NEATS, once it is made available and once, they have access to it and to the flight information in NEATS. *Primary data* provided by aircraft operators must be correlated to the correct flights. **Therefore, it is required to provide flight information, as *Primary data* when providing other *Primary data*.** The flight information to monitor includes the ICAO call sign, date and time of departure and arrival, as well as the ICAO/IATA codes of the departure and arrival airports (see definition in Annex IIIa, section 1 of the Regulation).

Flight trajectory data

Operators can provide 4D flight trajectory data, defined by the aircraft latitude, longitude, and pressure altitude (flight level) at time stamps between the start and end of the flight. The interval between two-time stamps must not exceed 60 seconds. If this is not possible, linear interpolation can be used in homogenous flight phases, typically for the cruise phase.

The aircraft operators must always start considering if they can use *Primary data* (e.g. collected planned flight trajectory data from the flight plan (OFP)) and if not, make use of the *Secondary data* provided in NEATS: the EUROCONTROL planned flight trajectory data (Regulated Tactical Flight Model (RTFM), or alternatively, if RTFM is not available, the Filed Tactical Flight Model (FTFM) from EUROCONTROL, or an equivalent model with comparable data accuracy). The ex-ante (to the flight)

calculation allows to avoid regulatory route adjustments during flight as well as inaccuracies in the weather forecast have no consequences on calculated CO_2e values.

While in Method C, the flight trajectory is defined at the minimum by the latest flight plan (at the minimum, RTFM or FTFM), in theory the aircraft operator can decide to complement the latest flight plan by collected actual flight trajectory data (*Primary data*) or by flight flown data as *Secondary data* (represented by the EUROCONTROL Current Tactical Flight Model (CTFM), more generally referred to as model 3 document). In such case, it is assumed that the most up-to-date data (the post-operational one) is the one to be used for the $CO_2(e)$ calculation, where this is possible (as this would also entail use of weather reanalysis data). The aircraft operator should expressly justify the choice of different set of flight trajectory data (including in relation to *Secondary data*) in the monitoring plan, under section 21(a).

In all cases, when providing *Primary data* or deviating from the RTFM or FTFM, the aircraft operator needs to be vigilant about maintaining the consistency between the 4D trajectory data and the aircraft performance data (e.g. planned fuel flow should be used when planned flight trajectory is being used, while in principle, monitored in-flight fuel flow should be used when CTFM or collected actual flight trajectory data is being used). This ensures consistency between the flight trajectory and fuel flow data points. Accordingly, section 23 of the monitoring plan is always to be filled in.

Weather data

For Method C, NEATS provides the necessary Numerical Weather Prediction (NWP) model forecast data. In order to run the climate response models (e.g. CoCiP and aCCF), enhanced weather input data is necessary (15 weather parameters, see Appendix 3 of this guidance). While under NEATS only the NWP-provided weather data is accepted, with other IT tools approved this data can be further improved upon, meaning additional weather data to the one provided through the NWP can be accepted, as long the NWP is the same as the one used in NEATS. For Method D, the simplified weather data used includes air temperature, specific humidity, and pressure altitude along the flight trajectory.

Aircraft properties

The aircraft operator can provide aircraft properties – aircraft type, engine UID, and aircraft mass along the trajectory. The aircraft type can be collected from the flight plan, while the engine UID can be provided based on the aircraft's registration (flowchart option: YES). Alternatively, if this information is not available, a default engine for the aircraft type is used (see Annex IIIb of the Regulation) (flowchart option: NO).

For missing engines (not listed in the ICAO EDB), a suitable proxy (precursor/successor) could be selected from the ICAO EDB, e.g., based on similarities in engine design. Moreover, in case of aircraft equipped with different engines, NEATS calculates emissions per aircraft rather than per engine, making it currently impossible to set engine specific UIDs. If engine performance and emissions are similar, differences may be negligible. Alternatively, NEATS can be run separately for each engine type, and the average output from the calculations used.

Aircraft mass along trajectory is required for the calculation of the fuel flow as described in Figure 3. See further details in the section on aircraft performance.

Fuel properties

In NEATS, aircraft operators can input fuel properties on a per flight basis (aromatics content, sulphur, naphthalene content, hydrogen-to-carbon ratio, and the net calorific value). Since aircraft operators

typically do not monitor this information, it could be provided by fuel companies to aircraft operators, provided such arrangements exist between aircraft operators and fuel companies. Fuel companies routinely monitor fuel content and may be able to transmit fuel information to aircraft operators. Even then, monitoring specific fuel properties for individual flights is challenging, at the current time. The legal reference in the Regulation is the actual value or the use of ASTM maximum values as a default.

Provided the current challenge to measure the actual fuel properties value per flight and in order to reduce the administrative burden for the initial period of the MRV, it is recommended to temporarily accept for the years 2025 and 2026, as actual values (*Primary data*), the maximum values for each of the above mentioned (aromatics content, sulphur, naphthalene content, hydrogen-to-carbon ratio, and the net calorific value), as observed on a yearly basis in all the batches provided to a given EEA airport, as obtained by the aircraft operators from fuel suppliers, and assume these are the values for the flights taking off from the given airport for the given year. Average/mean values cannot be accepted as they may lead to underestimation of actual values.

Example for aromatics: In the year 2025, airport X received number of batches where the highest observed aromatics level is 20%, all flights taking off from airport X in 2025 are considered to contain 20% of aromatics. The same approach is applied for the other parameters.

If no fuel property data is available, NEATS will use the upper limits of Jet-A1 fuel for estimations (flowchart option: NO)

Aircraft performance

Operators can input aircraft performance data along the trajectory as *Primary data* (monitored values). This is optional for both Method C and Method D. This information is also available through the NEATS model as *Secondary data* (default values). Aircraft performance includes fuel flow and aircraft engine efficiency (known as aircraft overall propulsion efficiency).

These can be supplied by the aircraft operator or be provided through the EUROCONTROL's Base for Aircraft Data (BADA) model for fuel flow calculation that is part of NEATS. If the aircraft operator chooses not to provide monitored data, NEATS uses the aircraft properties information to derive fuel flow, overall propulsion, and aircraft mass along the trajectory. In all cases the provided values have to align with the type of trajectory (see section on flight trajectory data). This implies that when actual flight data is used the values are monitored from the actual flight or calculated using a fuel flow model based on the actual flight's trajectory. When planned flight data is used, the data should similarly be sourced from the flight planning process or calculated based on the planned trajectory. With regards to the discrepancies between the calculated and actual fuel used, the aircraft operators are encouraged to monitor the differences in fuel calculations. If NEATS provides higher fuel estimates, than actual usage, operators may want to submit their own verified fuel flow data (*Primary data*).

When considering the possibility of interpolating 4D-trajectory data in cases where on-board fuel data is recorded at intervals exceeding 60 seconds, it is important to remind that based on the assumptions for typical aircraft speeds and the extent of areas of ice supersaturation, a recommended effective time resolution is at least 60s. However, flight trajectories can be reported at a lower frequency (e.g. for straight cruise flight on same flight level) and subsequently be interpolated if the flight trajectory and aircraft performance are sufficiently homogeneous. Thus, an

up-sampling to 60s resolution is only critical if flight level changes are not resolved by the original trajectory data.

The aircraft overall propulsion efficiency means the percentage of useful thrust generated by an aircraft engine relative to the energy input from fuel. Aircraft operators should calculate the aircraft engine efficiency based on the thrust over the duration of the flight and the energy input from the fuel. These data inputs are calculated along the flight trajectory based on weather data input fields and aircraft performance data. In NEATS, BADA is used for these calculations, or aircraft operators can use own calculations based on an own performance model. More details and references to the equations are provided in the FAQs and/or in the *Reference set of technical specifications* document to come. The ways in which fuel flow and aircraft mass can be collected is described in Figure 3. If the aircraft operator opted for using the flown flight trajectory (CTFM) for flight trajectory data in the monitoring plan (see flight trajectory data section), then also monitored in-flight fuel flow must be used.

Aircraft operators have the option to obtain fuel flow, mass, and aircraft engine efficiency through BADA from NEATS as Secondary data. The BADA fuel model can be run with Primary data inputs, selected, and monitored by the aircraft operators, increasing the accuracy of the resulting fuel flow output, as opposed to the result from default values provided by NEATS. For more accurate results, the BADA model can be executed with aircraft mass along the trajectory. If this data is not available, alternatively monitored take-off mass can be used. In cases where take-off mass is not recorded, an approximate value can be calculated by applying a load factor to the default maximum mass of the aircraft type. The load factor is either collected by aircraft operators or set to 1 as a default value.

Explanation on emission & climate models

Method C uses the following emission & climate models:

- Boeing Fuel Flow Method 2 (BFFM2): calculates engine emissions (NO_x, HC, CO),
- Contrail Cirrus Prediction Model (CoCiP): models contrail formation,
- algorithmic Climate Change Functions (aCCF): quantifies climate impacts of emissions.

Within NEATS, The BFFM2 emissions module uses the collected and/or provided data to calculate engine emissions during different flight phases. The outputs, along with other collected and/or provided data, are fed into the CoCiP and aCCF open-source models. The models are further explained in the *Reference set of technical specification document* and the FAQ.

Outputs from NEATS

Once CoCiP and aCCF models are run, NEATS generates the results in CO_2(e). At the end of each reporting year, NEATS produces an XML table for each flight of each aircraft operator applying the MRV. This table includes details such as flight information, aircraft type, engine identifier, and CO_2(e) values for all three efficacy-weighted global warming potential (EGWP) time horizons (20, 50, and 100 years). This streamlined process reduces the administrative burden on operators while ensuring accurate and consistent reporting of emissions data.

2.5 Method D

The following section presents the guidance document for small emitters following Method D. Since Method D is a simplified version of Method C, this section highlights the key differences between the two methods to help aircraft operators in implementing NEATS. A flowchart illustrating the NEATS modelling process for Method D is provided in Figure 4.

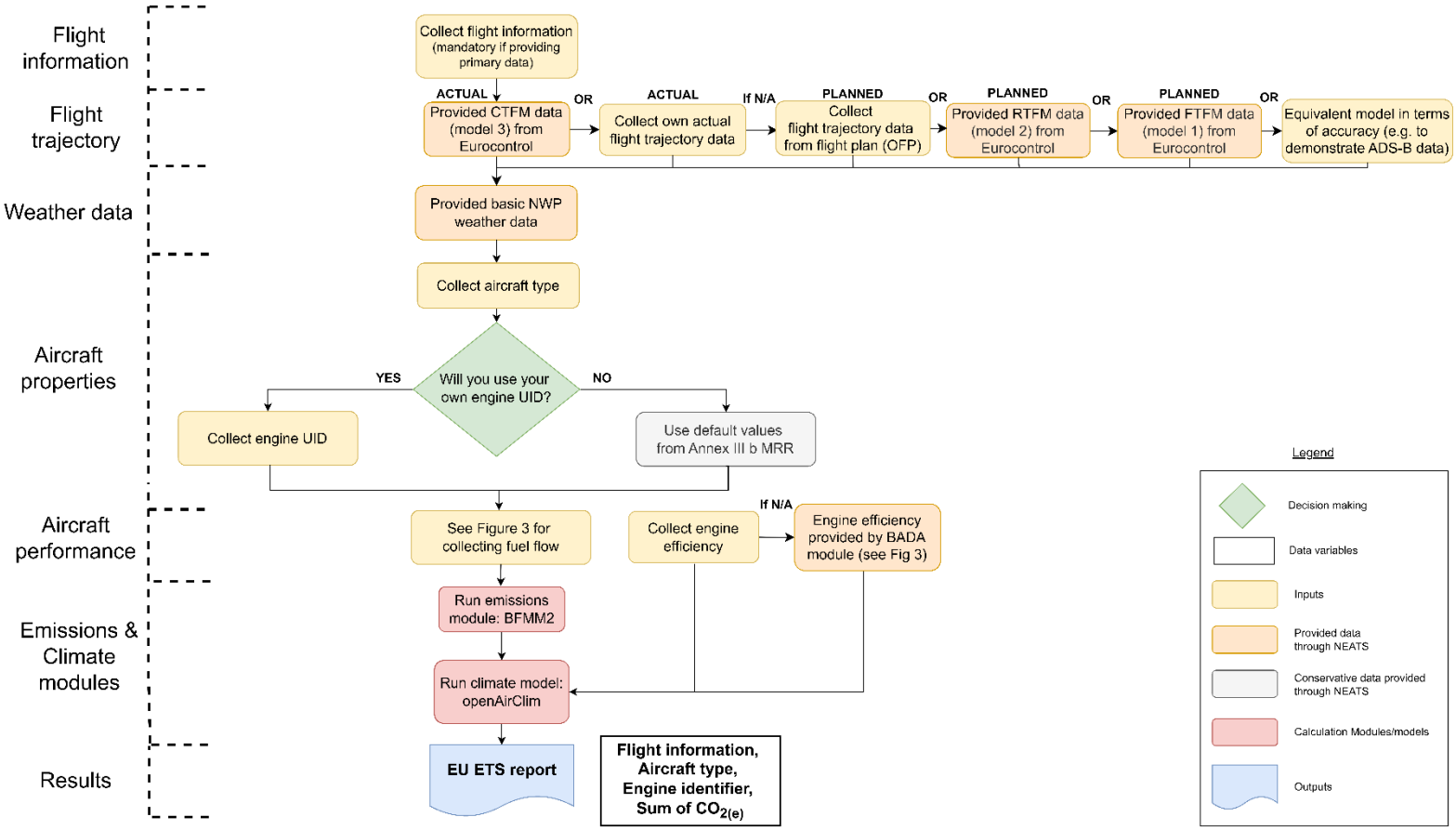

***Figure 4**: Flowchart for Method D*

Explanation on inputs

Small emitters using Method D are required to monitor similar sets of data to those using Method C. The inputs provided in the flowchart in Figure 4 are described, with a reference to the explanations provided for Method C where there is overlap.

Flight information & Flight trajectory data

For Method D it is recommended to collect the actual flown flight trajectory data (*Primary data*). If this cannot be provided the Current Tactical Flight Model (CTFM or model 3) from EUROCONTROL should be used or a model of equivalent accuracy, or finally the previously mentioned RTFM (model 2) or FTFM (model 1) can be used in the form of *Secondary data* (if no CTFM available). The flight information and flight trajectory data are monitored and collected under the same format and requirements as for Method C.

Weather data

Method D only requires basic weather data provided by weather sources through NEATS. This data includes air temperature, specific humidity, and pressure altitude along the flight trajectory.

Aircraft properties

See Method C.

Fuel properties

Fuel properties do not need to be specified in Method D as they are not used in the calculation.

Aircraft performance

Aircraft performance data is optional within Method D. See Method C.

Explanation of emissions & climate models

Method D uses the following emission & climate models:

- Boeing Fuel Flow Method 2 (BFFM2),
- openAirClim model.

Similarly to Method C, the Boeing Fuel Flow Method 2 (BFFM2) emissions module is executed. The module calculates aircraft engine emissions of NO_x, HC, and CO by correlating fuel flow rates with emissions generated during various flight phases.

The collected monitored data within NEATS is subsequently fed into the open-source climate model of AirClim (openAirClim). This model also requires the final input of engine efficiency from aircraft operators (if available and desired to improve accuracy of results). The models and their chosen parameters are further described in the *Reference set of technical specification* document.

Method D requires less data (in comparison with Method C), and it is better plannable (use of post-operational flight data), which can be helpful particularly for small emitters. As weather data is not explicitly included for the climate effect calculations, the calculated CO_2(e) will be similar for each flight on the same route. If only few flights are flown on a particular route, Method D could, in contrast to Method C, lead to large year-to-year variability in CO_2(e).

NEATS Outputs

When openAirClim is executed, it provides $CO_{2(}$e) values for three EGWP time horizons (20, 50, and 100 years). To facilitate the reporting exercise, once per year NEATS does an extract as XML table for each flight, including details such as flight information, aircraft type, engine identifier, and CO_2(e) values for the given aircraft operator and year. The EGWP results takes into account efficacy which is mandatory for the CO_2(e) calculation in the MRV. More detail will be provided in the reference set of technical specification document, expected in Q1 2025.

Appendix 1 NEATS input descriptions

The additional formatting and technical specifications of the data variables required by NEATS are described based on the system architecture specification that NEATS will be developed on. The

precision of the data variables is included and should be treated as approximate. Further operational validation is necessary to confirm their suitability.

Flight information, Aircraft properties and fuel properties data

Data type	Type	Format / Unit	Desired precision
flight_identification	String	ICAO Callsign	N/A
departure_date_time	String	ISO 8601	N/A
arrival_date_time	String	ISO 8601	N/A
departure_airport	String	ICAO location indicator/aerodrome name/IATA indicator	N/A
arrival_airport	String	ICAO location indicator/aerodrome name/IATA indicator	N/A
aircraft_type	String	[A-Z0-9]{2,4} for ICAO aircraft type designator, no pattern for other aircraft type	N/A
engine_uid	String	See ICAO Engine Emissions Database, **example below**	N/A
takeoff_mass	Decimal	Kg, **example below**	One decimal place
load_factor	Decimal	unitless	Three decimal places
hydrogen_content	Decimal	unitless	Two decimal places
hydrogen_per_carbon_ratio	Decimal	unitless	N/A
aromatic_content	Decimal	unitless	Three decimal places
calorific_value	Decimal	MJ kg_{fuel}^{-1}	Two decimal places

Flight trajectory and aircraft performance data

Data type	Type	Format / Unit	Requirements
flight_identification	String	ICAO Callsign	N/A
departure_date_time	String	ISO 8601	N/A
timestamp	String	See ISO 8601	Interval < 60s
latitude	Decimal	See WGS 84 / EPSG:4326	For each timestamp, 2 decimal places
longitude	Decimal	See WGS84 / EPSG:4326	For each timestamp, 2 decimal places
flight_level	Integer	flight level number	For each timestamp
fuel_flow	Decimal	kg s^{-1}	For each timestamp
engine_efficiency	Decimal	unitless	For each timestamp
aircraft_mass	Decimal	kg	For each timestamp

Appendix 2 Examples of *Primary data* files collected

This section provides a description and corresponding examples of the data file for a number of use cases in which aircraft operators provide *Primary data* in line with the above guidance. These examples only apply when an aircraft operator decides to provide *Primary data*, or are required to do so. All values in the data are fictional and only meant to indicate formatting.

Engine UID and basic trajectory

In this case the operator provides the engine UID and own basic trajectory data as *Primary data*.

Flights file:

```
flight_identification,departure_date_time,arrival_date_time,departure_airport,arrival_airport,aircraft_type,engine_uid
ABC123A,2024-12-23T13:06:23,2024-12-23T12:46:23,EHAM,LPPT,A320,1IA001
ABC123B,2024-08-26T16:37:30,2024-08-26T14:51:30,Amsterdam Airport Schiphol,LPPT,A320,1IA001
ABC123C,2024-09-11T03:31:08,2024-09-11T04:50:08,AMS,LPPT,A320,1IA001
```

Trajectory file:

```
flight_identification,departure_date_time,timestamp,latitude,longitude,flight_level
ABC123A,2024-12-23T13:06:23,2024-09-11T03:31:08,50.84,4.38,370
ABC123B,2024-08-26T16:37:30,2024-09-11T03:31:38,-50.91,4.45,370
ABC123C,2024-09-11T03:31:08,2024-09-11T03:32:08,-50.98,-4.52,245
```

Basic flight data with take-off mass

In this case the operator provides the aircraft take-off mass.

Flights file:

```
flight_identification,departure_date_time,arrival_date_time,departure_airport,arrival_airport,aircraft_type,takeoff_mass
ABC123A,2024-12-23T13:06:23,2024-12-23T12:46:23,EHAM,LPPT,A320,57462.7
ABC123B,2024-08-26T16:37:30,2024-08-26T14:51:30,EHAM,LPPT,A320,58850.1
ABC123C,2024-09-11T03:31:08,2024-09-11T04:50:08,EHAM,LPPT,A320,59066.4
```

Providing all *Primary data* parameters

The below examples provide the columns of all optional parameters. For clarity, the basic parameters are excluded in the flights file.

Flights file:

```
…,engine_uid,takeoff_mass,load_factor,hydrogen_content,hydrogen_per_carbon_ratio,aromatic_content,calorific_value
…,1IA001,57462.7,0.832,0.12,1,0.152,41.15
…,1IA001,58850.1,0.782,0.42,1,0.174,41.15
…,1IA001,59066.4,0.912,0.71,1,0.265,41.15
```

Trajectory file:

```
flight_identification,departure_date_time,timestamp,latitude,longitude,flight_level,fuel_flow,engine_efficiency,aircraft_mass
ABC123A,2024-12-23T13:06:23,2024-09-11T03:31:08,50.84,4.38,370,0.45,0.91,64015.1
ABC123B,2024-08-26T16:37:30,2024-09-11T03:31:38,-50.91,4.45,370,0.48,0.81,63998.6
ABC123C,2024-09-11T03:31:08,2024-09-11T03:32:08,-50.98,-4.52,245,0.47,0.71,63983.2
```

Appendix 3 Weather data

Weather data

Though currently not possible to input as *Primary data*, weather data detail is provided below. En-route weather is required for MRV in the format of a gridded weather standard (NetCDF4) and is provided in an automatic way. Based on sample data provided by the data stakeholder group, it is expected that NEATS will receive 4 predictions per day with a size of around 100GB (uncompressed) respectively about 60 GB (compressed) per prediction. Each one of these prediction files has an hourly forecast for relevant meteorological conditions for the whole world up to 60 hours ahead. The weather data parameters for the enhanced NWP model (Method C) are listed below. The first three parameters are required by the basic NWP model (Method D).

1. Air pressure
2. Air temperature
3. Specific humidity
4. Relative humidity over ice
5. Eastward wind
6. Northward wind
7. Vertical velocity (Omega)
8. Specific ice content
9. Geopotential
10. Outgoing longwave radiation
11. Total net solar radiation
12. Solar direct radiation
13. Air density
14. Potential Vorticity
15. Cloud cover