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COMMISSION IMPLEMENTING REGULATION (EU) …/...

of XXX

amending Implementing Regulation (EU) 2018/2066 as regards updating the monitoring and reporting of greenhouse gas emissions pursuant to Directive 2003/87/EC of the European Parliament and of the Council

(Text with EEA relevance)

This draft has not been adopted or endorsed by the European Commission. Any views expressed are the preliminary views of the Commission services and may not in any circumstances be regarded as stating an official position of the Commission.

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amending Implementing Regulation (EU) 2018/2066 as regards updating the monitoring and reporting of greenhouse gas emissions pursuant to Directive 2003/87/EC of the European Parliament and of the Council

(Text with EEA relevance)

THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union,

Having regard to Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a system for greenhouse gas emission allowance trading within the Union and amending Council Directive 96/61/EC[1], and in particular Article 14(1) and Article 30f(5) thereof,

Whereas:

(1) Directive 2003/87/EC establishing a system for greenhouse gas emission allowance trading within the Union (EU ETS) was revised and amended by Directive (EU) 2023/959 of the European Parliament and of the Council[2] to align it with Regulation (EU) 2021/1119 of the European Parliament and of the Council[3] setting a target of at least 55 % net emission reductions by 2030 compared to 1990.

(2) Following the amendment of Directive 2003/87/EC by Directive (EU) 2023/958 of the European Parliament and of the Council[4] and Directive (EU) 2023/959, Commission Implementing Regulation (EU) 2018/2066[5] should be amended accordingly to incorporate the necessary definitions and detailed arrangements for the monitoring and reporting of emissions from renewable fuels of non-biological origin and recycled

[1] OJ L 275, 25.10.2003, p. 32, ELI: http://data.europa.eu/eli/dir/2003/87/oj.

[2] Directive (EU) 2023/959 of the European Parliament and of the Council of 10 May 2023 amending Directive 2003/87/EC establishing a system for greenhouse gas emission allowance trading within the Union and Decision (EU) 2015/1814 concerning the establishment and operation of a market stability reserve for the Union greenhouse gas emission trading system (OJ L 130, 16.5.2023, p. 134, ELI: http://data.europa.eu/eli/dir/2023/959/oj).

[3] 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, ELI: http://data.europa.eu/eli/reg/2021/1119/oj)

[4] 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, 16.5.2023, p. 115, ELI: http://data.europa.eu/eli/dir/2023/958/oj).

[5] Commission Implementing Regulation (EU) 2018/2066 of 19 December 2018 on the monitoring and reporting of greenhouse gas emissions pursuant to Directive 2003/87/EC of the European Parliament and of the Council and amending Commission Regulation (EU) No 601/2012 (OJ L 334, 31.12.2018, p. 1, ELI: http://data.europa.eu/eli/reg_impl/2018/2066/oj).

carbon fuels and also to ensure proper alignment with sustainability and greenhouse gas savings criteria laid down in Directive (EU) 2018/2001 of the European Parliament and of the Council[6], for the monitoring and reporting of emissions from the transport of CO_2 by other means than pipelines for geological storage, emissions from aviation including monitoring and reporting of non-CO_2 aviation effects, emissions from the new emission trading system for buildings, road transport and non-ETS industry.

(3) Under the new emission trading system for buildings, road transport and additional sectors, it is necessary, for the definition of a 'final consumer' in Article 3(69) to provide for more specific reference to the definition of regulated entity in Article 3(ae) of Directive 2003/87/EC.

(4) Article 5 of Implementing Regulation (EU) 2018/2066 should be amended to reflect that the completeness of monitoring and reporting should cover all process and combustion emissions of the stationary installation, from all emission sources and sources belonging to activities listed in Annex I to Directive 2003/87/EC and other directly associated activities in line with Article 3(e) of that Directive.

(5) To improve the quality of information on biomass, on renewable fuels of non-biological origin (RFNBOs), on recycled carbon fuels (RCFs), and on synthetic low-carbon fuels and to facilitate national reporting under Regulation (EU) 2018/1999 of the European Parliament and of the Council[7], operators should monitor and report emissions from the non-zero rated and zero-rated carbon fraction of these fuels as memo-items in the emission reports. For that purpose, parameters concerning non-zero-rated and zero-rated biomass, RFNBOs and RCFs, or synthetic low-carbon fuels should be determined and reported for each corresponding source stream under the standard calculation methodology pursuant to Article 24 of Implementing Regulation (EU) 2018/2066 and the mass balance system pursuant to Article 25 of that Regulation. Specific rules are necessary on the determination of composition-related calculation factors concerning non-zero-rated and zero-rated biomass, RFNBOs and RCFs, and synthetic low-carbon fuels, including the zero-rated and non-zero-rated carbon fraction.

(6) To avoid systematic underestimation of the total emissions in the mass balance system when zero-rated carbon is contained in the input and in the output streams, it is important for operators to determine the zero-rated carbon content of the output streams. Clear evidence is needed to demonstrate that underestimation has been avoided and that the total mass of the zero-rated carbon fraction in output materials does not exceed the total mass from zero-rated input materials.

(7) Directive 2003/87/EC, as revised by Directive (EU) 2023/959, specifies that the emission factor of biomass is zero if the biomass complies with the sustainability and

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6 Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources (OJ L 328, 21.12.2018, p. 82, ELI: http://data.europa.eu/eli/dir/2018/2001/oj).

7 Regulation (EU) 2018/1999 of the European Parliament and of the Council of 11 December 2018 on the Governance of the Energy Union and Climate Action, amending Regulations (EC) No 663/2009 and (EC) No 715/2009 of the European Parliament and of the Council, Directives 94/22/EC, 98/70/EC, 2009/31/EC, 2009/73/EC, 2010/31/EU, 2012/27/EU and 2013/30/EU of the European Parliament and of the Council, Council Directives 2009/119/EC and (EU) 2015/652 and repealing Regulation (EU) No 525/2013 of the European Parliament and of the Council, (OJ L 328, 21.12.2018, p. 1, ELI: http://data.europa.eu/eli/reg/2018/1999/oj).

greenhouse gas emissions savings criteria for the use of biomass fuels established by Directive (EU) 2018/2001, taking into account any necessary adjustments for application under Directive 2003/87/EC, as set out in the implementing acts referred to in Article 14 of that Directive. In order to clarify the conditions under which biomass emissions can be zero-rated and to align with the revised Directive 2018/2001, Article 38(5) of Implementing Regulation (EU) 2018/2066 should be amended. Where the relevant sustainability and greenhouse gas emissions savings criteria do not apply to a specific type of biomass, that biomass can be zero-rated directly. However, in this case, operators should still demonstrate that the criteria are not applicable. Assessing the proof of applicability and proof of sustainability is an essential part of the verification where the verifier checks the correct application of the monitoring methodology, including the zero-rating of the biomass. Where sustainability and greenhouse gas emissions savings criteria laid down in Article 29(2) to (7) and (10) do apply, compliance with these criteria is required for zero-rating. Biomass that does not comply with the criteria in this case should be treated as a fossil fuel.

(8) Article 31a of Directive (EU) 2023/2413 of the European Parliament and of the Council[8] sets up a Union database to enable the tracing of liquid and gaseous renewable fuels, recycled carbon fuels and synthetic low-carbon fuels ('the Union Database'). By 21 November 2024, the Union Database should be fully operational. Where compliance is required with the sustainability and the greenhouse gas emissions saving criteria laid down in Article 29, paragraphs (2) to (7) and (10) of Directive (EU) 2018/2001, for biomass, and Article 29a of that Directive, for liquid and gaseous renewable fuels and RCFs, proof of sustainability should be provided in line with Article 30 and 31 of that Directive. To facilitate this process and to reduce the administrative burden, Member States should be able to rely on the evidence provided by EU ETS operators, aircraft operators and regulated entities from the Union Database on the transactions related to any amount of fuel that has been purchased and used during the reporting year and that has been connected to the cancellation of the respective quantity in the Union database. In the case of subsequent non-compliance regarding the proof of sustainability of the quantities cancelled in the databases, the competent authority shall correct the verified emissions accordingly.

(9) According to Article 33 of Implementing Regulation (EU) 2018/2066, sampling is to be representative for the specific batch and free of bias. Where continuous sampling of the flue gas stream is used, the analysis frequency should be aligned with this process and cover the whole reporting year without interruption.

(10) Directive (EU) 2023/959 has extended the scope of activities listed in Annex I to Directive 2003/87/EC for the refining of any oil, the production of any iron, the production of alumina, the production of hydrogen and the transport of CO_2 through means other than pipelines. In order to ensure alignment with Annex I to Directive 2003/87/EC, the Annexes to Implementing Regulation (EU) 2018/2066 need to be updated.

(11) Directive 2003/87/EC recognises the potential role of RCFs and RFNBOs for reducing greenhouse gas emissions in sectors that are hard to decarbonise. To contribute to the

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[8] Directive (EU) 2023/2413 of the European Parliament and of the Council of 18 October 2023 amending Directive (EU) 2018/2001, Regulation (EU) 2018/1999 and Directive 98/70/EC as regards the promotion of energy from renewable sources, and repealing Council Directive (EU) 2015/652, (OJ L, 2023/2413, 31.10.2023, ELI: http://data.europa.eu/eli/dir/2023/2413/oj).

decarbonisation, their greenhouse gas emissions savings need to meet the minimum greenhouse gas emissions savings laid out in Article 29a of Directive (EU) 2018/2001 and be calculated according to the methodology set out in the act adopted pursuant to that Article.

(12) RCFs or RFNBOs that contain carbon in their chemical composition, such as e-kerosene or e-methanol, require a carbon feedstock for their production. Until all stages of the life of a product in which captured carbon is used are subject to carbon pricing, in particular at the stage of waste incineration, reliance on accounting for emissions at the point of their release from products into the atmosphere would result in emissions being underestimated. Where RFNBOs or RCFs are produced from captured CO_2 under an activity covered by Directive 2003/87/EC, the emissions should be accounted for under that activity. In order to avoid double counting and requiring a double payment for the same emissions, the CO_2 emissions from RCFs and RFNBOs that comply with the criteria laid out in Directive (EU) 2018/2001 should have an emission factor of zero. Member States may design support schemes for renewable or low-carbon fuels or transformative technologies, to specify how to account for emissions from RFNBOs and RCFs in line with their national decarbonisation strategy or policy.

(13) Subject to review in respect of zero-rated carbon combusted in installations which are exempt from the EU ETS due their high use of biomass pursuant to point 1 of Annex I, synthetic low-carbon fuels must comply with the greenhouse gas savings criteria laid down in Article 2 point 13 of Directive (EU) 2024/… on common rules for the internal markets in renewable gas and natural gas and in hydrogen [Gas directive]. Synthetic low-carbon fuels require carbon feedstock for their production. To avoid double counting in accordance with Article 5 of Commission Implementing Regulation (EU) 2018/2066, if the carbon content of the fuels stems from the EU ETS and it has therefore been accounted, including when its emissions factor is zero, the emissions from the synthetic low-carbon fuel should be zero-rated. The emissions resulting from synthetic low-carbon fuels with other carbon content should be treated as their fossil fuel equivalents. It is necessary to provide rules for the determination of the fraction of zero-rated synthetic low-carbon fuels.

(14) RCFs or RFNBOs that do not meet the greenhouse gas emissions savings laid out in Article 29a of Directive 2018/2001 are considered to lead to insufficient greenhouse gas emissions savings in comparison to fossil fuels. Therefore, the emissions resulting from the combustion of such RCFs or RFNBOs should be treated as their fossil fuel equivalents. As fossil fuels may be blended with RCFs or RFNBOs, it is necessary to provide rules for the determination of the fraction of zero-rated RCF or RFNBO.

(15) Implementing Regulation (EU) 2018/2066 should determine the monitoring methodology that should be applied to emissions from zero-rated RFNBOs, RCFs and synthetic low-carbon fuels. Provisions should be included for the deduction of total zero-rated RFNBO, RCF and synthetic low-carbon fuels emissions, in the case where the operator uses the measurement-based methodology for the determination of total CO_2 emissions.

(16) In addition, when applying the measurement-based methodology for biomass-containing fuels and materials, conditions should be added when the biomass fraction equals the zero-rated biomass fraction. Clarifications should also be provided when these conditions are not met and in such case the provisions deployed related to calculation-based approach should be followed by the operator.

(17) When the installation's proposed methodology involves continuous sampling from the flue gas stream, and at the same time the stationary installation consumes natural gas from the grid, to avoid double counting, the CO_2 stemming from biogas should be determined by laboratory analysis and this amount should be respectively deducted from the total zero-rated CO_2 previously determined by calculation-based approach.

(18) Directive 2003/87/EC does not recognise negative greenhouse gas emissions. To avoid generating negative emissions, an operator should not subtract from its emissions any CO_2 that originates from zero-rated fuels. In the case of the capture of emissions from a mix of zero and non-zero-rated sources, to ensure clarity and simplicity, the quantity of CO_2 resulting from non-zero-rated sources that can be deducted from the operator's emissions should be established based on the proportion of the zero-rated and non-zero-rated emissions.

(19) The activities 'transport of greenhouse gases for geological storage', and 'geological storage of greenhouse gases', in Annex I to Directive 2003/87/EC, cover all CO_2 transported and stored in a storage site permitted under Directive 2009/31/EC, irrespective of the geographical and physical origin of the CO_2. In order to avoid any gaps in the monitoring and reporting framework and to provide the incentives for operators of CO_2 transport infrastructure or of CO_2 storage sites to minimise leaks, it is necessary to clarify that these operators should monitor and report any emissions from all CO_2 for geological storage in their custody, including if originating from activities outside of the scope of Directive 2003/87/EC.

(20) As CO_2 for geological storage is expected to be transported by a variety of modes, Directive (EU) 2023/959 expanded the scope of the activity 'transport of greenhouse gases for geological storage' in Annex I to Directive 2003/87/EC to any transport mode. Therefore, it is necessary to revise the monitoring and reporting provisions related to the CO_2 transport activity to ensure that they are applicable to a CO_2 transport infrastructure based on any transport modes. Where a transport mode is also covered by another activity under Directive 2003/87/EC, to avoid the double counting of emissions, the emissions covered by the other activity under that Directive should be excluded from the boundaries of the CO_2 transport activity.

(21) The transport of CO_2 for geological storage may take place over long distances. Therefore, the CO_2 may be in transit for lengthy periods. In such cases, it is appropriate to provide the operator of the CO_2 transport infrastructure the flexibility to subtract from the emissions to be reported in a given year any amount of CO_2 that is still in transit by 31 December of that year, provided that the CO_2 shipment reaches its destination and is transferred out to a storage site or to another EU ETS installation no later than 31 January of the following year.

(22) The revised Directive 2003/87/EC amended the definition of emissions to also encompass greenhouse gases that are not directly released into the atmosphere. Therefore, these should also be considered emissions under the EU ETS, unless they are stored in a storage site in accordance with Directive 2009/31/EC or they are permanently chemically bound in a product so that they do not enter the atmosphere under normal use, and do not enter the atmosphere under any normal activity taking place after the end of the life of the product. In consequence, the Annexes to Implementing Regulation (EU) 2018/2066 need to be updated accordingly to account for greenhouse gases released in ways other than directly into the atmosphere, while avoiding the double counting of emissions where greenhouse gases not emitted directly into the atmosphere are re-used within the same installation or in another EU

ETS installations. To avoid undue disruptions for installations affected by these changes, their application should be delayed until 1 January 2025 to allow sufficient time for the necessary adaptations.

(23) When determining the oxidation or conversion factor of a source stream, carbon monoxide (CO) emitted to the atmosphere should be considered as the molar equivalent amount of CO_2. CO that is otherwise transferred in a product or as a feedstock is not considered as an emission under the scope of Directive 2003/87/EC.

(24) Article 12(3b) of Directive 2003/87/EC provides that allowances do not need to be surrendered for greenhouse gases which are considered to have been captured and utilised in such a way that they have become permanently chemically bound in a product so that they do not enter the atmosphere under normal use, including any normal activity taking place after the end of the life of the product. It is necessary to include a general provision for operators to determine and subtract from their emissions the amount of CO_2 considered to be permanently chemically bound in a product listed in the delegated act adopted pursuant to Article 12(3b) of Directive 2003/87/EC, replacing the provision that allowed to subtract the CO_2 considered chemically bound in precipitated calcium carbonate.

(25) Having regard to Article 14(5) of Directive 2003/87/EC, the monitoring, reporting and verification framework (MRV) of non-CO_2 effects constitutes a stand-alone, distinct exercise from carbon pricing. EU research and innovation activities on the impact and technological solutions of non-CO_2 aviation effects are ongoing since 1994 and should continue. Given the uncertainties surrounding the impacts of non-CO_2 effects, it is key to start the MRV on non-CO_2 effects with a view to ensuring scientific validation of the impacts.

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

(27) In order to minimise administrative burden, aircraft operators should provide a single monitoring plan for CO_2 emissions and non-CO_2 effects.

(28) The calculation of the CO_2(e) per flight should be done using the Global Warming Potential (GWP) metric in three time horizons GWP_{20}, GWP_{50} and GWP_{100}, to better understand those impacts on climate, applying efficacy, as defined in Implementing Regulation (EU) 2018/2066, and the Commission's non-CO_2 aviation effects tracking system (NEATS), to refine the GWP metric.

(29) In order to calculate CO_2(e) for non-CO_2 effects, the aircraft operators should use a CO_2(e) calculation approach. This approach includes modules for estimating fuel burn and different emissions (NOx, CO, HC), models calculating CO_2(e) using the input data and default values as described in Annex IIIa and Annex IIIb to Implementing Regulation (EU) 2018/2066, where data gaps occur.

(30) In order to avoid incentivizing underreporting, conservative default values may be used. Where data sourced by the aircraft operator is not available, work needs to continue to enable reporting of measured values, based on the best information available. Relying on default values decreases the precision of the data.

(31) Acknowledging the importance of providing appropriate tools to limit the administrative effort of monitoring, reporting and verification of non-CO_2 aviation effects, the aircraft operators may rely on the information technology tool, NEATS, provided by the Commission. The aircraft operators may also opt to use their own or third-party information technology tools provided that these tools comply with the provisions of Implementing Regulation (EU) 2018/2066, in particular Article 56a, and provided that the Commission approves them.

(32) The aircraft operators should securely collect, and store monitored data, including flight details and aircraft information. For this purpose, the aircraft operators may rely on the Commission IT tool and/or third-party resources, ensuring compliance with confidentiality rules and accessibility for verification purposes.

(33) In a situation where no data is provided by the aircraft operators NEATS should be able to calculate the CO_2(e) automatically, on the basis of data gathered from external sources and the default values as described in Annex IIIa and Annex IIIb to Implementing Regulation (EU) 2018/2066.

(34) In the event of the unavailability of IT tools, aircraft operators should monitor essential flight and aircraft properties information as an interim measure.

(35) In the event of the unavailability of common reference Numerical Weather Prediction (NWP) model, aircraft operators should use a location-simplified approach to calculate the CO_2(e) of non-CO_2 aviation effects as an interim measure.

(36) For the purpose of minimising the administrative burden, small emitters may choose to use a location-simplified approach to calculate the CO_2(e) of non-CO_2 aviation effects.

(37) Based on the feedback on the implementation of the EU ETS, it is necessary to further facilitate the identification of the operator of an aircraft pursuant to Article 3(o) of Directive 2003/87/EC and to include an additional step in this process.

(38) In order to align the provisions of Article 28a(4) of Directive 2003/87/EC and this Regulation concerning the definition of small emitters, this Regulation should be updated to allow operators meeting the criteria defined in Article 28(4) of that Directive, to use the fuel estimation tools implemented by Eurocontrol.

(39) Reporting requirements play a key role in ensuring proper emission monitoring and enforcement of legislation. In order to streamline those reporting requirements, appropriate reporting rules should be established for aircraft operators for the use of different types of alternative aviation fuels, including biofuels, RFNBOs, RCFs and other fuels eligible under the EU ETS support system established pursuant to Article 3c(6) of Directive 2003/87/EC.

(40) Emission thresholds apply to aircraft operators for their inclusion into the EU ETS or ICAO's Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA). Aircraft operators can be considered small emitters or allowed to use simplified tools. In accordance with the purpose of the EU ETS and the principles also included in ICAO's CORSIA scheme, the calculation of these emissions thresholds should not take into account the possible use of fuels with an emission factor of zero.

Therefore, it is appropriate to establish a preliminary emission factor for the purpose of a calculation of these thresholds.

(41) In accordance with Directive (EU) 2023/959, the surrendering of allowances under the new emissions trading for buildings, road transport and additional sectors system will start in 2028 for the annual emissions of 2027. However, the monitoring and reporting of emissions under the new emissions trading system will start from 1 January 2025. Clear monitoring and reporting rules for the emissions trading system for buildings, road transport and additional sectors should be laid down sufficiently in advance, in order to facilitate orderly implementation in Member States. In order to reduce administrative burden, to ensure consistency between monitoring methodologies and to build on experiences from the existing emission trading system for stationary installations and aviation, it is appropriate to set up the relevant rules for the new system.

(42) In order to ensure a robust level of monitoring accuracy and to minimise the administrative burden for the regulated entities and competent authorities, the scope factor should be applied after the categorisation of the regulated entity and the fuel streams. This should allow more accurate monitoring and should avoid unnecessary changes to the monitoring plans, which reduce the administrative burden for regulated entities and competent authorities.

(43) In order to limit the administrative burden, it is appropriate to provide specific rules for regulated entities with low emissions and give flexibility to the competent authorities in the categorisation of regulated entities.

(44) In order to facilitate the implementation of the new measures, it is appropriate to provide a time-bound derogation, before 2027, to the application of the scope factor after the categorisation. It is appropriate for the competent authorities to be able to qualify regulated entity as regulated entities with low emissions, or to allow the regulated entity to classify itself and each fuel stream, based on the emissions after the application of the scope factor, with the exclusion of CO_2 stemming from biomass, where it can be demonstrated to the satisfaction of the competent authority that the scope factor applied for the classification will also remain to be representative in the future years.

(45) In order to facilitate verification, it is appropriate that stationary installations operators, aircraft operators, shipping companies and regulated entities submit the information on fuels used for activities referred to in Annex I to Directive 2003/87/EC together with the annual emissions report. No separate report should be required on the amounts of fuels acquired and used. Implementing Regulation (EU) 2018/2066 should therefore be amended accordingly.

(46) In order to facilitate the orderly and coherent submission of the monitoring plan for regulated entities to the competent authorities, and considering the provisions that have already been adopted in Commission Implementing Regulation (EU) 2023/2122 of 17 October 2023, amending Implementing Regulation (EU) 2018/2066, all provisions contained in this Regulation relating to the new emissions trading for buildings, road transport and additional sectors, should apply from 1 July 2024.

(47) Directive 2003/87/EC already provides that the emissions from RFNBOs used for aircraft operators shall be zero-rated before the entry into force of this revision of the Implementing Regulation (EU) 2018/2066. Therefore, in order to ensure consistency, clarity and a level playing field, the rules for monitoring and reporting of emissions

from zero-rated RFNBO, RCF and synthetic low-carbon fuels should apply as of 1 January 2024.

(48) The measures provided for in this Regulation are in accordance with the opinion of the Climate Change Committee.

HAS ADOPTED THIS REGULATION:

Article 1

Implementing Regulation (EU) 2018/2066 is amended as follows:

(1) Articles 1 and 2 are replaced by the following:

'Article 1

This Regulation lays down rules for the following:

(i) from 1 January 2021 and subsequent trading periods, monitoring and reporting of greenhouse gas emissions and activity data pursuant to Directive 2003/87/EC in the trading period of the Union emissions trading system;

(ii) from 1 January 2025, monitoring and reporting of non-CO_2 aviation effects pursuant to Article 14 of Directive 2003/87/EC.

Article 2

This Regulation shall apply to the monitoring and reporting of greenhouse gas emissions specified in relation to the activities listed in Annex I and III to Directive 2003/87/EC, to activity data from stationary installations, to aviation activities, including non-CO_2 aviation effects, and to released fuel amounts from activities referred to in Annex III to that Directive.

It shall apply to the following:

(i) from 1 January 2021, emissions, activity data and released fuel amounts occurring;

(ii) from 1 January 2025, non-CO2 aviation effects.

The monitoring and reporting of non-CO_2 aviation effects from 2025 shall cover all non-CO_2 effects from aviation activities listed in Annex I to the Directive involving an aerodrome located in the EEA. However, in respect of the monitoring and reporting of non-CO_2 aviation effects taking place in 2025 and 2026, such reporting shall only be required in respect of routes involving two aerodromes located in the EEA, and routes from an aerodrome located in the EEA departing to Switzerland or to the United Kingdom. In respect of 2025 and 2026, the non-CO_2 aviation effects taking place from other flights may be reported on a voluntary basis.';

(2) Article 3 is amended as follows:

(a) point (4)(b) is replaced by the following:

'(b) in the case of a mass balance methodology in accordance with Article 25 of this Regulation, one of the following:

(i) a specific fuel type, raw material or product containing carbon;

(ii) CO2 transferred in accordance with Article 49 of this Regulation;';

(b) point (7) is replaced by the following:

‘ (7) ‘calculation factors’ means net calorific value, emission factor, preliminary emission factor, oxidation factor, conversion factor, carbon content, fossil fraction, biomass fraction, zero-rated biomass fraction, RFNBO or RCF fraction, zero-rated RFNBO or RCF fraction, synthetic low-carbon fraction, zero-rated synthetic low-carbon fraction, zero-rated fraction, or unit conversion factor;’,

(c) point (15) is replaced by the following:

‘ (15) ‘conversion factor’ means the ratio of carbon emitted as CO_2 to the total carbon contained in the source stream before the emitting process takes place, expressed as a fraction, considering CO emitted to the atmosphere as the molar equivalent amount of CO_2. In the case of CO_2 emissions considered to be permanently chemically bound in a product, conversion factor means the ratio of CO_2 bound as carbon in a product during the production process in which the CO_2 is bound to the total CO_2 contained as carbon in a product leaving the production process;’;

(d) points (23b) to (23h) are inserted:

‘(23b) ‘alternative aviation fuels’ means neat aviation fuels containing carbon other than stemming from the neat fossil fuels listed in Table 1 of Annex III to this Regulation;

(23c) ‘zero-rating’ means the mechanism by which the emission factor of a fuel or material is reduced in order to acknowledge:

(a) in case of biomass, its compliance with sustainability or greenhouse gas savings criteria provided by Article 29(2) to (7) and (10) of Directive (EU) 2018/2001, as specified in Article 38(5) of this Regulation;

(b) in case of RFNBO or RCF, its compliance with the greenhouse gas savings criteria in accordance with Article 29a of Directive (EU) 2018/2001, as specified in Article 39a(3) of this Regulation;

(c) in case of synthetic low-carbon fuels, its compliance with the greenhouse gas savings criteria provided by Article 2 point 13 of Directive (EU) 2024/… on common rules for the internal markets in renewable gas and natural gas and in hydrogen [Gas directive]; and the prior surrendering of allowances under Directive 2003/87/EC for the captured carbon necessary to produce the synthetic low-carbon fuels, as specified in Article 39a(4) of this Regulation, unless that captured carbon is zero-rated carbon as defined in Article 3(38f).

(23d) ‘zero-rated fuels’ means biofuels, bioliquids, biomass fuels, synthetic low-carbon fuels, RFNBO or RCF or fractions of mixed fuels or materials which comply with the criteria as specified in Articles 38(5) or 39a(3) or 39a(4) of this Regulation, as applicable;

(23e) ‘recycled carbon fuels’ (RCF) means recycled carbon fuels as defined in Article 2, point (35) of Directive 2018/2011;

(23f) ‘renewable fuels of non-biological origin’ (RFNBO) means renewable fuels of non-biological origin as defined in Article 2, point (36) of Directive 2018/2011;

(23g) ‘neat fuel’ means a fuel in its pure form containing only one of the following fractions:

(i) fossil fraction;

(ii) non-zero-rated biomass fraction;

(iii) zero-rated biomass fraction;

(iv) non-zero-rated RFNBO or RCF fraction;

(v) zero-rated RFNBO or RCF fraction;

(vi) non-zero-rated synthetic low-carbon fraction;

(vii) zero-rated synthetic low-carbon fraction;

(viii) fraction of fuels containing carbon other than stemming from the fossil fuels listed in Table 1 of Annex III to this Regulation or from biomass, RFNBO, RCF or synthetic low-carbon fuels;

(23h) ‘synthetic low-carbon fuels’ means gaseous and liquid fuels, the energy content of which is derived from low-carbon hydrogen as defined in Article 2, point (11) of Directive (EU) 2024/..., which meet the greenhouse gas emission reduction threshold of 70% compared to the fossil fuel comparator for renewable fuels of non-biological origin set out in the methodology adopted according to Article 29a(3) of Directive (EU) 2018/2001, as certified in accordance with Article 9 of [Gas Package Directive];’;

(e) points (34) and (34a) are replaced by the following:

‘(34) ‘mixed fuel’ means a fuel which contains at least two of the following:

(i) carbon stemming from biomass;

(ii) carbon stemming from a RFNBO or RCF;

(iii) carbon stemming from synthetic low-carbon fuels;

(iv) other fossil carbon;

or which contains both zero-rated carbon and other carbon.

(34a) ‘mixed aviation fuel’ means a fuel which contains at least two different neat fuels;’;

(f) points (36), (37) and (38) are replaced by the following:

‘(36) ‘preliminary emission factor’ means the assumed total emission factor of a fuel or material based on its total carbon content before multiplying it by the fossil fraction to produce the emission factor;

(37) ‘fossil fraction’ means the ratio of fossil carbon to the total carbon content of a fuel or material, expressed as a fraction;

(38) ‘biomass fraction’ means the ratio of carbon stemming from biomass to the total carbon content of a fuel or material, expressed as a fraction, independent of whether the biomass complies with the criteria of Article 38(5) of this Regulation;’;

(g) point (38a) is deleted.

(h) points (38b) to (38h) are inserted as follows:

‘(38b) ‘zero-rated biomass fraction’ means the ratio of carbon stemming from biomass which complies with the criteria of Article 38(5) of this Regulation to the total carbon content of a fuel or material, expressed as a fraction;

(38c) ‘RFNBO or RCF fraction’ means the ratio of carbon stemming from an RFNBO or RCF to the total carbon content of a fuel, expressed as a fraction, independent of whether the RFNBO or RCF complies with the criteria of Article 39a(3) of this Regulation;

(38d) ‘zero-rated RFNBO or RCF fraction’ means the ratio of carbon stemming from an RFNBO or RCF that complies with the criteria of Article 39a(3) of this Regulation, to the total carbon content of a fuel, expressed as a fraction;

(38e) ‘zero-rated carbon fraction’ means:

(i) in case of a fuel, the sum of its zero-rated biomass fraction, its zero-rated synthetic low-carbon fraction and its zero-rated RFNBO or RCF fraction without double counting of any carbon;

(ii) in case of a material, its zero-rated biomass fraction.

(38f) ‘zero-rated carbon’ means carbon contained in a fuel or material that belongs to the zero-rated carbon fraction of that fuel or material.

(38g) ‘synthetic low-carbon fraction’ means the ratio of carbon stemming from synthetic low-carbon fuel to the total carbon content of a fuel, expressed as a fraction, independent of whether the synthetic low-carbon fuel complies with the criteria of Article 39a(4);

(38h) ‘zero-rated synthetic low-carbon fraction’ means the ratio of carbon stemming from a synthetic low-carbon fuel that complies with the criteria of Article 39a(4), to the total carbon content of a fuel;’;

(i) point (42) is replaced by the following:

‘(42) ‘fossil carbon’ means inorganic and organic carbon that is not zero-rated carbon;’;

(j) point (55) is replaced by the following:

‘CO_2 transport’ means the transport of CO_2 for geological storage in a storage site permitted under Directive 2009/31/EC;’;

(k) point (63) is replaced by the following:

‘(63) ‘CO_2 transport infrastructure’ means an infrastructure as defined in Article 3(30) of Regulation [(EU) xxx of 2024 (NZIA)] for the purpose of storage in geological sites permitted under Directive 2009/31/EC;’;

(l) point (63b) is inserted:

‘(63b) ‘CO2 in transit’ means any amount of transferred CO2 in a CO2 transport infrastructure that has not been transferred to another installation or CO2 transport infrastructure within the same reporting period it was received;’;

(m) point (69) is replaced by the following:

‘(69) ‘final consumer’ for the purposes of applying the definition of regulated entity, in accordance with Article 3(ae) of Directive 2003/87/EC, in this Regulation, means any natural or legal person that is the consumer of the fuel, whose annual fuel consumption does not exceed 1 tonne of CO2;’;

(n) points (71) to (80) are inserted:

'(71) 'non-CO_2 aviation effects' means non-CO_2 aviation effects as defined in Article 3(v) of Directive 2003/87/EC;

(72) 'CO_2(e) per flight' means the non-CO_2 aviation effects that warm the atmosphere, expressed as the equivalent amount of CO_2 emissions of the given flight;

(73) 'climate forcing' means an imposed change of the planetary energy balance, measured in watts per square meter (W/m^2);

(74) 'efficacy' is the change in global mean temperature per unit radiative forcing exerted by the forcing agent, relative to the response generated by a standard CO_2 forcing starting from the same initial climate state;

(75) 'CO_2(e) calculation model' means a model used to calculate the total climate impact of non-CO_2 aviation effects, in accordance with Annex IIIa Section 4 to this Regulation;

(76) 'weather-based approach' means Method C, as provided in Annex IIIa Section 4 to this Regulation, using primarily enhanced weather data, as well as flight information, trajectory, aircraft properties and fuel properties;

(77) 'location-simplified approach' means Method D, as provided in Annex IIIa Section 4 to this Regulation, using primarily aircraft in-flight location-related data such as flight information, trajectory, but also basic weather data and aircraft properties;

(78) 'non-CO_2 aviation effects tracking system (NEATS)' means an information technology (IT) tool, that is provided by the Commission to aircraft operators, to accredited verifiers and to competent authorities for the purpose of facilitating and, to the extent possible, automating monitoring, reporting and verification of non-CO_2 aviation effects, in line with Article 14(5) of Directive 2003/87/EC;

(79) 'aircraft properties' means the category of information regrouping as a minimum and for each flight, the aircraft type, the engine(s) identifier(s) and the aircraft mass.

(80) 'aeroplane' means a power-driven heavier-than-air aircraft, which derives its lift in flight chiefly from aerodynamic reactions on surfaces which remain fixed under given conditions of flight.';

(3) Article 4 is replaced by the following:

'

Article 4

Operators and aircraft operators shall carry out their obligations related to the monitoring and reporting of greenhouse gas emissions and non-CO_2 aviation effects under Directive 2003/87/EC in accordance with the principles laid down in Articles 5 to 9 of this Regulation.';

(4) in Article 5, the first subparagraph is replaced by the following:

'Monitoring and reporting shall be complete and cover all process and combustion emissions from all emission sources and source streams belonging to activities listed in Annex I to Directive 2003/87/EC and other relevant activities included pursuant to Article 24 of that

Directive, as well as associated activities included in the boundaries of the installation, and of all greenhouse gases specified in relation to those activities, while avoiding double-counting.';

(5) in Article 6, paragraph 3 is inserted:

'3. Aircraft operators shall obtain, record, compile, analyse and document monitoring data, including assumptions, references, activity data and calculation factors, in a transparent manner that enables the reproduction of the determination of non-CO2 aviation effects per flight by the verifier and the competent authority.';

(6) Article 8 is replaced by the following:

Article 8

Operators and aircraft operators shall enable reasonable assurance of the integrity of emission and non-CO2 aviation effects data to be reported. They shall determine emissions and non-CO2 aviation effects using the appropriate monitoring methodologies set out in this Regulation.

Reported emissions and non-CO2 aviation effects data and related disclosures shall be free from material misstatement as defined in Article 3(6) of Commission Implementing Regulation (EU) 2018/2067 (*), avoid bias in the selection and presentation of information, and provide a credible and balanced account of an installation's or aircraft operator's emissions and non-CO2 aviation effects.

In selecting a monitoring methodology, the improvements from greater accuracy shall be balanced against additional costs. Monitoring and reporting shall aim for the highest achievable accuracy, unless this is technically not feasible or incurs unreasonable costs.

(*) Commission Implementing Regulation (EU) 2018/2067 of 19 December 2018 on the verification of data and on the accreditation of verifiers pursuant to Directive 2003/87/EC of the European Parliament and of the Council (*OJ L 334, 31.12.2018, p. 94,* ELI: http://data.europa.eu/eli/reg_impl/2018/2067/oj).';

(7) in Article 11(1), the first subparagraph is replaced by the following:

'1. Each operator or aircraft operator shall monitor greenhouse gas emissions, and non-CO2 aviation effects, on the basis of a monitoring plan approved by the competent authority in accordance with Article 12 of this Regulation, taking into account the nature and functioning of the installation or aviation activity to which it applies.';

(8) in Article 14(2), the following point (aa) is inserted:

'(aa) non-CO2 aviation effects occur due to new activities carried out;';

(9) Article 15(4) is amended as follows:

(a) the introductory sentence of paragraph (4) and the introductory sentence of point (a) are replaced by the following:

'4. Significant modifications to the monitoring plans of an aircraft operator include:

(a) with regard to emissions:';

(b) point (a)(iv) is replaced by the following:

'(iv) changes in the status of the aircraft operator as a small emitter within the meaning of Article 55(1) of this Regulation and whether the aircraft operator intends to use the simplification pursuant to Article 28a(4) of Directive 2003/87/EC.';

(c) point (b) is inserted:

‘(b) with regard to the non-CO_2 aviation effects:

(i) (a change in the CO_2(e) calculation approach selected, as laid down in Article 56a(4) of this Regulation, notably in terms of IT tools to apply the CO_2(e) calculation models;

(ii) changes in the status of the aircraft operator as a small emitter within the meaning of Article 55(1) of this Regulation.’;

(10) in Article 18(2), second subparagraph, Article 19(2), points (a), (b) and (c), Article 19(5), Article 38(1) and Article 47(2), points (a) and (b), the term “biomass” is replaced by “zero-rated carbon”.

(11) in Article 19, paragraph 6 is deleted.

(12) Article 24 is amended as follows:

(a) paragraph 1 is replaced by the following:

‘1. Under the standard methodology, the operator shall calculate combustion emissions of each source stream by multiplying the activity data related to the amount of fuel combusted, expressed as terajoules based on net calorific value (NCV), by the corresponding emission factor, expressed as tonnes of CO_2 per terajoule (t CO_2/TJ) consistent with the use of NCV, and the corresponding oxidation factor.’;

(b) the following paragraph 1a is inserted:

‘1a. For the purpose of reporting memo-items, the operator shall also calculate for each source stream combusted and for fuels used as process input the following parameters which are defined by these calculations:

(i) the total preliminary emissions shall be calculated by multiplying the activity data related to the amount of fuel combusted, expressed as tonnes or normal cubic metres, by the corresponding preliminary emission factor and the corresponding oxidation factor;

(ii) biomass emissions shall be calculated by multiplying the total preliminary emissions by the biomass fraction;

(iii) zero-rated biomass emissions shall be calculated by multiplying the total preliminary emissions by the zero-rated biomass fraction;

(iv) emissions from RFNBO, RCF or synthetic low-carbon fuels shall be calculated by multiplying the total preliminary emissions by the RFNBO or RCF fraction or the synthetic low-carbon fraction;

(v) emissions from zero-rated RFNBO, RCF or synthetic low-carbon fuels shall be calculated by multiplying the total preliminary emissions by the zero-rated RFNBO or RCF fraction or the zero-rated synthetic low-carbon fraction;’;

(c) the following paragraph 2a is inserted:

‘2a. For the purpose of reporting memo-items, the operator shall also calculate for each source stream relating to process emissions the following parameters which are defined by these calculations:

(i) The total preliminary emissions shall be calculated by multiplying the activity data related to the material consumption, throughput or production output, expressed in tonnes or normal cubic metres, by the corresponding emission factor, expressed in t CO2/t or t CO2/Nm3, and the corresponding conversion factor;

(ii) Biomass emissions shall be calculated by multiplying the total preliminary emissions by the relevant biomass fraction;

(iii) Zero-rated biomass emissions shall be calculated by multiplying the total preliminary emissions by the relevant zero-rated biomass fraction.';

(13) Article 25 is amended as follows:

(a) paragraph 1 is replaced by the following:

'(1) Under the mass balance methodology, the operator shall calculate the quantity of CO_2 corresponding to each source stream included in the mass balance by multiplying the activity data related to the amount of fuel, material or CO2 transferred entering or leaving the boundaries of the mass balance, with the fuel's, material's or CO2 transfer's carbon content multiplied by its fossil fraction and by 3,664 t CO2/t C, applying Section 3 of Annex II to this Regulation.';

(b) the following paragraph 1a is inserted:

'1a. For the purpose of reporting memo-items, the operator shall also calculate for each source stream covered by the mass balance the following parameters which are defined by these calculations:

(i) The total preliminary quantity of CO2 shall be calculated by multiplying the activity data related to the amount of fuel or material entering or leaving the boundaries of the mass balance, with the fuel's or material's carbon content and by 3,664 t CO2/t C;

(ii) The quantity of CO2 relating to biomass shall be calculated by multiplying the total preliminary quantity of CO2 by the biomass fraction;

(iii) The quantity of CO2 relating to zero-rated biomass shall be calculated by multiplying the total preliminary quantity of CO2 by the zero-rated biomass fraction;

(iv) If applicable, the quantity of CO2 relating to RFNBO, RCF or synthetic low-carbon fuels shall be calculated by multiplying the total preliminary quantity of CO2 by the RFNBO or RCF fraction or the synthetic low-carbon fraction;

(v) If applicable, the quantity of CO2 relating to zero-rated RFNBO, RCF or synthetic low-carbon fuels shall be calculated by multiplying the total preliminary quantity of CO2 by the zero-rated RFNBO or RCF fraction or the zero-rated synthetic low-carbon fraction.';

(c) the following paragraph 3 is inserted:

'3. Where the operator uses a mass balance in accordance with this Article, and zero-rated carbon is contained in input materials or fuels, and output materials contain carbon, the operator shall provide to the competent authority data on the zero-rated fraction of the carbon content of the output streams. The operator shall thereby provide evidence that the installation's total emissions are not systematically underestimated by the applied monitoring methodology and that the total mass of carbon corresponding to the zero-rated carbon

fractions of the carbon contained in all relevant output materials, is not lower than the total mass of zero-rated fractions of the carbon contained in input materials and fuels.

For the purpose of the first subparagraph, Article 39, paragraphs 3 and 4 shall apply regarding the zero-rated biomass fraction of biogas and natural gas used as input.';

(14) Article 30 is amended as follows:

(a) in paragraph 2, the last subparagraph is deleted.

(b) the following paragraphs 2a and 3 are inserted:

'2a. The operator shall determine the biomass fraction only for mixed fuels or materials containing biomass. For other fuels or materials, the default value of 0% for the biomass fraction of fossil fuels or materials shall be used, and a default value of 100% biomass fraction for biomass fuels or materials consisting exclusively of biomass.

The operator shall determine the RFNBO or RCF fraction or the synthetic low-carbon fraction only for mixed fuels containing RFNBOs, RCFs or synthetic low-carbon fuels. For other fuels the default value of 0% for the RFNBO or RCF fraction or the synthetic low-carbon fraction shall be used, and a default value of 100% RFNBO or RCF fraction or synthetic low-carbon fraction consisting exclusively of RFNBOs, RCFs or synthetic low-carbon fuels.

The operator shall determine the zero-rated biomass fraction, zero-rated RFNBO or RCF fraction and zero-rated synthetic low-carbon fraction only where the operator wants to make use of zero-rating.

3. Regarding the interdependency of composition-related calculation factors, the operator shall apply the following rules:

(i) Where a fuel or material contains biomass, the operator shall determine the biomass fraction in accordance with Article 39 of this Regulation.

(ii) Where the biomass fraction is not zero and where the operator wants to make use of zero-rating, the operator shall determine the zero-rated biomass fraction in accordance with Article 38(5) of this Regulation.

(iii) Where a fuel contains an RFNBO, RCF or synthetic low-carbon fuel, the operator shall determine the RFNBO or RCF fraction or the synthetic low-carbon fraction in accordance with Article 39a(1) and (2) of this Regulation.

(iv) Where the RFNBO or RCF fraction is not zero and where the operator wants to make use of zero-rating, the operator shall determine the zero-rated RFNBO or RCF fraction in accordance with Article 39a(3) of this Regulation.

(v) Where the synthetic low-carbon fraction is not zero and where the operator wants to make use of zero-rating, the operator shall determine the zero-rated synthetic low-carbon fraction in accordance with Article 39a(4) of this Regulation.

(vi) Where the zero-rated biomass fraction, the zero-rated RFNBO or RCF fraction or the zero-rated synthetic low-carbon fraction are not zero, the operator shall calculate the zero-rated fraction as the sum of zero-rated biomass fraction, zero-rated RFNBO or RCF fraction and zero-rated synthetic low-carbon fraction. The fossil fraction is the sum of all non-zero-rated fractions.

(vii) The operator shall calculate the emission factor as the preliminary emission factor multiplied by the fossil fraction.

For the purpose of point (vi), where the operator does not calculate the zero-rated fraction, the fossil fraction shall be 100%.

By way of derogation from the first subparagraph, the operator may:

(i) determine the biomass fraction as identical to the zero-rated biomass fraction, if the latter is determined based on the mass balance pursuant to Article 30(1) of Directive (EU) 2018/2001;

(ii) determine the RFNBO or RCF fraction as identical to the zero-rated RFNBO or RCF fraction, if the latter is determined based on the mass balance pursuant to Article 30(1) of Directive (EU) 2018/2001;

(iii) determine the synthetic low-carbon fraction as identical to the zero-rated synthetic low-carbon fraction, if the latter is determined based on the mass balance pursuant to Article 30(1) of Directive (EU) 2018/2001.';

(15) in Article 37(2), the last subparagraph is replaced by the following:

'Where mixed fuels are used, the operator shall provide evidence that application of points (a) or (b) of the first subparagraph does not lead to an underestimation of emissions.';

(16) in Section 2, the title of subsection 5 is replaced by the following:

'**TREATMENT OF BIOMASS, SYNTHETIC LOW-CARBON FUELS, RFNBO AND RCF';**

(17) Article 38 is amended as follows:

(a) in paragraph 1, the last subparagraph is deleted;

(b) in paragraph 2, the first subparagraph is deleted;

(c) paragraph 4 is amended as follows:

(i) the term 'biomass fraction' is replaced by 'zero-rated biomass';

(ii) the last subparagraph is deleted;

(d) paragraph 5 is amended as follows:

(i) the first subparagraph is replaced by the following:

'Biofuels, bioliquids and biomass fuels shall fulfil the sustainability and the greenhouse gas emissions saving criteria laid down in paragraphs 2 to 7 and 10 of Article 29 of Directive (EU) 2018/2001, in order to be counted towards the zero-rated biomass fraction of a source stream.';

(ii) the sixth subparagraph is replaced by the following:

'The compliance with the criteria laid down in paragraphs 2 to 7 and 10 of Article 29 of Directive (EU) 2018/2001 shall be assessed in accordance with Articles 30 and 31(1) of that Directive. The criteria may also be considered complied with if the operator provides evidence for a purchase of a quantity of biofuel, bioliquid or biogas connected to the cancellation of the respective quantity in the Union Database set up pursuant to Article 31a or a national database set up by the Member State in accordance with Article 31a(5) of that Directive. In case of subsequent non-compliance regarding the proof of sustainability of the quantities cancelled in the aforementioned databases, the competent authority shall correct the verified emissions accordingly.';

(iii) the seventh subparagraph is replaced by the following:

‘Where the biomass used does not comply with this paragraph, its carbon content shall be considered as fossil carbon.’;

(iv) the following eighth subparagraph is inserted:

‘Where according to the first to sixth subparagraphs of this paragraph, the criteria laid down in paragraphs 2 to 7 and 10 of Article 29 of Directive (EU) 2018/2001 do not apply to biomass, the zero-rated biomass fraction equals its biomass fraction.’;

(18) Article 39 is amended as follows:

(a) paragraph 1 is replaced by the following:

‘1. For fuels or materials containing biomass, the operator may either assume the absence of biomass and apply a default biomass fraction of 0 % or determine a biomass fraction in accordance with paragraph 2, applying tiers as defined in Section 2.4 of Annex II to this Regulation.’;

(b) in paragraph 2, the second subparagraph is replaced the following:

‘Where, subject to the tier level required, the operator has to carry out analyses to determine the biomass fraction, but the application of the first subparagraph is technically not feasible or would incur unreasonable costs, the operator shall submit an alternative estimation method to determine the biomass fraction to the competent authority for approval. For fuels or materials originating from a production process with defined and traceable input streams, the operator may base the estimation on a material balance of fossil and biomass carbon entering and leaving the process.’;

(c) paragraph 2a is deleted.

(d) paragraph 3 is amended as follows:

(i) in the first subparagraph, the reference to “Article 43(4)” is replaced by “Article 43(4b)”.

(ii) the second subparagraph is replaced by the following:

‘The operator may determine that a certain quantity of natural gas from the gas grid is zero-rated biogas by using the methodology set out in paragraph 4. In this case, by way of derogation from Article 30(3), the operator shall consider the biomass fraction to be identical to the zero-rated biomass fraction.’;

(e) paragraph 4 is amended as follows:

(i) the first subparagraph is replaced by the following:

‘4. The operator may determine the biomass fraction and identical zero-rated biomass fraction of biogas using purchase records of biogas of equivalent energy content, provided that the operator provides evidence to the satisfaction of the competent authority that:’;

(ii) the last subparagraph is replaced by:

‘For the purpose of demonstrating compliance with this paragraph, the operator may use the data recorded in a database set up by one or more Member States which enables tracing of transfers of biogas. Compliance with this paragraph may be considered demonstrated if the operator provides evidence for a purchase of a quantity of biogas connected to the cancellation of the respective quantity in the Union Database set up pursuant to Article 31a of Directive (EU) 2018/2001 or a national database set up by the Member States in accordance with Article 31a(5) of

that Directive. In case of subsequent non-compliance regarding the proof of sustainability of the quantities cancelled in the aforementioned databases, the competent authority shall correct the verified emissions accordingly.';

(19) the following Article 39a is inserted:

'*Article 39a*

Determination of RFNBO or RCF or synthetic low-carbon fraction and zero-rated RFNBO or RCF or synthetic low-carbon fraction

1. For fuels or materials containing RFNBOs, RCFs or synthetic low-carbon fuels for which the operator cannot determine the RFNBO or RCF fraction or synthetic low-carbon fraction in accordance with paragraph 2, the operator shall assume the absence of RFNBO, RCF or synthetic low-carbon fuel and apply a default RFNBO or RCF fraction or synthetic low-carbon fraction of 0 %.

2. The operator shall determine the following calculation factors relating to the composition of fuels based on the mass balance pursuant to Article 30(1) of Directive (EU) 2018/2001:

   (i) the zero-rated RFNBO or RCF fraction or zero-rated synthetic low-carbon fraction;

   (ii) the RFNBO or RCF fraction or synthetic low-carbon fraction.

   By way of derogation from the first subparagraph, if the operator does not want to make use of zero-rating, for the RFNBO or RCF fraction or the synthetic low-carbon fraction other approaches may be used such as a material balance of the blending or production process from which the fuel or material is obtained.

3. The carbon content of fuels qualifying as RFNBOs or RCFs under Directive (EU) 2018/2001 that comply with the greenhouse gas emissions saving criteria laid down in Article 29a of that Directive, shall be considered zero-rated.

   The compliance with the criteria laid down in Article 29a of Directive (EU) 2018/2001 is to be assessed in accordance with Articles 30 and 31(1) of that Directive. The criteria may also be considered complied with if the operator provides evidence for a purchase of a quantity of RFNBOs or RCFs connected to the cancellation of the respective quantity in the Union Database set up pursuant to Article 31a of Directive (EU) 2018/2001, or a national database set up by the Member State in accordance with Article 31a(5) of that Directive. In case of subsequent non-compliance regarding the proof of sustainability of the quantities cancelled in the aforementioned databases, the Competent Authority shall correct the verified emissions accordingly.

   Where the RFNBO or RCF does not comply with the criteria referred to in the first subparagraph, its carbon content shall be considered as fossil carbon.

4. Synthetic low-carbon fuels shall be zero-rated when their carbon content has been subject to the prior surrendering of allowances under Directive 2003/87/EC, unless that captured carbon is zero-rated carbon as defined in Article 3(38f).

   The compliance with the criteria laid down in Article 29a(3) of Directive (EU) 2018/2001 is to be assessed in accordance with Articles 30 and 31(1) of that

Directive. The criteria may also be considered complied with if the operator provides evidence for a purchase of a quantity of synthetic low-carbon fuels connected to the cancellation of the respective quantity in the Union Database set up pursuant to Article 31a of Directive (EU) 2018/2001, or a national database set up by the Member State in accordance with Article 31a(5) of that Directive. In case of subsequent non-compliance regarding the proof of sustainability of the quantities cancelled in the aforementioned databases, the Competent Authority shall correct the verified emissions accordingly.

In any other cases, the carbon content of synthetic low-carbon fuels shall be considered as fossil carbon.

5. The operator may determine the RFNBO or RCF fraction and identical zero-rated RFNBO or RCF fraction of natural gas where such fractions have been injected into a natural gas grid using purchase records of RFNBO or RCF of equivalent energy content, provided that the operator provides evidence to the satisfaction of the competent authority that:

(a) there is no double counting of the same RFNBO or RCF quantity, in particular that the RFNBO or RCF purchased is not claimed to be used by anyone else, including through a disclosure of a guarantee of origin as defined in Article 2(12) of Directive (EU) 2018/2001;

(b) the operator and the producer of the RFNBO or RCF are connected to the same gas grid.

Compliance with this paragraph may be considered demonstrated if the operator provides evidence for a purchase of a quantity of gaseous RFNBO or RCF connected to the cancellation of the respective quantity in the Union Database set up pursuant to Article 31a of Directive (EU) 2018/2001, or a national database set up by the Member States in accordance with Article 31(5) of that Directive. In case of subsequent non-compliance regarding the proof of sustainability of the quantities cancelled in the aforementioned databases, the competent authority shall correct the verified emissions accordingly.';

(20) Article 43 is amended as follows:

(a) paragraph 4 is amended as follows:

(i) the first subparagraph is replaced by the following:

'4. Where relevant, the operator shall determine separately any CO2 amount stemming from biomass. For this purpose, the operator may use:';

(ii) the last subparagraph is replaced by the following:

'Where the method proposed by the operator involves continuous sampling from the flue gas stream, EN 15259 (Air quality — Measurement of stationary source emissions — Requirements for measurement sections and sites and for the measurement objective, plan and report) shall be applied. The sampling plan pursuant to Article 33 shall be commensurate with the frequency of analysis in accordance with Annex VII to this Regulation and ensure representativeness to cover the whole reporting year.';

(b) the following paragraphs 4a, 4b and 4c are inserted:

'4a. The operator shall use the biomass fraction determined in accordance with paragraph 4 as the zero-rated biomass fraction, if the following conditions are fulfilled for all fuels or materials leading to emissions to which the measurement-based methodology is applied:

(i) according to the first to sixth subparagraphs of Article 38(5) of this Regulation, the criteria laid down in paragraphs 2 to 7 and 10 of Article 29 of Directive (EU) 2018/2001 do not apply; or

(ii) 100% of the biomass fraction of the used fuel or material are covered by the evidence relevant according to Article 38(5) of this Regulation.

The condition (ii) shall be deemed fulfilled for biogas monitored in accordance with Article 39(4) of this Regulation.

Where conditions (i) and (ii) are not fulfilled for fuels or materials leading to emissions to which the measurement-based methodology is applied, the operator shall determine the zero-rated biomass fraction for these fuels or materials using a calculation-based approach in accordance with Articles 24 to 39a of this Regulation.

4b. The operator may deduct from the total emissions of that emission source the emissions from zero-rated biomass determined in accordance with paragraph 4a of this Article.

Where the method proposed by the operator for the determination of the zero-rated biomass fraction involves continuous sampling from the flue gas stream and the installation consumes natural gas from the grid, the operator shall determine the physical CO_2 amount of the biogas used in accordance with Articles 32 to 35 of this Regulation and deduct the respective CO_2 amount from the zero-rated CO_2 determined in accordance with paragraph 4a of this Article.

4c. Where the operator uses zero-rated RFNBOs, RCFs or synthetic low-carbon fuels in a process for which the measurement-based methodology is applied, the operator may deduct from the total emissions the emissions from zero-rated RFNBOs, RCFs or synthetic low-carbon fuels.

The emissions from zero-rated RFNBOs, RCFs or synthetic low-carbon fuels shall be determined using a calculation-based approach in accordance with Articles 24 to 39a of this Regulation. They shall equal the activity data of the relevant fuel multiplied by the preliminary emission factor and the zero-rated RFNBO or RCF fraction or the zero-rated synthetic low-carbon fraction.';

(c) in paragraph 5, point (a) is replaced by the following:

'(a) calculation by means of a suitable material balance, taking into account all significant parameters on the input side, including for CO_2 emissions at least input material loads, input airflow and process efficiency, and on the output side, including at least the product output and the concentration of oxygen (O_2), sulphur dioxide (SO_2) and nitrogen oxides (NO_x)';

(21) in Article 44(1), the first subparagraph is replaced by the following:

'1. The operator shall calculate hourly averages for each parameter, including concentrations and flow, relevant for determining emissions or amounts of CO_2 transferred, using a measurement-based methodology by using all data points available for that specific hour.';

(22) in Article 46 and in Annex I, Section 1, points (7)(a), (b) and (c), the term "transport network" is replaced by "CO_2 transport infrastructure".

(23) in Article 47(2), the last subparagraph is deleted.

(24) Article 48 is amended as follows:

(a) in paragraph 2, the first subparagraph is replaced by the following:

'2. Where inherent CO_2 originates from activities covered by Annex I to Directive 2003/87/EC or included pursuant to Article 24 of that Directive and is subsequently transferred out of the installation as part of a source stream to another installation and activity

covered by that Directive, it shall not be counted as emissions of the installation where it originates. For the determination of the zero-rated biomass fraction, zero-rated RFNBO or RCF fraction or zero-rated synthetic low-carbon fraction of the inherent CO_2 in accordance with Article 39 of this Regulation, the operator of the transferring installation shall ensure the chosen monitoring methodology does not systematically underestimate the transferring installation's total emissions.';

(b) in paragraph 3, the first subparagraph is replaced by the following:

'3. The operators may determine quantities of inherent CO_2 transferred out of the installation both at the transferring and at the receiving installation. In that case, the quantities of respectively transferred and received inherent CO_2 and the corresponding zero-rated biomass fraction, zero-rated RFNBO or RCF fraction and zero-rated synthetic low-carbon fraction shall be identical.';

(25) Article 49 is amended as follows:

(a) paragraph 1 is replaced by the following:

'1. The operator shall subtract from the emissions of the installation any amount of CO2 originating from the activities covered by Annex I to Directive 2003/87/EC that does not originate from zero-rated carbon and that is not emitted from the installation, but transferred out of the installation to any of the following installations:

(i) a capture installation for the purpose of transport and long-term geological storage in a storage site permitted under Directive 2009/31/EC;

(ii) a CO2 transport infrastructure with the purpose of long-term geological storage in a storage site permitted under Directive 2009/31/EC;

(iii) a storage site permitted under Directive 2009/31/EC for the purpose of long-term geological storage.';

(b) paragraphs 3 and 4 are replaced by the following:

'3. For the determination of the quantity of CO_2 transferred from one installation or CO_2 transport infrastructure to another installation or CO_2 transport infrastructure in accordance with paragraph 1, the operator shall apply, subject to the further provisions set out in Annex IV to this Regulation, either a calculation-based methodology, or a measurement-based methodology, in accordance with Articles 43, 44 and 45 of this Regulation.

Where the measurement-based methodology is applied the emission source shall correspond to the measurement point and the emissions shall be expressed as the quantity of CO_2 transferred.

4. When using a measurement-based methodology for determining the quantity of CO_2 transferred from one installation or CO_2 transport infrastructure to another, the operator shall apply the highest tier as defined in Section 1 of Annex VIII to this Regulation.

However, the operator may apply the next lower tier provided that it establishes that applying the highest tier as defined in Section 1 of Annex VIII to this Regulation is technically not feasible or incurs unreasonable costs.';

(c) paragraphs 6 and 7 are inserted:

'6. In the case of the transfer of CO_2 to a capture installation resulting from materials or fuels containing a fraction of zero-rated carbon, the transferring installation shall only subtract from its reported emissions in accordance with the first paragraph of this Article the quantity of CO_2 proportional to the fraction of carbon that does not originate from zero-rated carbon.

An operator of a CO_2 transport infrastructure or a storage site shall monitor emissions from leakage events, fugitive emissions and vented emissions from any CO_2 mentioned in the first sub-paragraph, including from CO_2 stemming from entities not carrying out activities listed in Annex I to Directive 2003/87/EC, and report emissions as if the CO_2 were fossil.

7. The operator of a CO_2 transport infrastructure may include in the emissions reported in a given reporting period, any CO_2 in transit that has been transferred to another installation or CO_2 transport infrastructure no later than 31 January of the following year. The operator shall compile annually an inventory of the CO_2 entering and leaving the CO_2 transport infrastructure and report separately any CO_2 in transit.';

(26) the following Article 49a is inserted:

'Article 49a

Emissions permanently chemically bound in a product

1. The operator shall subtract from the emissions of the installation any amount of CO_2 originating from non-zero-rated carbon in activities covered by Annex I to Directive 2003/87/EC that is not emitted from the installation, but permanently chemically bound in a product listed in the Delegated Regulation adopted pursuant to Article 12(3b) of Directive 2003/87/EC.

In the case of CO_2 resulting from materials or fuels containing a fraction of zero-rated carbon, the operator shall only subtract from the emissions of the installation the share of the CO_2 permanently chemically bound in a product listed in the Delegated Regulation adopted pursuant to Article 12(3b) of Directive 2003/87/EC, proportional to the fraction of carbon that does not originate from zero-rated carbon.

2. For the determination of the quantity of CO_2 bound in a product meeting the specifications set out in paragraph 1, the operator shall either apply the standard methodology in accordance with Sections 2 and 4 of Annex II to this Regulation, or apply a mass balance in accordance with Article 25 of this Regulation using the fuels and materials entering and leaving the process in which the CO_2 is chemically bound as the relevant source streams for this calculation, while taking into account any combustion emissions related to the process. To this end, the highest tier as defined in Annex II to this Regulation shall be applied as specified in the same Annex for the activity the CO_2 arises from. However, the operator may apply the next lower tier provided that the operator demonstrates to the satisfaction of the competent authority that applying the highest tier as defined in Annex II to this Regulation is technically not feasible or incurs unreasonable costs.';

(27) the title to Chapter IV is replaced by the following:

'MONITORING OF EMISSIONS AND NON-CO_2 EFFECTS FROM AVIATION';

(28) Article 51 is amended as follows:

(a) in paragraph 1, the first subparagraph is replaced by the following:

'1. Each aircraft operator shall monitor and report emissions and non-CO_2 aviation effects from aviation activities for all flights included in Annex I to Directive 2003/87/EC that are

performed by that aircraft operator during the reporting period and for which the aircraft operator is responsible.';

(b) the following paragraph 3a is inserted:

' 3a. Where the unique aircraft operator cannot be identified using the call sign as referred to in paragraph 3, the unique aircraft operator referred to in point (o) of Article 3 of Directive 2003/87/EC that is responsible for a flight, is the legal or natural person that contracts or employs the captain of the flight.';

(29) In Article 52(1), the first subparagraph is replaced by the following:

'1. At the latest four months before an aircraft operator commences aviation activities covered by Annex I to Directive 2003/87/EC, it shall submit to the competent authority a monitoring plan for the monitoring and reporting of emissions and non-CO_2 aviation effects in accordance with Article 12 of this Regulation.';

(30) Article 53 is amended as follows:

(a) paragraph 1 is replaced by the following:

'1. Each aircraft operator shall determine the annual CO_2 emissions from aviation activities by multiplying the annual consumption of each neat fuel (expressed in tonnes) by the respective emission factor.

For mixed aviation fuels, the aircraft operator shall determine the theoretical amount of each neat fuel from the total amount of that mixed aviation fuel and relevant composition data by applying the following:

(i) where a fuel contains biomass, the aircraft operator shall determine the biomass fraction in accordance with Article 54;

(ii) where a fuel contains an RFNBO, RCF or synthetic low-carbon fuel, the aircraft operator shall determine the RFNBO or RCF fraction or the synthetic low-carbon fraction in accordance with Article 54b;

(iii) where the RFNBO or RCF fraction or synthetic low-carbon fraction is not zero and where the aircraft operator wants to make use of zero-rating, the aircraft operator shall determine the zero-rated RFNBO or RCF fraction or the zero-rated synthetic low-carbon fraction in accordance with Article 54c;

(iv) where the zero-rated biomass fraction, the zero-rated RFNBO or RCF fraction or the zero-rated synthetic low-carbon fraction are not zero, the aircraft operator shall calculate the zero-rated fraction as the sum of zero-rated biomass fraction, zero-rated RFNBO or RCF fraction and zero-rated synthetic low-carbon fraction. The fossil fraction is the sum of all non-zero-rated fractions.

(v) the aircraft operator shall calculate the amount of each neat fuel as total amount of the mixed aviation fuel multiplied by the relevant fraction.';

For the purpose of point (iv) of this paragraph, where the aircraft operator does not calculate the zero-rated fraction, the fossil fraction shall be 100%.

(b) the following paragraphs 1a and 1b are inserted:

'1a. By way of derogation from paragraph 1, for the purpose of assessing emissions thresholds set out in Articles 55(1) and 55(2) of this Regulation, in Article 28a(4) of Directive 2003/87/EC and in the entry 'Aviation' of the table in Annex I to Directive 2003/87/EC, the aircraft operator shall determine the CO_2 emissions by multiplying the annual consumption of each fuel by its preliminary emissions factor.

1b. For the purpose of reporting pursuant to Article 3 of Commission Delegated Regulation (EU) 2019/1603 (*), the aircraft operator shall determine and report the emissions which result from multiplying the annual consumption of each fuel by its preliminary emission factor.

(*) Commission Delegated Regulation (EU) 2019/1603 of 18 July 2019 supplementing Directive 2003/87/EC of the European Parliament and of the Council as regards measures adopted by the International Civil Aviation Organisation for the monitoring, reporting and verification of aviation emissions for the purpose of implementing a global market-based measure (OJ L 250, 30.9.2019, p. 10, ELI: http://data.europa.eu/eli/reg_del/2019/1603/oj). ';

(c) in paragraph 6, the last subparagraph is replaced by:

'For alternative aviation fuels other than biofuels, RFNBO, RCF or synthetic low-carbon fuels, the aircraft operator shall determine the emission factor in accordance with Article 32 of this Regulation. For such fuels, the net calorific value shall be determined and reported as a memo-item.'

(31) the following Article 53a is inserted:

'Article 53a

Reporting rules for the use of alternative aviation fuels

1. The aircraft operator shall monitor the amount of alternative aviation fuels used and report that amount as attributed to each flight or aerodrome pair.

2. Where the alternative aviation fuels are delivered to the aircraft in physically identifiable batches, the aircraft operator shall provide evidence to the satisfaction of the competent authority that the alternative aviation fuel is attributed to the flight immediately following the fuel uplift of that flight.

   Where several subsequent flights are carried out without fuel uplift between these flights, the aircraft operator shall split the amount of the alternative fuel and assign it to these flights proportionally to the emissions from those flights calculated using the preliminary emission factor.

3. Where alternative aviation fuels cannot be physically attributed at an aerodrome to a specific flight, the aircraft operator shall attribute the fuel to its flights for which allowances have to be surrendered in accordance with Article 12(3) of Directive 2003/87/EC proportionally to the emissions from those flights departing from that aerodrome calculated using the preliminary emission factor.

   In this regard, the aircraft operator must provide evidence to the satisfaction of the competent authority that the alternative aviation fuel was delivered to the fuelling system of the departure aerodrome in the reporting period, or 3 months before the start, or 3 months after the end, of that reporting period.

4. For the purpose of paragraphs 2 and 3, the aircraft operator shall provide evidence to the satisfaction of the competent authority that:

   (i) the total amount of alternative aviation fuel claimed does not exceed the total fuel usage of that aircraft operator for flights for which allowances have to be surrendered in accordance with Article 12(3) of Directive 2003/87/EC, originating from the aerodrome at which the alternative aviation fuel is supplied;

   (ii) the amount of alternative aviation fuel for flights for which allowances have to be surrendered in accordance with Article 12(3) of Directive 2003/87/EC does not exceed the total quantity of alternative aviation fuel purchased from which the total quantity of alternative aviation fuels sold to third parties is subtracted;

(iii) the ratio between alternative aviation fuels and fossil fuels attributed to flights aggregated per aerodrome pair does not exceed the maximum blending limit for that fuel type as certified according to a recognised international standard;

(iv) there is no double counting of the same quantity of alternative aviation fuel, in particular that the alternative aviation fuel purchased is not claimed to be used in an earlier report or by anyone else, or in another system.

For the purpose of points (i) to (iii), any fuel remaining in tanks after a flight and before an uplift is assumed to be 100 % fossil fuel.

For the purpose of demonstrating compliance with the requirements referred to under point (iv) , the aircraft operator may use the data recorded in the Union database set up in accordance with Article 31a of Directive (EU) 2018/2001 or a national database set up by the Member State in accordance with Article 31a(5) of that Directive.';

(32) Articles 54 and 54a are replaced by the following:

'*Article* 54

Determining the biomass fraction for biofuels

1. The aircraft operator shall determine the biomass fraction of mixed aviation fuels containing biofuels. The aircraft operator may either assume the absence of biofuel and apply a default fossil fraction of 100% or determine a biofuel fraction in accordance with paragraphs 2 or 3. The aircraft operator shall use a default value of 100% biomass fraction for neat biofuels.

   By way of derogation from the first subparagraph, the aircraft operator using mixed aviation fuels containing biofuels may choose to monitor the biofuel content and fossil aviation fuel content as separate source streams if the evidence provided by the fuel suppliers allows such approach.

2. Where biofuels are physically mixed with fossil fuels and delivered to the aircraft in physically identifiable batches, the aircraft operator may carry out analyses in accordance with Articles 32 to 35 to determine the biomass fraction, on the basis of a relevant standard and the analytical methods set out in those Articles, provided that the use of that standard and those analytical methods is approved by the competent authority. Where the aircraft operator provides evidence to the competent authority that such analyses would incur unreasonable costs or are technically not feasible, the aircraft operator may base the estimation of the biofuel content on a material balance of blending fossil fuels and biofuels purchased. If the biomass fraction was determined using the mass balance pursuant to Article 30(1) of Directive (EU) 2018/2001, no evidence for unreasonable costs or technical feasibility shall be required.

3. Where purchased biofuel batches are not physically delivered to a specific aircraft, the aircraft operator shall not use analyses to determine the biomass fraction of the fuels used. The aircraft operator may determine the biomass fraction using purchase records of biofuel of equivalent energy content.

Article 54a

Specific provisions for eligible aviation fuels

1. For the purpose of Article 3c(6) of Directive 2003/87/EC, the commercial aircraft operator shall establish, document, implement and maintain a written procedure in order to monitor any amounts of neat eligible aviation fuel (in tonnes) used for subsonic flights, and shall report the amounts of eligible aviation fuels claimed as a separate memo-item in its annual emission report.

2. For the purpose of paragraph 1, the aircraft operator shall ensure that any amount of eligible aviation fuel claimed is certified in accordance with Article 30 of Directive (EU) 2018/2001 or another certification accepted under Regulation 2023/2405. The competent authority may allow the aircraft operator to use the data recorded in the Union database set up in accordance with Article 31a of Directive (EU) 2018/2001 or a national database set up by the Member State in accordance with Article 31a(5) of that Directive. In case of subsequent non-compliance regarding the proof of sustainability of the quantities cancelled in the aforementioned databases, the Competent Authority shall correct the verified amounts of neat eligible aviation fuels accordingly.

3. For mixed aviation fuels, the aircraft operator may either assume the absence of eligible aviation fuel and apply a default fossil fraction of 100% or determine the amount of neat eligible aviation fuel in accordance with paragraph 3a.

   3a. The aircraft operator shall determine the amount of neat eligible aviation fuel as a sum of neat alternative fuels eligible under Article 3c(6) of Directive 2003/87/EC as determined in accordance with Article 53(1) of this Regulation. The neat eligible fuels shall be attributed to each flight or aerodrome pair in accordance with paragraphs 4 or 5.

4. Where eligible aviation fuels are delivered to the aircraft in physically identifiable batches, the aircraft operator shall provide evidence to the satisfaction of the competent authority that the eligible aviation fuel is attributed to the flight immediately following the fuel uplift of that flight.

   Where several subsequent flights are carried out without fuel uplift between these flights, the aircraft operator shall split the amount of the eligible aviation fuels and assign it to these flights proportionally to the emissions from those flights calculated using the preliminary emission factor.

5. Where eligible aviation fuels cannot be physically attributed at an aerodrome to a specific flight, the aircraft operator shall attribute the fuel to its flights for which allowances have to be surrendered in accordance with Article 12(3) of Directive 2003/87/EC and from flights covered by Article 3c(8) of that Directive proportionally to the emissions from those flights departing from that aerodrome calculated using the preliminary emission factor.

   For that purpose, the aircraft operator must provide evidence to the satisfaction of the competent authority that the eligible aviation fuel was delivered to the fuelling system of the departure aerodrome in the reporting period, or 3 months before the start, or 3 months after the end, of that reporting period.

6. For the purpose of paragraphs 4 and 5, the aircraft operator shall provide evidence to the satisfaction of the competent authority that:

   (a) the total amount of eligible aviation fuel claimed does not exceed the total fuel usage of that aircraft operator for flights for which allowances have to be

surrendered in accordance with Article 12(3) of Directive 2003/87/EC and from flights covered by Article 3c(8) of that Directive, originating from the aerodrome at which the eligible aviation fuel is supplied;

(b) the amount of eligible aviation fuel for flights for which allowances have to be surrendered in accordance with Article 12(3) of Directive 2003/87/EC and from flights covered by Article 3c(8) of that Directive does not exceed the total quantity of eligible aviation fuel purchased from which the total quantity of eligible aviation fuels sold to third parties is subtracted;

(c) the ratio between eligible aviation fuels and fossil fuels attributed to flights aggregated per aerodrome pair does not exceed the maximum blending limit for that fuel type as certified according to a recognised international standard;

(d) there is no double counting of the same quantity of eligible aviation fuel, in particular that the eligible aviation fuel purchased is not claimed to be used in an earlier report or by anyone else, or in another system.

For the purpose of points (a), (b) and (c), any fuel remaining in tanks after a flight and before an uplift is assumed to be 100% not eligible fuel.

For the purpose of demonstrating compliance with the requirements referred to under point (d), the aircraft operator may use the data recorded in the Union database set up in accordance with Article 31a of Directive (EU) 2018/2001 or a national database set up by the Member State in accordance with Article 31a(5) of that Directive.';

(33) the following Articles 54b and 54c are inserted:

'Article 54b

Determining the RFNBO, RCF or synthetic low-carbon fraction

1. The aircraft operator shall determine the RFNBO or RCF fraction or synthetic low-carbon fraction of mixed aviation fuels containing RFNBO, RCF or synthetic low-carbon fuel. The aircraft operator may either assume the absence of RFNBO, RCF or synthetic low-carbon fuel and apply a default fossil fraction of 100 %, or determine a RFNBO or RCF fraction or synthetic low-carbon fraction in accordance with paragraphs 2 or 3. The aircraft operator shall use a default value of 100% RFNBO or RCF fraction, or 100% synthetic low-carbon fraction, as applicable, for neat RFNBO or RCF or neat synthetic low-carbon fuel.

   By way of derogation from the first subparagraph, the aircraft operator using mixed aviation fuels containing RFNBO, RCF or synthetic low-carbon fuel, may choose to monitor the RFNBO or RCF content or synthetic low-carbon content and other fossil aviation fuel content, as separate source streams if the evidence provided by the fuel suppliers allows such approach.

2. Where RFNBO, RCF or synthetic low-carbon fuel are physically mixed with fossil fuels and delivered to the aircraft in physically identifiable batches, the aircraft operator shall base the estimation of the RFNBO or RCF content or synthetic low-carbon content on a mass balance pursuant to Article 30(1) of Directive (EU) 2018/2001, reflecting the blending of fossil fuels and RFNBO, RCF or synthetic low-carbon fuel purchased.

3. Where purchased RFNBO, RCF or synthetic low-carbon fuel batches are not physically delivered to a specific aircraft, the aircraft operator may determine the

RFNBO or RCF fraction or synthetic low-carbon fraction using purchase records of RFNBO, RCF or synthetic low-carbon fuel of equivalent energy content.

Article 54c

Conditions for zero-rating biofuels, RFNBO, RCF and synthetic low-carbon fuels by aircraft operators

1. The aircraft operator may count the biomass fraction of a mixed aviation fuel towards the zero-rated biomass fraction only to the extent that the biofuel content complies with the criteria set out in Article 38(5).

2. The aircraft operator may count the RFNBO or RCF fraction of a mixed aviation fuel towards the zero-rated RFNBO or RCF fraction only to the extent that the RFNBO or RCF content complies with the criteria set out in Article 39a(3).

3. The aircraft operator may count the synthetic low-carbon fraction of a mixed aviation fuel towards the zero–rated synthetic low-carbon fraction only to the extent that the synthetic low-carbon content complies with the criteria set out in Article 39a(4).

4. The aircraft operator may claim zero-rated biofuels, zero-rated RFNBO or RCF and zero-rated synthetic low-carbon fuels only to the extent these zero-rated fuels comply with the maximum amount of fuel use determined in accordance with Article 53a of this Regulation, for flights for which allowances have to be surrendered in accordance with Article 12(3) of Directive 2003/87/EC.';

(34) in Article 55(2), the first subparagraph is replaced by the following:

'2. By way of derogation from Article 53, small emitters and aircraft operators having total annual emissions lower than 3 000 tonnes of CO_2 from flights other than those referred to in Article 28a(1), point (a), and Article 3c(8) of Directive 2003/87/EC may estimate the fuel consumption based on distance per aerodrome pair using tools implemented by Eurocontrol or another relevant organisation, which can process all relevant air traffic information and avoid any underestimations of emissions.';

(35) the following Articles 56a and 56b are inserted:

'Article 56a

Calculation of CO_2 equivalent for non-CO_2 aviation effects

1. Each aircraft operator shall monitor the non-CO_2 aviation effects from its activities performed by aeroplanes equipped with jet engines in CO_2 equivalent (CO_2(e)) per flight.

2. The aircraft operator shall calculate the CO_2(e) per flight using the GWP metric, in particular GWP_{20}, GWP_{50} and GWP_{100}, resulting in three GWP values for each of the monitored flights.

3. The aircraft operator shall use efficacy as defined in this Regulation and in NEATS, to refine the GWP as referred to in paragraph 2 for calculating the CO_2(e) per flight

unless the aircraft operator provides evidence to the competent authority that it is not possible to use efficacy.

4. To calculate CO_2(e) per flight each aircraft operator shall apply a CO_2(e) calculation approach covering the following elements:

(a) the fuel-burn module and emissions-estimation module, as described in Annex IIIa, Section 3;

(b) Method C consisting of a weather-based approach and Method D consisting of a location-simplified approach, as referred to in Annex IIIa, Section 4;

(c) a default values approach, used in case of data gaps, described in Annex IIIa, Section 5 and Annex IIIb.

Method C and method D shall be based on input data from the modules referred to in point (a) of this paragraph, data from the aircraft operator and relevant weather data from the aircraft operator or third party-sources.

5. Each aircraft operator shall use Method C to calculate CO_2(e) per flight.

6. By way of derogation from paragraph 5, small emitters, as defined in Article 55(1), may use Method D.

7. To apply the CO_2(e) calculation models to their flights, aircraft operators shall meet all the following conditions, either using NEATS, pursuant to Annex IIIa, Section 2, own and third-party IT tools, or a combination of NEATS and these tools:

(a) these tools comply with the requirements laid down in Annex IIIa, with regard to emission-estimation module in Section 3, 4 and 5 of that Annex;

(b) where enhanced weather data is needed as defined in Annex IIIa, these tools use the same common reference Numerical Weather Prediction (NWP) model and weather data, as the one provided through NEATS;

(c) these tools allow for and facilitate, for the purpose of verification, access to the monitored data in accordance with Annex IIIa, Section 4;

(d) these tools ensure the data monitored is securely stored for at least 2 years, with backup and recovery functions;

(e) these tools comply with the principles established by Article 75(1).

8. Where an aircraft operator plans to use tools referred to in paragraph 7, other that the fuel burn module, the aircraft operator shall first submit the technical specifications of the tools to the Commission. The Commission shall assess the specifications of the tools and, where these tools comply with the requirements in this Regulation, shall approve the tools. Once approved, the tools technical specifications and workflow shall be further described by the aircraft operator in the monitoring plan.

Article 56b

Data monitoring

1. The aircraft operator shall monitor the data mentioned in Annex IIIa, Section 4.

2. The data monitored as referred to in paragraph 1 shall be sourced by the aircraft operator, including from flight data recorder equipment of the aircraft, where available.

3. By way of derogation from paragraph 2, the aircraft operator can choose to rely for the monitoring of some or all of the data, on the following:

(a) independent third-party sources such as Eurocontrol;

(b) NEATS, as described in Annex IIIa, Section 2.

4. Where data is missing and the aircraft operator has demonstrated that it is not capable of retrieving that data via NEATS or other methods, the aircraft operator shall use default values as provided in Annex IIIa, Section 5 and Annex IIIb.

5. The aircraft operators shall provide the verifier with access to all data that is necessary for the verification, including confidential data. Upon request of the aircraft operator the competent authority shall treat information provided by the aircraft operator as confidential.

6. Where it is not possible to use NEATS due to its unavailability, the aircraft operator shall monitor at a minimum the flight information and aircraft properties per flight. In such case the CO2(e) calculation per flight shall be performed at a later stage by the aircraft operator, at the latest, once NEATS is made available by the Commission.

7. Where it is not possible to use a common reference NWP model due to its unavailability in NEATS, the aircraft operator, shall, by way of derogation from Article 56a(5), use Method D. Once the common reference NWP model is made available, the aircraft operator shall use the appropriate method in line with Article 56a(5) and (6).

8. NEATS shall be updated as appropriate';

(36) Article 58 is amended as follows:

(a) paragraph 1 is replaced by the following:

'1. The operator or aircraft operator shall establish, document, implement and maintain written procedures for data flow activities for the monitoring and reporting of greenhouse gas emissions and non-CO_2 aviation effects and ensure that the annual emissions report resulting from data flow activities does not contain misstatements and is in conformance with the monitoring plan, those written procedures and this Regulation.';

(b) in paragraph 2, point (c) is replaced by the following:

'(c) each step in the data flow from primary data to annual emissions and non-CO_2 aviation effects which shall reflect the sequence and interaction between the data flow activities, including relevant formulas and data aggregation steps applied';

(37) Article 66 is amended as follows:

(a) the title is replaced by the following:

'Treatment of data gaps for emissions reporting';

(b) in paragraph 2, the last subparagraph is replaced by:

'Where the number of flights with data gaps referred to in the first two sub-paragraphs exceed 5% of the annual flights that are reported, the aircraft operator shall inform the competent authority thereof without undue delay and shall take remedial action for improving the monitoring methodology.';

(38) in Article 68, the following paragraphs 5 and 6 are inserted:

'5. The aircraft operator shall submit to the competent authority under the same conditions as referred to in paragraph 1, a separate report as attachment to the annual emissions report, that covers the annual non-CO_2 aviation effects.

6. The separate report referred to in paragraph 5 shall contain at least the information listed in Annex X, Section 2a.';

(39) in Article 69(1), the first subparagraph is replaced by the following:

'1. Each operator shall regularly check whether the monitoring methodology applied can be improved.';

(40) Article 70 is amended as follows:

(a) in paragraph 1, the first subparagraph is replaced by the following:

'1. The competent authority shall make a conservative estimate of the emissions of an installation or aircraft operator and, where relevant, the non-CO_2 aviation effects of an aircraft operator in any of the following situations:';

(b) paragraph 2 is replaced by the following:

'2. Where a verifier has stated, in the verification report pursuant to Implementing Regulation (EU) 2018/2067, the existence of non-material misstatements which have not been corrected by the operator or aircraft operator before issuing the verification report, the competent authority shall assess those misstatements, and make a conservative estimate of the emissions and non-CO_2 aviation effects of the installation or aircraft operator where appropriate. The competent authority shall inform the operator or aircraft operator whether and which corrections are required to the annual emissions report. The operator or aircraft operator shall make that information available to the verifier.';

(41) Article 72(1) is replaced by the following:

'1. Total annual emissions of each of the greenhouse gases CO_2, N_2O and PFCs, as well as non-CO_2 aviation effects shall be reported as rounded tonnes of CO_2 or CO_2(e). The total annual emissions of the installation shall be calculated as the sum of the rounded values for CO_2, N_2O and PFCs.';

(42) in Article 75d(3), second and third subparagraph and in Annex I, first Section, point (4), subpoint (g), the term 'biomass' is replaced by 'zero-rated fuels'.

(43) Article 75e is amended as follows:

(a) in paragraph 2, points (a) and (b) are replaced by the following:

(a) 'a category A entity, where from 2027 to 2030 the average verified annual emissions in the 2 years preceding the reporting period before the

application of the scope factor, with the exclusion of CO_2 stemming from zero-rated fuels, are equal to or less than 50 000 tonnes of CO_2(e);

(b) a category B entity, where from 2027 to 2030 the average verified annual emissions in the 2 years preceding the reporting period before the application of the scope factor, with the exclusion of CO_2 stemming from zero-rated fuels, are more than 50 000 tonnes of CO_2(e).';

(b) in paragraph 3, point (a) is replaced by the following:

'(a) *de minimis* fuel streams, where the fuel streams selected by the regulated entity jointly account for less than 1 000 tonnes of fossil CO_2 per year before the application of the scope factor;';

(c) paragraph 4 is replaced by the following:

'4. Where the average annual verified emissions used to determine category of the regulated entity as referred to in paragraph 2 are not available or no longer representative for the purpose of paragraph 2, the regulated entity shall use a conservative estimate of annual average emissions calculated before the application of the scope factor, with the exclusion of CO_2 stemming from zero-rated fuels, to determine the category of the regulated entity.';

(d) the following paragraph 4a is inserted:

'4a. By way of derogation from paragraphs 2, 3 and 4, before 2027, the competent authority may allow the regulated entity to classify itself and each fuel stream based on the emissions after the application of the scope factor, with the exclusion of CO2 stemming from zero-rated fuels, where the regulated entity can demonstrate to the satisfaction of the competent authority that the scope factor applied for the classification will remain to be representative in the future years.';

(e) paragraph 5 is deleted.

(44) The title of subsection 4 is replaced by the following:

'**TREATMENT OF BIOMASS SYNTHETIC LOW-CARBON FUELS, RFNBO AND RCF'**;

(45) Article 75m is amended as follows:

(a) the title and first paragraph, introductory sentence, are replaced by the following:

'Article 75m

Release of fuel streams containing biomass, synthetic low-carbon fuels, RFNBO and RCF

1. Article 38, Article 39, paragraphs 1, 3 and 4, and Article 39a shall apply. For that purpose:';

(b) in paragraphs 3 and 4, the term 'biomass fraction' is replaced by 'zero-rated carbon fraction'.

(46) Article 75n is amended as follows:

(a) (a) paragraph 1 is replaced by the following:

'1. The competent authority may consider a regulated entity to be a regulated entity with low emissions where at least one of the following conditions is met:

(a) from 2027 to 2030, the average verified annual emissions in the 2 years preceding the reporting period before the application of the scope factor, with the exclusion of CO_2 stemming from zero-rated fuels, were less than 1 000 tonnes of CO_2 per year;

(b) from 2031, the average annual emissions of that regulated entity reported in the verified emissions reports during the trading period immediately preceding the current trading period, calculated before the application of the scope factor and with the exclusion of CO_2 stemming from zero-rated fuels, were less than 1 000 tonnes of CO_2 per year;

(c) where the average annual emissions referred to in point (a) are not available or no longer representative for the purpose of point (a), but the annual emissions of that regulated entity for the next 5 years, calculated before the application of the scope factor and with the exclusion of CO_2 stemming from zero-rated fuels, will be, based on a conservative estimation method, less than 1 000 tonnes of CO_2(e) per year.';

(b) the following paragraph 1a is inserted:

'1a. By way of derogation from paragraph 1, before 2027, the competent authority may consider a regulated entity to be a regulated entity with low emissions based on the emissions after the application of the scope factor, with the exclusion of CO_2 stemming from zero-rated fuels, where the regulated entity can demonstrate to the satisfaction of the competent authority that the scope factor applied for the classification will remain to be representative in the future years.';

(47) Annex I is amended as follows:

(a) Section 1 is amended as follows:

(i) in point (7), point (f) is replaced by the following:

'(f) where applicable, a description of the conservative estimation method used for determining the zero-rated fraction and zero-rated RFNBO or RCF fraction of inherent or transferred CO_2 in accordance with Articles 48, 49 or 49a;';

(ii) points (8) and (9) are replaced by the following:

'8. a detailed description of the monitoring methodology where CO_2 is chemically bound in accordance with Article 49a, where appropriate in the form of a description of the written procedures applied, including the following:

(a) the procedures for determining whether or not a product in which the CO2 is permanently chemically bound in accordance with Article 49a(1) of this Regulation, meets the requirements set out in the delegated Regulation pursuant to Article 12(3b) of Directive 2003/87/EC and the types of uses of those products;

(b) a description of the calculation methodology for determining the CO2 amounts permanently chemically bound in accordance with Article 49a(3).

9. where applicable, a description of the procedure used to assess if zero-rated source streams comply with Article 38(5) or 39a(3) or 39a(4);';

(iii) the following point (9a) is inserted:

'9a. where applicable, a description of the procedure used to determine zero-rated biogas quantities based on purchase records in accordance with Article 39(4), or zero-rated RFNBO or RCF quantities in accordance with Article 39a(5);';

(b) Section 2 is amended as follows:

(i) point (1) is amended as follows:

- point (c) is replaced by the following:

‘(c) a description of procedures, systems and responsibilities used to update the completeness of the list of emission sources over the monitoring year for the purpose of ensuring the completeness of monitoring and reporting of the emissions and non-CO_2 aviation effects of owned aircraft as well as leased-in aircraft;’;

- points (k), (l) and (m) are replaced by the following:

‘(k) confirmation if the aircraft operator intends to use any of the tools referred to in Article 55(2) of this Regulation and whether the aircraft operator intends to use the simplification pursuant to Article 28a(4) of Directive 2003/87/EC;

(l) where applicable, a description of the procedure used to assess if zero-rated biofuel, RFNBO, RCF, or synthetic low-carbon fuel comply with Article 54c of this Regulation;

(m) where applicable, a description of the procedure used to determine quantities of alternative aviation fuels in accordance with Article 53(1) and to ensure the reported neat fuels comply with the conditions set out in Article 53a of this Regulation;’;

- point (o), is replaced by the following:

‘(o) where applicable a description of the procedure used to determine eligible aviation fuel quantities in accordance with Article 54a(3) and to ensure the reported fuels comply with the conditions set out in Article 54a(4) and 54a(5) of this Regulation;’;

– the following points (p) and (q) are inserted:

‘(p) a confirmation on whether the aircraft operator operates any flights under Article 56a(1);

(q) a confirmation on whether the aircraft operator intends to use only NEATS to determine the non-CO_2 aviation effects, or if it intends to use, for all or part of the monitored data, own or third party IT tools as described in Article 56a(7);’;

(ii) in point (2), the introductory sentence is replaced by:

‘2. For the purpose of monitoring emissions, the monitoring plan shall contain the following information for aircraft operators which are not small emitters in accordance with Article 55(1) or which do not intend to use a small emitter tool in accordance with Article 55(2):’;

(iii) the following point (3), is inserted:

‘3. For the purpose of monitoring non-CO_2 aviation effects, the monitoring plan shall contain, as relevant, the following information for aircraft operators not using only NEATS to determine the non-CO_2 aviation effects:

(a) (a) description of the fuel burn and emission estimation module, the CO_2(e) calculation model and associated IT tools that the aircraft operators intends to use;

(b) (b) a description and a flowchart of the monitoring process of data relative to the CO_2(e) calculation model as described in Annex IIIa, Section 4 to this Regulation;

(c) (c) a description of the written procedure for ensuring that appropriate data is used to input into the CO_2(e) calculation models in accordance with Annex IIIa to this Regulation and that climate effects of all non-CO_2 agents on a per flight basis are taken into account;

(d) (d) a description of the written procedure for identifying and assessing data gaps and applying the default values described in Annex IIIa, Section 5 and Annex IIIb to this Regulation, to complete the data gaps.';

(c) in Section 4, point (3), is replaced by the following:

'3. where applicable, a description of the procedure used to assess if zero-rated fuel streams comply with Article 38(5), or 39a(3), or 39a(4) and, where relevant, Article 75m(2) of this Regulation;';

(48) Annex II is amended as follows:

(a) Section 1 is amended as follows:

(i) paragraph 2 is replaced by the following:

'Where Table 1 does not include activities listed in Annex I to Directive 2003/87/EC and the mass balance set out in Article 25 of this Regulation is not applied, the operator shall use the tiers listed in Table 1 under 'Combustion of fuels and fuels used as process input' for those activities.';

(ii) Table 1 is amended as follows:

- the eleventh row, heading '**Refining of mineral oil'**, is replaced by the following:

'Refining of oil';

- the fifty-first row, heading '**Primary aluminium production'**, is replaced by the following:

'Primary aluminium or alumina production';

- the following row is added at the end of the Table:

'

CO_2 capture, transfer and geological storage in storage site permitted under Directive 2009/31/EC					
Mass balance of CO_2 transferred	CO_2 transferred into or out from an installation, transport infrastructure or storage site, vented, leaked or fugitive emissions [t]	± 7,5 %	± 5 %	± 2,5 %	± 1,5 %
CO_2 venting, leakage, and fugitive emissions	CO_2 vented, leaked or from fugitive emissions [t]	±17,5 %	± 12,5 %	± 7,5 %	

';

(b) in Section 2.1, the first paragraph is replaced by the following:

'Where a biomass fraction, or RFNBO or RCF fraction or synthetic low-carbon fraction is determined for a mixed fuel or material, the tiers defined shall relate to the preliminary emission factor. For fossil fuels and materials, the tiers shall relate to the emission factor.';

(c) Section 2.4, is replaced by the following:

'**2.4 Tiers for biomass fraction**

Tier 1: The operator shall apply an applicable value published by the competent authority or the Commission, or values in accordance with Article 31(1).

Tier 2: The operator shall apply an estimation method approved in accordance with the second subparagraph of Article 39(2).

Tier 3a: The operator shall apply analyses in accordance with the first sub-paragraph of Article 39(2), and in accordance with Articles 32 to 35.

Tier 3b: For fuels originating from a production process with defined and traceable input streams, the operator may base the estimation on a material balance of fossil and biomass carbon entering and leaving the process, such as the mass balance system in accordance with Article 30(1) of Directive (EU) 2018/2001.

Where an operator assumes a fossil fraction of 100% in accordance with Article 39(1) of this Regulation, no tier shall be assigned for the biomass fraction.';

(d) the following Section 2.5 is inserted:

'2.5 Tiers for RFNBO or RCF fraction or synthetic low-carbon fraction

Tier 1: The operator shall determine the RFNBO or RCF fraction or synthetic low-carbon fraction based on the mass balance system in accordance with Article 30(1) of Directive (EU) 2018/2001.

Where an operator assumes a fossil fraction of 100% in accordance with Article 39a(1) of this Regulation, no tier shall be assigned for the RFNBO or RCF fraction or synthetic low-carbon fraction.';

(e) Section 3.1 is amended as follows:

(i) the third subparagraph is replaced by the following:

'Where a biomass fraction or RFNBO or RCF fraction or synthetic low-carbon fraction is determined for a mixed fuel or material, the tiers defined shall relate to the total carbon content. The biomass fraction of the carbon shall be determined using the tiers defined in Section 2.4 of this Annex. The RFNBO or RCF fraction or synthetic low-carbon fraction of the carbon shall be determined using the tiers defined in Section 2.5 of this Annex.';

(ii) in the subheading Tier 2b, the first sentence is replaced by the following:

'Tier 2b: The operator shall derive the carbon content from emission factors for the fuel based on one of the following established proxies in combination with an empirical correlation as determined at least once per year in accordance with Articles 32 to 35 of this Regulation:';

(f) the following Section 3.4 is added:

'**3.4 Tiers for RFNBO or RCF fraction or synthetic low-carbon fraction**

The tiers defined in Section 2.5 of this Annex shall be used.';

(g) (g) in Section 4, before Section 4.1, the following paragraph is inserted:

'By way of derogation from the provisions in this section and the following sub-sections, operators may rate process emissions from materials as zero, provided those materials meet all the following conditions:

(i) do not meet the definitions of RFNBOs or RCFs or synthetic low-carbon fuels;

(ii) were produced in another installation covered by Directive 2003/87/EC;

(iii) CO2 was chemically bound to produce the materials;

(iv) the installation that emitted the CO2 in point (iii), included this CO2 in its annual emissions report;

(v) do not meet the specification of a product that is listed in the delegated Regulation adopted pursuant to Article 12(3b) of Directive 2003/87/EC.';

(h) the following Section 4.7 is added:

'4.7 Tiers for the RFNBO or RCF fraction or synthetic low-carbon fraction

The tiers defined in Section 2.5 of this Annex shall be used.';

(49) Annex IIa is amended as follows:

(a) in Section 2.1, a second subparagraph is inserted after the first subparagraph:

'Where a RFNBO or RCF fraction or synthetic low-carbon fraction is determined for a mixed fuel, the tiers defined shall relate to the preliminary emission factor';

(b) the following Section 2.3a is inserted:

'2.3a Tiers for RFNBO or RCF fraction or synthetic low-carbon fraction

Tier 1: The operator shall determine RFNBO or RCF fraction or synthetic low-carbon fraction based on the mass balance system in accordance with Article 30(1) of Directive (EU) 2018/2001.

Where an operator assumes a fossil fraction of 100% in accordance with Article 39a(1) of this Regulation, no tier shall be assigned for the RFNBO or RCF fraction or synthetic low-carbon fraction.';

(50) in Annex III, the title is replaced by the following:

'Monitoring methodologies for emissions from aviation (Article 53)';

(51) the following Annexes IIIa and IIIb are inserted:

'ANNEX IIIa

Monitoring methodologies for non-CO_2 aviation effects (Article 56a)

1. DEFINITIONS RELATED TO NON-CO_2 AVIATION EFFECTS

1. 'flight information' means the call sign as provided in Article 51 of this Regulation, the day and time of departure and arrival of the flight, expressed in Coordinated Universal Time (UTC) and using the ICAO codes of origin and destination airports for a given flight;

2. flight phase information' means the split of data (e.g. aircraft 4D position, fuel flow) according to operational flight phases (take-off, climb, cruise, etc.);

3. 'operation flight envelope' means the boundaries of altitude, aircraft speed, and load factor for each flight phase;

4. 'true airspeed' means the speed of the aircraft relative to the air mass through which it is flying, in meters per second (m/s);

5. ‘aircraft 4D position’ means the four-dimensional position of an aircraft defined by its latitude, in decimal degree; longitude, in decimal degree; and altitude, in pressure altitude, at any given moment of time between beginning and end of the flight;

6. ‘time stamp’ means a snapshot of data (e.g. aircraft 4D position, fuel flow) that corresponds to any given moment of time, in seconds, during flight and that is to be considered together with time interval;

7. time interval’ means the time, in seconds, between two-time stamps during the flight, not exceeding 60 seconds;

8. ‘latest flight plan’ means the latest flight plan available and acknowledged by relevant air navigation service for a given flight, before it takes place. The latest flight plan can be the Eurocontrol’s Regulated Flight Traffic Model (RTFM) or equivalent in terms of data accuracy;

9. ‘flown flight trajectory’ means the trajectory followed by the aircraft from its point of origin (departure) to its destination (arrival), constituted by all the time stamps, recorded during the flight. The flown flight trajectory can be sourced from the flight data recorder equipment or third-party. Its accuracy should be equivalent, where possible, to Eurocontrol’s Current Traffic Flight Model (CTFM);

10. ‘flight data recorder equipment’ a specialized electronic device installed on the aircraft for the purpose of recording various parameters and events during flight operations. These parameters may include but are not limited to flight control inputs, aircraft performance information, engine data, navigation information.

11. ‘three-dimensional radiative variables’ means number of variables such as radiative flux density, radiative heating rates, that describe how radiation varies across space, including the Earth’s surface and atmosphere, and how it changes over time;

12. ‘pressure’ means the force, in Pascals (Pa), exerted by the weight of the air above a given point in the atmosphere where the aircraft is situated at any given moment of time during flight and given for three-dimensional radiative variables;

13. .‘air ambient temperature’ means the temperature of the air, in Kelvin (K), surrounding an aircraft at any given moment of time during the flight and given for three-dimensional radiative variables;

14. .‘specific humidity’ means the ratio of water vapor per kilogram of total air mass (kg/kg) surrounding an aircraft at any given moment of time during flight and given for three-dimensional radiative variables;

15. .‘International Standard Atmosphere (ISA)’ means a standard against which to compare the actual atmosphere at any point and time, based on the specific values of pressure, density, and temperature at mean sea level, each of which decreases with increase in height;

16. .‘basic weather data’ means the category of information regrouping for each flight, at least the pressure, the air ambient temperature and the specific humidity, used in the fuel burn and emission estimation modules. Here, these values can be estimated, at the minimum, through standardised, altitude-dependent correction and/or be based on third party post-operational observations;

17. .‘relative humidity over ice’ means the concentration of water vapour, in percentage, present in the air compared to its concentration at the saturation point of ice;

18. .‘eastward and northward wind’ means the horizontal speed of air moving towards the East or North, in meters per second, at any given moment of time during flight and given for three-dimensional radiative variables;

19. ‘vertical velocity’ means the speed of air motion in the upward or downward direction (in Pa/s), where negative values of vertical velocity indicate upward motion. It is necessary to calculate, e.g., advection and wind shear;

20. .‘specific cloud ice water content’ means the mass of cloud ice particles per kilogram of the total mass of moist air (kg/kg) surrounding an aircraft at any given moment of time during flight and given for three-dimensional radiative variables;

21. .‘geopotential’ means the gravitational field strength experienced by an aircraft at different altitudes, at any given moment of time during flight, in square meters per squared second (m^2/s^2) and given for three-dimensional radiative variables;

22. .‘outgoing longwave radiation’ means the total radiation emitted to the space by earth atmosphere system, in W/m^2, at any given moment of time during flight and given for three-dimensional radiative variables;

23. .‘reflected solar radiation’ means the portion of sunlight that is reflected back into space by the Earth’s surface, clouds, aerosols, and other atmospheric particles, in W/m^2, at any given moment of time during flight and given for three-dimensional radiative variables;

24. ‘solar direct radiation’ means the portion of sunlight that reaches the Earth’s surface directly from the Sun without being scattered or reflected by the atmosphere or clouds, in W/m^2, at any given moment of time during flight and given for three-dimensional radiative variables;

25. ‘Numerical Weather Prediction (NWP) model’ refers to a computational system utilised in meteorology, comprising algorithms and mathematical formulations implemented in software, designed to simulate, and forecast atmospheric conditions over a defined spatial and temporal domain (spatial grid). In the case of the enhanced weather data, a common reference NWP model is provided by the Commission through NEATS;

26. ‘enhanced weather data’ means the category of information regrouping for each flight, the pressure, the air ambient temperature, the specific humidity, the relative humidity over ice, the eastward and northward wind, the vertical velocity, the specific cloud ice water content, the geopotential, the outgoing longwave, reflected solar and solar direct radiation, taken as input from a common reference NWP model, provided by the Commission through NEATS;

27. ‘engine identifier’ means the aircraft engine unique identifier number as contained in the ICAO engine emissions databank, or equivalent, allowing to unequivocally identify the engines attached to the aircraft, through internationally recognized standardised lists;

28. ‘aircraft mass’ means the mass in kilogrammes of the aircraft along the trajectory, which equals to subtracting from the take-off mass the fuel burn during flight at any given moment of time. If the aircraft mass is not available, it can be approximated based on either the take-off mass or the load factor, and either the given fuel flow or an aircraft performance simulation through the fuel burn module;

29. ‘take-off mass’ means the aircraft mass at beginning of the take-off run, including everything and everyone carried at that moment, in kilograms. It is used to

approximate the aircraft mass if the latter is not provided. If the take-off mass is not available, it can be approximated based on the load factor;

30. ‘maximum take-off mass’ is the maximum mass, in kilograms, at which the pilot of an aircraft is allowed to take off, as specified by the aircraft manufacturer;

31. ‘maximum payload mass’ is the maximum number of passengers and related baggage, mass of cargo, including mail and hand luggage, that can be transported by an aircraft. Values for maximum payload can be retrieved by the applied fuel burn module;

32. ‘load factor’ means the weight of passengers, cargo and baggage, including mail and hand luggage, expressed as fraction of the maximum payload mass. The load factor is used to approximate the take-off mass if the latter is not provided. If the load factor is not available, a conservative default value shall be used, in accordance with Annex IIIa, Section 5;

33. ‘fuel flow’ means the volume of fuel in kilograms that passes through the aircraft fuel system and into the aircraft’s engines per second during the flight. It can be modeled during flight planning, measured in-flight, or estimated through fuel burn module;

34. ‘aircraft engine efficiency’ means the percentage of useful thrust generated by an aircraft engine relative to the energy input from fuel;

35. ‘aircraft performance’ means the category of information regrouping fuel flow and aircraft engine efficiency by all-time stamps;

36. ‘hydrogen per carbon (H/C) ratio of fuel per flight’ means the number of hydrogen atoms (H) per carbon atom (C) per molecule of the fuel used per flight;

37. ‘aromatic content of the fuel per flight’ means the percentage of aromatic hydrocarbons present in the fuel used per flight;

38. ‘flight fuel properties’ means the category of information regrouping for each flight the hydrogen per carbon ratio, aromatic content, and the net calorific value of the fuel on board;

2. NON-CO_2 AVIATION EFFECTS TRACKING SYSTEM (NEATS)

NEATS is provided by the Commission to aircraft operators, to accredited verifiers and to competent authorities for the purpose of facilitating and, to the extent possible, automating monitoring, reporting and verification of non-CO_2 aviation effects, in order to minimise any administrative burden.

NEATS is aligned with the principles established in Article 75(1) of this Regulation and provides a dedicated and secured user interface per aircraft operator, verifier and competent authority.

Monitoring:

NEATS streamlines the monitoring process as it incorporates directly, or gives access to, available third-party collected flight trajectories and weather data allowing to minimise monitoring by aircraft operators to aircraft properties, as well as to fuel properties, where needed, as defined in Annex IIIa, Section 1 or to render it fully automatic depending on use of default values.

NEATS incorporates the CO_2(e) calculation approaches as listed in paragraph 4 of Article 56a of this Regulation and provides a common reference NWP model, where enhanced weather data is needed (Method C). This results into the calculation of CO_2(e) per flight as part of the monitored data.

Reporting:

NEATS streamlines the reporting exercise referred to in Article 68(5) of this Regulation. The tool generates automatically the XML table referred to in Annex X, Section 2a(9) to this Regulation at the end of each reporting year, minimising administrative burden associated with reporting.

Verification:

NEATS streamlines the verification and cross-checks done respectively by the verifier and the competent authority. It provides the means to verify a CO_2(e) per flight, while protecting confidential data.

Data storage:

NEATS allows to store all the data (from aircraft operators and from third parties), securely encoding and protecting from release confidential data, where such data is uploaded by the aircraft operator on NEATS, as long as it is identified as confidential by the aircraft operator.

Transparency:

NEATS relies on state-of-art models to calculate the CO_2(e) for non-CO_2 effects. Aircraft operators may develop their own or use third-party tools, provided they comply with the requirements laid down in this Annex.

NEATS shall feed into a public website summarising the non-confidential data and CO_2(e) per flight and per aircraft operator.

3. FUEL BURN AND EMISSION ESTIMATION MODULES FOR NON-CO_2 AVIATION EFFECTS

Fuel burn module:

The fuel burn module is based on a kinetic approach to aircraft performance modelling, which enables to accurately predict aircraft trajectories and the associated fuel consumption over the entire operation flight envelope and in all phases of a flight. The model processes the theoretical fundamentals to compute aircraft performance parameters, including information on drag, lift, weight, thrust, fuel consumption, as well as the speeds for the climb, cruise, and descent phases of an aircraft, assuming normal aircraft operations. In addition, aircraft-specific coefficients are key data inputs for the computation of the flight trajectory planning of specific aircraft types.

Emission-estimation module:

The emission-estimation module enables to compute aircraft engine emissions of NOx, HC, and CO by means of correlation equations without proprietary airplane and engine performance models along with proprietary engine emissions characterisations. This module applies exhaust emission indices (EIs) from the ICAO engine type certification under predefined reference conditions on the ground and estimates the corresponding EIs during

flight conditions assuming international standard atmosphere (ISA) conditions using correction factors for differences in the ISA conditions of temperature, pressure and humidity.

4. CO_2(e) CALCULATION MODELS FOR NON-CO_2 AVIATION EFFECTS

General criteria:

In the CO_2(e) calculation models, the aircraft operator shall consider the climate effects of all non-CO_2 agents on a per flight basis including flight trajectories (flight plan and flown flight trajectories), as well as aircraft and flight fuel properties. The emissions from each flight shall be accounted for as pulse emissions. When applying the CO_2(e) calculation models, flight trajectory-dependent aircraft emission data shall be used to calculate all the following elements:

(a) composition changes;

(b) temporal evolution of radiative forcing caused by composition changes;

(c) near surface temperature changes caused by flight trajectory-dependent aircraft emissions.

Administrative and computational efforts shall be kept low to ensure feasibility for all stakeholders. The model(s) shall be transparent and suitable for operational use.

Depending on the model, there are two types of requirement lists:

Method C:

For the weather-based approach, detailed climate effects of all aircraft non-CO_2 emissions at a specific location and time shall be considered taking into account current weather information to calculate climate-optimised four-dimensional trajectories for individual flight planning. To allow detailed accounting of the climate effects with regards to current atmospheric conditions, different aircraft, propulsion types, as well as fuel properties shall explicitly be considered in the models. Estimates for the formation, life cycle and contrail climate effects for single flights as well as the residence times for the emitted H_2O and NO_x and their impact on the atmospheric composition shall be included. For being able to output advanced information for use in daily flight planning, the model(s) shall be computationally efficient.

Each aircraft operators shall monitor the following data per flight:

(a) flight information;

(b) flight trajectory, defined at the minimum, as the latest flight plan;

(c) enhanced weather data;

(d) aircraft properties;

(e) (optional) aircraft performance information. Planned fuel flow is to be used preferentially, in order to align with the latest flight plan data available;

(f) flight fuel properties.

Method D:

For the location-simplified approach, the aircraft operator shall use climate response model(s) to estimate the impact of all non-CO2 effects per flight on a climatological basis. The tool(s) shall be used to assess the climate benefit of general routing options, while accounting for general differences in aircraft, propulsion types and fuel properties through their physical parameterisations. The CO2(e) calculated with the location-simplified approach shall average out any large deviations for individual flights over a longer period of time. The model(s) should ensure reduced efforts in data need, computation, and handling, as compared to the model(s) for the weather-based approach.

By way of derogation of Method C, small emitters, as defined in Article 55(1) of this Regulation, may monitor the following data per flight:

(a) flight information;

(b) flight trajectory, defined by the flown flight trajectory;

(c) basic weather data;

(d) aircraft properties;

(e) (optional) aircraft performance along the flight information;

(f) (optional) flight fuel properties.

5. USE OF DEFAULT VALUES FOR NON-CO_2 AVIATION EFFECTS

Subject to further scrutiny by the competent authority and the Commission, the use of default values shall always result in higher CO_2(e) per flight compared to what can be obtained with monitored data.

1. Flight trajectory:

   (a) For the purpose of applying Method C, the latest flight plan shall be provided. If the RTFM, or equivalent, is not available, the Filed Traffic Flight Model (FTFM), or equivalent shall be used as default. In such case, where data by time stamp is not available, it can be calculated by linear interpolation of measured data stemming from the two measurement times closest before and after the time stamp under consideration, within the same flight phase, provided it results in homogenous flight trajectory for the given flight phase, especially the cruise phase.

   (b) For the purpose of applying Method D:

      (i) the flown flight trajectory shall always be provided. If the CTFM, or equivalent, is not available, the RTFM or FTFM can be used.

      (ii) where data by time stamp is not available, it can be calculated by linear interpolation of measured data stemming from the two measurement times closest before and after the time stamp under consideration, within the same flight phase, provided it results in homogenous flight trajectory for the given flight phase, especially the cruise phase.

2. Aircraft properties:

(a) Engine identifier: where no engine identifier or equivalent, is provided, conservative default values per aircraft type, as defined in Annex IIIb to this Regulation, shall be used.

(b) Aircraft mass: if the aircraft mass is not provided, the aircraft operator can simulate the aircraft mass by using the take-off mass. If neither the aircraft mass, nor the take-off mass are available, the load factor can be used to approximate the take-off mass. If no load factor is provided, a default value of 1 is used.

3. Aircraft performance:

Fuel flow: if the fuel flow is not provided from the flight data recorder equipment, the aircraft operator can use other means to derive the fuel flow, in line with Annex IIIa, Section 1 to this Regulation defining fuel flow, taking into account the thrust which depends on the aircraft's mass and true airspeed.

4. Flight fuel properties:

If no flight fuel properties are provided, the upper limits of Jet A-1 fuel according to the ASTM Standard Specification for Aviation Turbine Fuels, are assumed:

(a) Aromatic content: 25% volume;

(b) Sulphur: 0.3% mass;

(c) Naphthalene: 3.0% volume.

ANNEX IIIb

Conservative default engine values per aircraft type

ICAO	**First UID**
A148	13ZM003
A19N	01P22PW163
A20N	01P22PW163
A21N	01P20CM132
A306	1PW048
A30B	1GE007
A310	1PW027
A318	7CM049
A319	1IA001
A320	1IA001
A321	3IA008
A332	4PW067
A333	4PW067
A337	3RR029

A338	04P24RR146
A339	02P23RR141
A343	2CM015
A346	8RR045
A358	01P18RR125
A359	01P21RR125
A35K	01P21RR125
A388	9EA001
A3ST	1GE021
AN72	1ZM001
B38M	01P20CM138
B39M	01P20CM138
B463	1TL003
B701	1PW001
B703	1PW001
B721	1PW008
B731	01P20CM138
B732	1PW008
B733	1CM007
B734	1CM007
B735	1CM007
B736	3CM031
B737	2CM015
B738	2CM015
B739	3CM034
B741	8PW088
B742	1RR011
B743	1PW029
B744	1RR010
B748	13GE157
B74S	8PW088
B752	1RR011
B753	3RR034
B762	1PW026

B763	5GE085
B764	5GE085
B772	3GE060
B773	2RR024
B77L	01P21GE217
B77W	01P21GE217
B778	01P21GE217
B779	01P21GE217
B788	02P23RR138
B789	02P23RR138
B78X	02P23RR138
BCS1	16PW111
BCS3	16PW111
C550	1PW037
C560	1PW037
C650	1AS002
C680	7PW077
C68A	7PW077
C700	01P18HN013
C750	6AL024
CL30	11HN003
CL35	01P14HN011
CL60	10GE130
CRJ2	01P05GE189
CRJ7	01P11GE202
CRJ9	01P08GE190
CRJX	01P08GE193
E135	01P10AL033
E145	6AL006
E170	01P08GE197
E190	10GE130
E195	10GE130
E290	04P20PW200
E295	04P20PW201

E35L	6AL006
E545	11HN003
E550	01P14HN016
E55P	01P14HN016
E75L	01P08GE197
E75S	01P08GE197
F100	1RR020
F2TH	01P07PW146
F900	1AS001
FA10	1AS002
FA50	1AS002
FA7X	03P16PW192
FA8X	03P15PW193
G280	01P11HN012
GA5C	01P22PW142
GA6C	01P22PW141
GALX	7PW077
GL5T	4BR004
GL7T	21GE185
GLEX	4BR004
GLF4	11RR048
GLF5	4BR004
GLF6	4BR004
H25B	1AS001
H25C	7PW077
HA4T	01P07PW146
IL62	1KK001
IL86	1KK003
LJ35	1AS001
LJ45	1AS002
LJ55	1AS002
MD11	5GE085
MD90	1IA001
RJ85	1TL004

SU95	01P11PJ004
T154	1KK001

’;

(52) Annex IV is amended as follows:

(a) The title of Section 2 is replaced by the following:

‘**REFINING OF OIL AS LISTED IN ANNEX I TO DIRECTIVE 2003/87/EC**’;

(b) The title of Section 5 is replaced by the following:

‘**PRODUCTION OF IRON AND STEEL AS LISTED IN ANNEX I TO DIRECTIVE 2003/87/EC**’;

(c) in Section 6, point (A), the first paragraph is replaced by the following:

‘The operator shall not apply the provisions in this section for the monitoring and reporting of CO_2 emissions from the production of iron and steel and primary aluminium.’;

(d) Section 7 is amended as follows:

(i) The title is replaced by the following:

‘CO_2 EMISSIONS FROM PRODUCTION OR PROCESSING OF PRIMARY ALUMINIUM OR ALUMINA AS LISTED IN ANNEX I TO DIRECTIVE 2003/87/EC’;

(ii) in Point (A), the first and second paragraphs are replaced by the following:

‘The operator shall apply the provisions of this section to the monitoring and reporting of CO_2 emissions from the production of alumina (Al_2O_3), the production of electrodes for primary aluminium smelting, including stand-alone plants for the production of such electrodes, and the consumption of electrodes during electrolysis.

The operator shall consider at least the following potential sources for CO_2 emissions: fuels for the production of heat or steam, Al_2O_3 production, electrode production, reduction of Al_2O_3 during electrolysis which is related to electrode consumption, and use of soda ash or other carbonates for waste gas scrubbing.’;

(e) in Section 10, point (A), the second paragraph is replaced by the following:

‘Where the burnt lime and the CO2 stemming from the limestone are used for purification processes, the CO2 shall be considered emitted, unless the CO2 is bound in a product that satisfies the conditions set out in Article 49a(1) of this Regulation.’;

(f) in Section 17, point (B), the second paragraph is replaced by the following:

‘Where CO_2 from ammonia production is used as feedstock for the production of urea or other chemicals, or transferred out of the installation for any use not covered by Article 49(1) of this Regulation, the related amount of CO_2 shall be considered as emitted by the installation producing the CO_2 , unless the CO_2 is bound in a product that satisfies the conditions set out in Article 49a(1) of this Regulation.’;

(g) Section 20 is amended as follows:

(i) in Point (A), points (b) and (c) are replaced by the following:

‘(b) raw materials, including vent gas from calcination of limestone;

(c)waste gases from washing or filtration steps after carbonation.’;

(ii) Point (B) is replaced by the following:

‘**B. Specific monitoring rules**

Emissions from combustion processes, including flue gas scrubbing shall be monitored in accordance with Section 1 of this Annex. Process emissions from raw material components and additives shall be monitored in accordance with Section 4 of Annex II to this Regulation.

Intermediary CO_2 for the production of soda ash shall be considered as emitted by the installation producing the CO_2, unless the CO_2 is bound in a product that satisfies the conditions set out in Article 49a(1) of this Regulation.’;

(h) Section 21 is amended as follows:

(i) in Point (A), the first paragraph is replaced by the following:

‘CO2 capture shall be performed either by a dedicated installation receiving CO2 by transfer from one or more other installations, or by the same installation carrying out the activities producing the captured CO2 under the same greenhouse gas emissions permit. All parts of the installation related to CO2 capture, and transfer to a CO2 transport infrastructure or to a site for geological storage of CO2 greenhouse gas emissions, including any functionally connected ancillary facilities, such as CO2 intermediate storage, booster, liquefaction, gasification, purification stations or heaters, shall be included in the greenhouse gas emissions permit and accounted for in the associated monitoring plan. In the case of the installation carrying out other activities covered by Directive 2003/87/EC, the emissions of those activities shall be monitored in accordance with the other relevant sections of this Annex.’;

(ii) Point (B), is replaced by the following:

‘B. Quantification of transferred and emitted CO2 amounts

B.1. Installation level quantification

Each operator shall calculate the emissions by taking into account the potential CO_2 emissions from all emission relevant processes at the installation, as well as the amount of CO_2 captured and transferred to the CO_2 infrastructure, using the following formula:

$E_{\text{capture installation}} = T_{\text{input}} + E_{\text{without capture}} - T_{\text{for storage}}$

Where:

$E_{\text{capture installation}}$ = Total greenhouse gas emissions of the capture installation;

T_{input} = Amount of CO_2 transferred to the capture installation, determined either based on one or more source streams as in a mass balance methodology in accordance with Article 25 or based on a measurement-based methodology in accordance with Article 40 to 46 and Article 49 of this Regulation.

$E_{\text{without capture}}$ = Emissions of the installation assuming the CO_2 were not captured, meaning the sum of the emissions from all other activities at the installation, monitored in accordance with relevant sections of Annex IV, including Method B in Section 22 of Annex IV to this Regulation for any functionally connected ancillary facilities;

$T_{\text{for storage}}$ = Amount of CO_2 transferred to a CO_2 transport infrastructure or a storage site, determined either based on one or more source streams as in a mass balance methodology in

accordance with Article 25 or based on a measurement-based methodology in accordance with Article 40 to 46 and Article 49 of this Regulation.

In cases where CO_2 capture is carried out by the same installation as the one from which the captured CO_2 originates, the operator shall use zero for T_{input}.

In cases of stand-alone capture installations, the operators of these installations shall take into consideration the following:

(a) the operator shall consider $E_{without\ capture}$ to represent the amount of emissions that occur from other sources than the CO_2 transferred to the installation for capture. The operator shall determine those emissions in accordance with this Regulation;

(b) by way of derogation from the monitoring methodology described in this section, the operator may monitor the emissions of the installation by using Method B as described in Section 22 of Annex IV to this Regulation.

In the case of stand-alone capture installations, the operator of the installation transferring CO_2 to the capture installation shall deduct the amount T_{input} from the emissions of its installation based either as one or more source streams as in a mass balance methodology in accordance with Article 25 or based on a measurement-based methodology in accordance with Article 49 of this Regulation.

B.2. Determination of transferred CO_2

Each operator shall determine the amount of CO_2 transferred from and to the capture installation based either as one or more source streams as in a mass balance methodology in accordance with Article 25 or based on a measurement-based methodology in accordance Articles 40 to 46 and Article 49 of this Regulation.';

(i) Section 22 is replaced by the following:

' 22. Determination of greenhouse gas emissions from the transport of CO2 for geological storage in a storage site permitted under Directive 2009/31/EC

A. Scope

The boundaries for monitoring and reporting emissions from CO_2 transport shall be laid down in the CO_2 transport infrastructure's greenhouse gas emissions permit, including all ancillary facilities functionally connected to the transport infrastructure, such as CO_2 intermediate storage, booster, liquefaction, gasification, purification stations or heaters. Each transport infrastructure shall have a minimum of one start point and one end point, each connected to other installations or CO_2 transport infrastructure carrying out one or more of the activities: capture, transport or geological storage of CO_2. Start and end points may be set at bifurcations of the transport infrastructure and at cross national borders. Start and end points as well as the installations or CO_2 transport infrastructure they are connecting to, shall be laid down in the greenhouse gas emissions permit.

Each operator of a CO_2 transport infrastructure shall consider at least the following potential emission sources for CO_2 emissions: combustion and other processes at installations functionally connected to the transport infrastructure including booster stations and liquefaction stations; combustion units, including internal combustion units in CO_2 transport

vehicles, to the extent emissions are not subject to surrender obligations related to activities listed in Annexes I or III to Directive 2003/87/EC in that same reporting year; fugitive emissions from the transport infrastructure; vented emissions from the transport infrastructure; and emissions from leakage incidents in the transport infrastructure.

CO_2 transported for purposes other than for geological storage in a storage site permitted under Directive 2009/31/EC shall not be part of the boundaries for monitoring and reporting emissions by the CO_2 transport infrastructure. In cases where the same infrastructure is used for the transport of CO_2 for multiple purposes, including for geological storage in a storage site permitted under Directive 2009/31/EC, in a manner where the different consignments cannot be distinguished, the operator of a CO_2 transport infrastructure shall indicate this in the greenhouse gas emissions permit and establish a method for recording and documenting the volumes of CO_2 transported for purposes other for geological storage in a storage site permitted under Directive 2009/31/EC. The operator of a CO_2 transport infrastructure shall monitor emissions resulting from the total volume of CO_2 transported but shall report as emitted the share of the emissions corresponding to the volume of CO_2 transported for geological storage in a storage site permitted under Directive 2009/31/EC divided by total volume of CO_2 transported.

B. Quantification Methodologies for CO_2

The CO_2 transport infrastructure operator shall determine emissions using one of the following methods:

(a) Method A (overall mass balance of all input and output streams) set out in subsection B.1;
(b) Method B (monitoring of emission sources individually) set out in subsection B.2.

The operator shall apply Method B unless the operator can demonstrate to the competent authority that the application of Method A will lead to more reliable results with lower uncertainty of the overall emissions, using best available technology and knowledge at the time of the application for the greenhouse gas emissions permit and approval of the monitoring plan, without incurring unreasonable costs. Where Method B is applied, each operator shall demonstrate to the satisfaction of the competent authority that the overall uncertainty for the annual level of greenhouse gas emissions for the operator's transport infrastructure does not exceed 7,5 %.

The operator of a CO_2 transport infrastructure using Method B shall not add CO_2 received from another installation or CO_2 transport infrastructure permitted in accordance with Directive 2003/87/EC to its calculated level of emissions, and shall not subtract from its calculated level of emissions any CO_2 transferred to another installation or CO_2 transport infrastructure permitted in accordance with Directive 2003/87/EC.

Each operator of a CO_2 transport infrastructure shall use Method A for the validation of the results of Method B at least once annually. For that validation, the operator may use lower tiers for the application of Method A.

B.1. Method A

Each operator shall determine emissions in accordance with the following formula:

$$Emissions\ [t\ CO2] = E_{transport\ infrastructure} + \sum iT_{IN,i} - \sum iT_{OUT,i} - \Delta E_{in\ transit}$$

Where:

Emissions = Total CO_2 emissions of the transport infrastructure [t CO_2];

$E_{transport\ infrastructure}$ = Amount of CO_2 [t CO_2] from the transport infrastructure's own activity, meaning not emissions stemming from the CO_2 transported, but being emitted from combustion or other processes functionally connected to the transport infrastructure, monitored in accordance with the relevant sections of Annex IV to this Regulation;

$T_{IN,i}$ = Amount of CO_2 transferred to the transport infrastructure at entry point *i*, determined either based on one or more source streams as in a mass balance methodology in accordance with Article 25 or based on a measurement-based methodology in accordance with Articles 40 to 46 and Article 49 of this Regulation.

$T_{OUT,i}$ = Amount of CO_2 transferred out of the transport infrastructure at exit point i, determined either based on one or more source streams as in a mass balance methodology in accordance with Article 25 or based on a measurement-based methodology in accordance with Articles 40 to 46 and Article 49 of this Regulation.

$\Delta E_{in\ transit}$ = Amount of CO_2 transferred to the transport infrastructure at entry point *i*, that is not transferred to another installation or CO2 transport infrastructure in the same reporting period but by the deadline indicated in Article 49(7) of this Regulation in the year after the reporting period. Corresponding amounts shall not be taken into account for $T_{OUT,i}$ for the subsequent reporting period.

B.2. Method B

Each operator shall determine emissions considering all processes relevant to emissions at the installation as well as the amount of CO_2 captured and transferred to the transport facility using the following formula:

Emissions [t CO_2]= $E_{fugitive} + E_{vented} + E_{leakage\ events} + E_{transport\ infrastructue}$

Where:

Emissions = Total CO_2 emissions of the transport infrastructure [t CO_2];

$E_{fugitive}$ = Amount of fugitive emissions [t CO_2] from CO_2 transported in the transport infrastructure, including from seals, valves, intermediate compressor stations and intermediate storage facilities;

E_{vented} = Amount of vented emissions [t CO_2] from CO_2 transported in the transport infrastructure;

$E_{leakage\ events}$ = Amount of CO_2 [t CO_2] transported in the transport infrastructure, which is emitted as the result of the failure of one or more components of the transport infrastructure;

$E_{transport\ infrastructure}$ = Amount of CO_2 [t CO_2] from the transport infrastructure's own activity, meaning not emissions stemming from the CO_2 transported, but being emitted from combustion or other processes functionally connected to the transport infrastructure, monitored in accordance with the relevant sections of Annex IV to this Regulation.

B.2.1. Fugitive emissions from the transport infrastructure

The operator of a CO_2 transport infrastructure shall consider fugitive emissions from at least any of the following types of equipment:

(a) seals;

(b) measurement devices;

(c) valves;

(d) intermediate compressor stations;

(e) intermediate storage facilities including those mounted onto CO_2 transport vehicles.

The operator shall determine average emission rates *ER* (expressed in g CO_2/unit time) per piece of equipment per occurrence where fugitive emissions can be anticipated at the beginning of operation, and by the end of the first reporting year in which the transport infrastructure is in operation at the latest. The operator shall review those factors at least every 5 years in the light of the best available techniques and knowledge.

The operator shall calculate fugitive emissions by multiplying the number of pieces of equipment in each category by the emission factor and adding up the results for the single categories as shown in the following equation:

$$Fugitive\ Em\ [tCO_2] = \left(\sum_{Category} ER\ [gCO_2/occurr] \cdot N_{occur} \right) / 10^6$$

The number of occurrences (N_{occurr}) shall be the number of pieces of the given equipment per category, multiplied by the number of time units per year.

B.2.2. Emissions from leakage events

The operator of a CO2 transport infrastructure shall provide evidence of the system integrity by using representative (spatial and time-related) temperature and pressure data. Where the data indicates that a leakage has occurred, the operator shall calculate the amount of CO2 leaked with a suitable methodology documented in the monitoring plan, based on industry best practice guidelines, including by use of the differences in temperature and pressure data compared to integrity related average pressure and temperature values.

B.2.3. Vented emissions

Each operator of a CO2 transport infrastructure shall provide in the monitoring plan an analysis regarding potential situations of venting emissions, including for maintenance or emergency reasons, and provide a suitable documented methodology for calculating the amount of CO2 vented, based on industry best practice guidelines.';

(j) Section 23 is amended as follows:

(i) in Point (A), the first paragraph is replaced by the following:

'

The competent authority shall base the boundaries for monitoring and reporting of emissions from geological storage of CO2 on the delimitation of the storage site and storage complex as specified in the permit pursuant to Directive 2009/31/EC, as well as all ancillary facilities functionally connected to the storage complex, such as CO2 intermediate storage, booster, liquefaction, gasification, purification stations or heaters. Where leakages from the storage complex are identified and lead to emissions or release of CO2 into the water column, the operator shall immediately carry out all the following:

(a) notify the competent authority;

(b) include the leakage as a source stream or an emission source for the respective installation;

(c) monitor and report the emissions.'

(ii) in Point (B), the first paragraph is replaced by the following:

'The operator of the geological storage activity shall not add CO_2 received from another installation to its calculated level of emissions, and shall not subtract from its calculated level of emissions any CO_2 which is geologically stored in the storage site or which is transferred to another installation. The operator shall monitor emissions from any ancillary facilities functionally connected to the storage complex in accordance with the provisions set out in Section 22 of Annex IV to this Regulation.';

(iii) Point (B1), the second paragraph is replaced by the following:

'Each operator shall determine V CO_2 either as one or more source streams as in a mass balance methodology in accordance with Article 25 or by using a measurement-based methodology in accordance with Articles 41 to 46 of this Regulation. By way of derogation from the first sentence and upon approval by the competent authority, the operator may include in the monitoring plan an appropriate methodology for determining V CO_2 based on industry best practice, where the application of monitoring methodologies referred to in the first sentence would incur unreasonable costs or the operator can demonstrate that the methodology based on industry best practice allows the amounts to be determined with at least the same accuracy as measurement-based methodologies.';

(iv) Point (B2), the first paragraph is replaced by the following:

'Each operator shall consider at least the following potential additional emission sources from enhanced hydrocarbon recovery (EHR):';

(53) Annex V is amended as follows:

(a) Table 1 is amended as follows:

(i) the twelfth row, heading **'Refining of mineral oil'** is replaced by the following:

'Refining of oil';

(ii) the twenty-seventh row, heading **'Primary aluminium production'** is replaced by the following:

'**Primary aluminium or alumina production**';

(iii) the following row is added at the end of the Table:

'

CO_2 capture, transfer and geological storage in storage site permitted under Directive 2009/31/EC						
Mass balance of CO_2 transferred	2	n.a.	n.a.	2	n.a.	n.a.
CO_2 venting, leakage, and fugitive emissions	2	n.a.	n.a.	2	n.a.	n.a.

';

(54) in the Table of Annex VII, the following rows are inserted after the second row, heading 'natural gas' :

‘

CO_2 transferred	At least weekly
Flue gas for the purpose of Article 43(4)	Every 50 000 tonnes of total CO_2, but at least once a month

’;

(55) Annex IX is amended as follows:

(a) Section 2 is amended as follows:

(i) the title is replaced by the following:

‘**SPECIFIC ELEMENTS FOR STATIONARY INSTALLATIONS:**’

(ii) in point (6), the introductory sentence is replaced by the following:

‘For primary aluminium or alumina production, the following additional elements:’;

(iii) in point (7), point (b) is replaced by the following:

‘representatively aggregated pressure and temperature data from a transport infrastructure’;

(iv) the following point (8) is inserted:

‘8. For CO_2 permanently chemically bound, where applicable, the following additional elements:

(a) documentation of the amount of CO_2 permanently chemically bound;

(b) the types of products the CO_2 was chemically bound, their amounts produced and the respective uses of the products.’;

(b) Section 3 is amended as follows:

(i) point (4) is replaced by the following:

‘For the purposes of monitoring emission, documentation on the methodology for data gaps where applicable, the number of flights where data gaps occurred, the data used for closing the data gaps, where they occurred, and, where the number of flights with data gaps exceeded 5% of flights that were reported, reasons for the data gaps as well as documentation of remedial actions taken;’;

(ii) the following points (5) and (6) are inserted:

‘(5) For the purpose of monitoring and reporting of non-CO2 aviation effects, all data monitored by the aircraft operator pursuant to Article 56b(2) of this Regulation, where such data is used to calculate the CO2(e) per flight in accordance with the method referred to in Article 56a of this Regulation;

(6) For the purpose of monitoring non-CO2 aviation effects and where the aircraft operator does not use NEATS, the number of flights where data gaps occurred and appropriate default values used of Annex IIIa, Section 5 and Annex IIIb to this Regulation for closing the data gaps.’;

(56) Annex X is amended as follows:

(a) Section 1 is amended as follows:

(i) the title is replaced by the following:

'ANNUAL EMISSION REPORTS OF STATIONARY INSTALLATIONS';

(ii) in point (6), point (a) is replaced by the following:

'the total emissions expressed as t CO_2(e), including CO_2 from biomass source streams which do not comply with Article 38(5) of this Regulation, or from RFNBO or RCF source streams which do not comply with Article 39a(3) of this Regulation, or from synthetic low-carbon fuels source streams which do not comply with Article 39a(4) of this Regulation ;';

(iii) in point (6), point (f) is replaced by the following:

'emission factors, expressed in accordance with the requirements set out in Article 36(2) of this Regulation; biomass fraction; zero-rated biomass fraction, RFNBO or RCF fraction, zero-rated RFNBO or RCF fraction, synthetic low-carbon fraction, zero-rated synthetic low-carbon fraction, oxidation and conversion factors, expressed as dimensionless fractions;';

(iv) point (7) is replaced by the following:

'Where a mass balance methodology is applied, the mass flow, and carbon content for each source stream into and out of the installation; biomass fraction, zero-rated biomass fraction, RFNBO or RCF fraction, zero-rated RFNBO or RCF fraction, synthetic low-carbon fraction, zero-rated synthetic low-carbon fraction, and net calorific value, where relevant;';

(v) in point (8), points (a), (b), (c), (d) and (e) are replaced by the following:

'

(a) amounts of biomass and of zero-rated biomass combusted or amounts of RFNBO or RCF and of zero-rated RFNBO or RCF combusted, or amounts of synthetic low-carbon fuels and of zero-rated synthetic low-carbon fuels combusted, expressed in TJ, or employed in processes, expressed in t or Nm3;

(b) CO2 emissions from biomass and from zero-rated biomass or emissions from RFNBO or RCF and from zero-rated RFNBO or RCF, or emissions from synthetic low-carbon fuels and of zero-rated synthetic low-carbon fuels expressed in t CO2, where measurement-based methodology is used to determine emissions;

(c) a proxy for the net calorific value of the biomass or RFNBO or RCF or synthetic low-carbon fuels source streams used as fuel, where relevant;

(d) emissions, amounts and energy content of biomass fuels and bioliquids combusted or RFNBO or RCF combusted, or synthetic low-carbon fuels combusted expressed in t and TJ, and information that zero-rated biomass fuels and bioliquids or RFNBO or RCF or synthetic low-carbon fuels comply with Article 38(5) or Article 39a(3) or Article 39a(4) of this Regulation;

(e) CO2 or N2O transferred to an installation or received from an installation and any CO2 in transit, where Article 49 or 50 of this Regulation is applicable, expressed in t CO2(e);';

(vi) in point (8), points (i) and (j) are inserted:

‘(i) amount of CO_2 chemically bound in product in accordance with Article 49a(1) of this Regulation, expressed in t CO_2;

(j) the types and amounts of products produced in which CO_2 was chemically bound in accordance with Article 49a(1) of this Regulation, expressed in t of product;’;

(vii) in point (9), point (c) is replaced by the following:

‘(c) where applicable, a proxy for the energy content from fossil fuels and materials and from biomass used as fuels and materials as well as from RFNBO or RCF or synthetic low-carbon fuels.’;

(b) Section 2 is amended as follows:

(i) points (8) and (9), are replaced by the following:

‘ 8. Mass of neat fuel (in tonnes) per fuel type per State pair, including information on all of the following:

(a) (a) Whether the alternative aviation fuel is zero-rated in compliance with Article 54c of this Regulation;

(b) (b) Whether the fuel is an eligible aviation fuel;

(c) (c) For eligible aviation fuels, the fuel type as defined in Article 3c(6) of Directive 2003/87/EC;

9. Total CO_2 emissions in tonnes of CO_2 using the preliminary emission factor as well as the emission factor disaggregated by the Member State of departure and arrival;’;

(ii) point (12) is replaced by the following:

‘12. Memo-items:

(a) amount of alternative aviation fuels used during the reporting year (in tonnes) listed per fuel type, and whether the fuels comply with Article 54c of this Regulation;

(b) the net calorific value of alternative fuels;’;

(iii) point (13) is replaced by the following:

‘As an annex to the annual emission report, the aircraft operator shall include annual emissions and annual numbers of flights per aerodrome pair. If applicable, the amount of alternative aviation fuel and eligible aviation fuel (in tonnes) shall be indicated per aerodrome pair. Upon request of the operator the competent authority shall treat that information as confidential.’;

(c) Section 2a is inserted:

‘2a. ANNUAL NON-CO_2 AVIATION EFECTS REPORTS OF AIRCRAFT OPERATORS

For non-CO_2 aviation effects, the separate report as referred to in Article 68(5) of this Regulation shall at least contain the following information:

1. Data identifying the aircraft operator, and the call sign or other unique designators used for air traffic control purposes, as well as relevant contact details;

2. Name and address of the verifier of the report;

3. The reporting year;

4. Reference to and version number of the latest approved monitoring plan and the date from which it is applicable, reference to and version number of other monitoring plans relevant for the reporting year;

5. Relevant changes in the operations and deviations from the approved monitoring plan during the reporting period;

6. The aircraft registration numbers and types of aircraft used in the period covered by the report to perform the aviation activities covered by Annex I to Directive 2003/87/EC carried out by the aircraft operator;

7. The total number of flights per State pair covered by the report;

8. The sum of CO_2(e) of the monitored flights of the aircraft operator per aerodrome pair, expressed in the climate metrics provided in Article 56a(2) of this Regulation.

9. A XML table containing per flight and as defined in Annex IIIa, Section 1 to this Regulation, flight information, aircraft type, engine identifier and CO_2(e), expressed in the climate metrics provided in Article 56a(2) of this Regulation;

10. If the aircraft operator is not using NEATS to calculate the CO_2(e), but own or third-party IT tools as referred to in Article 56a(7)(b) of this Regulation, a description of how efficacy is applied in those tools, in line with this Regulation and NEATS, to refine the GWP. If efficacy was not applied in the tools, the aircraft operator shall provide a description explaining the reasons for not applying efficacy.';

(d) Section 4 is amended as follows:

(i) point (6) is amended as follows:

- point (a) is replaced by the following:

'(a) the total emissions expressed as t CO_2, including CO_2 from biomass fuel streams which do not comply with Article 38(5) of this Regulation, or from RFNBO or RCF source streams which do not comply with Article 39a(3) of this Regulation, or from synthetic low-carbon fuels source streams which do not comply with Article 39a(4) of this Regulation;';

- point (d) is replaced by the following:

'(d) emission factors, expressed in accordance with the requirements set out in Article 75f of this Regulation; biomass fraction, zero-rated biomass fraction, RFNBO or RCF fraction, zero-rated RFNBO or RCF fraction, synthetic low-carbon fraction, zero-rated synthetic low-carbon fraction expressed as dimensionless fractions;';

(ii) in point (7), points (a) and (b) are replaced by the following:

'(a) a proxy for the net calorific value of the biomass, RFNBO or RCF or synthetic low-carbon fuels fuel streams, where relevant;

(b) emissions, amounts and energy content of biofuels, bioliquids, biomass fuels, RFNBOs and RCFs, synthetic low-carbon fuels released for consumption, expressed in t and TJ, and information whether they comply with Article 38(5) or 39a(3) or 39a(4) of this Regulation; emissions, amounts and energy content of biofuels, bioliquids, biomass fuels, RFNBOs or RCFs released for consumption, expressed in t and TJ, and information whether they comply with Article 38(5) or 39a(3) or 39a(4) of this Regulation;';

(57) in Annex Xa, the introductory sentence is replaced by the following:

‘Together with the information contained in the annual emission report pursuant to Annex X to this Regulation, the operator shall submit the following information for each purchased fuel as defined in Article 3, point (af) of Directive 2003/87/EC:’;

(58) in Annex Xb, the introductory sentence is replaced by the following:

‘Together with the information contained in the annual emission report pursuant to Annex X to this Regulation, the regulated entity shall submit the following information for each purchased fuel as defined in Article 3, point (af), of Directive 2003/87/EC: ‘;

Article 2

Entry into force and application

This Regulation shall enter into force on the twentieth day following that of its publication in the *Official Journal of the European Union*.

It shall apply from 1 January 2024.

However, Article 1, points (2)(m), (43) to (46), (57) and (58) shall apply from 1 July 2024.

Article 1, points (3), (5) to (8), (9)(c), (21), (25) to (27), (28)(a), (29), (35), (36), (38), (40), (41), (47)(a), (47)(b)(i) first and fourth dash, (47)(b)(iii), (48)(a)(ii), (51), (52)(d), (52)(e), (52)(f), (52)(g)(ii), (52)(h), (52)(i), (52)(j), (53), (55)(a)(ii), (55)(a)(iii), (55)(a)(iv), (55)(b)(ii), (56)(a)(vi), (56)(c) shall apply from 1 January 2025.

This Regulation shall be binding in its entirety and directly applicable in all Member States.

Done at Brussels,

For the Commission
The President
Ursula VON DER LEYEN