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Guidance on the targets for the consumption of renewable fuels of non-biological origin in the industry and transport sectors laid down in Articles 22a, 22b and 25 of Directive (EU) 2018/2001 on the promotion of energy from renewable sources, as amended by Directive (EU) 2023/2413

(C/2025/2983)

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1. Introduction

Directive (EU) 2023/2413 of the European Parliament and of the Council ([1]) which amends Directive (EU) 2018/2001 of the European Parliament and of the Council ([2]) entered into force on 20 November 2023. The amending directive introduces changes to the legislative framework regulating renewable energy until 2030 and beyond. This guidance refers to the latest version of the Renewable Energy Directive, as amended in 2023, as 'revised RED' or 'revised Directive'.

The revised RED is a cornerstone of the European Green Deal and of REPowerEU in order to reach the Union's ambition to fight climate change and reduce the Union's energy dependence from Russia. It increases substantially the level of renewable energy ambition, not only by increasing the Union renewable energy binding target that needs to be collectively achieved by 2030 from 32 % to 42,5 % (with an aspiration to reach 45 %), but also by adding and strengthening the sub-targets for renewables to be achieved across various sectors, including in industry.

Industry accounts for approximately 25 % of the Union's energy consumption ([3]) and is a major consumer of fossil fuels, especially for heating and cooling purposes. Furthermore, fossil fuels are used as feedstock for the production of industrial products, such as fertilisers, chemicals or steel. Given the significant share of industry in the Union's energy consumption, a substantial increase of renewable energy penetration in this sector across the Union is required to achieve its renewable energy objectives. Furthermore, industrial investment decisions today will determine the future industrial processes and energy options that can be considered by industry, so it is important that those investments decisions are future-proof and avoid the creation of stranded assets (Recital 59 of the revised RED).

The revised RED includes two specific provisions (Articles 22a and 22b) focused on mainstreaming renewable energy in the industry sector. It provides incentives and obligations for Member States to ensure that their industry can switch to production processes using renewable energy, such as renewable fuels of non-biological origin ('RFNBOs'), as fuel or feedstock, instead of fossil fuels. It must be noted in this regard that the revised RED introduces in Article 2, point 36, a new definition of RFNBOs which includes all uses of RFNBOs, and not only the use of RFNBOs as a transport fuel as was the case in the previous definition in the 2018 RED.

In addition to an indicative target to increase the share of renewable sources in the industry sector, Article 22a provides an obligation for Member States to ensure that RFNBOs will partially replace their fossil fuel equivalents for final energy and non-energy purposes in their industry sector. This obligation aims to promote the development of a market for the consumption of RFNBOs in industrial uses, which is necessary because RFNBOs are currently more expensive than their fossil-based equivalent and are unlikely to be produced and sold on market terms alone without regulatory intervention. The revised RED provides the option to reduce the target of RFNBO in a Member State provided the conditions set out in Article 22b are fulfilled.

The general deadline for the transposition of the provisions necessary to comply with the revised RED – including Articles 22a and 22b - is 21 May 2025.

The Directive further establishes binding targets in the transport sector. Next to the achievement of the overarching targets of either a share of 29 % of renewable energy in transport or a reduction of the emissions intensity of transport fuels by 14,5 %, by 2030, Member States are required to increase the share of RFNBOs to at least 1 %. RFNBOs also contribute towards a combined target of 5,5 % for RFNBOs and advanced biofuels. The Directive further sets out rules how RFNBOs contribute towards the targets and how Member States should promote the use of renewable energy in transport via an obligation on fuel suppliers.

This Notice is intended purely as a guidance document for the purposes of transposing and implementing the revised RED. It does not provide interpretation in the context of other legal acts.

([1]) Directive (EU) 2023/2413 of the European Parliament and 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).

([2]) 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).

([3]) This share exceeds 30 % combining final energy and non-energy consumption.

Only the text of the EU legislation itself has legal force. Any authoritative reading of the law has to be derived from the text of the Directive and directly from the decisions of the Court of Justice of the EU.

2. **Scope of application of the RFNBO target in Article 22a**

Article 22a of the revised RED provides that '*Member States shall ensure that the contribution of renewable fuels of non-biological origin used for final energy and non-energy purposes shall be at least 42 % of the hydrogen used for final energy and non-energy purposes in industry by 2030, and 60 % by 2035*'.

Regarding the scope of application of the new mandatory target for RFNBOs in industry laid down in Article 22a, the following sub-sections clarify the following concepts: (i) the concept of industry (section 2.1), (ii) the addressees of the RFNBO target (section 2.2), (iii) the calculation of the numerator (section 2.3) and (iv) the calculation of the denominator for the purposes of complying with the target (section 2.4).

2.1. *Definition of industry*

Article 2(18a) of the revised RED defines *'industry'* as *'undertakings and products that fall under sections B, C, and F and under section J, division (63) of the statistical classification of economic activities (NACE REV.2), as set out in Regulation (EC) No 1893/2006 of the European Parliament and of the Council'* ([4]).

Sections B, C and F include respectively 'Mining and Quarrying', 'Manufacturing' and 'Constructing'. Section J, division (63) includes Information service activities. From the latter activities, data centres represent the most energy-intensive activity and are therefore a key sector for the purposes of the indicative target in Article 22a. The definition of industry under Article 2(18a) of the revised RED goes beyond the scope of the Eurostat guidelines for final energy consumption in industry as it covers also Section J, division (63) which is not covered under the Eurostat guidelines on reporting of energy consumption by industry. Eurostat guidelines require mandatory reporting for industry under Section B, C and F (with voluntary reporting for its Divisions 41, 42 and 43) ([5]). Mandatory reporting of the final energy consumption for data centres is covered by the guidelines for final energy consumption in services ([6]). The statistical guidelines on oil and gas require the collection of data on the use of oil and gas for non-energy purpose in industry ([7]).

Refineries are included under the definition of industry (Section C of NACE REV.2). However, they have a special status when it comes to the consumption of RFNBOs and how they are accounted for under the different targets of the revised RED, namely the targets for the increase of renewable energy in the industry and in the transport sectors set under Articles 22a and 25 of the revised RED. The majority of fuels produced in refineries are used as transport fuels and therefore they are accounted towards the targets of renewables uptake in the transport sector. However, there are also refineries that produce fuels used for power generation (i.e. heavy fuel oils), oil products for the chemical sector and even solid materials (like coke) used in the production of aluminium, steel, or fertiliser production. Moreover. there is a small number of refinery products that are used both as transport fuels and as industrial products, such as MTBE (Methyl tert-butyl ether) and methanol.

The allocation of hydrogen consumption at refinery level should be done on the basis of all the different products produced with hydrogen at the end of the process, on an energy content basis, and on an annual basis at refinery level. This should be done after excluding the hydrogen produced as a by-product and consumed within the refinery. If the refinery does not have clarity on whether a product is used in the transport sector or as an industrial product, Member States should use EU-level data to determine the ratio of products used for transport fuels or as industrial product.

([4]) Regulation (EC) No 1893/2006 of the European Parliament and of the Council of 20 December 2006 establishing the statistical classification of economic activities NACE Revision 2 and amending Council Regulation (EEC) No 3037/90 as well as certain EC Regulations on specific statistical domains (OJ L 393, 30.12.2006, p. 1).
([5]) https://ec.europa.eu/eurostat/documents/38154/16135593/energy-consumption-industry-reporting-instructions.pdf.
([6]) https://ec.europa.eu/eurostat/documents/38154/16135593/energy-consumption-services-reporting-instructions.pdf.
([7]) https://ec.europa.eu/eurostat/documents/38154/16135593/Natural_Gas_Questionnaire_Instructions.pdf & https://ec.europa.eu/eurostat/documents/38154/16135593/Oil_Questionnaire_Instructions.pdf.

RFNBOs used in a refinery therefore partly contribute towards the target for RFNBOs consumption in transport as set in Article 25.2.(a) of the revised RED and partly towards the target for RFNBOs consumption in industry set in Article 22a of the revised RED. The share of the contribution may be established on the basis of the annual ratio of refinery products used in transport and in industry, without exceeding the amount of hydrogen consumption allocated to industry at refinery level.

Section D (Electricity, gas, steam and air conditioning supply) is not included. Therefore, hydrogen used as fuel in central power plants or hydrogen used to produce commercial steam do not fall under the scope of Article 22a, including the RFNBO target.

Since January 2022, the Energy Statistics Regulation ([8]) also covers data collection on the production and consumption of hydrogen and since January 2024 the transformations between hydrogen and other fuels. Mixtures of hydrogen and other gases are not included yet in the Eurostat reporting instructions on hydrogen ([9]).

To calculate the RFNBO target for industry, it is important that hydrogen used in industrial processes and transported in the form of a mixture is taken into account when calculating the amount of RNFBOs that are consumed in industry: in particular, the hydrogen in syngas (a mixture of hydrogen and carbon monoxide) used as a feedstock for the production of chemicals, and the hydrogen in a mixture of hydrogen and nitrogen (N_2) used as a feedstock for the production of ammonia.

National statistics are already gathering data on hydrogen on a voluntary basis, although a reporting requirement only applies from the year 2024 on. The Eurostat reporting instructions on hydrogen ([10]) currently allow for voluntary reporting of ammonia consumption, and they do not include voluntary report of methanol yet. Both ammonia and methanol are derivative products of hydrogen, and voluntary reporting by Member States is already encouraged.

The Commission will support as soon as possible the tracking of the share of RFNBO in industrial hydrogen consumption via the SHort Assessment of Renewable Energy Sources (SHARES) ([11]) tool.

2.2. *Obligation addressed to Member States*

The RFNBO target included in Article 22a of the revised RED applies to Member States, meaning that it is the responsibility of Member States to ensure that the contribution of RFNBOs reaches the target. This is clear from the text of Article 22a and it is motivated by the two following reasons: first, there is no market for RFNBOs today, because there is limited production of RFNBOs and they are still relatively expensive compared to fossil-based equivalents. Consequently, regulatory incentives at Union and national level are needed to make RFNBOs available to industry and to promote the creation of a market for these products. Member States should design the measures to achieve the RFNBO target for industry according to their national circumstances, taking into account the different levels of hydrogen use in different sectors as well as how the availability of RFNBOs to certain industrial consumers can support their transition to renewables-based production processes. Second, the volume of hydrogen consumption in industry and the number of industrial hydrogen consumers differs significantly among the Member States. Consequently, Member States can adapt their policies according to their own specific circumstances and can make sure that in the implementation of this obligation they ensure a level-playing field for hydrogen consumers.

The obligation, therefore, does not apply directly to hydrogen consumers. This does not preclude Member States from setting mandatory quotas for RFNBOs consumption as one of the possible measures to achieve the target. In such a case, it is important for Member States to take into account the impact that mandatory quotas can have on the competitiveness of industrial hydrogen consumers. Quotas that are not backed by adequate regulatory measures and State-aid compliant support mechanisms to compensate for the cost difference between RFNBOs and fossil-based fuels could lead to carbon leakage and additional intra-EU or extra-EU imports of products produced with fossil-based hydrogen. This would be in contradiction with the objective of Article 22a to decarbonise the Union's industrial sector. Furthermore, all national implementing measures should be designed without prejudice to the TFEU and notably Article 28.

([8]) Commission Regulation (EU) 2022/132 of 28 January 2022 amending Regulation (EC) No 1099/2008 of the European Parliament and of the Council on energy statistics, as regards the implementation of updates for the annual, monthly and short-term monthly energy statistics (OJ L 20, 31.1.2022, p. 208) and Commission Regulation (EU) 2024/264 of 17 January 2024 amending Regulation (EC) No 1099/2008 of the European Parliament and of the Council on energy statistics, as regards the implementation of updates for the annual, monthly and short-term monthly energy statistics (OJ L, 2024/264, 18.1.2024, ELI: http://data.europa.eu/eli/reg/2024/264/oj).

([9]) In this case, a mixture is simply hydrogen together with one or more chemical components, but that are not chemically linked.

([10]) See footnote 8.

([11]) The Short Assessment of Renewable Energy Sources (SHARES) tool developed by EUROSTAT focuses on the harmonised calculation of the share of energy from renewable sources.

2.3. *Calculation of the numerator*

Paragraph 1(b) of Article 22a provides that *'for the calculation of the numerator, the energy content of the renewable fuels of non-biological origin consumed in the industry sector for final energy and non-energy purposes shall be taken into account, excluding renewable fuels of non-biological origin used as intermediate products for the production of conventional transport fuels and biofuels'*.

Thus, only renewable hydrogen and its derivatives falling under the definition of RFNBOs in the revised RED ([12]) and used in industry can contribute to the numerator, based on their energy content. RFNBOs include renewable hydrogen and its derivatives that are compliant with the definition provided in Article 2(36) of the revised RED and with the RFNBOs delegated acts ([13]). For the purposes of calculating the numerator, derivatives are considered products obtained as direct derivatives of hydrogen, i.e. resulting from a chemical link between hydrogen with other molecules. Products containing hydrogen but which are not direct derivatives of hydrogen (e.g. fertilisers), or products produced using hydrogen as a reducing agent (e.g. direct reduced iron ([14])) would not be considered RFNBOs.

Paragraph 1(b) refers to RFNBOs 'consumed in the industry sector' and therefore the RFNBO target laid down in Article 22a is a 'consumption' target. This means that RFNBOs are accounted in the numerator of the Member State where they are consumed in their final form in the industry sector. In the case of RFNBOs that are derivatives of renewable hydrogen, the renewable hydrogen used to produce them must not be included in the numerator of the producing Member State ([15]) (whether this is the same Member State where the RFNBOs are consumed or a different one). As a result, in a situation where certain RFNBOs (e.g. renewable ammonia) are produced in a Member State and then exported to another Member State, the importing Member State would account the RFNBO in its industry target in the numerator while the exporting Member State would not account the renewable hydrogen used to produce it in the numerator.

For tracing renewable hydrogen certified as RFNBOs that is injected into the Union's interconnected gas infrastructure, it is possible to apply a mass balance system in accordance with Article 30 of the RED provided the consumer would physically separate the hydrogen from the mixture of gases. An allocation of the sustainability and greenhouse gas emission saving characteristics of hydrogen to natural gas is not possible in the absence of such physical separation of renewable hydrogen from the mixture of gases. Apart from that, the same rules for mass balancing apply. The relevant volumes of RFNBOs have to be entered into the Union Database in line with Article 31a of the RED.

([12]) The revised RED defines in Article 2 (36) RFNBOs as 'liquid and gaseous fuels the energy content of which is derived from renewable sources other than biomass'.

([13]) Commission Delegated Regulation (EU) 2023/1184 of 10 February 2023 supplementing Directive (EU) 2018/2001 of the European Parliament and of the Council by establishing a Union methodology setting out detailed rules for the production of renewable liquid and gaseous transport fuels of non-biological origin, C/2023/1087, OJ L 157, 20.6.2023, p. 11 and Commission Delegated Regulation (EU) 2023/1185 of 10 February 2023 supplementing Directive (EU) 2018/2001 of the European Parliament and of the Council by establishing a minimum threshold for greenhouse gas emissions savings of recycled carbon fuels and by specifying a methodology for assessing greenhouse gas emissions savings from renewable liquid and gaseous transport fuels of non-biological origin and from recycled carbon fuels, C/2023/1086, OJ L 157, 20.6.2023, p. 20.

([14]) To be noted that in the case of stell manufacturing through the DRI process, the renewable hydrogen used as reducing agent for the direct reduction of iron would be considered an RFNBO used in the industry sector. The pig iron resulting from the direct reduction of iron using renewable hydrogen would not be considered an RFNBO.

([15]) Unless, as provided under Article 7(1) of the revised RED, Member States 'agree, via a specific cooperation agreement, to count all or part of the renewable fuels of non-biological origin consumed in one Member State towards the share of gross final consumption of energy from renewable sources in the Member State where those fuels are produced. In order to monitor whether the same renewable fuels of non-biological origin are not counted in both the Member State where they are produced and in the Member State where they are consumed and in order to record the amount counted, Member States shall notify the Commission of any such cooperation agreement. Such a cooperation agreement shall include the amount of renewable fuels of non-biological origin to be counted in total and for each Member State and the date on which the cooperation agreement is to become operational'.

RFNBOs used in refineries, including as an intermediate product, for the production of conventional transport fuels ([16]) and biofuels ([17]), do not count towards the industry target under Article 22a, but to the transport under Article 25 (see below). However, RFNBOs used in refineries to produce industrial products consumed in the industry sector can be counted towards the industry target.

Hydrogen produced as a by-product and which complies with the definition of RFNBO ([18]) can be accounted in the numerator.

2.4. *Calculation of the denominator*

Paragraph 1, 5th subparagraph, point a) of Article 22a provides that '*for the calculation of the denominator, the energy content of hydrogen for final energy and non-energy purposes shall be taken into account, excluding: (i) hydrogen used as intermediate products for the production of conventional transport fuels and biofuels; (ii) hydrogen that is produced by decarbonising industrial residual gas and that is used to replace the specific gas from which it is produced; (iii) hydrogen produced as a by-product or derived from by-products in industrial installations*'.

Although this paragraph mentions hydrogen used for final energy and non-energy purposes without mentioning the sector in which it is consumed, it is clear from the fifth subparagraph of paragraph 1 that the denominator refers only to hydrogen consumed in the industry sector by setting the target of '*42 % of the hydrogen used for final energy and non-energy purposes in industry by 2030*'. Therefore, the denominator includes only hydrogen consumed in the industry sector as defined in Article 2(18a) and not hydrogen consumed in all sectors.

Furthermore, the denominator does not distinguish between the energy source of the hydrogen production, and includes hydrogen produced through all the different pathways. It also includes the hydrogen that is purposely consumed as part of a mixture, for example the share of hydrogen in syngas (a common mixture of hydrogen and carbon monoxide used in the chemical industry) or the share of hydrogen in a mixture with nitrogen (N2) for the production of ammonia.

Paragraph 1, 5th subparagraph, point (a) of Article 22a provides that the following three cases of hydrogen consumption in industry are excluded from the denominator:

i) '*hydrogen used as intermediate products for the production of conventional transport fuels and biofuels*'. This includes any hydrogen that is consumed for the desulfurization or hydrogenation of transport fuels and biofuels. This exclusion will mostly apply to hydrogen consumption in refineries. Refineries that produce both transport fuels as well as industrial products should only exclude the hydrogen consumed for the production of conventional transport fuels and biofuels.

ii) '*hydrogen that is produced by decarbonising industrial residual gas and that is used to replace the specific gas from which it is produced*'. This includes any hydrogen that is produced from residual gases, and which is subsequently re-introduced into the industrial process to replace the residual gas from which it was produced. This exclusion is a subcategory that is also covered by the broader exclusion for '*hydrogen produced as a by-product or derived from by-products in industrial installations*' (see below).

iii) '*hydrogen produced as a by-product or derived from by-products in industrial installations*'. This exception covers hydrogen that is produced as an unavoidable and unintentional consequence of the production of the main product, or hydrogen that is produced from residual gases that are the unavoidable and unintentional consequence of the production of the main product. This category includes hydrogen produced in chloro-alkali or sodium chlorate production processes, hydrogen that is produced as a by-product of the cracking of fossil fuels to produce alkanes or alkenes, hydrogen that is produced in the dehydrogenation process for the production of styrene or ethylene, or hydrogen that is produced during the production of coke oven gas or blast furnace in iron/steel making.

([16]) Conventional transport fuels include fossil fuels such as diesel, petrol and kerosine that are consumed in the transport sector.
([17]) To be noted that according to the revised RED 'biofuels' are liquid fuel for transport produced from biomass.
([18]) For instance, hydrogen that is a by-product of the chloro-alkali production process where renewable electricity was used in the production process and which complies with the RFNBOs delegated acts.

The Eurostat reporting instructions on hydrogen statistics include hydrogen production whether intentional and exclusive or as a by-product.

In addition to the above exclusions, recital 62 of the revised RED recognises the role of early movers that have taken investment decisions with a view to retrofitting pre-existing hydrogen production facilities based on steam methane reforming technology with the aim of decarbonising hydrogen production. It should be noted that the recognition in this recital is limited only to projects for which a grant under the Innovation Fund was awarded before the entry into force of the revised RED i.e. 20 November 2023. Consequently, it would not apply to new projects for which the award decision was taken after this date.

Regarding the scope of the denominator, the fifth subparagraph of Article 22a refers to 'hydrogen' used for final energy and non-energy purposes in industry. This contrasts with the wording used in Article 22b which lays down conditions for the reduction of the RFNBO target in the industry sector (further explained in section 4 of this guidance). Article 22b allows Member States to reduce the RFNBO target in the industry sector if they consume a limited share of 'hydrogen, or its derivatives' produced from fossil fuels.

The use of reference to 'hydrogen' only in Article 22a appears to show a deliberate willingness from the co-legislators to account only the consumption of hydrogen in the denominator and not the consumption of its derivatives thus indicating the intention to target specifically the decarbonisation of hydrogen in the EU. Hydrogen used to produce derivatives (regardless of whether they qualify as RFNBOs or not) would be accounted in the denominator in the Member State where the derivative is produced. For instance, if hydrogen is used in a Member State (Member State A) to produce ammonia, which is then exported to another Member State (Member State B), the hydrogen used to produce the ammonia will be accounted in the denominator in Member State A while the resulting ammonia would not be accounted in the denominator in Member State B.

While the above rules on the denominator apply to all Member States for the purposes of accounting hydrogen consumption in industry to verify the compliance with the target set in Article 22a, Member States have the discretion to set a stricter target which includes the consumption of derivatives in the denominator and would therefore increase the denominator and, as a consequence, the RFNBOs target. In this case, however, they should report to Eurostat the data aligned with the rules on the accounting of the denominator explained in the previous paragraphs.

3. Relationship between the RFNBO target and the overall EU renewable energy target of Article 3

Article 2 (4) of the revised RED defines 'gross final consumption of energy' as '*the energy commodities delivered for energy purposes to industry, transport, households, services including public services, agriculture, forestry and fisheries, the consumption of electricity and heat by the energy branch for electricity and heat production, and losses of electricity and heat in distribution and transmission*'. The general renewable energy consumption target set in Article 3 of the revised RED refers to the share of renewable energy out of the Union's gross final consumption of energy. This means that only renewable energy commodities (including RFNBOs) used for energy purposes can contribute to the target but not those used for non-energy purposes.

RFNBOs used for non-energy purposes contribute towards the indicative target for the increase of renewable energy in the industry sector set in paragraph 1 of Article 22a, which refer to the '*share of renewable sources in the amount of energy sources used for final energy and non-energy purposes in the industry sector*' and thus they contribute to the achievement of the RFNBO target set in the same article. However, based on Article 3 of the revised RED, they do not contribute to the overall EU 2030 renewable energy target of at least 42,5 %.

Furthermore, renewable electricity used to produce RFNBOs will not be counted towards the overall EU renewable energy target (as referred to in Article 7(2) of the RED). RFNBOs used for energy purposes are counted towards the overall renewable energy target, and within the sector where they are consumed. Renewable electricity produced from RFNBOs will also be counted towards the overall renewable energy target.

4. **Article 22b**

Paragraph 1 of Article 22b (1) states that '*A Member State may reduce the contribution of renewable fuels of non-biological origin used for final energy and non-energy purposes referred to in Article 22a(1), fifth subparagraph, by 20 % in 2030, provided that:*

(a) *that Member State is on track towards its national contribution to the binding overall Union target set in Article 3(1), first subparagraph, which is at least equivalent to its expected national contribution in accordance with the formula referred to in Annex II to Regulation (EU) 2018/1999; and*

(b) *the share of hydrogen, or its derivatives, produced from fossil fuels which is consumed in that Member State is not more than 23 % in 2030 and not more than 20 % in 2035*'.

Article 22a of the revised RED requires Member States, from 2030, to achieve a share of RFNBOs consumption in industry equal to 42 % of the total hydrogen consumption in the industry sector. This percentage will increase to 60 % by 2035. Article 22b introduces flexibility for the fulfilment of such target by allowing Member States to reduce it by 20 % at two points in time, i.e., in 2030 and 2035, provided that they are on track towards their national contribution to the binding overall Union target and that their share of hydrogen and its derivatives produced from fossil fuels is not higher than 23 % in 2030 and not higher than 20 % in 2035. If these conditions are cumulatively met, the RFNBO target laid down in Article 22a can be reduced to 33,6 % in 2030 and 48 % in 2035.

The numerator to calculate the share of hydrogen and its derivatives produced from fossil fuels and consumed in the industrial sector includes all hydrogen production processes that use fossil sources, including those where CO_2 is captured and used or stored. The denominator is calculated on the basis of the consumption of all hydrogen and its derivatives in the industrial sector in a Member States, i.e. including RFNBOs, fossil-based and low-carbon hydrogen and its derivatives. Given that hydrogen is naturally present in many substances used in industry, such as methane (CH_4) or even water (H_2O), a distinction has to be made between hydrogen derivatives and all other substances that contain hydrogen. For the purposes of the denominator, only those products that are produced using hydrogen as an input are to be considered relevant hydrogen derivatives. Products that contain hydrogen in their natural condition or products produced from products that contain hydrogen in nature should be excluded.

On the basis of the above, methane – which contains hydrogen in its natural condition – would not fall under the denominator while synthetic methane (e-methane) would. The scope, though, is limited to products obtained as direct derivatives of hydrogen, i.e. resulting from the combination of hydrogen with other molecules. Products containing hydrogen but which are not direct derivatives of hydrogen (e.g. fertilisers), or products produced using hydrogen as a reducing agent (e.g. direct reduced iron) would not fall under the denominator.

Article 22b does not explicitly exclude hydrogen by-product from the calculation of the share of hydrogen and derivatives referred to in Article 22b(1) point (b). However, taking into account that Article 22b is not a standalone provision, but it rather builds on Article 22a by providing flexibility to achieve the RFNBO target in the industry sector, and to ensure consistency with article 22a, where hydrogen by-product is excluded in order not to account it in the calculation of hydrogen consumption, it could be interpreted that the same exclusions apply to both the numerator and the denominator of Article 22b, point b for hydrogen produced as a by-product.

If a Member State decides to apply the flexibility provided under Article 22b, it has to notify the Commission, together with its integrated national energy and climate plans. The notification shall include information about the updated share of renewable fuels of non-biological origin and all relevant data to demonstrate that both conditions set out in Articlebe 22b are fulfilled.

5. **RFNBO target in Article 25**

Article 25 sets out a dedicated biding sub-target for RFNBOs of 1 % of transport energy consumption that is calculated in line with the rules set out in Article 27. In addition, RFNBOs count towards the combined sub-target set out for RFNBOs and advanced biofuels as well as the overall transport target. RFNBOs are eligible for counting towards the targets only if they achieve at least 70 % emissions savings.

Two main ways for compliance are possible:

i) RFNBOs count towards the targets if they are supplied to any of the transport modes, including to international marine bunkers, in the territory of a Member State.

ii) RFNBOs count towards the targets if they are used as intermediate products for the production of conventional transport fuels and biofuels provided that the greenhouse gas emissions reduction achieved by the use of RFNBOs is not counted in the calculation of the greenhouse gas emissions savings of the biofuels. s. The use as intermediate products covers cases where renewable hydrogen is used in refineries e.g., to remove impurities during the hydro treating as well as hydrogen used for the production of HVO and methanol that is use for the production of biodiesel.

RFNBOs that are used as intermediate products for the production of conventional transport fuels and biofuels are counted towards the target in the country where they are used and are not considered in the output of the facility that is producing conventional transport fuels or biofuels. If RFNBOs that are used as intermediate products for the production of biofuels are counted towards the targets, they must be considered as fossil input in the calculation of the greenhouse gas emissions savings of the biofuels.

While the Directive clearly specifies that RFNBOs that are used as intermediate products for the production of conventional transport fuels count towards the targets, it does not specify how the use of RFNBOs for the purpose of the transport target is promoted. One promising approach is integrating economic operators using RFNBOs as intermediate products for the production of conventional transport fuels and biofuels in the supply obligation referred to in Article 25 in a similar way as operators that supply renewable electricity to electric vehicles under the credit mechanism as foreseen under Article 25.4.

ANNEX

Article 22a

Mainstreaming renewable energy in industry

1. Member States shall endeavour to increase the share of renewable sources in the amount of energy sources used for final energy and non-energy purposes in the industry sector by an indicative increase of at least 1,6 percentage points as an annual average calculated for the periods 2021 to 2025 and 2026 to 2030.

Member States may count waste heat and cold towards the average annual increases referred to in the first subparagraph up to a limit of 0,4 percentage points, provided that the waste heat and cold is supplied from efficient district heating and cooling, excluding networks which supply heat to only one building or where all thermal energy is consumed only on-site and where the thermal energy is not sold. If they decide to do so, the average annual increase referred to in the first subparagraph shall increase by half of the waste heat and cold percentage points counted.

Member States shall include the policies and measures planned and taken to achieve such indicative increase in their integrated national energy and climate plans submitted pursuant to Articles 3 and 14 of Regulation (EU) 2018/1999 and their integrated national energy and climate progress reports submitted pursuant to Article 17 of that Regulation.

When electrification is considered to be a cost-effective option, those policies and measures shall promote the renewable-based electrification of industrial processes. Those policies and measures shall endeavour to create conducive market condition for the availability of economically viable and technically feasible renewable energy alternatives to replace fossil fuels used for industrial heating with the aim of reducing the use of fossil fuels used for heating in which the temperature is below 200 °C. When adopting those policies and measures, Member States shall take into account the energy efficiency first principle, effectiveness and international competitiveness and the need to tackle regulatory, administrative and economic barriers.

Member States shall ensure that the contribution of renewable fuels of non-biological origin used for final energy and non-energy purposes shall be at least 42 % of the hydrogen used for final energy and non-energy purposes in industry by 2030, and 60 % by 2035. For the calculation of that percentage, the following rules shall apply:

(a) for the calculation of the denominator, the energy content of hydrogen for final energy and non-energy purposes shall be taken into account, excluding:

  (i) hydrogen used as intermediate products for the production of conventional transport fuels and biofuels;

  (ii) hydrogen that is produced by decarbonising industrial residual gas and that is used to replace the specific gas from which it is produced;

  (iii) hydrogen produced as a by-product or derived from by-products in industrial installations;

(b) for the calculation of the numerator, the energy content of the renewable fuels of non-biological origin consumed in the industry sector for final energy and non-energy purposes shall be taken into account, excluding renewable fuels of non-biological origin used as intermediate products for the production of conventional transport fuels and biofuels;

(c) for the calculation of the numerator and the denominator, the values regarding the energy content of fuels set out in Annex III shall be used.

For the purposes of point (c) of the fifth subparagraph of this paragraph,, in order to determine the energy content of fuels not included in Annex III, the Member States shall use the relevant European standards for the determination of the calorific values of fuels, or where no European standard has been adopted for that purpose, the relevant ISO standards.

2. Member States shall promote voluntary labelling schemes for industrial products that are claimed to be produced with renewable energy and renewable fuels of non-biological origin. Such voluntary labelling schemes shall indicate the percentage of renewable energy used or renewable fuels of non-biological origin used in the raw material acquisition and pre-processing, manufacturing and distribution stage, calculated on the basis of the methodologies laid down either in Commission Recommendation (EU) 2021/2279 (*) or in ISO 14067:2018.

3. Member States shall report the amount of renewable fuels of non-biological origin that they expect to import and export in their integrated national energy and climate plans submitted pursuant to Articles 3 and 14 of Regulation (EU) 2018/1999 and in their integrated national energy and climate progress reports submitted pursuant to Article 17 of that Regulation. On the basis of that reporting, the Commission shall develop a Union strategy for imported and domestic hydrogen with the aim of promoting the European hydrogen market as well as domestic hydrogen production within the Union, supporting the implementation of this Directive and the achievement of the targets laid down herein, while having due regard to security of supply and the Union's strategic autonomy in energy and level playing field on the global hydrogen market. Member States shall indicate in their integrated national energy and climate plans submitted pursuant to Articles 3 and 14 of Regulation (EU) 2018/1999 and in their integrated national energy and climate progress reports submitted pursuant to Article 17 of that Regulation how they intend to contribute to that strategy.

Article 22b

Conditions for reduction of the target for the use of renewable fuels of non-biological origin in the industry sector

1. A Member State may reduce the contribution of renewable fuels of non-biological origin used for final energy and non-energy purposes referred to in Article 22a(1), fifth subparagraph, by 20 % in 2030, provided that:

(a) that Member State is on track towards its national contribution to the binding overall Union target set in Article 3(1), first subparagraph, which is at least equivalent to its expected national contribution in accordance with the formula referred to in Annex II to Regulation (EU) 2018/1999; and

(b) the share of hydrogen, or its derivatives, produced from fossil fuels which is consumed in that Member State is not more than 23 % in 2030 and not more than 20 % in 2035.

Where any of those conditions are not fulfilled, the reduction referred to in the first subparagraph shall cease to apply.

2. Where a Member State applies the reduction referred to in paragraph 1, it shall notify the Commission thereof, together with its integrated national energy and climate plans submitted pursuant to Articles 3 and 14 of Regulation (EU) 2018/1999 and as part of its integrated national energy and climate progress reports submitted pursuant to Article 17 of that Regulation. The notification shall include information about the updated share of renewable fuels of non-biological origin and all relevant data to demonstrate that conditions set out in paragraph 1, points (a) and (b), of this Article are fulfilled.

The Commission shall monitor the situation in Member States benefitting from a reduction with a view to verifying the ongoing fulfilment of conditions set out in paragraph 1, points (a) and (b).

(*) Commission Recommendation (EU) 2021/2279 of 15 December 2021 on the use of the Environmental Footprint methods to measure and communicate the life cycle environmental performance of products and organisations.