

Finnish Energy's feedback on delegated regulations on hydrogen and RFNBO fuels

This paper provides feedback on the following delegated regulations:

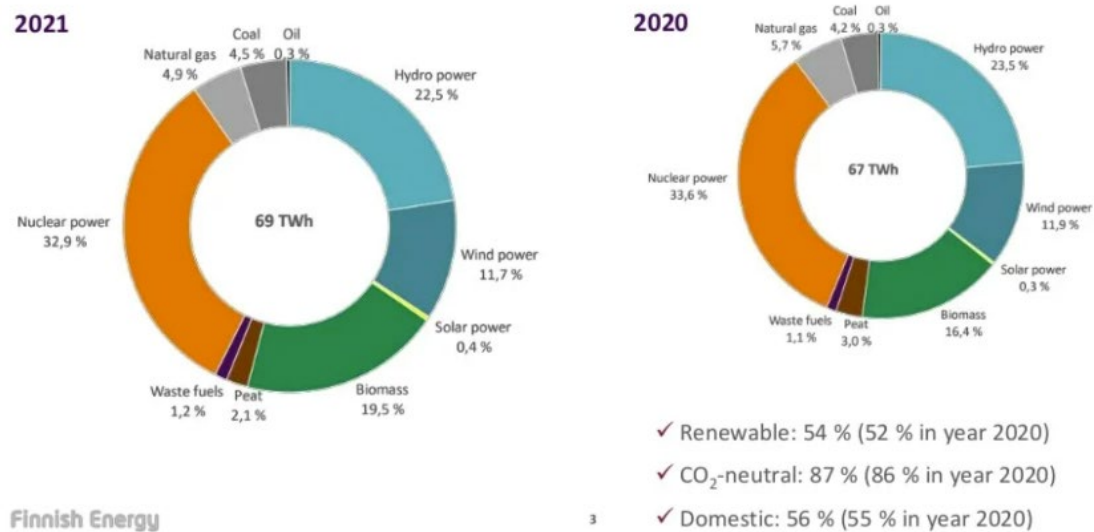
- *Supplementing Directive (EU) 2018/2001 of the European Parliament and of the Council by establishing a minimum threshold for greenhouse gas emissions savings of recycled carbon fuels and by specifying a methodology for assessing greenhouse gas emissions savings from renewable liquid and gaseous transport fuels of non-biological origin and from recycled carbon fuels*
- *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*

Finnish Energy welcomes the rules for hydrogen and RFNBO production and thanks the European Commission for the opportunity to give feedback on the European Commission's delegated regulation of supplementing Directive (EU) 2018/2001 of the European Parliament and of the Council by establishing a Union methodology setting out rules to produce renewable liquid and gaseous transport fuels of non-biological origin (later delegated regulation).

The European Union is re-shaping its climate policy, to reach at least 55 % of GHG reduction by 2030, and being climate neutral by 2050. Finnish government has even more ambitious target of being climate neutral by 2035. The recent change in international politics and its relation to energy has increased the importance of security of supply besides the climate targets. Moving towards hydrogen economy is the sustainable long-term solution to both climate change and reaching independency from Russian energy imports.

Technology neutrality will accelerate the hydrogen sector development. The Finnish electricity mix was 87 % CO₂-free in 2021. In 2022, Olkiluoto 3 nuclear power plant began producing electricity for the grid, and significantly increase the share of CO₂-free electricity. Furthermore, there is more than 15 GW of confirmed additional wind power capacity by 2030 (3,25 GW at the end of 2021). The grid mix will become increasingly carbon free, and nuclear has relatively high share. Therefore, the electricity grid mix will be decarbonized in near future, and **member states with high shares of all types of fossil free electricity should be allowed to use electricity from the grid to produce fossil free hydrogen**. Hydrogen produced by nuclear electricity will maximize the domestic production of fossil free hydrogen and RFNBO fuels, increasing the Union's energy independence, decreasing emissions at accelerated phase, and minimizing the cost of deploying the hydrogen economy. **The role of fossil free hydrogen from nuclear power should be recognized as a complementary source to hydrogen from renewable power**. Furthermore, the hourly matching rules creates unnecessary administrative burden for countries with more than 90 % of fossil free grid electricity.

The share of CO₂-neutral electricity 87 percent



There are synergies between the hydrogen production, district heating, and production of hydrogen and RFNBO fuels. Hydrogen production creates waste heat, which can be utilized in district heating networks. District heating systems are widespread in Finland, allowing the use of carbon neutral biomass fuels and waste heat to heat homes and offices. **District heating plants widely utilize biomass-based fuels, which could act as a source of renewable CO₂ from biomass, to be utilized in the production of carbon-neutral renewable fuels of non-biological origin (RFNBO) alongside hydrogen production, making local power producers key actors to produce carbon free RFNBO fuels.** However, the production of district heating is directed by heat demand, not renewable power production. Therefore, hydrogen production in this context cannot follow the variable patterns of wind and solar production. Regardless, this highly efficient setting to produce hydrogen and RFNBO fuels should be allowed and supported by legislative framework.

Finnish Energy's feedback on the 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

General comments

The role of the Guarantees of Origin needs to be communicated more explicitly throughout the Delegated Act. The lack of clarification could result in a system that enables double counting of renewable properties.

Detailed comments

Article 2 – Definitions

Point 3: 'installation generating renewable electricity'

The proposed definition covers not only individual RES-E units but also multiple RES-E units that can be located in different places. This should be fully supported as this offers flexibility to RFNBO producers and reflects the fact that power purchase agreements can be linked to multiple RES units.

Point 4: 'renewable hydrogen'

The proposed definition appears sensible in the framework of this DA, which covers exclusively hydrogen and hydrogen-based fuels produced from electrolysis powered by renewable electricity. It should however be made clear, for instance in a recital, that renewable hydrogen can also be biomass-based – the steam reforming of biogas / biomethane also producing renewable hydrogen, or thermal conversion (pyrolysis) of biomass – and that the definition currently being proposed is valid only in the context of this DA.

Point 6: ‘coming into operation’

With the proposed definition of ‘coming into operation’, existing RES-E facilities will be able to power RFNBO plants only if they have been repowered through an investment that equals at least 30% of what would be needed for a similar new-built. This is particularly problematic for hydropower plants which provide a stable and sustainable source of renewable power. We would therefore suggest lowering the investment ratio to 10% of the investment that would be needed to built a similar new installations.

Introduction of a new definition for electrolyser

Article 3 – Rules for counting electricity sourced from directly connected installations as fully renewable

Point a:

Under this article, it is possible for the RFNBO plants to be directly connected to the RES-E facilities or to be located within the same installation. We welcome the fact that the colocation of RFNBO plants with RES-E installations is allowed here.

Point b:

The RES-E plant is required to be put into operation not earlier than 36 months before the RFNBO plant so that the fuels produced can actually qualify as renewable. 48 months should be preferred here, in light of the very long permitting procedures for RES-E installations. In certain cases, it can indeed take up to 5-6 years to receive a permit for a RES-E plant. This would therefore delay the start of operation of RFNBO plants.

The introduction of a possibility to increase the capacity of the RFNBO plant at a later stage and to link it to the existing installation's commissioning date is very positive. However, limiting this possibility in time is detrimental as it would discourage RFNBO producers from increasing their plant capacity, whilst the need for RFNBOs is high. In its REPowerEU plan, the EC indeed introduces a target of 10 mt of domestic renewable hydrogen production. The limitation in time should therefore be deleted. If this provision were to remain, it should at least be in line with article 4, i.e. time limitation increased from 24 to 36 months.

Point c:

This point aims to ensure that, when using the requirements under this article, electricity was not sourced from the grid in case the RFNBO plant is also connected to the grid.

Whilst this appears sensible, it should be made explicitly possible for the RFNBO producers to combine both articles 3 and 4, i.e.:

- Using article 3 when electricity is sourced from the RES-E installation;
- Using article 4 to use electricity from the grid when the RES-E installation is not producing electricity.

Wind and solar being intermittent, sourcing electricity from the grid is important to maximise the operating hours of the RFNBO plant.

Article 4 – electricity sourced from the grid

3 options are being envisaged to enable fuels of non-biological origin to be fully accounted as renewable when sourcing electricity from the grid. Whilst we generally view the introduction of multiple possibilities to meet the requirement under article 4 positively, most of these possibilities seem unpractical, unrealistic:

Point 1 / option 1 – share of RES-E above 90% in the previous calendar year:

With this option, grid electricity can account as fully renewable if the average proportion of RES-E exceeded 90% in the previous calendar year in the relevant bidding zone.

The use of this first option will remain very limited in practice given that renewable electricity accounted on average for [37.5%](#) of Europe's electricity mix in 2020. A more sensible share should be proposed here: 70%. This share should a.o. take into account the electricity produced from Biomass Combined Heat and Power (CHP).

The RES-E share requirement is linked to a limitation of the number of running hours. In case the share of RES in a grid is 90%, the number of running hours for the RFNBO plant would be limited to 7884 hours whilst operation 24/7 is needed for a RFNBO plant to recover its costs and fulfill the needs of RFNBO customers which require a flat RFNBO baseload supply. It should therefore be expressly allowed to combine the use of the different options under this article, for instance the use of option 1 for 90% of the electricity sourced and option 2 for the 10% remaining, thereby enabling 100% of electricity to be accounted as renewable and maximizing the number of running hours.

Point 2 / option 2 – combining renewable PPAs and meeting the additionality, temporality and regionality requirements:

This option enables RFNBO producers to account the electricity they use as fully renewable when concluding one or more power purchase agreements (PPAs) and meeting a series of requirements. Whilst we welcome the fact that multiple PPAs linked to multiple RES-E installations can be concluded, we voice strong concerns on the four additional requirements as they will be extremely difficult to meet, thereby hampering the deployment of RFNBOs:

Subpoint a – additionality requirement:

As in article 3, the RES-E plant needs to be put into operation not earlier than 36 months before the RFNBO plant so that the fuels produced can actually qualify as renewable. 48 months should be preferred here, in light of the very long permitting procedures for RES-E installations.

We however welcome the fact that the date of start of operation remains unchanged in case the initial period of PPAs has ended and a new one is signed and that there is a possibility to increase the RFNBO plant capacity at a later stage. However, limiting in time the possibility to increase the RFNBO plant capacity is detrimental, as explained under article 3. The limitation in time should therefore be deleted.

Subpoint b and article 4.3 – non-subsidy requirement:

Under this point, RES-E installations are generally required not to receive or to have received OPEX or CAPEX support. Exceptions to this requirement are needed, especially in case:

- The RES installation has been repowered in the meantime;
- The aid was provided in the form of net support and support was fully repaid;
- The RFNBO plant is used for research, testing and demonstration, as per article 4.3.

Requiring 30% of investments in a similar new-build to fall under the definition of ‘repowering’ would however limit possibilities for many RES-E plants, including hydropower, which might in turn cease their operations. As explained above, 10% of investments should be sufficient.

Subpoint c – temporality:

This requirement prescribes the introduction of a temporal correlation between the production of RFNBO and the production of RES-E.

The correlation will have to be generally proved over a one-hour period even though a one-month period will prevail until the end of 2026, as per article 7. An hourly requirement will be extremely difficult to meet, even after 2026, as this would a.o. require the availability of real-time information on RES-E production to decide whether a RFNBO can run or not. Instead, a weekly or, in the worse case scenario, a daily requirement should be preferred after the end of the phase-in period.

Whilst the introduction of point ii is generally welcome, we regret that the role that large-scale commercial energy storage could play on renewable hydrogen production is limited due to a requirement to store electricity onsite.

One of the solutions to be line with this requirement is when the day-ahead clearing price is lower or equal to 20€ per MWh or lower than 0,36 times the price of an EU ETS allowance (EUA) (point iii). Day-ahead prices have on average [tripled](#) between 2019 and 2021, reaching almost 100€ on average in Germany, 65€ in Sweden and above 70€ for Finland in 2021. This option would therefore, once again, be seldomly used.

Subpoint d and article 4.5 – regionality:

The localisation of both RFNBO and RES-E plants is closely regulated under this point:

- Both plants have to be located in the same bidding zone or
- Both plants have to be located in bidding zones with similar prices on the day-ahead market or,
- The RES-E plant is located in an adjacent offshore bidding zone.

These requirements do not reflect at all national specificities and the fact that MS have different approaches in terms of decarbonisation and set-up of bidding zones. This is particularly detrimental for a country like Sweden, which has multiple bidding zones with a high price differential but also a high penetration of renewable and zero-carbon electricity. As such, projects located in Sweden should be fully exempted from meeting the ‘regionality’ requirement. The notion of ‘adjacent offshore bidding zone’ should also be further clarified, to understand a.o. whether a plant in Germany could source electricity from an Danish or Dutch offshore park.

Article 4.5 enables MS to introduce additional requirements in terms of regionality, as long as this does not impact the internal energy market. As the requirements would be ‘additional’, this would only make the framework stricter, whilst more flexibility is required in light of MSs’ various energy mixes. This point should therefore be deleted.

Point 4 / option 3 – in case of RES-E curtailment:

This option would enable RFNBO plants running in times of RES-E curtailment to produce fuels of non-biological origin fully qualifying as renewable. This is in principle positive even though theoretical for now, as negative or zero prices are required (see above point on day-ahead price). This would also require TSOs to provide the relevant information in real time.

Article 5 – common rules

The Commission defines general rules to report the production of the renewable hydrogen including the correlation between electricity and hydrogen production and the share of RFNBO's and non-RFNBO's. This is unsustainable because the proposed strict requirements will lead to overcapacity in RES, electrolyzers, and energy storages. Investing in underutilised resources will waste natural resources and does not minimize the Europe's environmental footprint. EU also risks becoming increasingly dependent on raw material imports. Moreover, complex requirements may decrease competition between hydrogen producers because small actors may be excluded from the market.

RFNBO producers are required to document for each hour a wide range of information linked to the production of RFNBO and the electricity being sourced to power the RFNBO plant, including the amount of electricity sourced from the grid which counts as renewable, how much does not count as renewable, whether / how much electricity has been sourced from a direct connection to the RES plant etc.

Given that a monthly correlation is prescribed until the end of a transitional period, as per article 6, reporting should be done on a monthly basis during this period. This provision should be subject to a grandfathering rule.

Point b would require RFNBO producers to indicate the amount of electricity generated by the RES-E installations they are linked to, even if they do not consume this electricity. This is problematic and unproportionate as it should not be up to RFNBO producers to gather and share this type of information.

Article 6 – certification of compliance

This article prescribes that the requirement under this DA would apply to both domestically produced and imported RFNBOs. This is an important clarification which will ensure a level playing field between these two sources of RFNBOs. However, this will require third-countries to align with very stringent EU rules, which they might not support, and could result in a diversion of renewable hydrogen flows to regions with less strict regulations, such as Asia. More flexibility should therefore be proposed throughout this DA to maintain the competitiveness of the European market.

Article 7 – transitional phase

According to this DDA, a transitional phase is foreseen until 31 December 2026:

- The additionality and no-subsidy requirements (4.2, points a-b) would start applying after this date.
- Instead of a hourly correlation, a monthly correlation will be possible until the end of 2026, unless the project has received state aid in the form of CAPEX support.

As RFNBOs are in the very first stage of market ramp-up – no commercial projects have been fully developed yet – the transitional phase should generally be extended until 31 December 2030. During this period, operators should also be exempted from meeting the regionality (4.2.d) requirements. The transitional phase should apply to all RFNBO projects, including the ones receiving operating aids.

The possibility for a transitional phase until the end of 2030 is already fully embraced by the European Commission in other legislations, such as the proposals for a review of the Gas Directive and Gas Regulation,

which foresees some exemptions to the key regulatory principles for hydrogen infrastructure until 31 December 2030.

Article 8 – scope of application

The introduction of a grandfathering clause is extremely positive as it has long been advocated for by the industry. Similarly to the transition phase mentioned in article 7, the grandfathering rule should be extended to the end of 2030 and apply to all derogations laid out in article 7, i.e. including the temporality and regionality requirements. The one-month correlation requirement should remain applicable after the end of the transition period for those projects which have been put into operation before. This is critical to ensure investment certainty.

Finnish Energy's comments on the 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

General comments

The requirements on GHG emissions reduction savings aim to safeguard a key climate objective, namely ensuring that the production of RFNBOs will not result in any increase of the GHG emissions compared to the alternative use of fossil fuels.

Whilst the policy objective is well-understood, some shortcomings in the methodology for assessing the GHG emissions savings of RFNBOs should be tackled asap to ensure a swift deployment of RFNBOs:

- The methodology appears to be in many instances overcomplicated, for instance when calculating rigid emissions. More simplicity and clarity would be appreciated.
- There should be no phase-out date for the use of unavoidably-produced industrial CO₂, as this would hamper the deployment of much-needed RFNBOs, especially in the maritime and aviation sectors.
- How the size of RFNBO production batch is defined? The production of fuel electricity carbon intensity can be defined on hourly level. However, the RFNBO fuels are stored in tanks where the fuel is mixed over several hours or even days or weeks. How renewable certificates are defined to this type of batch that might be distributed e.g. on weekly level? It is understandable that there is hourly correlation requirement between renewable electricity generation and RFNBO production, but the certification of gas on hourly level is impossible.

Detailed comments

Recital 7

The recital aims to ensure that the capture of carbon dioxide (CO₂) emissions from non-sustainable sources should be phased-out by 2036. We raise strong concerns on this as:

- Volumes of biogenic CO₂ will be limited and technologies for Direct Air Capture of CO₂ will not be available shortly at affordable costs and will require massive quantities of energy to be deployed.
- High amounts of synthetic fuels will be needed in order to be able to reach our decarbonation goals, especially in the aviation and maritime sectors.

As such, there should be no phase-out date for industrial CO₂, provided that this CO₂ is unavoidably emitted. The recital should be removed from the delegated act. If this provision were to remain, a grandfathering provision should be introduced to safeguard RFNBO projects using non-avoidable CO₂ captured from industrial plants and waste incineration that were commissioned before 2036.

Article 2

This article specifies that the GHG emissions savings from the use of RCFs shall be at least 70 %. Even though the Renewable Energy Directive (RED II) already specifies that the GHG emissions savings for RFNBOs should also be 70 %, it might be necessary to recall this in article 2, for clarity purposes.

Annex, Part A - Methodology

Point 1: General formula for the calculation of GHG emissions from the production and use of RFNBO

The total emissions (E) from the use of RFNBOs or RCFs are to be calculated as follows:

$$E = e_i + e_p + e_{td} + e_u - e_{ccs}$$

This corresponds to the addition of emissions from supply of inputs - elastic emissions, rigid emissions and existing emissions-, processing, transport and distribution, and end-use combustion to which emissions savings from carbon capture and geological storage are deducted.

Emissions from the manufacture of machinery and equipment and emissions from compressing and distribution of hydrogen for its direct use in vehicles shall not be taken into account, which we welcome.

Whilst we would generally support the formula per se, the calculation details of each of its components raise concerns, as explained further below.

Point 2: Fossil fuel comparator

The proposed fossil fuel comparator of 94g CO₂eq / MJ corresponds to the one used in the EU Taxonomy's Climate Delegated Act for RFNBOs. We welcome in that regard consistency with other EU legislations.

This fossil fuel comparator appears sensible, provided that it has been calculated following the same formula as for point 1 and the same scope of emissions. If the fossil fuel comparator does not cover emissions arising from the transport and distribution (T&D) of fuels outside Europe, then the scope of emissions from T&D for RFNBOs should also be limited to Europe.

Point 3: Mixed process outputs

According to point 3a, the amount of RFNBO in a fuel should be calculated as the fraction of renewable energy input used to produce the fuel. This raises question as a fuel could be composed of two types of renewable fuels, e.g. a RFNBO and a biofuel.

This would also be in contradiction with the RED's Article 27 Delegated Act which specifies the conditions under which a fuel of non-biological origin can qualify as renewable.

Points 4-8 Elastic emissions - $e_{i \text{ elastic}}$

According to point 5, the GHG emissions of the electricity used for the supply of inputs shall equal to zero if this electricity qualifies as fully renewable according to the meaning of the RED II. Whilst this most likely refers to article 27, para 3 (i.e. use of additional renewable electricity), the reference should be made clearer, as in point 6.

In case the electricity does not qualify as fully renewable according to article 27, para 3 of the RED II, three options are proposed to calculate its GHG emissions:

- Option 1: use of average GHG emissions from the grid, as per part C of the methodology;
- Option 2: comparison between the number of running hours of RFNBO plants and the number of running hours during which renewables and nuclear set the marginal electricity price;
- Option 3: use of the GHG value of the marginal unit of electricity at time of RFNBO production.

Offering the possibility to use any of the three-above options is positive. However, some shortcomings are to be noted: option 1 refers to part C which has outdated values for the emission intensity of electricity (2018); option 2 could limit the number of running hours of RFNBO plants whilst 24/7 operation is necessary to meet the requirement from consumers to have baseload RFNBO supply; option 3 requires that the GHG value of the marginal units of electricity is made available, which is currently not the case.

Points 4 and 10: Rigid emissions - $e_{i \text{ rigid}}$

Rigid inputs – inputs whose supply cannot be expanded to meet extra demand – refer for instance to the loss of electricity and/or heat production. The calculation of associated emissions is linked to emission factors laid out in part C of the Annex which, as explained above, encompasses sometimes outdated data.

The provision from point 4 which requires certain rigid emissions to be treated as elastic under certain condition appears overcomplicated and unnecessary. The rationale behind should be better explained.

Point 7: Marginal unit

How is the marginal unit defined? This is referring to point 6 and 7 in the Annex, where the following is stated: Alternatively, the greenhouse gas emissions value of the marginal unit generating electricity at the time of the production of the renewable liquid and gaseous transport fuels of non-biological origin in the bidding zone may be used if this information is publicly available from a reliable source. In the electricity market, the highest priced unit in the merit order is setting the price and typically called as marginal unit. Typically, e.g. hydro is setting the price in the Nordic countries, even though e.g. CHP plants are running and providing electricity. In

these cases, we can assume that the hydro plant is the marginal unit as it setting the price?

Point 11: Emissions from inputs' existing use or fate - $e_{i \text{ ex-use}}$

Emission savings from the capture of carbon dioxide (CO₂) and its use (CCU) in RFNBOs is covered under this point. Savings from CCU should always be accounted for, provided there is no double counting / crediting of CO₂ emissions.

However, the mechanism proposed under point a is unclear. Under the EU ETS, CO₂ captured and sold is not subject to any pricing. According to the DA, CO₂ cannot be deducted from the carbon footprint of the fuel, unless it is paid for under the EU ETS. Therefore, it is unclear how this can be practically implemented.

As for recital 7, we raise strong concerns on the phase-out date for the use of industrial CO₂ indicated in point a (before 2036):

- Volumes of biogenic CO₂ will be limited and technologies for Direct Air Capture of CO₂ will not be available shortly at affordable costs and will require massive quantities of energy to be deployed.
- High amounts of synthetic fuels will be needed in order to be able to reach our decarbonation goals, especially in the aviation and maritime sectors.

As such, there should be no phase-out date for industrial CO₂, provided that this CO₂ is unavoidably emitted. There reference to the phase-out date should be deleted. If this provision were to remain, a grandfathering provision should be introduced to safeguard RFNBO projects using non-avoidable CO₂ captured from industrial plants that were commissioned before 2036.

Finally, CO₂ from waste incineration should be fully accounted here too, even though it might be partly covered under the notion of biogenic CO₂.

Point 12: Emissions from processing

Emissions from processing are defined as direct atmospheric emissions from the processing itself, from waste treatment and leakages. Here, a better understanding of what is meant by 'leakages' would be welcome.

Point 16: Emissions from transport and distribution

All emissions arising from the transport, distribution and storage of RFNBOs are covered under this category. We raise concerns on the availability of data on the GHG emissions once the RFNBO is exported outside Europe.

Point 13: Emissions from combusting the fuel in its end-use

The calculations of emissions from the combustion of the RFNBO in use does not seem to raise any particular issue.

Point 17: Emissions from savings from carbon capture and geological storage

This part, which covers the permanent storage of CO₂ stemming from the RFNBO processing in geological storages, appears too limited. All savings linked to the carbon, capture and storage (CCS) along the RFNBO value chain should be taken into account, not only the ones from processing.

Finally, the savings linked to carbon capture and replacement, such as the CO₂ mineralisation / carbonation which transforms CO₂ into construction products for instance, should also be fully taken into account in this methodology. Annex V of the RED II accounts these savings in the calculation of the GHG emissions linked to the production of biofuels. They should therefore also be accounted for RFNBOs.

About Finnish Energy

Finnish Energy represents approximately 260 companies that produce, acquire, transmit and sell electricity, gas, district heat and district cooling and offer related services.

Finnish Energy is responsible for the management of collective labor agreements for the personnel of its member companies, and it provides advice and training for its members, conducts studies and disseminates information.

Finnish Energy follows a code of conduct for sustainable lobbying.

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