REQUEST FOR INTERNAL REVIEW[1]

UNDER TITLE IV OF THE AARHUS REGULATION

Of Commission Delegated Regulation (EU) 2023/2485 of 27 June 2023 amending Delegated Regulation (EU) 2021/2139 establishing additional technical screening criteria for determining the conditions under which certain economic activities qualify as contributing substantially to climate change mitigation or climate change adaptation and for determining whether those activities cause no significant harm to any of the other environmental objectives

Submitted by

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(2) Stichting ter bevordering vand de Fossielvrij-beweging

(3) Protect our Winters Austria – Verein für Kilmabildung und nachhaltigen Wintertourismus

To

European Commission, Directorate General for Financial Stability, Financial Services and Capital Markets Union.

According to Article 10 of Regulation 1367/2006[2] and Commission Decision 2023/748 of 11 April 2023.[3]

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[1] This Request for Internal Review exceeds 50 pages because of the complexity of the underlying fact pattern and issues raised. It also combines two separate possible RIRs, in relation to shipping and aviation into one document.

[2] Regulation (EC) No 1367/2006 of the European Parliament and of the Council of 6 September 2006 on the application of the provisions of the Aarhus Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters to Community institutions and bodies (OJ L 264, 25.9.2006, p. 13–19) as amended by Regulation (EU) 2021/1767 (OJ L 356, 8.10.2021, p. 1-7) (the "**Aarhus Regulation**").

[3] Commission Decision (EU) 2023/748 of 11 April 2023 laying down detailed rules for the application of Regulation (EC) No 1367/2006 of the European Parliament and of the Council as regards requests for the internal review of administrative acts or omissions (OJ L 99, 12.4.2023).

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INTRODUCTION AND SUMMARY OF REQUEST FOR INTERNAL REVIEW

1. This is a request for internal review ("**RIR**") of Commission Delegated Regulation (EU) 2023/2485 of 27 June 2023 ("**the Delegated Act**")[4] amending Delegated Regulation (EU) 2021/2139[5] ("**the 2021 Delegated Act**"), made pursuant to Regulation (EU) 2020/852[6] ("**the Taxonomy Regulation**").

2. The RIR is brought by three Non-Governmental Organisations: Dryade, Fossielvrij and Protect our Winters Austria ("**the Applicants**").

3. In a time of urgent climate and ecological crises, the Taxonomy Regulation is of critical importance in directing private investment to activities that benefit, rather than harm, the environment. Under the Taxonomy Regulation, a sustainable activity is one that (amongst other things): contributes substantially to one of the environmental objectives set out in Article 9 ("**the Environmental Objectives**"); and that meets the test of "do no significant harm" ("**DNSH**") to any of the Environmental Objectives. An economic activity should not qualify as environmentally sustainable "if it causes more harm to the environment than the benefits it brings" (Recital 40).

4. The Commission is tasked with setting technical screening criteria ("**TSC**"), which establish that certain economic activities meet these requirements. It goes without saying that the Commission should not and cannot include activities that do not meet those requirements. The Commission established TSC for a number of economic activities by way of the 2021 Delegated Act.

5. The TSC that form the subject of this RIR are certain of the new TSC applicable to the aircraft and shipping sectors ("**the Aircraft TSCs**" and "**the Shipping TSCs**" respectively). They concern:

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4 Delegated Regulation (EU) 2023/2485 (OJ L, 21.11.2023).

5 Delegated Regulation (EU) 2021/2139 (OJ L 198, 22.6.2020, p. 13–43).

6 Regulation (EU) 2020/852 of the European Parliament and of the Council on the establishment of a framework to facilitate sustainable investment, and amending Regulation (EU) 2019/2088 (OJ L 198, 22.6.2020, p. 13).

5.1. Section 3.21: Manufacturing of aircraft;

5.2. Section 6.18: Leasing of aircraft;

5.3. Section 6.19: Purchasing, financing and operating passenger and freight air transport;

5.4. Section 6.10 (amendments): Purchasing, financing, chartering and operating vessels designed and equipped for sea and coastal freight water transport, vessels for port operations and auxiliary activities; and

5.5. Section 6.11 (amendments): Purchasing, financing, chartering and operating vessels designed and equipped for sea and coastal passenger water transport.

6. As set out further below, the Applicants seek this review because the Commission either lacked competence to make those TSCs (because the statutory conditions precedent were not met) or fell into manifest error when it did so. If the Aircraft TSCs and the Shipping TSCs are not amended, investments will be directed to economic activities in a manner that is contrary to the requirements and the underlying intentions of the Taxonomy Regulation.

LEGAL FRAMEWORK

The Environmental law and policy of the EU

7. The EU is obliged pursuant to Regulation (EU) 2021/1119 of the European Parliament and of the Council[7] ("**European Climate Law**") to achieve climate neutrality by 2050 at the latest and to achieve a reduction of net greenhouse gas ("**GHG**") emissions by at least 55 % compared to 1990 by 2030.

8. The European Commission has described the challenge of tackling the urgent climate and ecological crises as "this generation's defining task."[8] The European Green Deal ("**EGD**"),

[7] Regulation (EU) 2021/1119 of the European Parliament and of the Council of 30 June 2021 establishing the framework for achieving climate neutrality and amending Regulations (EC) No 401/2009 and (EU) No 2018/1999 ("**European Climate Law**") (OJ L 243, 9.7.2021, p. 1).

[8] Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions: The European Green Deal, COM/2019/640 final, p. 1, accessed on 14 September 2022 at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2019%3A640%3AFIN .

published by the Commission, notes that "the private sector will be key to financing the green transition."[9]

9. The EU is a party to the Paris Agreement, adopted in 2015 by the 196 Parties to the United Nations Framework Convention on Climate Change ("**UNFCCC**"). Under the Paris Agreement, Parties have agreed to:

    9.1. Aim to strengthen the global response to climate change, by, amongst other things, holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C, recognising this would significantly reduce the risks and impacts of climate change (Article 2); and

    9.2. Make efforts of the highest possible ambition to reduce GHG emissions, in the form of increasingly progressive nationally determined contributions (Articles 3 and 4(3)).

10. Article 2(1)(c) of the Paris Agreement aims to strengthen the response to climate change by making finance flows consistent with a pathway towards low greenhouse gas emissions, among other means.

The Taxonomy

11. Article 23 of the Taxonomy Regulation grants the Commission the power to set TSC. That delegated power must be deployed in accordance with the requirements of the parent legislation (the Taxonomy Regulation).

12. The legislature has set a series of exacting objectives, standards and tests, which the Commission must meet when exercising this delegated function. In particular, the Commission's power to make delegated legislation under Article 23 of the Taxonomy Regulation is subject to three strict cumulative safeguards.

[9] Ibid. p. 1.

13. First, pursuant to Article 3 of the Taxonomy Regulation, the Commission can only establish TSC that, amongst other things "contribute substantially" to one or more of the Environmental Objectives set out in Article 9 and elaborated on in Articles 10-16.

14. Article 10 sets out the requirements for any TSC under the heading of substantial contribution to climate change mitigation. Article 10(1) provides that such an activity must contribute substantially to the stabilisation of greenhouse gas concentrations in the atmosphere at a level consistent with the temperature goals of the Paris Agreement, by meeting certain specified requirements.

15. Under Article 10(2), an activity may be classified as a transitional activity, that contributes substantially to climate change mitigation if all of the following cumulative criteria are met:

    15.1. "There is no technologically and economically feasible low-carbon alternative";

    15.2. It supports the transition to a climate-neutral economy consistent with a pathway to limiting temperature increases to 1,5º C above pre-industrial levels;

    15.3. It has greenhouse gas emission levels that correspond to the best performance in the sector or industry;

    15.4. It does not hamper the development and deployment of low-carbon alternatives; and

    15.5. It does not lead to a lock-in of carbon-intensive assets, considering the economic lifetime of those assets.

16. Recital 41 to the Taxonomy Regulation states that such transitional economic activities can qualify as contributing substantially to climate change mitigation if, amongst other things, their greenhouse gas emissions ("**GHG**") are "substantially lower" than the sector or industry average. The Recital also notes that TSC for such transitional economic activities should ensure that those transitional activities have "a credible path towards climate-neutrality".

17. Second, in order to be included within TSC, an activity must also meet the test of DNSH as regards "any" of the Environmental Objectives, in accordance with Article 17. Article 17

provides that "taking into account the life cycle of the products and services provided by an economic activity", the economic activity shall be considered to significantly harm climate change mitigation, where that activity leads to significant greenhouse gas emissions.

18. Third, Article 19 of the Taxonomy Regulation sets out mandatory and cumulative criteria that constrain the Commission's powers and discretion in formulating TSC. They include the obligation in Article 19(f) that the Delegated Act shall be based on conclusive scientific evidence and the precautionary principle enshrined in Article 191 TFEU.

19. This is an unusual and exacting standard. As far as the Applicants are aware, it is unprecedented in EU law. Other legislation has adopted less exacting thresholds such as "scientific evidence of probably serious effects to human health or the environment"[10] or the need to make decisions by reference to "the best available and most recent scientific evidence."[11]

20. The effect of this novel threshold is:

    20.1. In order to make a positive decision that an activity should be included within the Delegated Act, the Commission must conclude that there is "conclusive scientific evidence" to support that decision. This does not mean that there can be no countervailing, or contradictory, evidence or research. The evidence does not need to be final and unanimous. However, the state of the scientific research must be clear and decisive. This is reflected in the French language text, which refers to the scientific evidence being "concluant."

    20.2. The converse of this test is that the Commission may not include an activity in a delegated act if the evidence before the Commission is inconclusive or incomplete as to: (a) whether the economic activity contributes substantially to one or more of the six Environmental Objectives; and (b) whether it DNSH. If this test is not met, the

[10] Article 57 of Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC (OJ L 396, 30.12.2006, p. 1–849).

[11] Articles 4 and 8 of Regulation (EU) 2021/1119 of the European Parliament and of the Council of 30 June 2021 establishing the framework for achieving climate neutrality and amending Regulations (EC) No 401/2009 and (EU) 2018/1999 ('**European Climate Law'**) (OJ L 243, 9.7.2021, p. 1–17).

Commission is precluded from including that activity within the list of environmentally sustainable activities.

21. Article 19(1)(f) also obliges the Commission to establish technical screening criteria in a manner consistent with the precautionary principle. Article 191(2) TFEU provides:

> "Union policy on the environment shall aim at a high level of protection taking into account the diversity of situations in the various regions of the Union. It shall be based on the precautionary principle and on the principles that preventive action should be taken, that environmental damage should as a priority be rectified at source and that the polluter should pay."

22. It is well-established that an approach based on the precautionary principle should: (a) rest on a careful evaluation of the best scientific knowledge in the field; and (b) once the potential risks arising from an activity have been identified – with as much certainty as possible – the action taken (or not taken) should be proportionate to the chosen level of protection and based on an examination of the potential benefits and costs of action/inaction.

23. This follows from the Court of Justice's reasoning in Case C-127/02 *Waddenzee* at [44], which linked the precautionary principle with the need not to take steps that might lead to harm, in the absence of scientific certainty under the Habitats Directive:

> "In the light, in particular, of the precautionary principle, which is one of the foundations of the high level of protection pursued by Community policy on the environment, in accordance with the first subparagraph of Article 174(2) EC, and by reference to which the Habitats Directive must be interpreted, such a risk exists if it cannot be excluded on the basis of objective information that the plan or project will have significant effects on the site concerned (see, by analogy, inter alia Case C-180/96 *United Kingdom* v *Commission* [1998] ECR I-2265, paragraphs 50, 105 and 107). Such an interpretation of the condition to which the assessment of the implications of a plan or project for a specific site is subject, which implies that in case of doubt as to the absence of significant effects such an assessment must be carried out, makes it possible to ensure effectively that plans or projects which adversely affect the integrity of the site concerned are not authorised, and thereby contributes to achieving, in accordance

> with the third recital in the preamble to the Habitats Directive and Article 2(1) thereof, its main aim, namely, ensuring biodiversity through the conservation of natural habitats and of wild fauna and flora."

24. Following *Waddenzee*, in Case C-254/19 *Friends of the Irish Environment* the Court held:[12]

> "Having regard to the precautionary principle, in particular, that risk is deemed to be present where it cannot be ruled out, having regard to the best scientific knowledge in the field, that the plan or project might affect the conservation objectives of the site… Thus, an assessment made under Article 6(3) of the Habitats Directive cannot be regarded as appropriate if it contains gaps and lacks complete, precise and definitive findings and conclusions capable of removing all reasonable scientific doubt as to the effects of the proposed works on the protected site."

25. The Commission has emphasised that scientific uncertainty can arise from controversy regarding existing data or due to lack of some relevant data.[13] It can also flow from the insufficiency, inconclusiveness or imprecision of the results of studies that have been conducted.[14] In such a situation, the precautionary principle may give rise to an obligation not to act in order to avoid an identifiable risk eventuating.[15] The risk, that should be avoided in this case, is the risk of including activities within the TSC that are not consistent with the overall objectives of the Taxonomy Regulation.

26. The precautionary principle is particularly important to the Commission's assessment of whether any individual activity DNSH. The Commission bears a heavy burden to positively establish that the activities in question do not present a risk by reference to the standard chosen by the legislature: no significant harm. The application of the precautionary principle, in this context, is as follows:

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12 Case C-254/19, *Friends of the Irish Environment v An Bord Pleanála*, (EU:C:2020:680) [51] – [53]. See further: Case C-333/08 *Commission v France* (EU:C:2010:44), [92]; Case C-487/17 *Verlezza and Others* (EU:C:2019:270), [57].

13 COM(2000) 0001 final, Communication from the Commission on the Precautionary Principle. [5.1.3].

14 See e.g. Case C-157/14, *Neptune Distribution v. Minister for Economic Affairs and Finance*, [82].

15 Case T-31/07 *Du Pont de Nemours and others v Commission* (EU:T:2013:167) at [135].

26.1. The Commission has to consider and review the most up-to-date scientific literature in order to identify all potential risks to the Environmental Objectives.

26.2. Where there is scientific doubt as to the potential for significant harm, the Commission must prevent that risk and must not include activities within the list of sustainable activities.

27. The combined effect of these two standards imposed by the legislature, therefore, is that the Commission bears a heavy double-evidential burden:

27.1. To positively establish that there is conclusive scientific evidence that the activities in question make a significant contribution to the Environmental Objectives; and

27.2. To positively establish, on the basis of the most conclusive, up-to-date scientific evidence, that the activities DNSH to any of the other Environmental Objectives.

28. There are sound policy reasons why the legislature imposed this exacting double threshold. Once an activity has been categorised as sustainable, there is a severe risk of lock-in effects (see Recitals 39, 41, 42 and Article 10) and also of leaving stranded assets (contrary to Article 19(1)(i)).

29. The risks of over-inclusion, therefore, are far greater than the risks of under inclusion. It was for this reason that the legislature imposed such a high threshold on the Commission before it could satisfy itself that an activity could be included within the Union's defined list of sustainable activities. As set out at Recital 40 to the Taxonomy Regulation, an economic activity should not qualify as environmentally sustainable if it causes more harm to the environment than the benefits it brings.

Aircraft

30. The Delegated Act, that forms the subject matter of this RIR, amends and/or supplements the 2021 Delegated Act. It does so, in essence, by adding new sustainable activities to the list set out in the original 2021 Delegated Act.

31. Annex 1 of the Delegated Act establishes TSC for three new activities that relate to aircraft, each of which is said to contribute substantially to climate change mitigation under Article 10 of the Taxonomy Regulation:

    31.1. Manufacturing of aircraft (section 3.21);

    31.2. Leasing of aircraft (section 6.18); and

    31.3. Purchasing, financing and operating passenger and freight air transport (section 6.19).

32. Within each of these sections, the Delegated Act states that, where an economic activity in the respective category does not make a substantial contribution to climate change mitigation, in the manner specified in point (a) of the section, the activity is a transitional activity as referred to in Article 10(2) of Taxonomy Regulation, provided it complies with the remaining TSC. The criterion specified in point (a) (in each section) is "the aircraft with zero direct (tailpipe) CO_2 emissions".

33. Other than criterion (a), the criteria for substantial contribution to climate change mitigation differ slightly for each section. As regards Manufacturing of aircraft (s. 3.21), the criteria are as follows:

> "(b) until 31 December 2027, the aircraft, other than produced for private or commercial business aviation, meeting the margins specified below and limited by the replacement ratio to ensure that the delivery does not increase the worldwide fleet number:
>
> > (i) having maximum take-off mass greater than 5,7 t and less than or equal to 60 t and a certified metric value of CO2 emissions of at least 11 % less than the New Type limit of the International Civil Aviation Organization (ICAO) standard;
> >
> > (ii) having a maximum take-off mass greater than 60 t and less than or equal to 150 t and a certified metric value of CO2 emissions of at least 2 % less than the New Type limit of the ICAO standard;
> >
> > (iii) having a maximum take-off mass greater than 150 t and a certified metric value of CO2 emissions of at least 1,5 % less than the New Type limit of the ICAO standard.
>
> The share of Taxonomy compliance of eligible aircraft shall be limited by the replacement ratio. The replacement ratio shall be calculated based on the proportion of aircraft permanently withdrawn from use to

aircraft delivered at the global level averaged over the preceding 10 years as evidenced by verified data available from independent data providers.

In the absence of a certificate on the metric values of CO2 emissions confirming the required margin to the New Type limit of the ICAO standard, the aircraft manufacturer shall deliver a declaration that the aircraft meets the required level of performance and margins of improvement with the condition that the aircraft is certified by 11 December 2026;

(c) from 1 January 2028 to 31 December 2032, the aircraft meeting the technical screening criteria set out in point (b) of this subsection that is certified to operate on 100 % blend of sustainable aviation fuels."

34. As regards **Leasing of aircraft (s. 6.18)**, the criteria are as follows:

"(b) the aircraft delivered before 11 December 2023, complying with the technical screening criteria referred to in Section 3.21., subsection 'Substantial contribution to climate change mitigation', points (b) or (c);

(c) the aircraft delivered after 11 December 2023, complying with the technical screening criteria referred to in Section 3.21., subsection "Substantial contribution to climate change mitigation", points (b) or (c) and with the commitment that another non-compliant aircraft in the fleet is either:

(i) permanently withdrawn from use within 6 months of delivery of the compliant aircraft, in which case, the replacement ratio does not apply; or

(ii) permanently withdrawn from the fleet within six months of delivery of the compliant aircraft in which case the share of Taxonomy compliance of eligible aircraft is limited by the replacement ratio as set out in Section 3.21;

whereby the aircraft permanently withdrawn from use or from the fleet:

(i) is non-compliant with the margins set out in Section 3.21., subsection "Substantial contribution to climate change mitigation", point (b);

(ii) has at least 80 % of maximum take-off weight of the compliant aircraft;

(iii) has remained in the fleet within at least 12 months prior to its withdrawal;

(iv) has a proof of airworthiness dating back less than 6 months prior to the delivery of the compliant aircraft.

The lessor ensures that aircraft in point (b) or (c) is operated on sustainable aviation fuels (SAF) consistently with the criteria specified in point (d) and paragraph 2 of Section 6.19 of this Annex."

35. As regards Purchasing, financing and operating passenger and freight air transport (s. 6.19), the criteria are as follows:

"(b) until 31 December 2029, the aircraft acquired before 11 December 2023, complying with the technical screening criteria specified in Section 3.21., subsection "Substantial contribution to climate change mitigation", points (b) or (c);

(c) until 31 December 2029, the aircraft acquired after 11 December 2023, complying with the technical screening criteria specified in Section 3.21., subsection "Substantial contribution to climate change mitigation", points (b) or (c), and with the commitment that another non-compliant aircraft in the fleet is either:

(i) permanently withdrawn from use within 6 months of delivery of the compliant aircraft in which case, the replacement ratio does not apply; or

(ii) permanently withdrawn from the fleet within 6 months of delivery of the compliant aircraft in which case, the share of Taxonomy compliance of eligible aircraft is limited by the replacement ratio as set out in Section 3.21;

whereby the aircraft permanently withdrawn from use or from the fleet:

(i) is non-compliant with the margins defined in Section 3.21., subsection "Substantial contribution to climate change mitigation", point (b);

(ii) has at least 80 % of maximum take-off weight of the compliant aircraft;

(iii) has remained in the fleet within at least 12 months prior to its withdrawal;

(iv) has a proof of airworthiness dating back less than 6 months prior to the delivery of the compliant aircraft;

(d) from 1 January 2030, the aircraft meeting technical screening criteria specified in points (b) or (c) above and operated with a minimum share of sustainable aviation fuels (SAF), corresponding to 15 % in 2030 and increased by 2 percentage points annually thereafter;

(e) the aircraft operated with a minimum share of sustainable aviation fuels (SAF), corresponding to 5 % SAF in 2022, with the percentage of SAF increasing by 2 percentage points annually thereafter.

The SAF use requirement referred to in points (d) and (e) is calculated with reference to the total aviation fuel used by the compliant aircraft and SAF used at the fleet level. Operators calculate compliance as the ratio of the quantity (expressed in tonnes) of SAF purchased at the fleet level divided by the total aviation fuel used by the compliant aircraft multiplied by 100. SAF are defined in a regulation on ensuring a level playing field for sustainable air transport."

36. The TSC for 6.18 and 6.19, therefore, cross refer back to and rely on (b) and (c) of 3.21.

Other Relevant provisions of EU law and International Standards

37. In October 2023, the European Parliament and the Council adopted Regulation EU 2023/2405[16] ("**ReFuel EU Aviation**"). Article 4 and Annex 1 require aviation fuel suppliers to ensure that all fuel made available to aircraft operators at EU airports contains a minimum share of 2% sustainable aviation fuel ("**SAF**") from 2025, 6% in 2030, 20% in 2035, 34% in 2040, 42% in 2045, and 70% in 2050. There are corresponding sub-targets on synthetic aviation fuels, which require an average share of 1.2% of such fuels from 1 January 2030 until 31 December 2031, increasing to a minimum share of 35% synthetic fuels in 2050.

38. The technical certification of SAF is regulated by the American Society for Testing Materials ("**ASTM**"). The ASTM certification pathways under standard D7566 and D7566-23a at present all require SAF to be "dropped-in" to conventional jet fuel, with a maximum limit of 50% of the blend.

39. In May 2023, the EU Emissions Trading Scheme ("**ETS**") Aviation was adopted.[17] The new text brings important changes to the ETS: the end of free allowances, the scheduled inclusion of non-CO_2 emissions in airlines' reporting obligations, and the potential inclusion of all departing flights as of 2027. It announces a €1.6bn subsidy scheme between 2024 and 2030, which will cover part of the price difference between SAF and kerosene.

40. In 2017, the International Civil Aviation Organization ("**ICAO**") adopted a metric for the purpose of measuring aircraft greenhouse gas emissions,[18] expressed in terms of kg of fuel burn per km.

41. In addition to defining the metric, in 2017 the ICAO's Council established a CO_2 certification standard applicable to all "new type" aircraft entering service after 2020. This standard determines the maximum level of the CO_2 metric value as a function of the aircraft's maximum

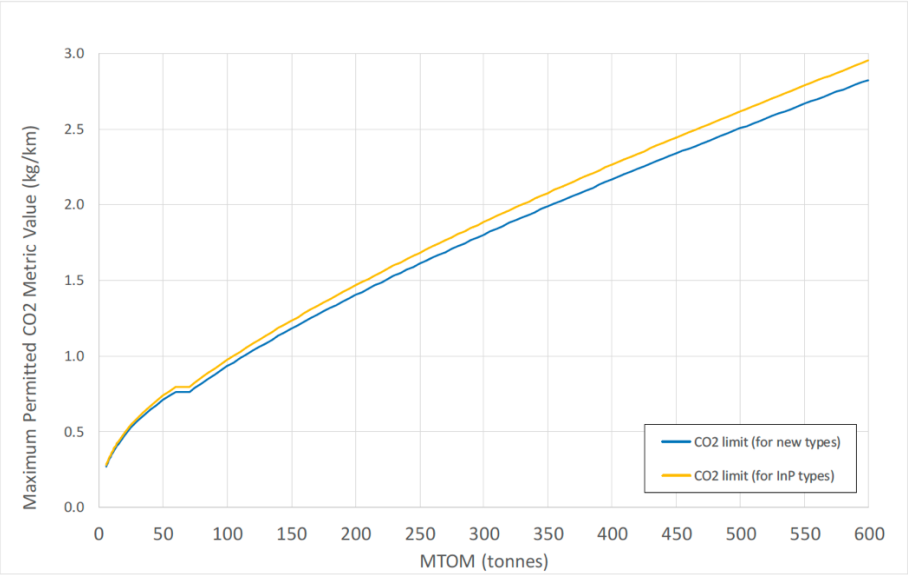
[16] Regulation of 18 October 2023 on ensuring a level playing field for sustainable air transport (OJ L, 32.10.2023).

[17] Directive (EU) 2023/958 of the European Parliament and of the Council of 10 May 2023 amending Directive 2003/87/EC as regards aviation's contribution to the Union's economy-wide emission reduction target and the appropriate implementation of a global market-based measure (OJ L 130, 16 May 2023).

[18] ICAO – Environmental Protection - Annex 16, Volume III - CO2 Certification Requirement, 2017 (**Annex A.1**).

take-off ("**MTOM**"). The chart below shows the regulatory limit against the aircraft MTOM for both "new type" and "in-production" aircraft (the "new type" standard being the more stringent).[19]

Figure 5.5: ICAO Aeroplane CO_2 regulatory limits



Source: EASA

Shipping

42. The Commission has amended the TSC (as set out in the 2021 Delegated Act) for two categories of activities relating to shipping by way of the Delegated Act:

    42.1. Sea and coastal freight water transport, vessels for port operations (section 6.10); and

    42.2. Sea and coastal passenger water transport (section 6.11).

43. Sections 6.10 and 6.11 cross refer to criterion (a) in s. 6.10 of the 2021 Delegated Act: "*the vessels have zero direct (tailpipe) CO_2 emissions*." The existing version of s. 6.10 contains three examples of activities that are transitional activities (6.10(b)-(d)), for the purposes of sea

[19] European Commission, Directorate-General for Mobility and Transport, Wiener, P., Scott, M., Toro, A. et al., Sustainable finance taxonomy for the aviation sector – Final report, Publications Office, 2021, https://data.europa.eu/doi/10.2832/500890 pp. 75-76 (**Annex A.2**).

and coastal freight water transport, in circumstances where criterion (a) cannot be satisfied. The Delegated Act adds two further TSC that will apply to vessels after 1 January 2026: criteria (e) and (f). The wording added by the Delegated Act is set out below:

> "(e) where technologically and economically not feasible to comply with point (a), from 1 January 2026, the vessels that are able to run on zero direct (tailpipe) CO2 emission fuels or on fuels from renewable sources have an attained Energy Efficiency Design Index (EEDI) value equivalent to reducing the EEDI reference line by at least 20 percentage points below the EEDI requirements applicable on 1 April 2022, and
>
> 1. are able to plug-in at berth;
>
> 2. for gas-fuelled ships, demonstrate the use of state-of-the-art measures and technologies to mitigate methane slippage emissions.
>
> (f) where technologically and economically not feasible to comply with the criterion in point (a), from 1 January 2026, in addition to an attained Energy Efficiency Existing Ship Index (EEXI) value equivalent to reducing the EEDI reference line by at least 10 percentage points below the EEXI requirements applicable on 1 January 2023, the yearly average greenhouse gas intensity of the energy used on-board by a ship during a reporting period does not exceed the following limits:
>
> 1. 76,4 g CO2e/MJ from 1 January 2026 until 31 December 2029;
>
> 2. 61,1 g CO2e/MJ from 1 January 2030 until 31 December 2034;
>
> 3. 45,8 g CO2e/MJ from 1 January 2035 until 31 December 2039;
>
> 4. 30,6 g CO2e/MJ from 1 January 2040 until 31 December 2044;
>
> 5. 15,3 g CO2e/MJ from 1 January 2045."

44. Section 6.11 adds to existing list of activities that are transitional activities, in relation to sea and coastal passenger water transport. The wording added by the Delegated Act is below:

> "(d) where technologically and economically not feasible to comply with point (a), from 1 January 2026, the vessels that are able to run on zero direct (tailpipe) emission fuels or on fuels from renewable sources have an attained Energy Efficiency Design Index (EEDI) value equivalent to reducing the EEDI reference line by at least 20 percentage points below the EEDI requirements applicable on 1 April 2022, and:
>
> (a) are able to plug-in at berth;

(b) for gas-fuelled ships, demonstrate the use of state-of-the-art measures and technologies to mitigate methane slippage emissions.

(e) where technologically and economically not feasible to comply with point (a), from 1 January 2026, in addition to an attained Energy Efficiency Existing Ship Index (EEXI) value equivalent to reducing the EEDI reference line by at least 10 percentage points below the EEXI requirements applicable on 1 January 2023, the yearly average greenhouse gas intensity of the energy used on-board by a ship during a reporting period does not exceed the following limits:

(a) 76,4 g CO2e/MJ from 1 January 2026 until 31 December 2029;

(b) 61,1 g CO2e/MJ from 1 January 2030 until 31 December 2034;

(c) 45,8 g CO2e/MJ from 1 January 2035 until 31 December 2039;

(d) 30,6 g CO2e/MJ from 1 January 2040 until 31 December 2044;

(e) 15,3 g CO2e/MJ from 1 January 2045."

45. The Delegated Act also amends the DNSH criteria for Section 6.10 and 6.11 of the 2021 Delegated Act.

Other relevant provisions of EU law and international law

46. Recital 12 to the Delegated Act explains that the TSC for maritime freight and passenger transport are being aligned with recently adopted international and Union reference values. Specifically, the Delegated Act refers to Phase 3 of the International Maritime Organisation ("**IMO**") Energy Efficiency Design Index ("**EEDI**") (applicable from 1 January 2025), and the Energy Efficiency Index of Existing Ships ("**EEXI**") (entered into force on 1 January 2023).[20]

47. The EEDI is a measure that aims to promote the use of more energy efficient equipment and engines for new designs of ships, adopted by the IMO in 2011. Specifically, the EEDI requires a minimum energy efficiency level per capacity mile for different types and segments of ships.[21] For example, Phase 3 EEDI requires that ships built in April 2022 or later are less carbon intensive than a baseline of older ships, with the specific requirement varying

[20] Delegated Regulation, Preamble, para 12.
[21] Improving the energy efficiency of ships (imo.org) [Accessed 05/12/23] (**Annex A.3**).

depending on the vessel type and size (e.g., large containerships above a deadweight tonnage of 200,000 need to be at least 50% less carbon intensive than their baseline).[22]

48. One important limitation of the EEDI is that it currently only considers CO_2 emissions, as opposed to emissions of other GHGs on a life-cycle basis.[23] In part, this reflects how the EEDI was designed as a criteria to help in the design and construction of vessels, as opposed to assist with GHG emissions reductions at an operational level.[24] For example, the fact that a vessel's EEDI score should be calculated at the design and sea trial stages when building new ships demonstrates that it is a measure targeting ship manufacturing, and not actual operations.[25]

49. The EEXI is a measure that reflects the "technical" or "design" efficiency of a ship. Since 1 January 2023, all existing ships of 400 GT[26] and above are required to reach a certain EEDI level (that is equivalent to required EEXI levels).[27]

50. The Commission's Staff Working Document ("**SWD**") also refers to the need to adapt the TSC for maritime freight and passenger transport to the Fit for 55/FuelEU Maritime developments.[28] The EU's Fit for 55/FuelEU Maritime framework aims to increase demand for and use of renewable and low-carbon fuels, in line with the EU's broader "Fit for 55" package. Specifically, the Fuel EU Maritime regulation aims to ensure that the GHG intensity of fuels used by the shipping sector will decrease overtime by setting GHG emissions intensity requirements for energy used on-board ships.[29]

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22 IMO, "Regulations on Energy Efficiency for Ships – Regulation 24" (2023), Table 1, Available at: https://imorules.com/GUID-82DA0CF7-5A83-476B-A1F5-B455E4610E58.html (**Annex A.4**); Comer, B., and Sathiamoorthy, B., "*How Updating IMO Regulations can Promote Lower Greenhouse Gas Emissions from Ships*" (International Council on Clean Transportation, 2022).

23 Ibid.

24 IMO, "Module 2: Ship Energy Efficiency Regulations and Related Guidelines" (2016), Available at: https://wwwcdn.imo.org/localresources/en/OurWork/Environment/Documents/Air%20pollution/M2%20EE%20regulations%20and%20guidelines%20final.pdf, p.7: "*EEDI is thus a goal-based technical standard that is applicable to new ships. Ship designers and builders are free to choose the technologies to satisfy the EEDI requirements in a specific ship design*." (**Annex A.5**)

25 IMO, "2014 Guidelines on Survey and Certification of The Energy Efficiency Design Index (EEDI)" (2019), Annex, p.3: "*Survey and certification of the EEDI should be conducted in two stages: preliminary verification at the design stage and final verification at the sea trial*." (**Annex A.6**)

26 N.B. "GT" refers to gross tonnage and is a measure of a ship's overall internal volume.

27 Improving the energy efficiency of ships (imo.org) [Accessed 05/12/23] (see footnote 21)

28 SWD (2023) 239 final 27.6.2023, p.73.

29 Regulation (EU) 2023/1805 of the European Parliament and of the Council of 13 September 2023 on the use of renewable and low-carbon fuels in maritime transport, and amending Directive 2009/16/EC, Article 4.

THE COMMISSION'S COMPETENCE AND DISCRETION

51. The Delegated Act was made pursuant to Article 290 TFEU, which provides that:

> "A legislative act may delegate to the Commission the power to adopt non-legislative acts of general application to supplement or amend certain non-essential elements of the legislative act.
>
> The objectives, content, scope and duration of the delegation of power shall be explicitly defined in the legislative acts. The essential elements of an area shall be reserved for the legislative act and accordingly shall not be the subject of a delegation of power."

52. The Commission enjoys a discretion in making complex assessments, but that discretion is not unfettered. The Commission's decision-making is subject to judicial review on the basis of:[30] lack of competence (exceeding bounds of discretion); misuse of powers; and manifest errors of assessment.

53. The Courts have consistently held that: "the possibility of delegating powers provided for in Article 290 TFEU aims to enable the legislature to concentrate on the essential elements of a piece of legislation."[31] The Court will ask whether the Commission acted "within the limits of the powers" given to it, and whether it complied "with the essential elements of the enabling act".[32] The Commission acts outside its competence when it does not comply with an essential element of an enabling act.[33] The role of the Commission, therefore, is to give effect to the political judgment of the legislature, within the parameters laid down in the Taxonomy Regulation.

Sections 6.10(f) and 6.11(e) of the Delegated Acts set yearly average GHG intensity limits for the energy used on-board ships.

30 Cases T-279/30 and T-283/20 *CWS Powder Coatings GmbH v Commission* [2022] ECLI:EU:T:2022:725 at [41]-[42].

31 Case C-44/16 P *Dyson v Commission*, (ECLI:EU:C:2017:357), [58]-[59] and case law cited.

32 Case C-44/16 P *Dyson v Commission* [2017] ECLI:EU:C:2017:357 at [52]-[53].

33 Ibid. [78] and [80].

54. To show manifest error, the evidence adduced by an applicant must be such as to show the factual assessments by the EU institution were "implausible".[34]

55. The Commission will fall into manifest error when the evidence relied upon is not factually accurate, reliable or consistent. The Commission must also take into account all relevant information. This test is adapted to the specific provisions within the Taxonomy Regulation about the standard of evidence that must be present (conclusive scientific evidence) and the application of the precautionary principle, as set out above.[35]

56. By this RIR, the Applicants ask the Commission to review the Delegated Act because the Commission lacked competence to make it and/or fell into manifest errors of assessment when it did so.

ADMISSIBILITY

Representation

57. The Applicants are represented by Dr Fred Logue, solicitor, who is authorised to practice before the courts of Ireland – in compliance with Article 4(2) of Commission Decision (EU) 2023/748 please see **Annex B.1** for a copy of a document evidencing such authorisation and **Annexes B.2 to B4** for copies of powers of attorney from each of the Applicants evidencing Dr Logue's entitlement to act for the Applicants.

58. Some of the parties that were consulted in the preparation of this request, and who reviewed earlier drafts of it, were in possession of internal information that was relevant to the subject matter of this request from the European Commission. That information was not shared with Dryade, Protect Our Winters and Fossielvrij (the Applicants) and was not read or relied on by the Applicants or their legal team.

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[34] Case T-605/21 *TestBioTech eV v European Commission* ECLU:EU:T:2023:648 at [20].

[35] Ibid. at para 21. C-12/03 P, *Tetra Laval*, ECLI:EU:C:2005:87, para. 39; Case T-257/07, *France v Commission*, EU:T:2011:444, [87]. In Case T-187/06, *Ralf Schräder v Community Plant Variety Office (CPVO)*, EU:T:2008:511, para. 61 it was held that the analysis in *Tetra Laval* applies to cases where the decision is the result of complex technical as well as economic assessment.

59. Article 10 of the Aarhus Regulation, as amended, entitles any non-governmental organisation that meets the criteria set out in Article 11 to make a request for internal review to the Union Institution or body that adopted an administrative act, as defined in Article 2(1)(g), on the grounds that such an act contravenes environmental law.

60. The present request for internal review fulfils all three criteria because (i) the Applicants meet the criteria set out in Article 11; (ii) the Delegated Act constitutes an administrative act in the sense of Article 2(1)(g); and (iii) the legal grounds raised in this request show that the Delegated Act contravenes environmental law.

The Applicants meet the criteria set out in Article 11 of the Aarhus Regulation

61. Having regard to requests for internal review numbered 49 to 59 in the internal review register[36], the three Applicants jointly submit this RIR and provide the documents identified below demonstrating that each Applicant individually fulfils the criteria set out in Article 11 of the Aarhus Regulation.

Dryade

62. Dryade VZW was established on 1 February 2021 and is registered in Belgium. It submits the following documents listed in Article 2, Paragraph 5(a) to (c) of Commission Decision (EU) 2023/748:

    62.1. The articles of association in their current form as published in the Belgian Official Journal – see Annex B.5 in Dutch;

    62.2. Annual activity reports for the years 2022 and 2023 – see **Annex B.6** in Dutch;

    62.3. A copy of the legal registration is available on the website of the Belgian Crossroads Bank for Enterprises see **Annex B.7** in Dutch[37].

[36] https://environment.ec.europa.eu/law-and-governance/aarhus/requests-internal-review_en

[37] https://kbopub.economie.fgov.be/kbopub/toonondernemingps.html?lang=nl&ondernemingsnummer=762778603

63. These documents demonstrate the Dryade meets all of the criteria under Article 11(1) of the Aarhus Regulation.

64. As to Article 11(1)(a) and (c) these documents show that Dryade is a legal person incorporated as a non-profit organisation (Vereniging zonder winstoogmerk, VZW). This is confirmed by the extract from the Belgian Crossroads Bank for Enterprises which also shows that Dryade was incorporated on 1 February 2021

65. In particular as to Articles 11(1)(b) and 11(1)(d), Article 2, section 1 of the Articles of Association provide that Dryade shall have as its disinterested purpose: to promote and encourage the improvement, restoration, conservation and protection of the environment, climate, biodiversity, nature, heritage, landscape and sustainability; facilitating access to legal information. The present RIR seeks to ensure that the Delegated Act only defines as environmentally sustainable those activities in the aviation and shipping sectors which contribute to climate mitigation and do not significantly harm the environment. This objective is fully in line with Dryade's statutory purpose. It is also in line with Dryade's wider activities aimed at decarbonisation.

Fossielvrij

66. Stichting ter bevordering vand de Fossielvrij-beweging (Fossielvrij) was established on 23 March 2016 and is registered in the Netherlands. It submits the following documents listed in Article 2, Paragraph 5(a) to (c) of Commission Decision (EU) 2023/748:

    66.1. A notarised copy of its Statutes in their current form – see **Annex B.8** in Dutch;

    66.2. Annual activity reports for the years 2021 and 2022[38] – see **Annex B.9 and B.10**;

    66.3. A copy of the legal registration with the Netherlands Chamber of Commerce see **Annex B.11** in Dutch.

[38] The 2023 report is not yet available but can be provided once it is finalised.

67. These documents demonstrate the Fossielvrij meets all of the criteria under Article 11(1) of the Aarhus Regulation.

68. As to Article 11(1)(a) and (c) these documents show that Fossielvrij is a legal person incorporated as a foundation (Stichting) under Netherlands Law. Its non-profit character is evidenced by the extract from the trade regsiter from the Chamber of Commerce. As the Chamber of Commerce extract shows, Fossielvrij was incorporated on 23 March 2016.

69. In particular as to Articles 11(1)(b) and 11(1)(d), of Article 3 of the Fossielvirj's Statutes states, it aims to promote, support and realise social, ecological and economic justice and health for current and future generations, to remove the social legitimacy of companies producing or relying on fossil fuels in their core business model (the so-called fossil companies), and to bring about alternative uses of investments and resources in order to accelerate the transition to a just and sustainable economy based on renewable energy.. The present RIR seeks to ensure that the Delegated Act only defines as environmentally sustainable those activities in the aviation and shipping sectors which contribute to climate mitigation and do not significantly harm the environment. This objective is fully in line with Fossielvrij's statutory purpose. It is also in line with its wider activities aimed at decarbonisation.

Protect Our Winters Austria

70. Protect our Winters Austria – Verein für Kilmabildung unde vachhaltigen Wintertourismus (Protect Our Winters) was established on 24 November 2014 and is registered in the Netherlands. It submits the following documents listed in Article 2, Paragraph 5(a) to (c) of Commission Decision (EU) 2023/748:

    70.1. A copy of its Statutes in their current form – see **Annex B.12** in German;

    70.2. Annual activity reports for the years 2021 and 2022[39] – see **Annexes B.13 and B.14**;

[39] The 2023 report is not yet available but can be provided once it is finalised.

70.3. A copy of the registration with the Austrian Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology see **Annex B.15** in German.

70.4. d. A copy of the official association registration document from the registry of the Austrian Federal Ministry of Internal Affairs (Vereinsregisterauszug) – See **Annex B.16** in German

71. These documents demonstrate the Protect Our Winters meets all of the criteria under Article 11(1) of the Aarhus Regulation.

72. As to Article 11(1)(a) and (c) these documents show that Protect Our Winters is a legal person incorporated as an association (Verein) under Austrian Law. As the registration with the Austrian Ministry shows at paragraph 1 it has had this status since 24 November 2014. Its non-profit character is evidenced by its statutes (Paragraphs 2.2 and 2.3), the registration with the Austrian Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology (Paragraph 4 of the reasoning), and the official Association Registration Document..

73. In particular as to Articles 11(1)(b) and 11(1)(d), Paragraph 2.1 of the Statutes states that the purpose of the association is to sensitize and inform the general public as well as political and economic decision-makers about the consequences of climate change and to encourage them to act in an environmentally conscious manner. The present RIR seeks to ensure that the Delegated Act only defines as environmentally sustainable those activities in the aviation and shipping sectors which contribute to climate mitigation and do not significantly harm the environment. This objective is fully in line with Protect Our Winter's statutory purpose. It is also in line with its activities aimed at decarbonisation. To name but a few examples Protect Our Winters Austria currently campaigns against the climate-damaging practices of the Fédération Internationale de Ski (FIS), urging more sustainability, transparency, and a 50% emissions reduction by 2030 for winter sports, and, moreover, in 2023 organised a (symbolic) glacier funeral on Austria's largest glacier with broad media coverage to raise awareness about the impacts of the climate crisis.

Admissibility of the Delegated Act

74. Article 2(1)(g) of the Aarhus Regulation defines "administrative act" as "any non-legislative act adopted by a Union institution or body, which has legal and external effects and contains provisions that may contravene environmental law withing the meaning of point (f) of Article 2(1).

75. The Commission has already accepted as admissible several[40] requests for internal review as regards Delegated Regulation (EU) 2021/2139 and several[41] more as regards Delegated Regulation (EU) 2022/1214 amending this act.

76. Therefore it is submitted that the Delegated Act subject this request for internal review is also admissible: it has the same material characteristics as these earlier delegated regulations which were accepted as coming with the material scope of the procedure for internal review.

77. The Commission has already accepted that similar delegated acts adopted by the Commission under the Taxonomy Regulations are within the material scope of Article 2(1)(g) of the Aarhus Regulation. The Applicants therefore rely on the Commission's earlier decisions[42,43] in that regard but will also set out briefly below why the Delegated Act, in this instance, is also an administrative act that is amenable to an RIR by the Applicants.

78. In brief summary, the Delegated Act was adopted in accordance with Article 290 TFEU. Article 290(1) expressly confirms that delegated acts are non-legislative acts.

79. In terms of external legal effect, Article 288 provides that regulations adopted by the Union institutions have general application, are binding in their entirety and are directly applicable in

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[40] Requests numbered 62, 63 and 64 on the Commission register of requests for internal review.

[41] Requests numbered 69 and 70 on the Commission register of requests for internal review.

[42] Annex 1 to the Commission's reply to internal review requests against Delegated Regulation (EU) 2022/1214 of 9 March 2022 amending Delegated Regulation (EI) 2021/2139 as regards economic activities in certain energy sectors and Delegated Regulation (EU) 2021/2178 as regards specific public disclosures for those economic activities (Ares(2023)931612 – 08/02/2023)

[43] Commission's reply to internal review requests against Delegated Regulation (EU) 2020/852 of 4 June 2021 supplementing Regulation (EU) 2020/825 (Ares(2022)4942150 – 06/07/2022)

all Member States. This is confirmed by Article 2 of the Delegated Act and the fact that the effect of the Delegated Regulation is to amend Delegated Regulation (EU) 2021/2139.

80. Article 2(1)(f) of the Aarhus Regulation defines environmental law as "Union legislation which irrespective of its legal basis, contributes to the pursuit of the objectives of Union policy on the environment as set out in the Treaty: preserving, protecting and improving the quality of the environment, protecting human health, the prudent and rational utilisation of natural resources, and promoting measures at international level to deal with regional or worldwide environmental problems." The General Court has held that this concept must be interpreted, in principle, broadly.[44]

81. It is obvious, for example, from recitals 15, 16 and 20 that the Delegated Act forms part of EU environmental law and therefore meets this aspect of the qualifying criteria in Article 2(1)(g) of the Aarhus Regulation.

FACTUAL BACKGROUND

Aircraft

82. Decarbonising aviation will be critical in the transition to net zero emissions by 2050. While global aviation has increased dramatically in recent decades, from 310 million in 1970 to 4.5 billion passenger journeys in 2019, flying is also one of the most carbon-intensive ways to travel. It emits 100 times more carbon per hour than train, bus or shared car rides.[45] In 2019, the emissions of global aviation were about 1 billion tonnes of CO_2, more than four times the emissions of New York City.[46] It is estimated that aviation contributed approximately 4% to observed human induced global warming to date (taking into account aviation's total climate impact, including namely both its CO_2 and non-CO_2 impacts) and, as one of the fastest growing sources of GHG emissions, will account for a growing proportion of future human induced global warming.[47] Indeed, in November 2023, the Global Carbon Budget Report projected

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44 Judgment of 14 March 2018, T-33/16, *Testbiotech v Commission,* EU:T:2018:135, [44]-[46].

45 M Klöwer et al, 'Quantifying aviation's contribution to global warming', 2021 Environ. Res. Lett. 16 104027, https://iopscience.iop.org/article/10.1088/1748-9326/ac286e p.1. (**Annex A.7**)

46 Ibid. p.4.

47 Ibid. p.4; See also https://climate.ec.europa.eu/eu-action/transport/reducing-emissions-aviation_en.

that international aviation and shipping (2.8% of global emissions) were projected to increase by 11.9% in 2023 on 2022, with international aviation projected to be up 28% on 2022.[48]

83. The SWD[49] states that the air transport sector accounts for 3% of GHG emissions in the EU27 and for 18% of GHG emissions in the transport sector as a whole and that emissions reductions in this sector continue to be "vital" for decarbonisation and the transition to a net-zero emissions economy (p.72).

84. However, while decarbonisation is critical, it is estimated that there will be a growth in Europe of up to 3.1 % per year until 2050 for air passenger traffic, and up to 2.4 % per year for air freight traffic.[50] EUROCONTROL aviation outlook 2050 predicts a growth in traffic of up to 76% between 2019 and 2050.[51]

85. Improvements in efficiency can mitigate some of this passenger growth. The average fuel burn of new jet aircraft fell by about 40% on the block fuel intensity metric from 1970 to 2019.[52] However, to date, improved efficiency measures have not led to emissions' reductions for the sector as a whole, because increases in demand such as that projected by the ICAO into the future have outpaced efficiency savings (Recital 7 to ReFuelEU Aviation). For example, the Commission found in 2018 that CO_2 emissions of international aviation more than doubled from 1990 to 2018 as efficiency improvements were more than compensated by traffic

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48 Global Carbon Budget Report 2023, Pierre Friedlingstein, Corinne Le Quéré, Julia Pongratz, Mike O'Sullivan, Glen Peters, Philippe Ciais: https://globalcarbonbudget.org/fossil-co2-emissions-at-record-high-in-2023/ p.22. (**Annex A.8**)

49 SWD(2023) 239 final 27.6.2023.

50 Recital 2 to ReFuelEU Aviation. See also M Klöwer et al, 'Quantifying aviation's contribution to global warming', 2021 Environ. Res. Lett. 16 104027 at p.4 (cited at footnote 45).

51 EUROCONTOL, Aviation outlook 2050, 13 April 2022, https://www.eurocontrol.int/press-release/eurocontrol-2050-air-traffic-forecast-showing-aviation-pathway-net-zero. (**Annex A.9**)

52 Xinyi Sola Zheng, Dan Rutherford, PhD. (ICCT) 'Fuel burn of new commercial jet aircraft: 1960 to 2019', September 2020 at p.vi https://theicct.org/sites/default/files/publications/Aircraft-fuel-burn-trends-sept2020.pdf. (**Annex A.10**)

increase.[53] Research shows that CO_2 emissions increased by 129% between 1990 and 2017 despite energy efficiency of new aircraft improving by 18% over the same period.[54]

86. Projections indicate that under business-as-usual conditions, demand growth in aviation is very likely to continue to outstrip efficiency improvements, such that CO_2 emissions will continue to increase both in absolute terms and with respect to their share in global emissions.[55] There is general consensus in the literature that technical and operational measures alone, such as fuel efficiency improvements, will not be able to offset emission growth in the coming decades.[56] Emissions from international aviation are expected to increase to 2050, by a factor ranging from approximately 2 to 4 times the 2015 levels, depending on the type of emissions (CO_2, NOx or PM), and the analysis scenario used.[57] The ICAO has also found that even with

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[53] European Commission, 'In-depth Analysis in Support of Commission Communication COM (2018) 773: A Clean Planet for all, A European strategic long-term vision for a prosperous, modern, competitive and climate neutral economy', 28 November 2018, https://climate.ec.europa.eu/system/files/2018-11/com_2018_733_analysis_in_support_en.pdf. See also European Commission, Directorate-General for Mobility and Transport, Wiener, P., Scott, M., Toro, A. et al., Sustainable finance taxonomy for the aviation sector – Final report, Publications Office, 2021, supra p.29 at §4.11, which found that the total level of GHG emissions increased by 30% over the period between 2005 and 2017. See also European Environment Agency, 'Indicator assessment – Greenhouse gas emissions from transport in Europe', , https://www.eea.europa.eu/data-and-maps/indicators/transport-emissions-of-greenhouse-gases/transport-emissions-of-greenhouse-gases-12.

[54] European Environment Agency, 'Indicator assessment – Greenhouse gas emissions from transport in Europe' (https://www.eea.europa.eu/en/analysis/indicators/greenhouse-gas-emissions-from-transport), and Xinyi Sola Zheng, Dan Rutherford, PhD. (ICCT) 'Fuel burn of new commercial jet aircraft: 1960 to 2019', September 2020, supra (footnote 52).

[55] Martin Cames and others 'Emissions Reduction Targets for International Aviation and Shipping', 2015, Policy PE 569.964, European Parliament's Committee on Environment, Public Health and Food Safety, https://www.europarl.europa.eu/RegData/etudes/STUD/2015/569964/IPOL_STU(2015)569964_EN.pdf at p.10. Less than half of the of aviation executives surveyed believe the industry will meet net zero by 2050, see Reuters, Aviation industry split on whether 2050 net zero goal achievable, https://www.reuters.com/sustainability/aviation-industry-split-whether-2050-net-zero-goal-achievable-ge-survey-2023-06-15/ (**Annex A.11**)

[56] Ibid [Cames]. p.21. See also M Klöwer et al, 'Quantifying aviation's contribution to global warming', 2021 Environ. Res. Lett. 16 104027 at p.7 (footnote 45), which states that fuel efficiency improvements alone will not significantly reduce aviation's contribution to warming, as past progress in efficiency was overcompensated by air traffic growth and further efficiency potential is limited. See also International Energy Agency, 'Aviation', https://www.iea.org/energy-system/transport/aviation. (**Annex A.12**)

[57] ICAO, 2019 Environmental Report: Aviation and Environment, 2019 Environmental Trends in Aviation to 2050 By Gregg G. Fleming (US DOT Volpe) and Ivan de Lépinay (EASA) p.23, https://www.icao.int/environmental-protection/Documents/ICAO-ENV-Report2019-F1-WEB%20(1).pdf. (**Annex A.13**) Similarly, the ICCT estimate that CO2 emissions from international aviation are projected to triple by 2050 compared with today's levels: see Anastasia Kharina, Daniel Rutherford, PhD., Mazyar Zeinali, Ph.D. (ICCT) 'Cost assessment of near and mid-term technologies to improve new aircraft fuel efficiency, 2016,

an optimistic technology and operational improvement scenario, emissions are projected to grow by 139.46% between 2020 and 2050.[58] The Climate Action Tracker finds that the current trajectory for international aviation places it on a 4°C+ pathway if all other sectors were to follow the same approach: small or incremental percentage improvements on CO_2 emissions are highly unlikely to be consistent with a 1.5°C pathway.[59]

87. The ICCT's mapping of possible aviation decarbonisation pathways ("**the ICCT Report**") shows that even a "breakthrough case" in which there is "early, aggressive, and sustained government intervention" which "triggers widespread investments in zero-carbon aircraft and fuels, peaking fossil jet fuel use in 2025 and zeroing it out by 2050" is consistent with a +1.75°C global temperature rise.[60] The ICCT found that CO_2 emissions from aircraft need to peak by 2030 at the latest, and as soon as 2025, to align aviation with the Paris Agreement (p.27).

88. That aligns with the finding of a study within the ICAO's 2019 Environmental Report[61] ("**ICAO Report**") that achievement of carbon neutral growth at 2020 emissions levels out to 2050 would require nearly complete replacement of petroleum-based jet fuel with SAF by 2050 and the implementation of aggressive technological and operational scenarios.

89. Under the International Energy Agency's ("**IEA**") 1.5°C pathway for aviation, emissions need to fall by 80% between 2019 and 2050, with direct emissions from aviation peaking by 2025 and then the sector decarbonising at an annual average rate of almost 6% until 2050.[62] Both

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https://theicct.org/sites/default/files/publications/ICCT%20aircraft%20fuel%20efficiency%20cost%20assessment_final_09272016.pdf at p. iv. (**Annex A.14**)

[58] Global Aviation CO2 Emissions Projections to 2050, https://www.icao.int/environmental-protection/giacc/giacc-4/cenv_giacc4_ip1_ip2%20ip3.pdf. (**Annex A.15**)

[59] Climate Action Tracker, 'International Aviation', 22 September 2022, https://climateactiontracker.org/sectors/aviation/ (**Annex A.16**)

[60] Brandon Graver, Sola Zheng, Dan Rutherford, Jayant Mukhodpadhaya, Erik Pronk (ICCT) 'Vision 2050: Aligning Aviation With The Paris Agreement', June 2022, https://theicct.org/wp-content/uploads/2022/06/Aviation-2050_report_final_v2.pdf (**Annex A.17**) ("**ICCT Report**").

[61] International Civil Aviation Organization, 2019 Environmental Report: Aviation and Environment, 2019, Environmental Trends in Aviation to 2050 By Gregg G. Fleming (US DOT Volpe) and Ivan de Lépinay (EASA) p.21. (footnote 57)

[62] International Energy Agency's (IEA) Net Zero by 2050 report January 2022 at p.135, https://www.iea.org/reports/net-zero-by-2050. (**Annex A.18**)

the IEA and the ICCT are clear, therefore, that in order to be consistent with the Paris Agreement (and a 1.5°C pathway), emissions must peak in aviation by 2025 (and no later).

90. However, decarbonising aviation is not straightforward. That is in part because aircraft have long asset lives of between 20 and 30 years, with many freight companies using even older aircraft.[63] As a result, even though the technology is already available or will very shortly become available that will give rise to dramatic changes in pollution levels (such as zero emission planes), investments in today's best-in-class aircraft will lead to lock-in of carbon-intensive assets for many years into the future. Put another way, today's best-in-class aircraft will not be best-in-class for long, because the technology in this sector is evolving rapidly. While the Commission can potentially review the TSC in future in response to technological progress, that does not absolve the Commission of the requirement that the TSC as currently expressed must today be lawful.

91. At the same time, investment in today's best-in-class aircraft will divert investment away from technologies that are critical for decarbonising, namely zero-emission planes, certain SAFs and high speed rail. IATA has estimated that US$2 trillion in investment will be required up to 2050 for the aviation sector to reach net-zero emissions.[64] Similarly, the March 2023 SEO report commissioned by Airlines for Europe (A4E) concludes that €820 billion of expenditure is necessary by 2050, including €441 billion for alternative fuel, €100 billion for R&D for future aircraft, and €80 billion for fleet renewal.[65] What is clear is that by 2030, a massive, unprecedented scale-up of aviation decarbonisation technologies will be required along with significant investment.[66] The necessary investment will not be possible if the aviation sector continues to invest in existing and polluting technologies, which is why it is crucial that the

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63 European Commission, Directorate-General for Mobility and Transport, Wiener, P., Scott, M., Toro, A. et al., Sustainable finance taxonomy for the aviation sector – Final report, Publications Office, 2021 p.47 at §5.18.; AerSale, (footnote 19) 'Aircraft Life Cycle Management: A Breakdown of Your Aircraft Life Cycle', 19 June 2019, https://www.aersale.com/media-center/aircraft-life-cycle-management; https://simpleflying.com/cargo-operators-older-planes/ (**Annex A.19**)

64 Climate Action 100+, Global Sector Strategies: Investor Actions to Align the Aviation Sector with the IEA's 1.5C Decarbonisation Pathway, 2022, p.5 https://www.climateaction100.org/wp-content/uploads/2022/07/CA100_Aviation_Sector_Strategy_Final_March2022.pdf. (**Annex A.20**)

65 SEO The Price of Net Zero: Aviation Investments Towards Destination 2050, https://www.seo.nl/wp-content/uploads/2023/03/2023-17-The-price-of-net-zero.pdf, Executive Summary at p.1. (**Annex A.21**)

66 Ibid. p.16.

Taxonomy must direct finance flows into truly sustainable solutions, and play a key role in stimulating the rollout of truly cutting edge efficient planes. A Taxonomy that is characterised by low levels of ambition on emissions reduction will have an actively harmful consequence because they will direct financial flows into long-term and heavily polluting activities, making it impossible – in practical terms – to achieve key climate targets.[67] This is for the following three key reasons.

92. First, zero-emission aircraft are expected to enter the market in the next decade, but their rapid deployment requires significant private sector investment. There has been much progress on the technological front in recent years:

92.1. The Report produced by the Platform in March ("**Platform's March 2022 Report**") states at p.512 of Annex B that Airbus recently announced that the first zero-emission commercial aircraft [for the regional market segment with up to 100 passengers and around 1,000 nautical miles range] could enter service by 2035. The Commission's Sustainable and Smart Mobility strategy also has the objective of ensuring that such aircraft will become ready for market by 2035.[68] For aircraft with longer ranges and more seats, which account for the bulk of air transport and CO_2 emissions, there is currently no reliable indication when such aircraft will be market ready.

92.2. The ICCT Report notes at p.9 that aircraft fuelled by liquid hydrogen could potentially service short- to medium-haul flights up to 3,400 km in stage length.

92.3. Recital 7 to ReFuelEU Aviation states that "new technologies, including the development of zero-emission electric- or hydrogen-powered aircraft, are expected to

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67 Intergovernmental Panel on Climate Change, 2022 Mitigation Report, Summary for Policy Makers, https://www.ipcc.ch/report/ar6/wg3/downloads/report/IPCC_AR6_WGIII_SummaryForPolicymakers.pdf E.6.4. (**Annex A.22**)

68 For the Platform's March 2022 Report see: https://finance.ec.europa.eu/system/files/2022-04/220330-sustainable-finance-platform-finance-report-remaining-environmental-objectives-taxonomy_en.pdf **and the annex** at: https://finance.ec.europa.eu/system/files/2022-03/220330-sustainable-finance-platform-finance-report-remaining-environmental-objectives-taxonomy-annex_en.pdf. For the Sustainable and Smart Mobility Strategy see: COM/2020/789 final Communication from the Commission Sustainable and Smart Mobility Strategy – putting European transport on track for the future, 9.12.20 at p.2.

help reducing short-haul aviation's reliance on fossil energy in the next decades and can play an important role in commercial aviation in the medium and long term".

92.4. Steer were appointed by the Commission to develop a methodology for including aviation in the taxonomy, producing a final report in February 2021 ("**the Steer Report**").[69] That included a literature review which found that hydrogen powered aircraft are foreseen from 2030 for regional aircraft and from 2040 for short haul flights up to two hours. Other studies indicate that 40% of aircraft could potentially be hydrogen powered by 2050, although this is contingent on significant acceleration of research and investment in this area (p.61 at [5.41]).

92.5. The ICAO Report (p.125) states that the ICAO Secretariat is currently following the industry developments in electric and hybrid aircraft designs by means of the Electric and Hybrid Aircraft Platform for Innovation. This website is being maintained with a non-extensive list of projects that have been identified globally, ranging from general aviation or recreational aircraft; business and regional aircraft; large commercial aircraft; and vertical take-off and landing aircraft. Most of them target an entry-in-service date between 2020 and 2030, and some are already commercially available. Four of the projects had their first flights in 2019 (Lilium, City Airbus, Boeing Aurora eVTOL, and Bye Aerospace Sun Flyer 2).

92.6. Recent industry announcements also show test flights are progressing.[70] However, T&E has estimated that €299 billion would be needed between 2025 and 2050 to develop and run the hydrogen aviation value chain in Europe.[71]

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[69] European Commission, Directorate-General for Mobility and Transport, Wiener, P., Scott, M., Toro, A. et al., Sustainable finance taxonomy for the aviation sector – Final report, Publications Office, 2021, supra.

[70] See e.g. March 2023, Universal Hydrogen test flight: https://www.ft.com/content/aa1fb5bb-6393-427a-9450-4ea02f9969d8 (**Annex A.23**) and https://www.edie.net/zeroavia-welcomes-successful-zero-emission-hydrogen-aircraft-testing. (**Annex A.24**)

[71] T&E, Analysing the costs of hydrogen aircraft, April 2023 – Final report, https://www.transportenvironment.org/wp-content/uploads/2023/05/Study-Analysing-the-costs-of-hydrogen-aircraft.pdf at p.25. (**Annex A.25**)

93. If insufficient investment is directed towards these new technologies, they will not become available in sufficient time to achieve the transformation that is necessary to meet the EU's climate targets.

94. Secondly, SAF technology is already even more advanced than zero-emission aircraft:

94.1. Aircraft are already being produced that are capable of functioning using 100% SAF. Using a special permit issued by the UK Civil Aviation Authority, in November 2023, Virgin Atlantic flew a transatlantic flight on 100% SAF from London Heathrow to New York JFK using Rolls-Royce Trent 1000 engines. In 2022, Swedish airline Braathens flew an ATR commercial aircraft from Malmo to Stockholm on 100% SAF.[72] While current ASTM certification rules only allow for a maximum of 50% SAF take-up, these certification rules are evolving at a rapid pace, having recently been updated in November 2023.[73] It is anticipated that 100% SAFs will qualify shortly.[74]

94.2. The ICCT report at p.10 notes that to date, progress has been slow to scale up SAFs, but that accelerated progress is anticipated under proposed mandates, including ReFuelEU, the UK's Jet Zero consultation, and under incentives such as California's Low-Carbon Fuel Standard.[75]

94.3. Recital 9 to ReFuelEU Aviation states that "SAF are technologically ready to play an important role in reducing emissions from air transport already in the very short term."

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[72] See ATR, 26 July 2022, https://www.atr-aircraft.com/a-look-back-at-our-historic-100-saf-flight/#:~:text=On%2021%20June%202022%20at,Aviation%20Fuel%20in%20both%20engines. (**Annex A.26**)

[73] https://www.astm.org/d7566-23a.html is the new standard. This new standard is understood to be an important milestone in certification and will provide a "short reach" to 100% certification (see https://swedishbiofuels.se/news/astm-decision-brings-100-saf-certification-within-reach).

[74] See Energy Res., 24 January 2022 Perspectives on Fully Synthesized Sustainable Aviation Fuels: Direction and Opportunities, https://www.frontiersin.org/articles/10.3389/fenrg.2021.782823/full, which states that: "Stand-alone complete fuels could be qualified within 1–2 years, with blends of blending components to reach 100% synthesized fuels to follow." (**Annex A.27**)

[75] Brandon Graver, Sola Zheng, Dan Rutherford, Jayant Mukhodpadhaya, Erik Pronk (ICCT) 'Vision 2050: Aligning Aviation With The Paris Agreement', June 2022, (footnote 60).

94.4. The ICAO tracker records that there are 289 announced facilities worldwide that will produce 97.1 billion litres per year in the near future.[76]

95. However, sustainable SAF usage needs to be scaled up rapidly and significantly, which again requires significant investment and policy/fiscal support[77]:

95.1. As the Steer Report notes at [5.123], SAF production will need to be "significantly increased beyond the current trajectory" to make a substantial contribution to reducing emissions in the aviation sector. The industry is going to need "extremely large levels of investment" to produce the quantity of SAF required.

95.2. The IEA's net zero pathway for aviation envisages that by 2030 18% of total fuel consumption should be SAF (2% hydrogen, 16% biofuels), and by 2050 that biojet kerosene meets 45% of total fuel consumption in aviation and synthetic hydrogen-based fuels meet about 30%.[78] Critically the IEA's analysis also assumes that air travel growth will be constrained by comprehensive government policies that promote a shift towards high-speed rail and rein in expansion of long-haul business travel.[79] However, the historical evidence and future projections suggest that air travel will grow to 2050 (see above). While the speed of SAF deployment would raise sustainability concerns in particular as regards biofuels, the IEA's analysis does illustrate **a** pathway that would be aligned with the trajectory to net zero.

95.3. A "massive scale-up from current supply levels" of SAF will be required for the sector to align with the 1.5°C pathway, and significant investment is required in the order of US$1 trillion and US$1.4 trillion to 2050.[80]

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76 See https://www.icao.int/environmental-protection/GFAAF/Pages/Production-Facilities.aspx
77 International Energy Agency, 'Aviation' (footnote 57)
78 International Energy Agency's (IEA) Net Zero by 2050 report January 2022 at p.138. (footnote 63)
79 Ibid.
80 Climate Action 100+, Global Sector Strategies: Investor Actions to Align the Aviation Sector with the IEA's 1.5C Decarbonisation Pathway, 2022, p.5. (footnote 65)

95.4. The industry estimates that between 5,000 and 7,000 SAF production plants will be required by 2050 to meet the sector's requirements, but that there were fewer than 20 SAF plants in service worldwide in 2021.[81]

95.5. Recital 47 to ReFuelEU Aviation states that the development and production of SAF "should exponentially increase in the coming years", but that it is important to facilitate investment in SAF.

95.6. The Energy Transitions Commission puts the required investment at $175 billion (annual average), of which 92-96% would go to SAF and the remainder towards zero emission aircraft.[82]

96. While scale up of SAF is required, it is important that this is of truly sustainable SAF, in light of the potentially harmful environmental implications of rapid deployment of biofuels (as opposed to synthetic or e-fuels), including indirect land use change, fraud, deforestation, and increase of animal waste.[83] In particular, studies show that:

96.1. When land needed to produce biofuels is converted from other uses (forest, pasture, shrubland), this leads to reductions in carbon storage by biomass and soils on that land.[84] For example, increased consumption of palm-oil-based fuels drives land use change emissions from deforestation and peat drainage, which likely increases GHG emissions.[85]

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81 Ibid. p.14.

82 Energy Transitions Commissions et al, Making Net Aviation Zero Possible, https://www.energy-transitions.org/publications/making-net-zero-aviation-possible/, see pp. 13 and 24. (**Annex A.28**)

83 See e.g Corporate SAF buyers guide, T&E, October 2023, https://www.transportenvironment.org/wp-content/uploads/2023/11/2023-10-Corporate-SAF-Buyers-guide.pdf at pp.9-10 (**Annex A.29**); Pigs do fly: growing use of animal fats in cars and planes increasingly unsustainable, T&E, May 2023, https://www.transportenvironment.org/wp-content/uploads/2023/05/202304_Animal_fats_briefing_TE.pdf. (**Annex A.30**)

84 Scrutinising the future role of alternative fuels in delivering aviation decarbonisation, Dr Chris Malins and Dr Cato Sandford October 2023, https://www.aef.org.uk/2023/11/16/scrutinising-the-future-role-of-alternative-fuels-in-delivering-aviation-decarbonisation/, p. 7. (**Annex A.31**)

85 ibid. p.10, which states that fuel derived from crop-based feedstocks can result in higher emissions than the fossil fuels they seek to replace.

96.2. Producers of biofuels compete with food markets for agricultural products, and even the production of non-food biofuel feedstocks can compete with food crops for agricultural land.[86]

96.3. Indirect emissions from "waste" materials have also been found to be "significant".[87]

96.4. Europe's use of biofuels is partly reliant on imports of used cooking oils from Asia, which have been subject to documented instances of fraud.[88]

96.5. Biomass derived SAF have a water footprint 100- 1,000 times greater than e-fuels.[89]

96.6. T&E have estimated that the maximum production of truly sustainable and economically viable biofuel in the EU27 can only be 5.8 Mt of oil equivalent in 2030 and beyond.[90] That is minimal compared to the overall air transport energy use in 2050, forecasted at approximately 50 Mt in 2050.[91]

96.7. ReFuelEU excludes food and feed crop and palm oil based biofuels (Corporate SAF buyers guide page 9, cited at footnote 83, **Annex A.37**). However, RefuelEU includes used cooking oil and animal fats which can have displacement effects and are not available in the needed volume to comply with the SAF requirements laid out. Meeting the 15% target in 2030 using these biofuels will have unintended consequences.

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86 ibid. pp. 6-7.

87 Waste not want not, Cerulogy, Dr Chris Malins, August 2017, https://www.cerulogy.com/wp-content/uploads/2020/04/Cerulogy_Waste-not-want-not_August2017-v1_1.pdf at p.4. (**Annex A.32**)

88 Estimating sustainable aviation fuel feedstock availability to meet growing European Union demand, ICCT, March 2021, https://theicct.org/sites/default/files/publications/Sustainable-aviation-fuel-feedstock-eu-mar2021.pdf at p.3. (**Annex A.33**) See also Analysis of the European biofuels market, T&E, December 2023, https://www.transportenvironment.org/discover/80-of-europes-used-cooking-oil-now-imported-raising-concerns-over-fraud-study/ at pp.3-4. (**Annex A.34**)

89 Rojas-Michaga, Maria Fernanda, et al. "Sustainable aviation fuel (SAF) production through power-to-liquid (PtL): A combined techno-economic and life cycle assessment." Energy Conversion and Management 292 (2023): 117427. https://doi.org/10.1016/j.enconman.2023.117427 at p.19. (**Annex A.35**)

90 Advanced renewable fuels in EU Transport, T&E, March 2021 https://www.transportenvironment.org/wp-content/uploads/2021/07/202103_Advanced_renewable_fuels_EU_Transport_Final.pdf at p.13. (**Annex A.36**)

91 see EU Commission Study supporting the impact assessment of the ReFuelEU Aviation initiative 2021 at https://op.europa.eu/en/publication-detail/-/publication/46892bd0-0b95-11ec-adb1-01aa75ed71a1 pp.175-176.

97. In light of significant sustainability issues around biofuels and their limited supply, synthetic (or e-fuels), which can have near zero GHG emissions if produced using renewable energy,[92] are critical to decarbonisation of the aviation sector.[93] However, significant investment is needed, along with supporting policies for further development and eventually deployment at large scale.[94]

97.1. The International Energy Agency very recently highlighted the importance of synthetic fuels for decarbonisation of the sector and the need for policy to drive investments in this area.[95]

97.2. While e-kerosene is not yet available on the market, companies are increasingly seeking to set up production facilities.[96] By 2030, e-kerosene production is projected to reach 1.85 Mt, 3.69% of the EU's jet fuel demand.[97]

97.3. However, scaling e-kerosene faces multiple challenge,[98] and the investment needs of the sector are "colossal".[99] The ICCT has found that without policy support, it is unlikely that, from an economic perspective, airlines will use e-kerosene.[100] Yet, if scaled effectively with policy support, e-kerosene prices can be driven down to become the most competitive SAF on the market by 2050.[101]

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92 Current and future cost of e-kerosene in the United States and Europe, ICCT, March 2022 https://theicct.org/wp-content/uploads/2022/02/fuels-us-europe-current-future-cost-ekerosene-us-europe-mar22.pdf at pp. 9-10. (**Annex A.37**)

93 Rojas-Michaga, Maria Fernanda, et al. "Sustainable aviation fuel (SAF) production through power-to-liquid (PtL): A combined techno-economic and life cycle assessment." at p.20 (footnote 89).

94 Ibid.

95 The Role of E-fuels in Decarbonising Transport, International Energy Agency, December 2023 https://iea.blob.core.windows.net/assets/9e0c82d4-06d2-496b-9542-f184ba803645/TheRoleofE-fuelsinDecarbonisingTransport.pdf pp.7-9. (**Annex A.38**)

96 Corporate SAF buyers guide, T&E, October 2023 at p.14 (footnote 83)

97 Analysis of Green Jet Fuel Production in Europe, T&E, November 2022 https://www.transportenvironment.org/wp-content/uploads/2022/06/220915_E-kerosene-tracker-briefing_SB_2nd-release-4.pdf at p.10. (**Annex A.39**)

98 Current and future cost of e-kerosene in the United States and Europe, ICCT, March 2022, at p.3 (footnote 92).

99 Corporate SAF buyers guide, T&E, October 2023 at p.14 (footnote 83).

100 Current and future cost of e-kerosene in the United States and Europe, ICCT, March 2022, at p.9 (footnote 92)

101 Clean Skies for Tomorrow, World Economic Forum, November 2020, https://www.mckinsey.com/~/media/mckinsey/industries/travel%20transport%20and%20logistics/our%20insights/scaling%20sustainable%20aviation%20fuel%20today%20for%20clean%20skies%20tomorrow/clean-skies-for-tomorrow.pdf, p.34. (**Annex A.40**)

98. Thirdly, the shift from air to rail can play a critical role in the decarbonisation of aviation, but this too requires significant investment:

98.1. The ICCT Report[102] finds that a new or improved high-speed rail systems can compete with air travel over distances up to 1,000 km (p. 14). They are most competitive for trips under 700 or 800 km. The report refers to several studies that have quantified the magnitude of modal shift from air to rail, with the level of air traffic reduction ranging between 7% and 28% (p.14). This modal shift is required: the IEA net zero road map referred to above requires significant behaviour change in the form of constrained growth alongside fuels.

98.2. This conclusion is mirrored in the Commission's own analysis from 2018, which similarly concludes that high speed rail and coaches could replace aircraft for short/medium distances of <1,000km (pp.110-111).[103]

98.3. On 18 April 2023, the Parliament in its position on the implementation of the new ETS rules for aviation, asked the European Commission to submit a report on measures to promote a modal shift towards alternative, more sustainable modes of transport for flights spanning 1,000 km and less.

98.4. Recent studies have even shown the potential of the shift to night trains on distances up to 3,000 km, suggesting that up to 32 % of passengers could switch to night trains if there were an attractive offer, which would reduce emissions from air traffic by 26 %.[104]

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[102] Brandon Graver, Sola Zheng, Dan Rutherford, Jayant Mukhodpadhaya, Erik Pronk (ICCT) 'Vision 2050: Aligning Aviation With The Paris Agreement', June 2022, (footnote 60).

[103] European Commission, 'In-depth Analysis in Support of Commission Communication COM (2018) 773: A Clean Planet for all, A European strategic long-term vision for a prosperous, modern, competitive and climate neutral economy', 28 November 2018.

[104] The Global Warming Reduction Potential of Night-Trains, Back on Track, 15th September 2022, https://back-on-track.eu/the-global-warming-reduction-potential-of-night-trains/. (**Annex A.41**)

The Commission's approach when designing the Aircraft TSCs

99. It has been reported that, from the start, the aviation criteria have been a strongly disputed topic within the Commission.[105]

100. The Commission's reasoning and approach, when adopting the Aircraft TSCs, appears to have been as follows:

101. Steer were appointed by the Commission to develop a methodology for including aviation in the taxonomy, producing a final report in February 2021.[106] This work stated that it followed a "guiding principle" that transition activities should be consistent with the Paris Agreement goals, and that this means consistency with the EGD sustainable mobility targets, that is, a 90% reduction in GHG emissions from the transport sector as a whole by 2050 (see p. iii of the Steer Report). The Steer Report recommended carbon reduction targets but not SAF usage targets.

102. The Platform on Sustainable Finance then recommended TSC to the Commission in Platform's March 2022 Report. The proposed TSC for aircraft are set out in Annex B of the March 2022 Report. Platform's March 2022 Report states at p.512 that transitional activities must be consistent with a 1.5°C pathway, and that "[t]he objective is to contribute to mitigating GHG emissions from the sector before transformative technologies become market ready, ensuring a minimum aggregated emission reduction of 20% in the first decade."

103. There was then a call for feedback on Platform's recommended TSC. In May 2023, the Platform published its response to the call for feedback ("**Platform's 2023 Response**").[107]

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105 See e.g. POLITICO article, DG CLIMA head hits out at aviation's taxonomy inclusion, By Mari Eccles, Mar 14, 2023, 7:05 PM. (**Annex A.42**)

106 European Commission, Directorate-General for Mobility and Transport, Wiener, P., Scott, M., Toro, A. et al., Sustainable finance taxonomy for the aviation sector – Final report, Publications Office, 2021, supra.

107 EU Platform on Sustainable Finance, Response to the Call for feedback on the draft Taxonomy Delegated Acts, 3 May 2023, https://finance.ec.europa.eu/system/files/2023-05/230503-sustainable-finance-platform-response-draft-taxonomy-delegated-acts_en.pdf.

104. The Commission then published a draft of the Delegated Act, together with an Explanatory Memorandum and Staff Working Document ("**SWD**")[108] but no Impact Assessment.[109]

105. The Commission has not followed the recommendations of its expert advisors in two important regards, as we set out in the paragraphs below.

106. First, the Steer Report recommended certain CO_2 standards relative to ICAO's CO_2 standards for 2021, 2027 and 2037 that are more exacting than those adopted by the Commission in the Aircraft TSCs (see Steer Report Table 5.9, p.84). In particular, those selected by the Commission are less demanding in relation to medium and large size aircraft.

107. Second, the Platform 2023's Response stated that the criteria for SAF percentages for passenger and air freight transport should be increased from that proposed in the Platform's March 2022 Report, on the basis that there had been substantial changes in the legal environment relating to SAFs in the intervening 12 months (p. 21):

107.1. On 25 April 2023, Parliament and Council reached agreement on the ReFuelEU Aviation proposal, which on its own is projected to reduce aircraft CO_2 emissions by around two-thirds by 2050 compared to a "no action" scenario.

107.2. On 6 December 2022, Parliament and Council amended the EU ETS' rules on aviation, including those rules that are concerned with the price differential between kerosene and SAF up to 2030.

107.3. On 18 April 2023, Parliament in its position on the implementation of the new ETS rules for aviation, asked the European Commission to submit a report on measures to promote a modal shift towards alternative, more sustainable modes of transport for flights spanning 1,000km and less. This notes that flights of 1,000km and under account for 6-9% of total aviation emissions. The Commission will have to submit a report in 2026 on measures to promote a modal shift towards alternative more

[108] SWD(2023) 239 final 27.6.2023.

[109] The SWD explains at pp.19-20 that the TSC in Annex 1 of the Delegated Act were based on the recommendations of the Platform's March 2022 Report, subject to some changes.

sustainable modes of transport pending the technological breakthroughs and availability of zero-emission aviation fuels and aircrafts.

107.4. In July 2022 Sweden took the ambitious and climate positive step of amending its legislation by implementing a greenhouse gas reduction mandate which will reach 27% in 2030. Suppliers will have to meet this mandate through the use of SAF.

108. The Platform proposed that the European Commission revise its level of ambition to increase the SAF thresholds. The state of the scientific evidence, and available technology, had justified an increased level of ambition. Those increased thresholds were not adopted in the Delegated Act.

109. The Applicants make the following additional observations about the Steer Report, which played a crucial role in the formulation of the carbon efficiency Aircraft TSCs:

110. First, the Steer Report does not base its proposed TSC on net zero pathway modelling. Instead, its proposed TSC are based on an analysis of what "latest generation" aircraft can achieve in performance terms (see Figure 5.6 and [5.90]-[5.99]). As set out in the Report, the appropriate TSC at the present time "can be set for each aircraft category in terms of the required margin to the ICAO new type CO_2 standard as shown in the table below …. As noted above, this margin represents the minimum margin of all latest generation aircraft in that category." [5.99]

111. Second, the recommendations of the Steer Report up to 2027 (the date limit set out within the TSC) largely align with the 2019 ICAO Report's independent expert recommendations for fuel burn goals (see Table 3, p.35). These goals are not stated by the ICAO to be compliant with any kind of net zero pathway, nor are they assessed as reflecting the best technologically and economically feasible standards in the sector; they are simply technical goals for the sector.[110]

TABLE 3: Fuel Burn Goals Expressed as Margin to CO_2 Metric Level

[110] BJ = Business Jets, RJ = Regional Jets, SA = single-aisle aircraft, TA = twin-aisle. EIS = Entry into Service. TRA = Technology Reference Aircraft.

EIS Date	BJ	RJ	SA	TA
*2017 TRA**	-13	-11	-4	-4
2027	-15	-16	-14	-12
2037	-23	-26	-24	-21

112. Indeed, the ICAO Report notes at Table 3 by way of the asterisk that the 2017 numbers are not even "goals" (understandably, as the report was written in 2019), but simply the "technology reference aircraft" in 2017 for each class.

113. What this means is that the Steer Report did not analyse whether the proposed TSC would meet the Article 10(2) standards of:

113.1. Being activities "for which there is no technologically and economically feasible low-carbon alternative" (whether within aviation or otherwise); and

113.2. "[S]upport[ing] the transition to a climate-neutral economy consistent with a pathway to limit the temperature increase to 1.5 C above pre-industrial levels, including by phasing out greenhouse gas emissions."

114. Third, the Steer Report does review a number of emissions' projection reports, which provide varying analyses of the extent to which aviation can feasibly decarbonise (see [5.21]). However, as the Steer Report notes, these analyses "indicate different levels of potential emissions savings against the baseline, depending on which measures are taken into account (and on other assumptions made)" [5.23]. At [5.25]-[5.30], the Steer Report then sets out some of the different reports' pathway scenarios, but does not conclude that any particular pathway is compatible with the requirements in Article 10(2). All the Steer Report is able to conclude in respect of these various analyses is set out at [5.31], namely that the technical measures to achieve significant decarbonisation of the aviation industry over the period to 2050 must include a range of efficiency measures and improvements.

115. The Steer Report then states, without demonstrating that this conclusion has been reached on the basis of conclusive scientific evidence, that [5.34]:

> "Nevertheless, financial investments which are consistent with following pathways towards major reductions in aircraft emissions can be included in the EU Taxonomy, so long as the principle of following the "leading edge" of available improvements is applied. This follows, given that this leading edge is believed by credible commentators (including Airbus and the proposed European Partnership for Clean Aviation) to be, or to be able with suitable complementary policy interventions to become, compatible with the European Green Deal and Paris Agreement based on the pathway set out above".

116. In short, the Steer Report does not propose exacting TSC based on a credible modelled net zero pathway. Instead, it simply reads over an analysis of what "latest generation" aircraft can already achieve in performance terms to targets up until 2027.

117. However, the standards adopted in section 3.21(b) and (c) of the Delegated Act are even less stringent than those that both the Steer Report and the ICAO Report set out.

118. It is also of note that the ICAO standards which the TSC use as a reference point are not particularly ambitious, requiring an average of just 4% reduction in cruise fuel consumption compared to 2015 aircraft deliveries in 2028.[111] The most advanced new aircraft are already ahead of the ICAO standards by 10 to 20%.[112] The average new aircraft delivered in 2016 already met ICAO's 2028 standard, and in 2019, the average new aircraft delivered exceeded the standard by a significant margin of 6%.[113]

119. Indeed, analysis by T&E of Airbus' public order books and an estimated compliance list provided by the European Union Aviation Safety Agency ("**EASA**"), shows[114] that 90.4% to

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[111] International Council on Clean Transportation, 'International Civil Aviation Organization's Co2 standard For New Aircraft', 2017, https://theicct.org/sites/default/files/publications/ICCT-ICAO_policy-update_revised_jan2017.pdf. (**Annex A.43**)

[112] International Council on Clean Transportation, 'Proposed EPA Co2 Standard Lags New Aircraft Fuel Efficiency By More Than A Decade', 2020, https://theicct.org/proposed-epa-co2-standard-lags-new-aircraft-fuel-efficiency-by-more-than-a-decade/. (**Annex A.44**)

[113] Xinyi Sola Zheng, Dan Rutherford, PhD. (ICCT) 'Fuel burn of new commercial jet aircraft: 1960 to 2019', September 2020 at p.vi International Council on Clean Transportation, 'Proposed EPA Co2 Standard Lags New Aircraft Fuel Efficiency By More Than A Decade', 2020. (footnote 52)

[114] T&E analysis of EU taxonomy criteria for aviation (February 2023) https://www.transportenvironment.org/wp-content/uploads/2023/02/TE-analysis-aviation-taxonomy-February-2023-2.pdf (**Annex A.45**)

99.7% of Airbus pending aircraft orders as of 31st January 2023 would already be considered "best-in-class" under the Delegated Act TSC, assuming they will be delivered before 2032. At 2019 rates (863 deliveries/year), Airbus could deliver its 7,255 orders in 8 years and a half.

120. In short, there is clear evidence that marginal reductions in carbon efficiency of the levels proposed by Steer or set out within the final TSC will not give rise to decarbonisation outcomes that are consistent with the Paris Agreement and the EGD. As set out above, historically significant fuel efficiency improvements have failed to outpace fleet growth and have corresponded with growing overall emissions for the sector. The Commission's Sustainable and Smart Mobility Strategy notes that EU international emissions from navigation and aviation have grown by more than 50% since 1990 (see §20). However, as set out in the EGD, to achieve carbon neutrality by 2050 a 90% reduction in transport emissions is needed by 2050. The Applicants estimate that this requires a 3% yearly reduction in aviation emissions.[115]

121. The Applicants also make the following comments about the formulation of the proposed TSC for SAF:

121.1. The Steer Report does not propose TSC for SAF. However, Platform's March 2022 Report proposed: (a) for manufacturing, that aircraft should not be required to be able to uptake 100% SAF before 2028 (see p.517); and (b) for aircraft operating, a minimum of 10% of SAF by 2030 increased by 2 percentage points annually thereafter, or alternatively a minimum of 5% SAF in 2022, with the percentage of SAF increasing by 2 percentage points annually thereafter (see pp. 523-524).

121.2. The date by which the Platform proposed that aircraft should be required to uptake 100% SAF (i.e. 2028), while some four years earlier than the final date of 2032 chosen in section 3.21 of the Delegated Act, was not itself based on any net zero pathway modelling. All that is said in the Platform's March 2022 Report at p.515 is that the

[115] Using the data of the European Aviation Environmental Report 2022, https://www.easa.europa.eu/eco/sites/default/files/2023-02/230217_EASA%20EAER%202022.pdf, see chart at p.9:
- Emissions in 1990 were 70 MtCO2
- Emissions in 2019 (the starting date of the Green Deal) are 147 MtCO2
- Emissions in 2050 need to be -90% vs 1990: 9 MtCO2
- Linear reduction rate = (7 - 147) / (2050 - 2019) = - 4.5 Mt
- Express as a % of 2019 = 4.5 / 147 = 3.07%.

requirement "is aimed at giving the assets included in the transition activity a long-term decarbonisation perspective, as most aircraft have a lifetime going above 20 years."

121.3. Similarly, the minimum SAF % requirements were not based on any net zero pathway modelling. All that is said in the Platform's March 2022 Report at p.515 is that a progressive increase in the use of SAF was "set as a pathway to stimulate further CO2 emissions reductions," and that the percentages are set above any mandatory blending requirements that could be introduced by the EU during the coming years.

122. Following feedback from multiple parties indicating that the TSC on SAF were inadequate, the Commission updated the requirement for 2030 to 15%. However, there is no evidence that the final choice of 15% itself was based on any net zero pathway modelling or is consistent with the other requirements in Article 10(2).

Shipping

The Contribution of the Shipping Sector to Global GHG Emissions

123. The shipping sector is responsible for a significant quantity of GHG emissions: in 2018, global shipping emissions constituted 2.9% of total anthropogenic CO_2 emissions.[116] Further, there is clear evidence that the levels of GHG emissions from shipping are increasing. For example, the IMO's Fourth GHG Study (2020) estimated that emissions from shipping are projected to increase from approximately 90% of 2008 emissions in 2018 to 90-130% of 2008 emissions by 2050.[117]

124. More generally, in the context of shipping, the IPCC has commented that "the growth of global transport demand could pose a significant challenge to the achievement of potential emission reduction goals"[118], in part because "demand growth… is very likely to be stronger

[116] Lindstad et al., "Decarbonising Maritime Transport" Sustainability 2020, 12(21), 8793; European Commission, "Reducing emissions from the shipping sector" https://climate.ec.europa.eu/eu-action/transport/reducing-emissions-shipping-sector_en [Online, accessed 05/12/23].

[117] IMO, "Fourth Greenhouse Gas Study 2020" (https://www.imo.org/en/OurWork/Environment/Pages/Fourth-IMO-Greenhouse-Gas-Study-2020.aspx) [Online, accessed 05/12/13]. (**Annex A.46**)

[118] European Parliament's Committee on Environment, Public Health and Food Safety, https://www.europarl.europa.eu/RegData/etudes/STUD/2015/569964/IPOL_STU(2015)569964_EN.pdf at p.10.

than efficiency improvements in [this] sector[].”[119] The European Parliament’s Committee on Environment, Public Health and Food Safety has also noted that this trend of increasing emissions from shipping “risks undermining the efforts that are being made in order to stay on a trajectory that will keep the average global temperate increase below 2°C compared to pre-industrial levels.”[120] In light of this, in July 2023, the IMO revised its initial GHG emissions reduction target to a goal of net zero emissions “by or around, i.e., close to, 2050.”[121]

125. However, it should be noted that the IMO’s new 2050 target is not aligned with the Paris Agreement.[122] Specifically, the IMO’s net zero strategy will “not cut shipping emissions quickly enough to align the industry’s pollution with the Paris Agreement’s stretch goal to limit global warming to 1.5°C.”[123] This demonstrates that it is not appropriate for the Commission to uncritically rely on IMO-designed targets.

The Commission’s Approach to the TSC for Shipping

126. The Commission’s SWD states that adjusted post-2025 criteria for inland, maritime freight and passenger transport are required. Specifically, that the Shipping TSC requires adapting to “technical and economic feasibility but also to developments in the international ship energy efficiency and EU Fit for 55/FuelEU Maritime frameworks.”[124] Regarding maritime transport (including Section 6.10 and 6.11), the SWD makes three statements about the amendments to the TSC in the Delegated Act:

126.1. The EEDI will increase stringency with ‘Phase 3’ criteria as of 1st January 2025[125], and it is important to ensure that criteria in the 2021 Delegated Act remain relevant and fit-for-purpose;

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119 Ibid.

120 Ibid, p.17.

121 European Commission, “Reducing emissions from the shipping sector” [Online, accessed 05/12/23]. N.B. This is a significant increase in the level of ambition compared to the prior strategy, which aimed to reducing emissions from ships by just 50% in the same time period.

122 Wittels, J., “Shipping Regulator Falls Short of 1.5C-Aligned Climate Goals” (Bloomberg, 2023). Available at https://www.bloomberg.com/news/articles/2023-07-07/shipping-regulator-falls-short-of-1-5c-aligned-climate-targets?leadSource=uverify%20wall. (**Annex A.47**)

123 Ibid.

124 SWD (2023) 239 final 27.6.2023, p.72.

125 N.B. Phase 3 of the EEDI was brought forward to April 2022 (this is reflected in the Delegated Act). See IMO, Marine Environment Protection Committee 75, 16-20 November, available at:

126.2. Incorporating the EEXI (which entered into force on 1 January 2023) into the criteria for the purposes of investment in purchase or leasing ships is important;

126.3. With a view to adapt the technical screening criteria to the Fit for 55/FuelEU Maritime developments, an additional criterion for the greenhouse gas intensity for the energy used on-board is introduced.[126]

127. In simple terms, the Shipping TSCs include four additional activities within the taxonomy. Those additional TSCs provide two further options that will be treated as transitional activities (and thus qualify as substantially contributing to climate change mitigation under Article 10(2)):

127.1. Overachieve by 20 percentage points the reduction rates applicable for the IMO's Phase 3 EEDI targets applicable from 1 April 2022 (Section 6.10(e) and Section 6.11(d)) ("**Activity 1**");

127.2. Demonstrate a low GHG intensity per unit of energy use and minimum energy efficiency performance (Section 6.10(f) and Section 6.11(e)) ("**Activity 2**").

128. There is no conclusive scientific evidence, of which the Applicants are aware, to support the conclusion that Activity 1 will make a substantial contribution to climate change mitigation. Indeed, the opposite may well be true. Specifically, the Applicants are concerned that Activity 1 will promote the use of, and investment into, Liquefied Natural Gas ("**LNG**") powered vessels. This is because the EEDI standard will allow (i) some existing LNG-powered vessels to become 'sustainable' for the purposes of the taxonomy, and (ii) shipbuilders to retrofit LNG propulsion systems to diesel or heavy fuel oil ("**HFO**") powered vessels, making them taxonomy-compliant. The Applicants make no submissions about Activity 2.

The Increasing Use of LNG-Powered Vessels

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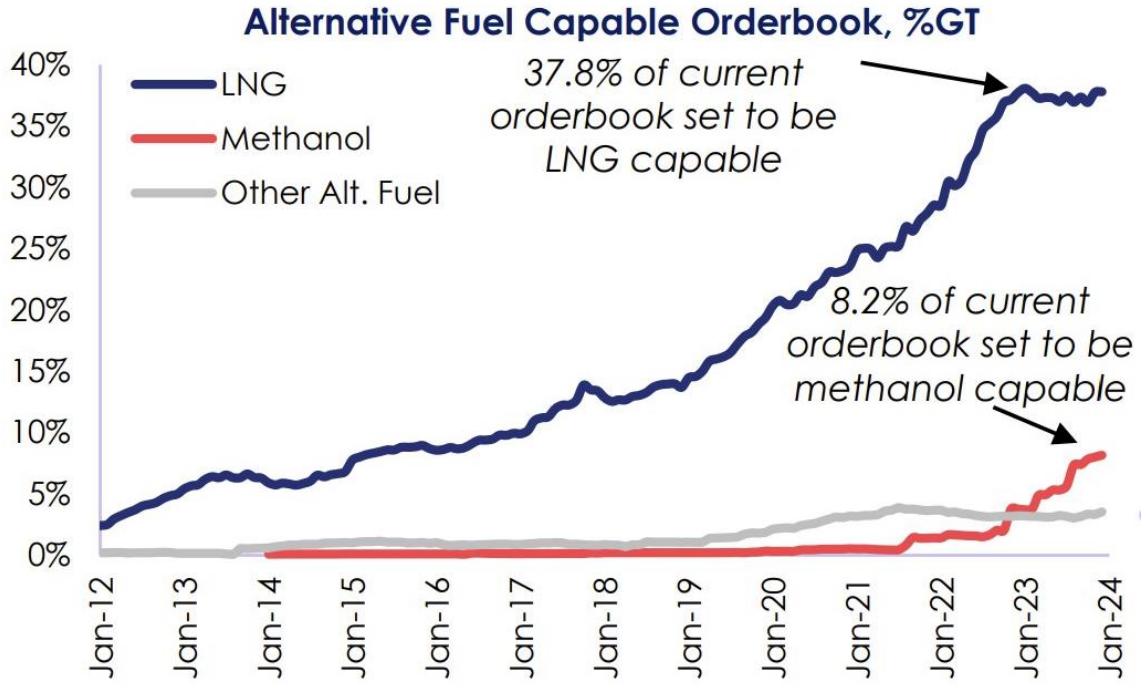
https://www.imo.org/en/MediaCentre/MeetingSummaries/Pages/MEPC-75th-session.aspx; (**Annex A.48**) Bureau Veritas, "Updated IMO Amendments" (2021), available at: https://marine-offshore.bureauveritas.com/updated-imo-amendments-bring-sustainability-forefront#:~:text=The%20latest%20milestone%20for%20the%20EEDI%20was%20agreed,April%201%2C%202022%2C%20for%20certain%20type%20of%20vessels. (**Annex A.49**)

126 Ibid.

129. Currently, a significant proportion of large container and cruise ships are designed to run on LNG, as it has a lower carbon content than diesel and HFO fuel.[127] Moreover, there is evidence that the number of vessels being designed to run on LNG is increasing. For example, the graph below illustrates that the number of LNG-capable vessels on Clarksons' alternative fuel capable order book has increased from around 2.5% in January 2012 to 37.8% in January 2024:[128]



130. This increasing reliance on LNG-powered vessels is especially concerning in respect to cruise ships[129] as these are powered with four-stroke low pressure dual-fuel engines, which is the engine type with the highest methane slippage (3.1% of the mass of the fuel used by the engine according the FuelEU Maritime Regulation, or 3.5% according to the IMO's Fourth Greenhouse Gas Study 2020).[130]

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127 Englert et al (2021), "The Role of LNG in the Transition Toward Low- and Zero-Carbon Shipping" (The World Bank, 2021), Executive Summary. (**Annex A.50**)

128 Clarksons Research, "Tracing 'Green' Technology Uptake" (2024), p.3. (**Annex A.51**)

129 Clarksons World Fleet Register Database: "*Out of the 25 LNG dual fuel cruise ships in the orderbooks today, 15 are to be equipped with a four-stroke low pressure engines (the other ones are unknown).*" https://www.clarksons.net/wfr/

130 Regulation (EU) 2023/1805 of the European Parliament and of the Council of 13 September 2023 on the use of renewable and low-carbon fuels in maritime transport, and amending Directive 2009/16/EC OJ L 234,

LNG's Contribution to GHG Emissions

131. The Applicants are concerned by the Commission's evident failure to take into account the substantial body of scientific evidence highlighting the potential risks of relying on LNG to reduce GHG emissions.[131]

132. These risks stem from the fact that LNG is effectively liquefied methane (a highly potent GHG with a global warming potential up to 83 times more powerful than CO_2 over a 20-year period and up to 30 times more powerful over a 100-year period).[132] Despite methane having a shorter lifetime compared to CO_2, it is more efficient at trapping radiation, thus leading to a significantly more potent warming effect (especially in the short-term).[133] The need to rapidly reduce global methane emissions in order to remain within the 1.5°C temperature limit due to the significant shorter-term impacts of methane emissions has been recognised by the IPCC, whose modelling suggests that limiting warming to 1.5°C requires global methane emissions to be reduced by "34 [21-57]% by 2030 relative to 2019."[134] This has also been recognised by the EU and other participants in the "Global Methane Pledge", which aims to achieve methane emissions reductions of at least 30% between 2020 and 2030.[135]

LNG's Lifecycle Emissions

133. The use of LNG is associated with high supply chain GHG emissions, driven by methane leaking into the atmosphere throughout extraction, processing and transport of the fuel, as well as the emission of unburned methane at the point of combustion (referred to as "methane slippage").[136] For example, there is evidence that the levels methane slippage occurring during the liquefaction stage of processing LNG and LNG carrier transport may be significant.[137]

22.9.2023, p3 48-100 Annex II, Column 9; The IMO methane slip is not indicated as a percentage of the fuel used by the engine, but as grams of methane/kWh. See Fourth IMO Greenhouse gas study 2020, p.76.

131 Amir Sharafian, Paul Blomerus and Walter Mérida, 'Natural gas as a ship fuel: Assessment of greenhouse gas and air pollutant reduction potential' (2019) 131 Energy Policy 332. (**Annex A.52**)

132 IPCC (2021). Climate Change 2021: The Physical Science Basis [online] Available at: https://report.ipcc.ch/ar6/wg1/IPCC_AR6_WGI_FullReport.pdf [Accessed 31 Aug. 23]

133 Global Methane Pledge, "The Imperative for Methane Action" [online] Available at: https://www.globalmethanepledge.org/imperative-methane-action [Accessed 8 Jan. 24]. (**Annex A.53**)

134 IPCC (2023). *Climate Change 2023. Synthesis Report – Summary for Policymakers*, p.21. (**Annex A.54**)

135 Global Methane Pledge, available at https://www.globalmethanepledge.org/ [Accessed 31 Aug. 23]. N.B. There are currently 155 country participants to the Global Methane Pledge.

136 Englert et al (2021), "The Role of LNG in the Transition Toward Low- and Zero-Carbon Shipping" (The World Bank, 2021), Executive Summary (footnote 127)

137 Carbon Limits AS, "Methane Emissions from LNG" (2021), p.53. (**Annex A.55**)

Furthermore, a study by the ICCT found that when upstream emissions from the international transportation of LNG are considered, the GHG emissions associated with LNG are 20% higher than HFO.[138]

134. There is substantial evidence indicating that both the Commission and the IMO have underestimated the level of methane slippage in LNG-powered vessels. For example, Balcombe et al's (2022) study of the CO_2 and CH_4 emissions from an LNG carrier operating under real-life conditions across a journey between the USA and Belgium found that the four-stroke low pressure engine let out an average methane slip of 8% (notably, this engine is popular for LNG-powered cruise ships and auxiliary engines on containerships).[139] Critically, this is significantly higher than the IMO and EU's CH_4 assumption value for this type of engine of 3.5% and 3.1% respectively.[140] This figure is particularly concerning given Gordon et al's (2023) study of the net life-cycle GHG emission intensities that found that "global gas systems that leak over 4.7% of their methane (when considering a 20-year timeframe)… are on par life-cycle emissions from methane leaking coal mines."[141] Similarly, Grönholm et al's (2021) study of eight LNG-powered vessels indicates that LNG-powered vessels equipped with a four-stroke low-pressure dual-fuel engine have the "potential for increased climatic impacts compared with using traditional marine fuels."[142]

135. Various studies also suggest that using LNG can result in higher life-cycle GHG emissions than other more conventional marine fuels.[143] For example, a 2020 study focusing on the use of LNG in cruise ships, observed that the use of LNG increases GHG emissions by 35-53% compared to conventional diesel fuels over a 20 year period, and by 2-10% over a 100-year

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138 ICCT, "Working Paper: The Climate Implications of Using LNG as a Marine Fuel", p.27. (**Annex A.56**)

139 Balcombe et al., "Total Methane and CO2 Emissions from Liquefied Natural Gas Carrier Ships: The First Primary Measurements". (**Annex A.57**)

140 Regulation (EU) 2023/1805 of the European Parliament and of the Council of 13 September 2023 on the use of renewable and low-carbon fuels in maritime transport, and amending Directive 2009/16/EC OJ L 234, 22.9.2023, p3 48-100 Annex II, Column 9; The IMO methane slip is not indicated as a percentage of the fuel used by the engine, but as grams of methane/kWh. See Fourth IMO Greenhouse gas study 2020, p.76.

141 Gordan et al., "Evaluating Net Life-cycle Greenhouse Gas Emissions Intensities from Gas and Coal at Varying Methane Leakage Rates" (2023), p.1. (**Annex A.58**)

142 Grönholm et al., "Evaluation of Methane Emissions Originating from LNG Ships Based on the Measurements at a Remote Marine Station", p. 13677. (**Annex A.59**)

143 Comer, B., and Sathiamoorthy, B., "*How Updating IMO Regulations can Promote Lower Greenhouse Gas Emissions from Ships*" (2022, International Council on Clean Transportation), p.2. (**Annex A.60**)

period.[144] Furthermore the World Bank's 2021 study on the use of LNG as a transitional fuel concluded that LNG's role in shipping decarbonisation was likely limited and warned "there are significant risks that speak against LNG as a transitional fuel."[145] In addition, Pavlenko et al (2022) conducted a comparative analysis of lifecycle GHG emissions of LNG, marine gas oil, very low sulphur fuel oil, and heavy fuel oil when used in engines suitable for international shipping (including cruises).[146] The study found that when methane slip is excluded from the analysis of lifecycle emissions, using LNG in dual-fuel engines generates lifecycle emissions savings of between 16% and 21% relative to marine gas oil.[147] However, when methane slippage is included in the analysis, these emissions savings "erode or disappear."[148] Moreover, specific LNG-powered vessels (the LPDF medium-speed, four-stroke engine that is popular with cruise ships) were found to have higher life-cycle GHG emissions when using LNG compared to conventional marine fuels.[149]

The Variability of Methane Slippage According to Engine Type and Load

136. There is also evidence that the levels of methane slippage associated with LNG varies according to engine type and load.[150] In general, it has been found that lower engine loads tend to increase the level of methane slippage.[151] This demonstrates that different engine loads will require different mitigation strategies to ensure methane slippage is reduced adequately across engine types.

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144 Lindstad and A Rialland, "*LNG and Cruise Ships, an Easy Way to Fulfil Regulations – Versus the Need for Reducing GHG Emissions*" (2020) 12(5) Sustainability, 2080. https://doi. org/10.3390/su12052080. (**Annex A.61**)

145 Englert et al (2021), "*The Role of LNG in the Transition Toward Low- and Zero-Carbon Shipping*" (The World Bank, 2021), Executive Summary, p.4; (footnote 127) N. Pavlenko (2020). *The Climate Implications of Using LNG as a Marine Fuel* [ICCT] Available at: https://theicct.org/wp-content/uploads/2021/06/LNG-as-marine-fuel-working-paper-02_FINAL_20200416.pdf [Accessed 31 Aug. 23]. (footnote 138)

146 Ibid. [Pavlenko et al.]

147 Ibid., p.11.

148 Ibid.

149 Ibid., p.17.

150 Rochussen et al., "Development and Demonstration of Strategies for GHG and Methane Slip Reduction from Dual-Fuel Natural Gas Coastal Vessels" (2023), p.1; Kuittinen et al., "Methane Slip Emissions from LNG Vessels – Review" (2023), p.1. (**Annex A.62**)

151 Kuittinen et al., "Methane Slip Emissions from LNG Vessels – Review" (2023), p.9: "*Increasing methane slip at low engine loads is visible in Figures 6-8*" (see diagrams on pp.8-9). (**Annex A.63**)

GROUND OF REQUEST 1: LACK OF COMPETENCE, AIRCRAFT

137. Each of the requirements of Article 19(1) is mandatory: the Commission "shall…" secure all the requirements (the list concludes with the word "and"). However, in adopting the Delegated Act, the Commission failed to take account of multiple of these cumulative mandatory requirements. It fell into, at least, the errors set out below.

Lack of Competence 1: Failure to base the new TSC on conclusive scientific evidence.

138. In breach of Article 19(1)(f), the aircraft TSC do not even purport to have been based on conclusive scientific evidence. This is a condition precedent of the Commission exercising its powers. As a result, the Commission has acted without competence in adopting these measures. The Applicants make this submission for four reasons.

139. First, the Commission has not produced any formal assessment summarising the scientific evidence that underpinned the Aircraft TSCs in relation to:

139.1. the carbon emissions reductions through aircraft efficiency measures that are necessary for aviation to be consistent with the a 1.5^{o} C pathway;

139.2. the percentage of SAF that is necessary for aviation to be consistent with a 1.5^{o} C pathway;

139.3. the dates by which these criteria should be met;

139.4. whether the replacement ratio will be effective in reducing sector-wide emissions; or

139.5. the total climate impact of aviation including non-CO2 impacts.

140. There is no reference to any scientific evidence in the Explanatory Memorandum, which simply states on p.6 that the draft Delegated Act is supported by "an analytical Staff Working Document that: …. (ii) explains the approach taken for the definition of the specific technical screening criteria…; (iv) summarises the expected benefits and costs of this initiative, including in particular administrative costs….."

141. The Explanatory Memorandum goes on to explain[152] that the Commission carried out an "assessment of impacts" of the Delegated Act, but that this did not include any formal impact assessment [3].[153] It states that this is because the Delegated Act follows previous policy choices already made in the 2021 Delegated Act. The Applicants understand this to mean that the "conclusive scientific evidence" relied on is the evidence that informed the policy choices of the Commission in 2021; in any event, no other evidence has been specified.

142. The Applicants are not aware of any scientific analysis, gathered or analysed in the course of making the 2021 Delegated Act that established to the requisite standard that those specific activities would make a substantial contribution to climate change mitigation. To the extent that the Commission relied on scientific research and information gathered prior to making the 2021 Delegated Act, that is clearly not sufficient. The state of scientific research, knowledge and innovation in this field is such that this evidence would have been out-of-date at the time of making the Delegated Act.

143. This error of approach is also evident from the SWD. It explains that the TSC in Annex 1 of the Delegated Act were based originally on the recommendations of the Platform's March 2022 Report (pp. 19-22). The Platform's March 2022 Report states at p.6 that the recommendations contained within it have been developed over 15 months and with "substantial consultation and scientific and technical input". However, there is no further information about the scientific evidence relied on and no statement that the scientific input was conclusive or, more importantly, that this threshold was even applied to the scientific evidence under consideration.

144. Second, the SWD describes the approach adopted in a manner that makes clear the wrong test was applied. It states that the headline ambition level for each environmental objective followed the "principles enshrined in the Taxonomy Regulation", namely that they: (i) are "science-based"; (ii) based on international agreements that the EU supports; and (iii) reflect the EU's leadership (p.40). As to this:

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152 C(2023) 3850 final 27.6.2023.

153 See also C-482/17 *Grand Chamber Czech Republic v European Parliament* ECLI:EU:C:2019:1035 at §§84-85 which provides that the preparation of impact assessments is a step in the legislative process that, as a rule, must take place if a legislative initiative is liable to have significant economic, environmental or social implications.

144.1. The Taxonomy Regulation does not provide that the TSC should be "science based." Rather it imposes the considerably more exacting threshold that they must be based on "conclusive scientific evidence."

144.2. Nor does it provide that TSC should be based on international agreements. There is no presumption within the Taxonomy Regulation that international agreements will be sufficiently exacting to meet the stringent requirements of the Taxonomy Regulation. The TSC must meet the exacting standards set down by the legislature. International agreements, nor the standards set by international organisations, should not be presumed to meet those thresholds.

144.3. The Applicants do not understand how the EU's leadership is a relevant reference point at all: the only reference points are those imposed by the legislature on the Commission, as described above. It is perfectly possible that the EU could adopt TSC that are world-leading and still do not comply with the requirements of the Taxonomy Regulation.

145. Third, to the extent that the "scientific" foundation for the Aircraft TSC is the Steer Report, that report proposed more stringent carbon reduction targets than the Aircraft TSC (see above). The Report did not propose any TSCs in relation to SAF target percentages.

146. Furthermore, the Steer Report did not contain modelling, based on conclusive scientific evidence, that the proposed carbon reductions were compatible with a net zero pathway. Instead, as set out above, the Steer Report simply "read across" its analysis of current "latest generation" technology to suggest TSCs up until 2027. It does not contain analysis that suggests these targets will enable the aviation sector to be on track to reach net zero.

147. Fourth, for completeness, to the extent that the Commission suggests that it made the Aircraft TSC in the light of an absence of evidence and/or reliable data, that does not provide a basis for the Commission to sidestep the obligations set out in the Taxonomy Regulation. The Commission can either make TSC on the basis of conclusive scientific evidence, (as required by the legislature) or accept that there is insufficient evidence on which to make TSC.

Lack of Competence 2: Failure to provide measurable threshold for the replacement ratio

148. In breach of Article 19(1)(c) and Article 19(1)(k) of the Taxonomy Regulation, the "replacement ratio" in sections 3.21, 6.18 and 6.19 of the Delegated Act does not contain a quantitative threshold (although that would have been possible) and is not "easy to use" and set in a manner that facilitates verification of compliance.

149. Section 3.21 of the Delegated Act provides that the replacement ratio shall be calculated based on the proportion of aircraft permanently withdrawn from use to aircraft delivered at the global level averaged over the preceding 10 years as evidenced by verified data available from independent providers.

150. The Commission has not published a replacement ratio, although the SWD had noted that it might do so "to facilitate disclosures" and "to ensure consistency and comparability of data" (p. 76). It is therefore for individual entities to calculate the replacement ratio. However, the TSC do not specify the methodology of calculation, nor what organisation will undertake such calculations. Such a ratio will also be difficult to calculate given the scope ("global fleet averaged over the preceding 10 years").

151. The SWD suggested that each entity's calculations "should be supported by the explanation of the methodology applied and the data source", seemingly a recognition of the potential for inconsistency and inaccuracy (p. 76). However, this suggestion has not carried through to the text of the Delegated Act itself. During the hearing on the Delegated Act which took place in the European Parliament Transport Committee on June 19th 2023, the Commission stated that the replacement ratio would be calculated by service providers such as Cirium, but failed to provide any more information.[154] This suggests the Commission is still unclear on the data behind the ratio, and that it did not make any calculations about the emissions it would save.

152. In addition, the approach to the replacement ratio in sections 6.18 and 6.19 of the Delegated Act is that for a new aircraft in the fleet to be labelled Taxonomy-compliant, there must simply be a "commitment" that another non-compliant aircraft in the fleet is permanently withdrawn

[154] https://multimedia.europarl.europa.eu/en/webstreaming/tran-committee-meeting_20230719-1000-COMMITTEE-TRAN at 11:15:19 and 11:14:20.

from use or permanently withdrawn from the fleet, subject to certain criteria including the replacement ratio. It is not clear how a "commitment" could be enforced or binding under the Delegated Act; what if the airline changes its mind after making the commitment and securing a Taxonomy-compliant label?

153. In short, the replacement ratio fails to provide a quantitative threshold, is not "easy to use", and is not set in a manner that facilitates verification of compliance. Therefore, the Commission has not complied with mandatory criteria and exceeded its delegated competence.

Lack of Competence 3: Failure to address life cycle

154. Article 19(1)(g) provides that any TSC shall "take into account the life cycle, including evidence from existing life-cycle assessments, by considering both the environmental activity itself and the environmental impact of the products and services provided by that economic activity, in particular by considering the production, use and end of life of those products and services."

155. The Applicants are not aware of any evidence that the Commission took this mandatory criterion into account when making the Aircraft TSC. Indeed, it is implausible that it did so, in light of the important life cycle considerations that have been left out. These include questions about the life cycle impacts of unsustainable biofuels, and the long asset lives of airplanes themselves. The factors that should have been taken into account include the life cycle of the aircraft manufactured and leased pursuant to the TSC.

156. This was not an optional consideration, to which the Commission could have regard should it wish to do so. By failing to have regard to this consideration, the Commission acted outside its competence.

Lack of Competence 4: Failure to take into account the potential market impact of the transition to a more sustainable economy, including the risk of stranded assets

157. Article 19(1)(i) provides that, in establishing the TSC, the Commission shall "take into account the potential market impact of the transition to a more sustainable economy, including the risk of certain assets becoming stranded as a result of such a transition…"

158. As set out above:

158.1. The investment cycle in aircraft is unusually long: around 30 years.

158.2. Zero emissions aircraft are expected to enter the market within a decade, and aircraft capable of operating using proportions of SAF far greater than the TSC propose, are already available.

159. Given the above, the risk that the Aircraft TSC might give rise to stranded assets is very considerable. There is a very considerable risk that the Aviation TSC might send market signals that drive investments towards activities and investments that are environmentally obsolete at or immediately after the time that they are made.

160. Article 10(2) reiterates the importance of these considerations, when making TSCs in relation to transitional activities. They must not: "hamper the development and deployment of low-carbon alternatives" or "lead to a lock-in of carbon-intensive assets, considering the economic lifetime of those assets." In the absence of conclusive scientific evidence that the Aircraft TSC do not give rise to these effects, the Commission lacked competence to adopt the measure under review.

GROUND OF REQUEST 2: MANIFEST ERRORS OF ASSESSMENT, AIRCRAFT

Manifest Error 1: Diversion of investments and lock-in of carbon intensive assets

161. Per Article 10(2), an activity can only qualify as a transitional activity where, amongst other things, it does not hamper the development and deployment of low-carbon alternatives and does not lead to a lock-in of carbon-intensive assets, considering the economic lifetime of those assets.

162. To the extent that the Commission considered these matters at all, it erred in concluding that the Aircraft TSC satisfied them, to the necessary standard. This is because the Aircraft TSC will divert investment from the technologies necessary to reach net zero and instead towards carbon-intensive aircraft that will then be "locked-in" for decades to come.

163. As set out in detail above, zero-emission aircraft will be ready to enter the market next decade, albeit requiring a significant boost in investment to be deployed at scale. Furthermore, aircraft are today able and permitted to fly using up to 50% SAF, with test flights showing it is already technologically feasible for commercial passenger planes to uptake and fly with 100% SAF. The critical challenge in relation to SAF is the investment boost that is needed to accelerate SAF production.

164. The March 2023 SEO report concludes that by 2050 €441 billion is required for alternative fuel, €100 billion for R&D for future aircraft, and €80 billion for fleet renewal.[155] Other reports estimate even higher figures. The Steer Report also concludes that both zero-emission and SAF technologies are critical in the transition to net zero [5.31]. However, the Aircraft TSC will divert investment away from these critical net zero technologies towards carbon-intensive assets with long life cycles, failing to correspond to the best performance of the industry as required by Article 10(2) of the Taxonomy Regulation:

164.1. The Aircraft TSCs will stimulate the manufacture of a generation of aircraft that will exist long after zero-emission aircraft are established on the market (given the 20-30 year life of these aircraft). This was a risk identified in the Steer Report the long lifetime of aircraft "leads to concerns about locking-in of carbon assets" [5.19]. Aircraft meeting the TSC established under section 3.21(b) will still be operating in the 2050s, despite being mostly reliant on fossil fuels to operate and not being required to be able to uptake anywhere close to 100% SAF. Therefore, long after zero-emission aircraft are available, the Aircraft TSCs will continue to have an effect as a result of the fact that they drove investment towards carbon-intensive technology. The TSC will encourage operators to continue to order older-style planes from the manufacturers, driving further investment into those older planes (long after the activity of manufacturing them no longer gets a green label).

164.2. The risk of lock-in is compounded because the emissions thresholds set out in section 3.21(b), as they apply to aircraft leasing (section 6.18) and purchasing,

[155] SEO The Price of Net Zero: Aviation Investments Towards Destination 2050, https://www.seo.nl/wp-content/uploads/2023/03/2023-17-The-price-of-net-zero.pdf, Executive Summary at p.1. (footnote 65)

financing and operation of aircraft (section 6.19) have no end point. The alternative option under 6.19(e), that the activity can be taxonomy compliant without meeting the requirements in 3.21(b) at all, so long as it meets certain SAF requirements, also has no end point.

165. While what counts as "best-in-class" changes rapidly, the TSC makes today's best-in-class aircraft compliant until at least 2032 (s. 3.21, point (c)). This poses a significant issue of carbon lock-in and creates the risk that the TSC do not appropriately reflect the technological change of the sector. The TSC should mirror the rapid pace of technological advancements and increase in stringency in parallel. This is essential to guarantee that aircraft remain effectively best-in-class over time.

166. In summary, the Commission fell into manifest error because the Aircraft TSCs:

166.1. Do not identify activities for which there is no technologically or economically feasible low-carbon alternative: such alternatives are already available in relation to SAF.

166.2. Where those alternatives are not available in full yet (zero emission aircraft), the Aircraft TSCs will lock-in the construction and sale of high-carbon aircraft. They will also generate stranded assets.

166.3. The Aircraft TSCs will divert investment away from activities that are consistent with a pathway to limit the temperature increase to 1.5°C. The activities certified as sustainable are not consistent with that pathway.

Manifest Error 2: Manifest error as regards whether there are technologically and economically feasible low carbon alternatives to activities included in the TSC

167. The Commission erred by failing to identify two different forms of "technologically and economically feasible" low carbon alternatives, to the activities set out in the Aircraft TSC (as required by Article 10(2)).

168. First, ground transport as a low-carbon alternative to short-haul flights. As set out above, at distances of up to 1,000km (or on some studies up to 3,000km) new or improved high-speed rail systems can compete with air travel and is considerably less carbon intensive.

169. The Platform's 2023 Response advised the Commission to consider separate / more ambitious thresholds for short-haul flights, which compete with environmentally less damaging ground transport alternatives. The Commission ignored that advice.

170. As a consequence, some short haul aircraft cannot be classed as "transitional" activities under Article 10(2) of the Taxonomy Regulation, because there is already a technologically and economically feasible alternative, that makes a considerably greater contribution to climate change mitigation, namely high speed rail. The Commission could only have reached the conclusion that it did by applying its mind to aviation as a 'silo', separated from other elements of the EU transportation network.

171. Furthermore, the Commission has failed to assess whether the proposed TSC would hamper deployment of high-speed rail, by diverting investments to fossil-fuelled aircraft for short-haul flights.

172. Second, high SAF compatible aircraft. The Commission failed to take into account, when setting the Aircraft TSC, that aircraft that are capable of 100% SAF uptake are already technologically and economically feasible now (see above). As a result, there is no justification for classifying aircraft that cannot uptake 100% SAF as taxonomy-compliant under section 3.21(b) until 2032: that criterion does not meet the requirements for being a transitional activity.

173. If and to the extent that the Commission concluded that 100% SAF were not economically feasible now, that is not accepted. In any event, the purpose of the Taxonomy Regulation is to "facilitate the shift of investment towards environmentally sustainable economic activities" (Recital 16). If a technology exists, but requires re-direction of investment to be scaled-up, it is exactly that technology that should be supported by the Delegated Act.

174. These errors are particularly stark because the Commission was obliged – by the legislature – only to include activities within the Taxonomy where there is "conclusive scientific

evidence" to support that inclusion and that it is consistent with the precautionary principle. The combined operation of those two requirements leads to the conclusion that – where there is insufficiently conclusive evidence to support the inclusion of an activity within the Taxonomy – the Commission should not do so. It fell into a manifest error, in this case, when it concluded that it had sufficient evidence before it to meet that exacting requirement as regards engines certified to operate with SAF at blends up to 50%.

Manifest Error 3: Carbon reduction targets in section 3.21(b) and (c)

175. Before adopting the TSC, the Commission must be satisfied that there is conclusive scientific evidence that the standards set out will make a significant contribution to climate change mitigation. Furthermore, to meet the requirement for a transitional activity in Article 10(2), the activity must be consistent with a pathway to limiting temperature increases to 1.5° C above pre-industrial levels. The IEA's analysis is that to reach that temperature goal, aviation emissions will have to peak in 2025 and reduce by 80% by 2050.

176. Section 3.21(b) of the Delegated Act establishes various CO_2 emissions reduction targets. Aircraft manufactured before 31 December 2027:

176.1. If they have a maximum take-off mass greater than 5.7t and less than or equal to 60t must have a certified metric value of CO_2 emissions of at least 11% less than the New Type limit of the ICAO standard.

176.2. If they have a maximum take-off mass greater than 60t and less than or equal to 150t must have a certified metric value of CO_2 emissions of at least 2% less than the New Type limit of the ICAO standard.

176.3. If they have a maximum take-off mass greater than 150t, must have a certified metric value of CO_2 emissions of less than 1.5% of the New Type Limit of the ICAO standard.

177. There is no conclusive scientific evidence (or indeed any evidence) to support the conclusion that these marginal reductions from the ICAO standard will make a significant contribution to climate change emissions or be consistent with a 1.5° C pathway.

178. First, they are less demanding than Steer's recommendations for the TSC (p. 84 Table 5.9), which (as above) are themselves simply read across from current performance of latest generation aircraft rather than being based on any credible net zero pathway modelling (see above). In particular, as regards aircraft manufactured before 2027 (section 3.21(b) of the Delegated Act), the TSC provide lower CO_2 targets than the Steer Report for aircraft in categories (ii) and (iii):

178.1. For category (ii), the TSC certify as sustainable aircraft with a MTOM of 60t-150t a reduction of 2% against the ICAO new type standard. However, the Steer Report proposed a reduction of 4% for aircraft with MTOM of 65t-150t.

178.2. For category (iii), the TSC certify as sustainable aircraft with a MTOM of >150t a reduction of 1.5% against the ICAO new type standard. However, the Steer Report proposed a reduction of 3%. The ICAO's analysis is that latest generation aircraft in 2017 could already achieve a 4% reduction (see Table 3, p.35).

179. The flaws in s. 3.21(b) are exacerbated by the wording of s. 3.21(c), which provides that the CO_2 reduction levels in (b) shall be extended until 31 December 2032 for aircraft that are certified to operate on 100% blend of SAF. This widens the difference between the levels recommended in the Steer Report and the Delegated Act:

- –11% against -16% proposed by Steer post-2027 for a category (i) regional aircraft;
- -2% against -14% proposed by Steer post-2027 for a single-aisle category (ii) narrow body aircraft;
- -1.5% as against -12% proposed by Steer post-2027 for a category (iii) twin aisle aircraft.

180. Second, the ICAO standards, which the TSC use as a reference point, are not themselves particularly stringent. They require an average of just 4% reduction in cruise fuel consumption compared to 2015 aircraft deliveries.[156] Research shows that the average new aircraft delivered

[156] International Council on Clean Transportation, 'International Civil Aviation Organization's Co2 standard For New Aircraft', 2017, (footnote 111)

in 2016 already met the ICAO's 2028 standard.[157] In short, the reductions set out in 3.21(b) and (c) are minor and they are discounted from an already undemanding starting point.

181. The incremental, and undemanding nature of the thresholds set out in s. 3.21(b) and (c) is evident from T&E's analysis that 90.4% to 99.7% of Airbus pending aircraft orders as of 31st January 2023 would already meet the Delegated Act TSC, assuming they will be delivered before 2032.[158]

182. The Commission fell into a manifest error of assessment when it concluded that there was "conclusive scientific evidence" that the incremental and undemanding thresholds in s. 3.21(b) and (c) would make a substantial contribution to climate change mitigation.

183. Third, on the contrary, there is conclusive scientific evidence that the thresholds set out in s. 3.21(b) and (c) will not make a substantial contribution to climate change mitigation. As set out at paragraphs XXX above:

183.1. CO_2 emissions increased by 129% between 1990 and 2017 despite energy efficiency of new aircraft improving by 18% over the same period.[159]

183.2. It is estimated that passenger and freight traffic will continue to grow in Europe of up to 3.1% per year until 2050 for passenger traffic, and up to 2.4% per year for freight traffic (Recital 2 to ReFuelEU Aviation).

183.3. The ICAO has found that even with an optimistic technology and operational improvement scenario, emissions are projected to grow by 139.46% between 2020 and 2050.[160] Yet, at the same time, the IEA finds that aviation emissions need to decrease by 80% by 2050 to be compatible with a 1.5°C pathway.

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157 International Council on Clean Transportation, 'Proposed EPA Co2 Standard Lags New Aircraft Fuel Efficiency By More Than A Decade', 2020, (footnote 112)

158 T&E analysis of EU taxonomy criteria for aviation (February 2023) supra.. T&E's analysis is based on an estimated compliance list provided by the European Union Aviation Safety Agency (EASA), as indicated in the methodology published alongside the report. (footnote 114)

159 European Environment Agency, 'Indicator assessment – Greenhouse gas emissions from transport in Europe and Xinyi Sola Zheng, Dan Rutherford, PhD. (ICCT) 'Fuel burn of new commercial jet aircraft: 1960 to 2019', September 2020. (footnote 52)

160 Global Aviation CO2 Emissions Projections to 2050, (footnote 58)

184. The science is clear that there is a need for "early, aggressive, and sustained government intervention" which "triggers widespread investments in zero-carbon aircraft and fuels, peaking fossil jet fuel use in 2025 and zeroing it out by 2050". [161] Investment of this kind is consistent with a +1.75°C global temperature rise.[162] The Aircraft TSC in 3.21(b) encourage, in the Platform's words, investment in planes that will have only "incremental efficiency improvements", but that will remain in operation for decades, locking in carbon-intensive assets well beyond 2035.

185. Fourth, the replacement ratio included in the TSC does not perform the required role of preventing growth in the sector from outpacing marginal efficiency improvements. It does not stop the overall fleet from growing; it only controls the share of the fleet that is "Taxonomy-compliant". As has happened in the past, there is a substantial risk that fleet sizes will continue to grow along with marginal emissions reductions, and the overall emissions of the sector will increase. The Platform's March 2022 Report noted that current market trends forecasts predict "that at least half of the new commercial aircraft ordered in the future will be for fleet expansion" (p.513).

186. As set out above, in the past, marginal efficiency improvements of the order proposed by the TSC under s. 3.21(b) have coincided with increases in the sector's overall emissions, because the size of the fleet has grown. For the marginal efficiency improvements set out in s. 3.21(b) to lead to an overall reduction in emissions from the aviation sector, there would need to be a compliance mechanism within the Delegated Act that would prevent the growth of the global fleet. This was something identified in the Platform's 2022 Report, which stated that the TSC should, inter alia, incentivise the replacement of old, less efficient aircraft with new, more efficient ones "without contributing to fleet expansion" (p.513). To achieve this ambition, the Platform recommended "a rule to ensure taxonomy criteria does not contribute to increasing aircraft fleets and therefore emissions (p.513).

187. The replacement ratio does not achieve this. Instead, sections 6.18 and 6.19 of the Delegated Act provide that for a new aircraft in the fleet to be labelled Taxonomy-compliant,

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161 Brandon Graver, Sola Zheng, Dan Rutherford, Jayant Mukhodpadhaya, Erik Pronk (ICCT) 'Vision 2050: Aligning Aviation With The Paris Agreement', June 2022. (footnote 60)

162 Ibid.

there must be a "commitment" that another non-compliant aircraft in the fleet is either (a) permanently withdrawn from use within 6 months of delivery, or (b) permanently withdrawn from the fleet within 6 months and meeting a number of criteria, in which case the share of Taxonomy compliance of eligible aircraft is limited by the replacement ratio.

188. In essence, if a lessor or operator of a fleet of aircraft purchases or leases a new aircraft that complies with the TSC, that aircraft can be labelled Taxonomy-compliant, even if the lessor or operator leases or sells one of its existing aircraft to another company to use rather than scrapping it. The only restriction is that there is a maximum share of the fleet that can be labelled Taxonomy-compliant. However, (a) whoever buys or leases the aircraft from the company purchasing the new aircraft could then label the aircraft that it has been sold Taxonomy-compliant as part of its own fleet, so long as it meets the TSC (for example, under criterion 6.19(e)), (b) the size of the global fleet has not necessarily reduced, and may actually increase, and (c) there is nothing to prevent operators or leasing companies from then buying another non-compliant aircraft to replace the one that has been sold. Even on an individual company level, the replacement ratio does not prevent an operator's fleet from growing. By allowing companies to sell older used aircraft to other companies (in other words, nothing guarantees the plane will be withdrawn from the market before the end of its lifetime), the replacement ratio will not prevent the global fleet from expanding and causing additional emissions (and so fails to comply with the DNSH criterion in relation to climate change mitigation).

189. In other words, an airline (airline A) can, according to s. 6.19 (c)(ii), sell the aircraft it is replacing to another airline (airline B). In the European Commission's rationale, airline B will decommission an older plane currently in use to adopt this less emitting one, therefore leading to the reduction of overall emissions from the global fleet. However, there is no preventative measure in place to stop the airline B from either (i) not decommissioning any plane and simply expanding its fleet; or (ii) selling the old plane to yet another airline (airline C), essentially allowing the continued use of the aircraft until the end of its operational lifetime.

190. In order to make a substantial contribution to climate change mitigation, the Delegated Act should contain a compliance mechanism ensuring that the global fleet does not increase,

following the "one-in, one-out" principle. Airlines and leasing companies should be issued a scrappage certificate for every aircraft withdrawn from use, and the share of Taxonomy-eligible aircraft should be assessed based on the issued scrappage certificates. Without a proper replacement ratio, the Taxonomy could perversely incentivise investment that leads to growth in emissions and the continued use of heavily polluting old aircraft.

191. Fifth, what the replacement ratio does is restrict the number of aircraft that will be labelled Taxonomy-compliant. However, it does not even do this effectively for the following reasons:

191.1. The Commission does not have oversight or control over sales and purchases that take place outside the EU.

191.2. A new aircraft can be labelled as Taxonomy-compliant under sections 6.18 and 6.19 of the Delegated Act so long as there is a "commitment" that another non-compliant aircraft is permanently withdrawn from use or from the fleet. As set out above, it is not clear how a "commitment" could be enforced under the Delegated Act.

192. To the extent that the Commission suggests that the replacement ratio will mitigate the risk that marginal efficiency improvements will not outpace emissions growth by way of fleet numbers, the replacement ratio itself is uncertain, lacks a clear basis and will not provide a reliable basis for restraining the growth of the global aircraft fleet. The ratio fails to prevent old polluting planes being used until the end of their lifetime (which can be up to 50 or 60 years[163]) by either freight airlines or third country airlines, which means that the objective of replacing very polluting planes with those that are 'best-in-class' is not guaranteed.

193. The carbon reduction targets within the TSC were aptly described in the Platform's March 2022 Report: the thresholds under section 3.21(b) of the Delegated Act are "incremental efficiency improvements of airframes and engines" (p. 512). These incremental efficiency improvements will not lead to a substantial reduction in emissions and are not consistent with a 1.5°C pathway, in breach of Article 10(2) of the Taxonomy Regulation.

[163] https://www.airfleets.net/recherche/airline.htm.

194. As a final point, the Applicants are concerned that the Platform's March 2022 Report states at p.527 that the replacement ratio only applies to revenues generated by compliant aircraft, not to the capital expenditure of buying the best-in-class aircraft. Whilst the Delegated Act does not explicitly treat capital expenditure and revenues from operations differently, the Platform's interpretation of the replacement ratio could take place in practice as airlines already report the Taxonomy-compliance of their capex and opex. This would further hinder the effectiveness of the replacement ratio.

Manifest error 4: SAF percentage targets

195. Like the fuel efficiency targets, the Commission has manifestly erred when setting SAF percentage targets within the Delegated Act. Sections 6.19(d) and 6.18(c) provide that, from 1 January 2030, aircraft will be Taxonomy-compliant if they meet the requirements in 6.19 (b) and (c) and that the aircraft is operated on 15% SAF (increasing by two percentage points annually thereafter).

196. The factual background to SAF is set out above:

196.1. 100% SAF engines are available to the market now.

196.2. The European Parliament and Council have stated that the necessary decarbonisation steps in the aviation sector will involve "a strong ramp-up of the production, supply and uptake" of SAF (Recital 2 to ReFuelEU Aviation).

197. The thresholds set out in ss. 6.19(d) and 6.18(c) are inadequate, and are not consistent with conclusive scientific evidence, for three reasons.

198. First, there is no basis for concluding that there will be no technologically and economically feasible low-carbon alternatives, that go beyond the undemanding 15% SAF threshold by 2030. This follows from the factual background above: aircraft capable of using greater than 15% SAF are already available on the market. By 2030 that availability will have greatly increased.

199. To the extent that the Commission's answer is that it might subsequently revise the 15% threshold, in the light of subsequent technological development, that would be a further

manifest error of approach. This is because the adoption of the 15% threshold now sends a powerful price signal to the market as to the thresholds that it should aim for in the coming 7 years. The perverse consequence of adopting an insufficiently exacting threshold is that it will slow the transition to low carbon alternatives before and after 2030.

200. Second, there is no conclusive scientific evidence to support the conclusion that a 15% SAF requirement will make a substantial contribution to mitigating climate change, and no conclusive evidence that they would be consistent with a pathway to limiting temperature increases to 1.5o C above pre-industrial levels as required by Article 10(2). As set out above, the Commission has not based the SAF % target on any credible net zero pathway modelling for the aviation sector.

201. Third, on the contrary, there is evidence that the SAF 15% thresholds should be considerably higher from 2030, and that the existing thresholds will not support the transition to a low-carbon economy:

201.1. The ICCT Report concluded that a 1.75°C pathway requires 17% SAF fuel use in 2030.[164] Logically, a 1.5°C pathway requires an even greater share of SAF in 2030.

201.2. The Commission's own expert advisors, the Platform, recommended in their 2023 Response that for the purposes of 6.19(d) from 1 January 2030, the aircraft should operate with a minimum share of SAF corresponding to 38% in 2030 (p. 21). However, the Delegated Act leaves the requirement as just 15%.

201.3. The IEA Net Zero roadmap provides the values of the blending mandates in line with a net zero trajectory. It states that in 2030 the biofuels mandate should be 16% and synthetic fuel should be 2%, and that by 2050 the overall mandate reaches almost 80%.[165] These percentages are higher than the TSC, and furthermore based on an assumption that there will be significant behaviour change in the form of constrained overall air travel growth. Such an assumption is not supported by the growth projections set out in the facts section above.

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164 ICCT Report Table 6, p.12 (footnote 59)

165 Supra. pp. 138 and 61.

202. Thus, the 15% SAF threshold will not make a substantial contribution to climate change mitigation. In simple terms, the SAF thresholds do not go far and fast enough, particularly given the important role that aviation plays in carbon emissions. Increasing the SAF targets will draw the needed investments to the sector, which, as set out above, will not materialise without policy/fiscal incentives.

203. Finally, the SAF use requirement compliance calculation in s. 6.19 following paragraph (e) is flawed. It allows airlines to calculate compliance as the ratio of the quantity of SAF purchased at the fleet level divided by the total aviation fuel used by the compliant aircraft multiplied by 100. Thus, instead of calculating the percentage of SAF usage of the compliant aircraft as a proportion of fleet-wide SAF use, this provision allows the airline to assume that all SAF bought was used on compliant aircraft. This artificially inflates the compliance ratio. The Applicants understand that it is impossible technically and physically, once the SAF is delivered to the airport, to attribute it to one flight, let alone one aircraft. It is therefore logical that the SAF ratio should be calculated based on the total amount of SAF used compared to the total fuel used by the airline's fleet and not – as s currently the case – on the basis of a presumption that all SAF use is attributed to compliant aircraft.[166]

Manifest error 5: Aircraft operators can avoid the carbon reduction targets by relying on section 6.19(e)

204. Sub-paragraph (e) of s. 6.19 of the Delegated Act provides that the purchase, financing and operation of aircraft may be Taxonomy-compliant when, notwithstanding the fact that it has not met the emissions' reduction requirements in 3.21(b), the aircraft operates with 5% SAF in 2022, with the percentage of SAF increasing by 2 percentage points annually thereafter.

[166] The replacement ratio leads to the following calculation: SAF usage at fleet level / number of compliant aircraft * 100 = high compliant ratio, Instead of: SAF usage/ all aircraft in fleet * 100 : more realistic compliance ratio. See KLM WEBSITE: "With your contribution, we buy extra SAF that we add to the fuel system at Amsterdam Airport Schiphol (or 1 of the other airports where we add SAF). Your flight will not directly include your extra SAF contribution because it is logistically inefficient and complicated to arrange." https://www.klm.be/information/sustainability/sustainable-aviation-fuel

205. Thus the effect of sub-paragraph (e) is to relieve operators from any obligations as regards emissions, if they operate with a very low threshold of SAF, increasing over time. This provision discloses a manifest error of approach for three reasons.

206. First, it does not describe a transitional activity, for the purposes of Article 10(2) of the Taxonomy Regulation. There are technologically and economically feasible low-carbon alternatives now, in the form of aircraft that are able to operate on considerably higher percentages of SAF.

207. Second, the sub-paragraph is not consistent with conclusive scientific evidence. This was recognised by the Platform in its March 2022 Report, which states that at present "incremental efficiency improvements of airframes and engines in combination with the use of sustainable aviation fuels" would give rise to transition activities consistent with a 1.5°C pathway (ensuring a minimum aggregated emission reduction of 20% in the first decade) (p. 512). Similarly, the Steer Report reviews various net zero pathway models and concludes at [3.21] that, amongst other things, efficiency improvements and SAF uptake are critical to decarbonising the sector. Similarly, the 1.5ºC pathway set out by the Energy Transitions Committee is clear that a combination of levers is required.[167] However, sub-paragraph (e) treats these as alternatives: aircraft operators may elect either for the use of SAF or emission reductions. This less demanding approach will not support the transition to a climate neutral-economy (as required by Article 10(2)).

208. In addition, while sub-paragraph (e) proposes that the aircraft can operate with just 5% SAF in 2022, Platform's 2023 Response recommended increasing the starting point from 5% to 32% as they are planes that are already in operation and do not require scrapping of existing planes and maintaining the increment of 2% going forward (p. 21).

Manifest error 6: Emissions reduction targets in 3.21(b) do not correspond to the best performance in the sector or industry

209. Pursuant to Article 10(2)(a) of the Taxonomy Regulation, an activity for which there is no technologically and economically feasible low-carbon alternative may only be treated as a

[167] Energy Transitions Commissions et al, Making Net Aviation Zero Possible, (footnote 82)

transitional activity where it has GHG emission levels that correspond to the "best performance in the sector or industry".

210. Recital 41 to the Taxonomy Regulation states that such transitional economic activities can qualify as contributing substantially to climate change mitigation if their GHG emissions are "substantially lower" than the sector or industry average.

211. As above, T&E has calculated[168] that 90.4% to 99.7% of Airbus pending aircraft orders as of 31st January 2023 would already be considered "best-in-class" under the Aircraft TSC, assuming they will be delivered before 2032 (and at 2019 rates, Airbus could deliver its 7,255 orders in 8.5 years).

212. Research also shows that the most advanced new aircraft are already ahead of the ICAO standards by 10 to 20%, suggesting the ICAO standards lag behind new technologies (the analysis also shows that the average new aircraft delivered in 2016 already met ICAO's 2028 standard).[169]

213. Investments in more marginally efficient aircraft would evidently happen with or without the Taxonomy; indeed, they are already happening. Airlines constantly renew their fleets to save fuel costs. The Aircraft TSCs will simply put a green label over aviation's business as usual, and allow green investments to flow to a fossil fuel dependent industry.

214. In essence, the effect of the TSC is that traditional aircraft will fall under the Taxonomy if they are only slightly more efficient than the majority of today's aircraft. Indeed, the majority of aircraft already on the order books meets the TSC criteria, such that the criteria evidently cannot be considered to have GHG emissions "substantially lower" than the sector or industry average. This amounts to a breach of the requirement in Article 10(2)(a) that transitional activities should only be included if they reach the standard of best performance in sector, meaning their emissions are substantially lower than the sector average.

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168 T&E analysis of EU taxonomy criteria for aviation (February 2023) (footnote 114)

169 International Council on Clean Transportation, 'Proposed EPA Co2 Standard Lags New Aircraft Fuel Efficiency By More Than A Decade', 2020, (footnote 112).

Manifest error 7: Failure to differentiate between sustainable and non-sustainable SAF.

215. Scale up of SAF is required, but this must be of sustainable SAF. SAFs still produce CO_2 at the tailpipe, so their sustainability relies on life cycle emissions' reductions in the production of those fuels. However, SAF is an umbrella term which comprises a range of different alternative fuel types with different sustainability profiles, some of which are not very sustainable at all.

216. As set out above, the science is clear that many biofuels are associated with harmful environmental implications, including land use changes resulting in increased GHG emissions, fraud, deforestation, and increase of animal waste (see above).

217. While synthetic fuels are not yet available, these will be critical to decarbonisation of the aviation sector, as (a) they can be produced using close to zero GHG emissions if generated through renewable energy, and (b) only synthetic and not biofuels can be scaled to the extent necessary (see above). However, synthetic fuels require policy and financial support, with significant investment required.

218. For these reasons, ReFuelEU Aviation includes a specific sub-target for synthetic SAF.

219. However, the Delegated Act fails to differentiate between SAFs. Without particular incentives for synthetic fuels as opposed to biofuels, there is considerable risk that the largest contribution to 2030 targets will come from diverting by-product and residual oils and fats out of other productive uses, delivering minimal (if any) net climate benefit.[170]

220. Accordingly, the SAF requirements in sections 6.18 and 6.19 of the Delegated Act are not based on conclusive scientific evidence or the precautionary principle, in conflict with Article 19 of the Taxonomy Regulation. This failure to differentiate between different forms of SAF amounts to a further manifest error of assessment.

[170] Scrutinising the future role of alternative fuels in delivering aviation decarbonisation, Dr Chris Malins and Dr Cato Sandford October 2023, supra, p. 13; Estimating sustainable aviation fuel feedstock availability to meet growing European Union demand, ICCT, March 2021, supra at p.16. (footnote 84)

GROUND OF REQUEST 3: EXCESS OF POWERS/ LACK OF COMPETENCE, SHIPPING

221. The Commission acted in excess of the power conferred on it by the Taxonomy Regulation or lacked competence to adopt the Shipping TSCs on two main grounds.

222. First, when making the Shipping TSCs, the Commission failed to satisfy certain essential requirements set out in Article 19(1) of the Taxonomy Regulation. This constitutes a failure to take account of a mandatory consideration, with the result that the Commission exceeded the powers conferred on it. Specifically, these measures failed to:

222.1. Be based on conclusive scientific evidence and the precautionary principle (Article 19(1)(f)). In fact, the Shipping TSCs appear to have been made contrary to conclusive scientific evidence;

222.2. Take into account life cycle, including evidence from existing life-cycle assessments, by considering both the environmental impact of the economic activity itself and the environmental impact of the products and services provided by that economic activity (Article 19(1)(g));

222.3. Take into account whether the economic activity is a transitional activity (Article 19(1)(h)(ii) and 10(2));

222.4. Take into account the potential market impact of the transition to a more sustainable economy, including:

222.4.1. The risk of certain assets becoming stranded as a result of such transition; and

222.4.2. The risk of creating inconsistent incentives for investing sustainably (Article 19(1)(i));

222.5. To be quantitative and contain thresholds to the extent possible (Article 19(1)(c)) and be set in a manner that facilitates the verification of their compliance (Article 19(1)(k)).

223. Second, the TSC fails to take into account the requirements for transitional activities in Article 10(2) of the Taxonomy Regulation.

Lack of Competence 5: Failure to base the TSC on conclusive scientific evidence (Article 19(1)(f))

224. The Delegated Act's amendments to the TSC for maritime freight and passenger transport via the additions of Section 6.10(e), 6.10(f), 6.11(d) and 6.11(e) are not based on conclusive scientific evidence. Critically, there is no formal assessment summarising the scientific evidence as to:

224.1. The validity of the EEDI when measuring contributions to climate change mitigation (including whether this creates any "loopholes" in the taxonomy, for example, by allowing vessels that are fully/largely powered by conventional marine fuels, but that have LNG propulsion systems, to be considered taxonomy compliment);

224.2. The adequacy of the threshold of 20 percentage points above the IMO's EEDI requirements (on 1 April 2022) for an activity to make a substantial contribution to climate change mitigation (contained in Section 6.10(e) and 6.11(d));

224.3. The environmental benefits/ harms of LNG-powered vessels more generally, in light of the fact that the Delegated Act will drive investment into manufacture and use of LNG-powered vessels.

225. As above, the Explanatory Memorandum to the Delegated Act states that the Commission did not carry out a formal impact assessment because the Delegated Act "*follows the policy choices already made in the Taxonomy Regulation and, to a large extent in the Taxonomy Climate Delegated Act*."[171] Unlike the Aircraft TSC, the Shipping TSC were considered as part of an earlier impact assessment for the 2021 Delegated Act.[172] Nonetheless, while this impact

[171] Explanatory Memorandum, §3, p.5.

[172] Commission Staff Working Document Impact Assessment Report Accompanying the document Commission Delegated Regulation (EU) …/… supplementing Regulation (EU) 2020/852 of the European Parliament and of the Council by establishing the technical screening criteria for determining the conditions under which an economic activity qualifies as contributing substantially to climate change mitigation or climate change adaptation and for determining whether that economic activity causes no significant harm to any of the other environmental objectives, SWD/2021/0152 final, §5.1.6, p.172.

assessment shows some awareness of some of the critical matters that had to be addressed by the Commission, it does not refer to any specific scientific evidence that was relied upon, let alone identifying a corpus of scientific evidence that meets the exacting standard of being "*conclusive*."

226. In the section summarising the TEG's second call for feedback on its July 2019 report on the Taxonomy Regulation, the impact assessment for the 2021 Delegated Act summarised the following feedback from respondents in the transport sector:

> "[S]ome stakeholders argued that the proposed EU Taxonomy lacked technology neutrality, that its scope should be broadened to cover life-cycle and Well-to-Wheel approaches, while others criticised the inclusion of biofuels and noted the difficulties of applying such an approach; still other stakeholders – in particular civil society organisations – asked for a stricter approach, such as only including vehicles and vessels with zero-emissions at tailpipe, or excluding any fossil-based fuel, and to consider wider impacts beyond CO_2 emissions" (emphasis added).[173]

227. As far back as 2019, therefore, the Commission was aware of: (i) the possibility of assessing the lifecycle emissions of water transport, (ii) the potential for stricter criteria, and (iii) the importance of considering emissions impacts beyond CO_2. Two things follow from this. First, this impact assessment does not constitute "conclusive scientific evidence" that could provide the basis for the Shipping TSCs in the Delegated Act. The Applicants are not aware that the Commission gathered any fresh specific scientific evidence, let alone "conclusive scientific evidence" to address these issues. Second, the Commission could not lawfully ignore – or leave out – lifecycle emissions and wider GHG emissions from the Shipping TSC.

228. The SWD reaffirms this conclusion. It describes the desirability of incorporating the EEDI, EEXI, and an additional criterion for the GHG intensity of on-board energy use into the TSC via the Delegated Act (see [119]). Broadly, the reasoning given on p.72 of the SWD focuses on ensuring the TSC align with Phase 3 of the IMO's EEDI, the EEXI framework, and the Fit for 55/FuelEU Maritime developments. While Recital 43 of the Taxonomy Regulation states that the Commission should take into account existing environmental indicators and reporting

173 Ibid, p.66.

frameworks when updating the TSC (including existing international standards), uncritical alignment with international standards will not satisfy the stringent requirements of the Taxonomy Regulation (particularly where those standards are not themselves made by reference to the Taxonomy Regulation's requirements). Those standards were not made by reference to the obligations imposed on the Commission by the Parliament. In particular, the Commission was not entitled to assume that these international instruments were based on "conclusive scientific evidence" (and that they are consistent with the "conclusive scientific evidence" available at the time of making the Shipping TSCs). The Commission erred when it proceeded on that assumption.

229. As above, the fact that the new IMO GHG strategy does not align with the Paris Agreement's goal of 1.5°C further compounds how the Commission erred by relying on this standard.[174]

230. In addition, there is a substantial range of evidence that criticises the use of EEDI on a number of grounds, thus the Commission should not have uncritically relied on this measure. These criticisms include, *inter alia*:

230.1. The fact that the EEDI is estimated on the basis of one ship design speed means that it fails to represent the actual operations of a vessel over its lifetime.[175] Critically, the EEDI is unable to accurately capture the real lifetime carbon emissions of a vessel[176] and "promotes plants with lower installed power rather than technologies that reduce the carbon emissions."[177]

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174 Wittels, J., "Shipping Regulator Falls Short of 1.5C-Aligned Climate Goals" (Bloomberg, 2023). Available at https://www.bloomberg.com/news/articles/2023-07-07/shipping-regulator-falls-short-of-1-5c-aligned-climate-targets?leadSource=uverify%20wall. (footnote 122)

175 Trivyza et al., "A Comparative Analysis of EEDI Versus Lifetime CO2 Emissions" (Journal of Marine Science and Engineering, 2020), p.17. (**Annex A.64**)

176 Ibid, p.18.

177 Ibid, p.3.

230.2. The EEDI is solely focused on calculating emissions produced from on-board combustion and is "technically ignorant [of] emissions generated from other life cycled processes of marine fuels."[178]

230.3. Owing to the above, the EEDI can thus be described as a "conservative measure"[179] which has been found to "underestimate[e] the actual lifetime CO_2 emissions in all… cases [investigated by Trivyza et al (2020)]."[180]

231. The SWD also contains a summary of the feedback from the Member States Expert Groups on the Commission's draft Delegated Act. In regards to the Delegated Act's waterborne transport criteria, some Member States noted that "specific criteria for maritime risked creating a loophole for ships to simply switch from diesel to LNG, the upstream emissions of which would cancel out any benefit."[181] This demonstrates that the Commission was aware that the TSC for maritime freight and passenger transport created a loophole for LNG-powered vessels. Nonetheless, the Commission failed to close that loophole or to demonstrate why the existence of the loophole was consistent with the obligations set out in the Taxonomy Regulation (including as regards conclusive scientific evidence).

232. Further, the SWD sets out some of the feedback from the waterborne transport industry on the proposed TSC, which includes the following concerns:

232.1. "Some signalled criticisms of reliance on EEDI/EEXI reference values in terms of direct emissions" (p.118);

232.2. "Some pointed to concerns linked to safety in striving for the margins over EEDI/EEXI reference values. Some business associations called for reverting to Platform proposals in this area to incentivise efficiency and renewables take-up in all ships, less linked to EEDI/EEXI criteria" (p.119).

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178 Hwang et al., "Life Cycle Assessment of LNG Fuelled Vessel in Domestic Services" (2019, Journal of Marine Science and Engineering", p.2. (**Annex A.65**)

179 Trivyza et al., "A Comparative Analysis of EEDI Versus Lifetime CO2 Emissions" (Journal of Marine Science and Engineering, 2020), p.18. (footnote 175)

180 Ibid.

181 SWD, p.111.

233. In terms of feedback from NGOs, the SWD reported that:

233.1. "Feedback from NGOs was generally critical. They said that… specific criteria for maritime risked creating a loophole for ships to simply switch from diesel to LNG, the upstream emissions of which would cancel out any benefit. Many said that… the option above for maritime activities should be scrapped, or that the EEDI -20% reference should be raised to 35%, and combined with declining lifecycle GHG emissions criteria" (p.119);

233.2. "The criticism about the possibility of ships switching to LNG was also picked up in some comments from the Platform and in the feedback of some Member States and MEPs" (p.119).

234. The Commission is not obliged to act on each and every item of feedback that it receives. Nonetheless, the concerns raised were substantial. The Commission's response to these concerns was not consistent with the obligation to found the Shipping TSCs on conclusive scientific evidence.

235. The Commission's primary response was to add a provision that gas-fuelled vessels, that overachieve the IMO Phase 3 EEDI targets by 20 percentage points, must also "demonstrate the use of state-of-the-art measures and technologies to mitigate methane slippage emissions." This purpose of this additional criterion is explained in the SWD at footnote 98:

> "This addition addressed concerns that gas-fuelled vessels could, via EEDI criteria, be favoured in view of the fact that methane slipped/fugitive emissions are not covered by EEDI. This responded to feedback from the Platform, and others, indicating the need to address specifically the case of gas-fuelled ships in the framework of application of the EEDI criteria."

236. However:

236.1. The Commission has not provided any further information about the scientific evidence relied upon as the basis for the conclusion that this additional provision will ensure that vessels that meet this requirement will substantially contribute to climate change mitigation.

236.2. Moreover, the fact that this additional provision only addresses methane slippage at the point of combustion further illustrates the Commission's failure to base the Shipping TSC on conclusive scientific evidence.[182] This is because the use of LNG is associated with methane leaks throughout its lifecycle, including (*inter alia*), extraction, processing, and transport. The provision referred to in footnote 98 fails to address these additional opportunities for methane leaks.

236.3. Further, the Commission has not provided any formal assessment on which to justify its continued reliance on the EEDI criteria.

Lack of Competence 5: Failure to take into account life cycle (Article 19(1)(g))

237. As above, Article 19(1)(g) provides that any TSC shall "take into account the life cycle, including evidence from existing life-cycle assessments, by considering both the environmental activity itself and the environmental impact of the products and services provided by that economic activity, in particular by considering the production, use and end of life of those products and services."

238. The Applicants are not aware of any evidence that the Commission took this mandatory criterion into account when making the Shipping TSC. The factors that should have been taken into account include the life cycle of LNG-powered vessels that operate pursuant to the TSC. While the impact assessment for the 2021 Delegated Act describes assessing life-cycle emissions as an "ambition"[183], the Taxonomy Regulation makes clear that this was not an optional consideration, to which the Commission could have regard should it wish to do so. By failing to have regard to this consideration, the Commission acted outside its competence.

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182 See Englert et al (2021), "The Role of LNG in the Transition Toward Low- and Zero-Carbon Shipping" (The World Bank, 2021), p.59: "[T]he sector's current Energy Efficiency Design Index, for instance, exclusively focuses on downstream CO2 emissions (that is, due to combustion on board), thereby disregarding any upstream or midstream CO2 emissions (that is, due to extraction and distribution, respectively) or any non-CO2 GHG emissions such as methane." (footnote 127)

183 Commission Staff Working Document Impact Assessment Report Accompanying the document Commission Delegated Regulation (EU) …/… supplementing Regulation (EU) 2020/852 of the European Parliament and of the Council by establishing the technical screening criteria for determining the conditions under which an economic activity qualifies as contributing substantially to climate change mitigation or climate change adaptation and for determining whether that economic activity causes no significant harm to any of the other environmental objectives, SWD/2021/0152 final, §5.1.6, p.177.

239. This failure is particularly significant given the existence of scientific evidence demonstrating that a holistic life-cycle assessment of LNG indicates that, in comparison to conventional marine fuels, its GHG benefits are at best negligible, and that it may in fact be worse for the climate.[184] As above, the uncertainty surrounding the total GHG emissions associated with LNG over its lifetime is due to the methane slippage and leaks that occurs during all stages of LNG's lifecycle.[185] In addition, as the levels of methane slippage associated with LNG vary significantly depending on the timeframe under consideration, it was essential for the Commission to take into account the life cycle of LNG-powered vessels operating under the Shipping TSC.

Lack of Competence 6: Failure to satisfy the requirements of Article 10(2) (transitional activity)

240. The Commission acted outside its competence, when it made the Shipping TSC, because it failed to demonstrate that the activities in question were transitional activities. As set out above, this involves demonstrating that:

240.1. There is no technologically and economically feasible low-carbon alternative; and

240.2. That the activity supports the transition to a climate-neutral economy consistent with a pathway to limit the temperature increase to 1.5°C above pre-industrial levels, including by phasing out greenhouse gas emissions.

241. The Commission failed to meet this standard for three reasons.

242. First, there are technologically and economically feasible low-carbon alternatives to LNG-powered vessels available now and more such technology will become available in the near future (2024). For example, in 2021, Maersk explicitly stated that it preferred not to invest in LNG as fuels that have significantly better GHG reduction potential were "*available now*"[186], while Viking Cruises have recently contracted six ships with zero emission

184 Englert et al (2021), "The Role of LNG in the Transition Toward Low- and Zero-Carbon Shipping" (The World Bank, 2021), Executive Summary, p.1; ((footnote 127)) see also paragraph REF/244 below.
185 Ibid, p.16.
186 Maersk, "*Sustainability Report 2021*" (2021), p.21. (**Annex A.66**)

capability.[187] More specifically, batteries are a feasible and commercially available for smaller vessels, including ferries. The first electric car and passenger ferry was launched in May 2015[188] and further vessels have subsequently used similar technology.[189] Whilst batteries are not a feasible alternative for larger, ocean-going vessels (which would need to be powered with a green hydrogen-based fuel, such as green ammonia or green methanol), there is evidence that, in 2024, two- and four-stroke ammonia engines will become commercially available.[190]

243. Second, the Commission failed to gather conclusive scientific evidence to support the proposition that LNG-powered vessels will support the transition to a climate-neutral economy. This is evident from the Commission's reliance on the impact assessment for the 2021 Delegated Act, which did not contain anything that can be deemed to constitute conclusive scientific evidence. Further, the SWD demonstrates that the Commission was aware of the risks of relying on the EEDI standard, but failed to carry out a formal assessment to evaluate whether their continued reliance on the EEDI was consistent with making the Shipping TSC on the basis of conclusive scientific evidence (see above). In particular, the Commission have failed to take into account scientific evidence demonstrating the inadequacy of LNG and the EEDI of contributing to climate change mitigation.[191] Indeed, by incentivising investment into LNG-powered vessels, which will lead to increased methane emissions, the Shipping TSCs will actively jeopardise the 1.5°C pathway (given the need for immediate methane reductions to limit warming to 1.5°C) (see the International Energy Agency's 2023 report, "*The Imperative of Cutting Methane from Fossil Fuels*").

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187 Viking, "Ministry of Climate and Environment" (2023), p.18: "*[Viking has] contracted for six ships with zero emission capability at cost of ~$300.0 million*." (**Annex A.67**)

188 The "Ampere", Pilot projects | European Alternative Fuels Observatory (europa.eu) [Accessed 19/12/23].

189 Ibid. For example, in 2021 the Bastø Electric was launched as the world's largest all-electric ferry.

190 E.g., Man Energy Solutions plans on delivering their first ammonia two-stroke engine in 2024. See Lindstrand, "Unlocking Ammonia's Potential for Shipping" (2023), Available at https://www.man-es.com/discover/two-stroke-ammoniaengine#:~:text=MAN%20Energy%20Solutions%20aims%20to%20have%20a%20commercially,gradual%20rebuild%20of%20existing%20maritime%20vessels%20by%202025. [Accessed 19/12/23] (**Annex A.68**). In addition, Wärtsilä plans to make their four-stroke ammonia engine commercially available in 2024, *Wärtsilä Interim Report* (January – September 2023), p.3. (**Annex A.69**)

191 See Ground of Request 4 below.

244. Third, pursuant to Article 10(2)(c) of the Taxonomy Regulation, an activity for which there is no technologically and economically feasible low-carbon alternative may only be treated as a transitional activity where that activity does not lead to "lock-in of carbon-intensive assets, considering the economic lifetime of those assets."

245. By making it easier for LNG-powered vessels to become taxonomy-compliant, the Delegated Act will send market signals that contribute to the "lock-in" of carbon-intensive LNG technology. Englert et al (2021) identify precisely this point when they conclude that "a significant temporary deployment of LNG [creates] the potential risk for a GHG emission 'lock-in'… [which] would be at odds with the IMO's GHG emissions reduction target for 2050."[192]

246. The Commission's failure to take the lock-in risk of LNG-technology into account is exacerbated by the absence of any sunset clause in ss. 6.10 and 6.11 of the Delegated Act. This is a particularly serious omission given the availability of technologically and economically feasible low-carbon alternatives to LNG-powered vessels available now/by 2024. Had the Commission taken adequate account of the risk of lock-in, it would not have made TSC that allowed LNG-powered vessels to become taxonomy-compliant.[193]

Lack of Competence 7: Failure to consider the risk of creating inconsistent incentives (Article 19(1)(i))

247. The Commission's failures, in this respect, mirror those set out above. The Shipping TSCs fail to take into account the risk of creating inconsistent incentives. Critically, the Delegated Act's additions to ss. 6.10 and 6.11 of the 2021 Delegated Act risk encouraging further investment in LNG-powered vessels. This is likely to come at the expense of investment in solutions that are consistent with the transition to a climate-neutral economy, such as electrification, wind power, and synthetic fuels. Neither the SWD nor the Explanatory Memorandum to the Delegated Act specifically address the risk that the TSC encourages

[192] Englert et al., "*The Role of LNG in the Transition Toward Low- and Zero-Carbon Shipping*" (2021), p.49. (footnote 127)

[193] Transport & Environment "T&E analysis of EU taxonomy criteria for shipping Estimating the eligibility of fossil LNG ships", p.5. https://www.transportenvironment.org/wp-content/uploads/2023/04/TE-shipping-taxonomy-explainer_v3.pdf (**Annex A.70**)

investment in LNG-powered vessels, giving rise to the risk of stranded assets and lock-in of carbon intensive assets.

Lack of Competence 8: Failure to be quantitative and contain thresholds to the extent possible (Article 19(1)(c)) and to be set in a manner that facilitates the verification of their compliance (Article 19(1)(k))

248. Part b of Section 6.10(e) and Section 6.11(d) requires gas-fuelled vessels that overachieve the IMO Phase 3 EEDI targets by 20 percentage points to also "demonstrate the use of state-of-the-art measures and technologies to mitigate methane slippage emissions" in order to comply with these sections.[194] Critically, this provision fails to indicate the types of technologies that should be used, or to specify a level/threshold of methane slippage emissions that must be mitigated against (the latter is required by Article 19(1)(c)). The effect of the Commission's inclusion of this provision is that it is easy for vessels to comply with Section 6.10(e) and Section 6.11(d) as there is no minimum amount of slippage that must be avoided. Further, as above, this provision only targets methane slippage arising at the point of combustion, leaving other opportunities for methane leaks outside of its scope. This means that it will be easy for vessels to comply with this provision, even if they are failing to significantly mitigate methane slippage emissions. The fact that vessels will be able to comply with this straightforwardly may make it difficult for the Commission to verify compliance with this provision (unless any vessel that uses state-of-the-art measures to mitigate methane slippage even in a very limited way are deemed compliant).

249. In addition, the fact that methane slippage varies according to engine load (see above) further compounds the difficulties the Commission will face in verifying compliance with the above provision. Critically, shipping companies are not required to report the engine load of their vessels. This means that the Commission will not be able to ensure that "state-of-the-art measures" contribute to methane slippage mitigation and will have to rely on the good-faith of shipping companies.

[194] SWD, footnote 98 addresses this.

GROUND OF REQUEST 4: MANIFEST ERRORS OF ASSESSMENT, SHIPPING

250. The Commission fell into two overarching manifest errors of assessment when making the Shipping TSCs:

250.1. There is no conclusive scientific evidence that the amended TSC will substantially contribute to climate change mitigation, and;

250.2. The conclusion that the amended TSC does not cause any significant harm to the Environmental Objectives set out in the Taxonomy Regulation is manifestly implausible.

Manifest Error 8: Lack of conclusive scientific evidence that the Shipping TSC would contribute substantially to climate change mitigation.

251. The Commission erred when it concluded that the Delegated Act's amendments to the TSC for maritime freight and passenger transport satisfy the requirements in Article 10(2) of the Taxonomy Regulation. Specifically, the conclusion that the Shipping TSCs contribute substantially to climate mitigation is unsustainable in light of the scientific evidence on LNG and the utility of the EEDI standard.

LNG: GHG Emissions and Methane Slippage

252. There is a significant body of evidence indicating that the environmental benefits of LNG are limited and/or negative when its full lifecycle GHG performance is considered.[195] While, owing to LNG's lower carbon content, it has a "theoretical greenhouse gas (GHG) emissions benefit relative to traditional oil-derived bunker fuels"[196], it is unlikely that the theoretical benefits of LNG can ever be realised. This is because LNG is essentially methane, a GHG that

[195] Englert et al., "The Role of LNG in the Transition Toward Low- and Zero-Carbon Shipping" *World Bank* 2021; ((footnote 127)) Grönholm et al., "Evaluation of Methane Emissions Originating from LNG Ships Based on the Measurements at a Remote Marine Station" *Environmental Science & Technology* **2021** *55* (20), 13677-13686 (footnote 142); Balcombe et al., "Total Methane and CO2 Emissions from Liquefied Natural Gas Carrier Ships: The First Primary Measurements" *Environmental Science & Technology* 2022 *56*, 9632-9640 (footnote 139); Fricaudet et al., "Exploring Methods for Understanding Stranded Value: Case Study on LNG-capable Ships" *UCL* 2022, p.4. (**Annex A.71**)

[196] Englert et al., "The Role of LNG in the Transition Toward Low- and Zero-Carbon Shipping" *World Bank* 2021, p.3. (footnote 127)

is more environmentally damaging than CO_2 (as above, it is 83 times more potent than CO_2 over a 20-year period and up to 30 times more in a 100-year period).[197] The key concern with LNG-powered vessels is the risk of emissions from unburnt methane evaporating into the atmosphere, i.e., methane slippage.[198] The Applicants note that the levels of methane slippage associated with LNG vary depending on engine type and load.[199] Moreover, there is substantial evidence indicating that the Commission and the IMO have underestimated the level of methane slippage in LNG-powered vessels (see above), and have not taken into account the lifecycle emissions of LNG.

253. As stated in the SWD at footnote 98, the Commission inserted Section 6.10(e)(b) and 6.11(d)(b) into the Delegated Act in order to address concerns that LNG-powered vessels were favoured via the use of the EEDI criteria in Section 6.10(e) and 6.11(d). This additional provision requires gas-fuelled vessels that overachieve the IMO Phase 3 EEDI targets by 20 percentage points to also "demonstrate the use of state-of-the-art measures and technologies to mitigate methane slippage emissions" ("**the Additional Provision**"). However, given the extent of the risks of GHG emissions from LNG-powered vessels, the Additional Provision fails to ensure that vessels that will be covered by Section 6.10(e) and 6.11(d) substantially contribute to climate change mitigation. This is for the following reasons:

254. First, the Additional Provision does not specify a level of methane slippage emissions that must be achieved. Failure to specify this is a manifest error as it could allow a LNG-powered vessel that overachieved the IMO Phase 3 EEDI targets and used state-of-the-art technologies to mitigate methane slippage, but only to a very limited extent, to become taxonomy-compliant. The flaw within the Additional Provision is exacerbated by the fact that it is so imprecise as to be unenforceable. Allowing LNG-powered vessels with high levels of methane slippage, to qualify as taxonomy-compliant is a manifest error of assessment as to the ability

197 Ibid; IPCC Second Assessment Report (2013) available at Global Warming Potentials (IPCC Second Assessment Report) | UNFCCC [Accessed 06/12/23]. (**Annex A.72**)

198 Englert et al., "The Role of LNG in the Transition Toward Low- and Zero-Carbon Shipping" *World Bank* 2021, p.3. (footnote 127)

199 Rochussen et al., "Development and Demonstration of Strategies for GHG and Methane Slip Reduction from Dual-Fuel Natural Gas Coastal Vessels" (2023), p.1; Kuittinen et al., "Methane Slip Emissions from LNG Vessels – Review" (2023), p.1 (footnote 150).

of the Additional Provision to ensure the activities included in Section 6.10 and 6.11 substantially contribute to climate change mitigation.

255. Second, the Additional Provision does not specify the type of technology/measures that should be used. As above, this makes the Additional Provision so imprecise as to be unenforceable. Moreover, there is evidence that certain technologies aimed at preventing methane slippage can lead to increased emissions of other GHGs. For example, relying on exhaust gas recirculation can increase carbon oxide and black carbon emissions.[200] Further, other technologies aim at mitigating methane slippage do not perform well on low engine loads, when methane slippages are highest.[201] The Additional Provision's failure to specify the type of technology that should be used to mitigate against methane slippage demonstrates that the requirement was not based on conclusive scientific evidence.

256. Third, requiring gas-fuelled ships to demonstrate use of "state-of-the-art measures and technologies" risks creating inconsistent incentives for investment and leading to stranded assets. This is because, given the cost of renewable fuels, it may be more cost-efficient to achieve taxonomy-compliance by investing in state-of-the-art measures and technologies that help mitigate methane slippage to a *de minimis* level, as opposed to investing in true decarbonisation solutions. Further, the technologies that mitigate methane slippage may become obsolete, for example due to policies that strongly incentivise a shift to true zero-emission shipping, leading to a significant risk of stranded assets/value.

257. A range of studies have recognised this risk. For example, Fricaudet et al (2022) simulated a hypothetical scenario where the size of the total LNG-capable shipping fleet grew between 2020-2030 and was then followed by a period from the late 2020's of policy stimulus to incentivise zero emission shipping, in line with the 1.5°C temperature goal.[202] The study found that if the initial rapid and accelerating growth of ordering LNG-capable technologies is left unchecked, "there is a material risk of the simulated scenario arising in practice. E.g. that the

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200 Carr et al (2023),"Options for Reducing Methane Emissions from New and Existing LNG-Fuelled Ships" (Expertise for a Shared Future), p.24. (**Annex A.73**)

201 Ibid, p.25: Relying on methane oxidation catalysts can reduce methane emissions, but performs poorly on low engine loads and the system erodes quickly.

202 Fricaudet et al (2022), "Exploring Methods for Understanding Stranded Value: Case Study on LNG-Capable Ships" (UCL), p.5 (footnote 195).

magnitude of the LNG-capable fleet and 'value at risk' could be around $850bn in 2030."[203] This demonstrates that there is a serious risk that promoting investment into/use of LNG-powered vessels now risks leading to a significant levels of stranded value in the future. In addition, the World Bank's 2021 study on LNG concluded that the two zero-carbon bunker fuels with the best prospects at contributing to climate change mitigation "require[d] technical infrastructure and onboard technologies that are not aligned with investments in LNG technology and LNG supply infrastructure for shipping."[204] LNG technology's technical incompatibility with important zero-carbon solutions further illustrates the serious risks associated with promoting investment into this technology.

Limitations of the EEDI Criteria

258. The Commission also fell into error when it relied uncritically on the EEDI criteria in the Shipping TSC. The EEDI criteria are a flawed measure that will allow vessels that emit high levels of CO_2 but nonetheless become taxonomy-compliant.

259. The main limitation of the EEDI measure is that it focuses exclusively on tailpipe CO_2 emissions and disregards upstream or midstream CO_2 emissions and non-CO_2 GHG emissions (including methane).[205] It is notable, in this respect, that Article 10(2) does not refer exclusively to CO_2 emissions but required the Commission to make the TSC in the light of "conclusive scientific evidence" relating to GHG emissions more generally.

260. The Applicants consider that there are four key problems with the Commission's use of the EEDI in the Delegated Act:

260.1. First, relying on the EEDI in the TSC for Section 6.10 and 6.11 will allow high-emitting vessels to become taxonomy-compliant. As above, this is because there are a range of techniques that can allow vessels to improve their attained EEDI score without installing new, green technologies. Further, EEDI requirements can be

[203] Ibid, p.6.
[204] Englert et al., "The Role of LNG in the Transition Toward Low- and Zero-Carbon Shipping" *World Bank* 2021, Executive Summary, p.4. (footnote 127)
[205] Ibid.

satisfied without using sustainable fuels (see above). The thresholds in the EEDI are not sufficiently exacting to support a pathway to a 1.5°C temperature rise.

260.2. Second, fulfilment of the EEDI Phase 3 requirements does not necessarily lead to a substantial reduction of GHG emissions at all (see above).

260.3. Third, if the EEDI standard is maintained as a standalone criterion, the over-compliance threshold of 20 percentage points is insufficient to make a substantial contribution to climate change mitigation.

Manifest Error 9: Manifest Error as to DNSH (Shipping)

261. Article 3(b) of the Taxonomy Regulation requires that an economic activity can only qualify as environmentally sustainable when DNSH to any of the Environmental Objectives set out in Article 9 in accordance with Article 17. The Commission fell into a manifest error, as to the significant harm that will be caused by the Shipping TSC to: (i) climate change mitigation and (ii) climate change adaptation (Article 9(a) and (b)). This is for the following reasons.

262. First, by allowing vessels that overachieve the IMO's Phase 3 EEDI targets by 20 percentage points to be classified as "sustainable", the Commission has created a loophole in the TSCs. This loophole will allow vessels that run entirely on fossil fuels to benefit from being classified as taxonomy-compliant. The Applicants are particularly concerned that this will lead to existing LNG-powered vessels becoming immediately compliant with the taxonomy. For example, the LNG-powered *MSC World Europa* (a cruise ship) performs 47% better than required by the EEDI.[206] This performance constitutes an over-compliance with the Delegated Act's EEDI requirements by 33 percentage points, meaning the *MSC World Europa* could be classified as taxonomy-compliant. However, the *MSC World Europa* is equipped with five Wartsila 4-stroke engines 14V46DF, an engine type which, according to the FuelEU Maritime Regulation, let out a 3.1% methane slip. This means that, for the reasons outlined above and as based on a growing body of scientific evidence, on a lifecycle well-to-wake basis, the use

[206] MSC WORLD EUROPA SETS NEW STANDARDS FOR ENVIRONMENTAL SUSTAINABILITY AT SEA AND ACCELERATES MSC CRUISES' JOURNEY TO NET ZERO (mscpressarea.com) (**Annex A.74**)

of LNG engines in this ship is likely worse than a traditional marine fuel such as marine gasoil or heavy fuel oil. Despite this, the *MSC World Europa* is able to achieve the requisite EEDI standard on the basis of its vessels being certified for a dual-fuel LNG propulsion system.[207] Moreover, vessels with such systems benefit from improved EEDIs, regardless of whether they actually use LNG in these systems.

263. Second, this means that Section 6.10(e) and 6.11(d) could lead to LNG-certified vessels that are powered by fossil diesel or residual fuel oil being classified as taxonomy-compliant. This presents a significant "*greenwashing*" opportunity for shipping companies. For example, a company could install LNG propulsion systems to a vessel that is not currently taxonomy-compliant and, due to the effect this will have on the vessel's EEDI score, it could become compliant. The central point is that this could occur even if the vessel was largely or fully powered by conventional marine fuels in reality.[208]

264. Recent examples of companies citing their use of LNG-powered ships as part of their sustainability plans demonstrates the greenwashing opportunities that arise from the promotion of LNG. For example, in 2022, Carnival Corporation & Plc announced that 11 LNG-powered cruise ships were expected to join their fleet through 2025, as "part of [their] plan for carbon footprint reduction."[209] In addition, Carnival Corporation confirmed that "due to the high price of LNG in certain markets, at times [they] have used conventional fuels to power [their] LNG ships."[210]

Harm to Climate Mitigation

265. Article 17(a) provides that an economic activity shall be considered to significantly harm climate change mitigation where that activity leads to significant greenhouse gas emissions. As above, it is highly likely that vessels fitted with LNG propulsion systems that nevertheless

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207 Transport & Environment "T&E analysis of EU taxonomy criteria for shipping Estimating the eligibility of fossil LNG ships" (foot note 193).

208 Ibid.

209 Carnival Corporation, "*2022 Sustainability Report*", p.32. (**Annex A.75**)

210 Ibid.

use conventional marine fuels will be classified as taxonomy-compliant. This risks causing significant greenhouse gas emissions for the following reasons:

265.1. First, vessels may seek to obtain taxonomy-compliance on the basis of the EEDI standard instead of investing in zero-tailpipe emission vessels or truly sustainable fuels. This failure to invest in zero carbon technologies will thus lead to higher levels of GHG emissions in the long-term.

265.2. Second, if LNG were to offer climate benefits (which the Applicants dispute on the basis of lifecycle analysis, see above), the Shipping TSC risks giving a green investment label to dual-fuel vessels notwithstanding that the operators of such vessels may continue to burn conventional marine oil (i.e., with no practical change being made to operations or emissions levels, such vessels risk being considered taxonomy-compliant).[211]

266. Moreover, the short-term consequences of promoting investment into LNG via the EEDI standard risk significantly harm climate change mitigation. Critically, methane has an extremely powerful short-term climate impact (as above, it is 83 times more potent than CO_2 over a 20-year period and up to 30 times more in a 100-year period). The significance of the short-term (20-year) impact of methane was recognised by the World Bank in its 2021 study on LNG, despite the impact of GHGs usually being assessed over a longer time-period (100-years). [212] By perversely incentivising investment into LNG and LNG-powered vessels, which themselves will have an estimated lifetime of 20-30 years, the Applicants consider that the Shipping TSC will have drastic climate impacts in the short-to-medium term. Evidently, this contradicts the requirement to do no significant harm in Article 17 of the Taxonomy Regulation.

267. Instead of the EEDI standard, the Applicants consider that the Commission should revise the Shipping TSC to focus on yearly average GHG energy intensity, as this is a more ambitious measure that captures all GHGs (as required by the Taxonomy Regulation).

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211 Cruise ships in Europe switch to diesel from LNG due to high costs | Clean Energy Wire (**Annex A.76**)

212 World Bank, "*The Role of LNG in the Transition Toward Low- and Zero-Carbon Shipping*" (2021), p.57. (footnote 127)

Harm to Climate Adaptation

268. Article 17(b) provides that an economic activity shall be considered to significantly harm climate change mitigation where that activity leads to an increased adverse impact of the current climate and expected future climate. The Applicants consider that the greenwashing that may result from the impugned measures risks (i) harming the current climate by increasing the use of fossil fuels in shipping operations, and (ii) the future climate by disincentivising investment in truly sustainable shipping fuel.

269. Therefore, the Shipping TSCs risk significantly harming climate mitigation and adaptation. The Commission has made a manifest error of assessment as to an essential element set out in Article 3(b) of the Taxonomy Regulation: that no activity that is classified as environmentally sustainable shall cause significant harm to any of the Environmental Objectives.

CONCLUSION

270. The Applicants respectfully ask the Commission to review the Aviation and Shipping TSCs on the basis set out above.