

Renewable Energy Directive III

Key considerations for the implementation of the RFNBO sub-targets in Belgium



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EXECUTIVE SUMMARY

The European clean hydrogen sector has been facing a deadlock in Europe: no producer will start producing as long as there is no offtake secured, and no offtaker will start consuming as long as production projects are not implemented to provide affordable clean hydrogen. With the revised Renewable Energy Directive (RED III), the EU has finally set national binding targets for consumption/supply of renewable fuels of nonbiological origin (RFNBO) **in industry and transport by 2030 and 2035, aiming to break this deadlock and to decarbonize the use of fossil based hydrogen**. The translation of these targets to Belgium could lead to a demand of 66-74 kiloton of RFNBO hydrogen in industry by 2030 and 300 kiloton of RFNBO hydrogen in transport (calculations in the body of the text), if certain conditions are met.

This paper suggests an implementation framework for Belgium that would allow the **protection of our industrial base** that is already facing difficult economic conditions and fierce international competition, while at the same time providing the necessary **kick-start for the hydrogen economy** that the hydrogen producers and technology players are looking for. Taking this into account, the Belgian Hydrogen Council recommends the following implementation framework in Belgium:

Preliminary recommendations

Preconditions

 Regardless of which implementation method is chosen, there are a number of preconditions that must be met for RED III to be successfully implemented (availability, quality, cost reduction, speed, infrastructure, certification, product labelling, ...). Visibility should be urgently created on a full RED III regulatory framework in Belgium (industry, transport, refinery route, etc).

European cooperation

• **Coordination** and cooperation with neighbouring countries and EU Member States on the implementation of the RFNBO sub-targets is crucial.

Ambitious implementation of the RFNBO transport sub-target

Credit trading mechanism

• Swiftly implement an **ambitious credit trading scheme** as is required by article 25, 4. of RED.

Direct use of RFNBO in transport

- The general transport sub-target of at least 1% stemming from article 25 from the RED should be transposed to incentivise also **direct use of hydrogen (and its derivatives like e-fuels) in transport**.
- Foresee OPEX support for all direct uses of RFNBO in transport.
- CAPEX support for trucks, busses and hydrogen refueling stations to level the playing field vis à vis our neighbouring countries.
- Install fiscal incentives like a zero road tax ("kilometerheffing") for zero emission trucks and an increased tax deduction for investments in hydrogen refueling stations.

Refinery route

- Define a dedicated RFNBO refinery sub-target, without any ceiling, cap or correction factor. The mandate level reflecting a substantial part of the national Belgium's refining capacity is estimated at 3% of the total energy amount used in transport, which could unlock 250 Kiloton of RFNBO hydrogen on the Belgian market.
- All RFNBO H2 consumed in refineries to produce fuels **should be eligible for the RED transport target**.
- A **dedicated incentive/penalty at ~10 €/kgH2** level needs to be associated with the RFNBOtransport sub-mandate to ensure its physical fulfilment by fuel suppliers.

Maritime sector

- Formulation of a **specific separate RFNBO sub-target** for maritime sector with the ability to be traded through credits. **Inland shipping** should be included in the scope, as was done in NL.
- Ensure the level playing field in the Hamburg Le Havre range, with Port of Rotterdam in particular. If this **level playing field** does not exist and Belgium imposes 1/1 targets on our bunker sector, we risk delocalisation of the Belgian bunker market.

Flexible and cost effective implementation of the RFNBO industry sub-target Implementation level • The industry sub-target should be kept at Member State level. No penalties shall be put on companies. Flexibilities and exemptions • Maximisation of flexibilities and exemptions allowed by the Directive: • Broad definition of by-product and intermediate hydrogen (that is not included following the calculation rules) • Deduction from denominator of quantities of low carbon hydrogen via recital 62 • Provide clarity on the application of recital 63 for integrated ammonia plants • Maximal flexibility vis-à-vis low carbon hydrogen • No credit trading system that would add extra cost for companies

Operational support

 OPEX-support for all hydrogen that helps to achieve the RFNBO sub-targets (RNBO + Kairos@C) according to its specific decarbonization potential and based on GHG abatement.

Towards a more comprehensive and technology neutral decarbonization strategy

Technology neutrality

In general, European legislation on decarbonisation should be formulated in a **technology neutral** way and climate legislation specifically should focus on GHG emission reduction. Member States and every individual company should be allowed to pursue all pathways toward climate neutrality taking into account the specific national context, cost structure, investment cycles and preferences.

Operational support

• Based on this principle of technology neutrality, **every technology should be eligible for operational support** according to its specific decarbonization potential and based on GHG abatement. For hydrogen, this means that low carbon in the sense of the upcoming delegated act should be supported.

RFNBO criteria

 Careful reconsideration of the RFNBO definitions may be necessary in order to adapt the criteria on additionality, temporal and geographical correlation to a more flexible definition and delay the 2028 additionality exemption date, to facilitate the ramp up to economies of scale in the RFNBO production.





TABLE OF CONTENT

0.		Executive Summary	2	
1.		Introduction	6	
2.		Renewable Energy Directive III	8	
	2.1.	RFNBO sub-target for industry	8	
	2.1.1.	Calculation rules	8	
	2.1.2.	Flexibilities and open choices for Member States	9	
	2.2.	RFNBO sub-target for transport	11	
	2.2.1.	Calculation rules	11	
	2.2.2.	Flexibilities and open choices for Member States	12	
3.		Calculations impact for Belgium	14	
	3.1.	Industry target	14	
	3.2.	Transport target	15	
4.		Options for the Implementation framework		
	4.1.	Mix of carrots & sticks	16	
	4.1.1.	Carrots	16	
	4.1.2.	Sticks	18	
5.		Position of the Belgian Hydrogen Council		
	5.1.	RFNBO sub-target for industry	20	
	5.2.	RFNBO sub-target for transport	21	
	5.3.	Beyond RED III – towards a more comprehensive and technology neutral decarbonization strategy		
6.		Conclusion & recommendations	25	



1 • INTRODUCTION

As the EU is facing the triple challenges of ensuring the EU's energy security, industrial competitiveness, and deep decarbonisation, hydrogen has become a crucial element in European industrial, energy and climate policy. The REPowerEU plan¹ outlined legal proposals to increasingly incentivise hydrogen production and consumption to reach the EU's climate goals and to decrease dependence on Russian fossil fuels. In this respect, swiftly establishing the right legal environment is crucial, to make full use of clean hydrogen's decarbonisation potential in the EU.

According to the IEA, industry accounts for +-40% of global emissions, making it the first emitting sector before transport and buildings.² Also in Flanders, industry accounts for 28,4% of the total GHG emissions.³ Clean⁴ hydrogen (and its derivatives) is to play an important role in the decarbonisation of those hard-to-abate industries, either as clean feedstock or fuel. It can substitute the current supply of fossil based hydrogen in the ammonia and refining sectors and to replace carbon-intensive fuels and feedstocks in the chemicals, steelmaking, cement, glass, ceramics, aluminium, pulp and paper industries, and many more where electrification is not the silver bullet.

The transport sector emissions represent 23.4% of total emissions in 2022 in Belgium. Where light duty applications will be decarbonised by direct electrification and batteries, the heavy duty segments of all transport modes (road, maritime, aviation, ...) could also turn to hydrogen and derived e-fuels for their decarbonisation pathways. Together with industry, transport accounts for more than half of the Belgian emissions, thus offering a huge potential for decarbonisation.

From production to infrastructure and consumption, a clear and incentivising policy framework is needed to foster the use of clean hydrogen by industry and transport sectors. This is an inevitable milestone in reaching the EU Green Deal targets and preserving Europe's current leadership in hydrogen technologies, in a context of fierce international competition. With the revised Renewable Energy Directive (RED III), the EU has set very ambitious binding targets for consumption/supply of renewable fuels of non-biological origin (RFNBO) **in industry and transport by 2030 and 2035** without any framework to support local investments and avoid carbon leakage which is important for the RED industry target. It should be noted that outside Europe such ambitious target on RFNBO's don't exist and instead support is given for all clean hydrogen (for example IRA in the US). As our industry operates in a global context this difference in policy threatens the competitiveness of our industry and current industry users is needed. However, it is precisely these targets' implementation at national or regional level that will ensure that those rules trigger strong and clear demand signals for the consumption and supply of clean hydrogen and derivatives in industry and

- ² After allocating electricity and heat emissions to the final sectors
- ³ Uitstoot per sector (klimaat.be)
- ⁴ Clean hydrogen: renewable or low carbon hydrogen



¹ European Commission, REPowerEU Plan Communication, 18 May 2022, URL:

https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2022%3A230%3AFIN&qid=1653033742483



transport, while making sure current and new industrial hydrogen users can remain competitive and noting that both sectors are very different in terms of cost structure and ability to pass on extra costs to end customers, specifically when It comes to refineries.

According to our estimations, Belgium already has a yearly consumption of around 600 Kiloton of hydrogen. Our country is thus facing a tremendous challenge to successfully implement the RFNBO-targets that were defined in the final texts of the Renewable Energy Directive III, while maintaining a level playing field for our industry that is operating in a context of international competition and in a constant struggle to remain cost competitive vis à vis competitors with less ambitious climate targets.

Although the text of the RED and the sub-quota for RFNBO in industry and transport raise a lot of questions with our members, this paper aims to analyse the main provisions and open choices in the agreed RED III framework and to provide the Belgian governments with recommendations and guidance on how to implement the RFNBO sub-targets for industry and transport in the best way in Belgium. After this introduction (chapter 1), this paper gives the state of play of the legal obligations, flexibilities and open choices the EU framework has defined (chapter 2), makes a "preliminary calculation" on what the target for Belgium would mean (chapter 3), lists the different sticks and carrots that can help our members to reach the targets (chapter 4). After that, the paper will give the position and recommendations of the members of the BHC in this matter (chapter 5&6).





Besides aiming to increase renewable energy sources in the EU's overall energy mix by 2030, the Directive fixes different sub-targets (and calculation rules) for the **consumption and supply of RFNBO hydrogen** for both industry and transport by 2030. RFNBO stands for Renewable Fuel of Non Biological Origin and means the hydrogen consumed needs to fulfil the criteria of the Delegated Act on a methodology for renewable fuels on non-biological origin:

- Additionality requirement⁵
- The criteria on temporal and geographic correlation ⁶
- Greenhouse gas reduction requirement of 70%

It is important to note that RED is "only" a Directive, and not a Regulation, meaning member states still have to implement the directive in their legislation. The directive only sets the target meaning it **leaves some flexibilities and open choices to the Member States** on how they wish to implement the targets.

The 27 EU Member States must now transpose the provisions of the recast Directive in their national regulatory framework by **21 May 2025**.

2.1. RFNBO sub-target for industry

2.1.1. Calculation rules

RED III aims to implement the ambitions set up in the REPowerEU plan, including concrete targets for transport and industry. For **industry**⁷, EU institutions agreed on the following binding objectives in article 22a:

• "The energy content of RFNBO (whether H2 or derivatives) used in industry must represent 42% of the energy content of the whole hydrogen consumed in industry in 2030.

MJ	of	RFNBOs	consumption			
by industry						

MJ of H2 consumption

by industry

≥ 42% by 2030

(≥ 60% in 2035)

The share rises to 60% for 2035."

The article continues with a clarification on the calculation rules of the target. For the calculation of that percentage, the following "rules shall apply:

⁷ The target covers industrial undertakings in the sectors B, C, F, and J (36) of the statistical classification of economic activities (NACE REV.2). This corresponds to the sectors of Mining & Quarrying, Manufacturing, Construction and Information Service Activities: <u>EUR-Lex - 02006R1893-20190726 - EN - EUR-Lex (europa.eu)</u>



⁵ The idea of additionality is to ensure that the increased hydrogen production goes hand in hand with new renewable electricity generation capacities. To this end, the rules require hydrogen producers to conclude power purchase agreements (PPAs) with new and unsupported renewable electricity generation capacity.

⁶ These criteria ensure that hydrogen is produced when and where renewable electricity is available. The criteria aim to avoid that the demand for renewable electricity used for hydrogen production is incentivising more fossil electricity generation as this would have negative consequences for greenhouse gas emissions, fossil fuel demand, and related gas and electricity prices.

- 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**; ⁸
 - ii. hydrogen that is produced by decarbonising **industrial residual gas** and that is used to replace the specific gas from which it is produced; ⁹
 - iii. hydrogen produced as a **by-product** or derived from by-products in industrial installations ¹⁰
- 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.

Impact for Belgium

These rules are especially important for the Flemish region, as large quantities of hydrogen are already used today in refineries (i) and large quantities of by-product hydrogen are being produced and consumed in the chemical industry (iii). These quantities can thus be **deducted from the denominator**.

It is important to note that for now the RED **does not impose any sanctions** in case the Member State misses its RFNBO target for industry. The classic infringement procedures from the European Commission towards the Member States of course always remain a possibility.

2.1.2. Flexibilities and open choices for Member States

Besides fixing the sub-targets and defining the calculation method as described above, the RED defines some **additional rules and exemptions** that offer Member States with several **flexibility options** to reach the RFNBO sub-targets (article 22b):

- a. Member States could discount the RFNBOs target by 20% under two conditions expressed in article 22 b):
 - a. if the Member State is on track to meet its RES target by 2030,
 - b. if the Member State's share of hydrogen from fossil fuels consumed is not more than 23% in 2030 and 20% in 2035.
- b. **Recital 62** provides that "hydrogen produced in retrofitted production facilities based on steam methane reforming technology for which a Commission decision with a view to the award of a grant under the Innovation Fund has been published before the entry into force of this Directive and that achieve an

¹⁰ This means hydrogen that is produced as a "waste" or by-product in other production processes, like for example Chlor[]alkali processes.



⁸ This means the hydrogen is used as feedstock in refineries

⁹ This means residual gases from chemical/refinery sector that are upgraded to more concentrated hydrogen streams and reused for e.g. heating purposes (e.g. to replace natural gas)



average greenhouse gas reduction of 70% on an annual basis, should not be taken into account."

c. **Recital 63** provides that "it should be acknowledged that the replacement of hydrogen produced from the steam methane reforming process might pose specific challenges for certain existing integrated ammonia production facilities. It would necessitate the rebuilding of such production facilities, which would require a substantial effort by Member States depending on their specific national circumstances and the structure of their energy supply." ¹¹

Impact for Belgium

Article 22b allows for the reduction of the overall 42% RFNBOs target in the industry sector by 20% in 2030, provided two conditions are met. The second condition specifies that the share of hydrogen, or its derivatives, produced from fossil fuels is not more than 23 % in 2030 and not more than 20 % in 2035. Hence, the use of electrolytic low-carbon hydrogen (meaning nuclear) is encouraged to help member states obtain the option of lowered RFNBOs target (an effective target of 33.6% instead of 42%). **However, this pathway for flexibility will be very difficult to walk for Belgium since we are not even close on reaching the RES target.** ¹²

Recital 62 could be important, because it means the hydrogen (coming from SMR + CCUS) that could be produced in the Kairos@C project by Air Liquide in the Port of Antwerp could be deducted from the denominator since the project as an early mover is supporting the EU climate targets by 2030 and has received Innovation Fund support before the entering into force of the RED III. Implementation hereof is thus important in calculating the impact of the 42% target.

Recital 63 is often referred to as "**the ammonia recital**" and is a very vague recital that should be read together with the accompanying Commission Declaration on the Recital where it said that it "on a case by case basis and when duly justified, will not take into account these existing plants while considering whether they have been fully amortised and when the final investment decision for retrofitting has been taken." The Commission also posted the relevant declaration on their website after the trialogue negotiation. DG Energy has stated in workshops that the "Declaration has effect" without further detailing what it entails "as it was very sensitive & difficult to reach a balanced agreement". The ammonia recital therefore has a big impact on the **Walloon region**, as the Yara Tertre plant is by far the largest producer and consumer of hydrogen in Wallonia. Logically the clause is also important to Yara to maintain flexibility on the decarbonisation pathways. Also for **Flanders** and the BASF site in Antwerp this recital could be very important. The interaction between recital 62 and 63 for BASF is still unclear.

Note that the recitals are not stated in the binding text (body) of the legislation.
 Belgium had less than 14% RES in its energy mix in 2022: Statistics | Eurostat (europa.eu).



Furthermore, different options and open choices can be envisaged for the implementation framework of the RED binding industry target:

- Keep the target at **Member State level or obligation on industry** at company (capital group) level?
- What mix of '**sticks and carrots**' approach to allow industry to reach the target?
- What trustworthy and tradeable crediting and certification systems at national level will be used, if any?
- Foresee a **force majeure clause** in case companies are in the impossibility of reaching the target, for example in the case there is no (sufficient, continuous, affordable...) availability of RFNBO hydrogen.

Whereas these choices currently are being heavily debated at national and regional level, the European Commission is expected to publish a **guidance** on the implementation on RED III shortly. Regardless of which of these options above is chosen, there are a number of **preconditions** that must be met for RED III to be successfully implemented (availability, quality, costs, speed, infrastructure, certification, product labelling, ...).

2.2. RFNBO sub-target for transport

2.2.1. Calculation rules

For transport, RED sets a general renewable energy/greenhouse gas reduction target combined with RFNBO sub-targets on fuel suppliers. The EU compromise agreement states in **article 25** that:

"Each Member State shall set an obligation on fuel suppliers to ensure that:

- a. the amount of renewable fuels and renewable electricity supplied to the transport sector leads to a:
 - i. **share of renewable energy** within the final consumption of energy in the transport sector of at least **29 % by 2030**; or
 - ii. greenhouse gas intensity reduction of at least 14,5 % by 2030, compared to the baseline set out in Article 27(1), point (b), in accordance with an indicative trajectory set by the Member State;
- b. the combined share of advanced biofuels and biogas produced from the feedstock listed in Part A of Annex IX and of renewable fuels of non-biological origin in the energy supplied to the transport sector is at least 1 % in 2025 and 5,5 % in 2030, of which a share of at **least 1 percentage point is from renewable fuels of non-biological origin in 2030**.

••••

Member States with maritime ports shall endeavour to ensure that as of 2030 the share of renewable fuels of non-biological origin in the total amount of energy supplied to the maritime transport sector is at **least 1,2 %.**"

Impact for Belgium

This last provision stipulates that Member states with maritime bunker supply need to have at least 1,2% of RFNBO supplied. Belgium holds a very important bunkering position in the international bunkering market with yearly more than 90 TWh of bunker fuels supplied to maritime vessels. This results in Belgium being the second largest bunkering country in Europe and a top 10 bunker hub worldwide. However, this 90 TWh can be limited to **50 TWh** as maritime bunkers can be limited to 13% of total MS energy consumption (see flexibility below)

2.2.2. Flexibilities and open choices for Member States

Just like for the industry target, the RED defines **some additional rules and exemptions** that offer Member States with several flexibility options to reach the RFNBO sub-target for transport:

- The transport target is developed in such a way that Member states have the choice to go for a share of **renewable energy supplied to the market** (29%) or a percentage of **greenhouse gas emissions avoided** (14,5%).
- Member States have to ensure a target of 1,2% in the maritime sector, but are free to choose how they design this target: as a separate denominator for fuels for the maritime sector or a common denominator for all fuels for the transport sector included in the scope of the RED. Additionally, "maritime sector" leaves some margin of interpretation to whereas inland shipping should be included in the scope or not. In the Netherlands, inland shipping is included.
- The 1,2% RFNBO target for the maritime sector could lead to extremely large quantities in some cases. This is why countries with a relatively high share of bunker fuels (such as Belgium and the Netherlands), rather than the entire bunker market, count 13% of the member state's gross final energy consumption. The figure below quantifies this difference. Member states may distinguish between the maritime sector and other sectors: either the maritime sector is given separate targets imposed, or the target is spread across all sectors.



Member states can choose to enable or stimulate the refinery route for RFNBOs, by setting specific targets and values ('correction factors' applied in the credit system) for the use of RFNBO in refineries. As refineries produce transport fuels, this would count towards the RED III transport target and not the industry target. A good argument for allowing the refinery route is that it can help to break the hydrogen market open by creating a significant demand.

- Article 25, 4 obliges Member States to establish a mechanism allowing fuel suppliers in their territory to exchange **credits** for supplying renewable energy to the transport sector. Such crediting system for transport, with an opt-in for maritime, already exists for many years in The Netherlands (HBEs).
- To meet targets for supplying specific energy carriers, Member States can choose to use specific multipliers up to:
 - Factor x2 for deployment Annex IX A and RFNBO across all transport modes
 - Factor x4 for deployment of (battery) electric road transport.
 - Factor x1,2 for deployment of (battery) electric rail transport.
 - Factor x1,5 for RFBNO in aviation and maritime transport modes on top of previously mentioned multipliers.

Impact for Belgium

Belgium hosts two refineries in the Port of Antwerp-Bruges that already consume substantial amounts of (fossil) hydrogen today. Refineries can play a crucial role to kick-start the hydrogen market and to meet the 2030 targets of the RED directive on renewables in transport by using RFNBO hydrogen as an intermediate product ("**refinery route**"). Up to **250 kilotons** of additional RFNBO hydrogen demand could be unlocked via the RED transport target in a very cost efficient way by 2030 by allowing the refinery route in Belgium. These quantities could provide the certainty that RFNBO producers and technology players need to implement pioneering projects and to help demand taking off, create economies of scale, get the infrastructure roll out (backbone and distribution networks) started and eventually help other hydrogen projects take FIDs. The advantage is that the refinery sector has a cost structure that allows it to pass along additional costs due to RFNBO use to the end customer (no risk of carbon leakage). For limited extra cost at the pump per liter of benzine/diesel, large additional quantities of RFNBO hydrogen can be brought on the market. This is why we see large refineries in Europe are already considering or launching tenders to source their RFNBO hydrogen towards 2030. For these quantities, **no production subsidies would** be necessary and thus no extra cost for the public budget. Allowing this 250kt, which is the natural cap, of RFNBO hydrogen to count towards the transport target would not hamper the development of direct applications of hydrogen in transport as it would only fill in 8,4 TWh of the total 60,6 TWh that is required to reach the 29% RES. In other words, the refinery route could "only" help Belgium reach 13% of its overall transport target. ¹³

With regards to setting up a **crediting system**, like the HBE mechanism in The Netherlands, it is important to note that this already had an important impact on the bunkering market. In Belgium, there has been no HBE system or similar incentives for maritime transport. For Dutch-based fuel suppliers enrolled in the HBE system, supplying biofuels in the Netherlands has been a lot more profitable (extra return via certificates) compared to supplying biofuels in Belgium (no return via certificates). As a result, end-use prices for biofuels in the Netherlands have been cheaper than in neighbouring countries, including Belgium. Shipping companies wishing to buy biofuels therefore bunkered in the Netherlands (Rotterdam), rather than in Antwerp or Zeebrugge. Additionally, the Netherlands includes **inland shipping** in the scope of their maritime target, which could potentially lead to market distortions if Belgium would decide not to do so.



3.1. Industry target

As mentioned in the introduction, an average of 600 kilotons of hydrogen are already consumed in Belgium today. These volumes are divided roughly 50/50 over hydrogen use in refineries and hydrogen use in chemical processes. In chemicals, the main part is consumed to produce ammonia.

Below you can find a summary of the calculations for Belgium, applying the calculation rules and exemptions/ flexibilities stemming from RED III. In our calculation, Belgium **would require 66-74 kilotons of RFNBO per year by 2030** to comply with the **industry target**.

Please note that these calculations focus only on decarbonizing **current hydrogen** use and thus do not include any additional use (new industrial projects) by 2030 nor do they take into account the targets for transport that are defined by RED III, FuelEU Maritime and Refuel EU Aviation. For example, steel industry in Belgium has plans to replace fossil cokes by renewable hydrogen to decarbonise their steelmaking process. In the chemical cluster in the Port of Antwerp, new hydrogen consumers might arise before 2030. These quantities need to be mapped and added to the number of 66-74 Kton/year by 2030. According to the roadmap of the Import Coalition, that takes into account all these factors, the annual consumption of RFNBO hydrogen in Belgium will be 10-15 TWh per year, meaning between 300 and 450 kilotons .¹⁴ **By 2035, the 60% target kicks** in and thus quantities will even rise.

The Vlaams Klimaat en Energie Agenschap (VEKA) is currently gathering data on projected demand and will have the best view on current and forecasted hydrogen consumption in Flanders over time. The chemical industry is also assessing current and future demand for the sector.



¹⁴ <u>Hydrogen import coalition maps out roadmap for hydrogen import in Belgium | Port of Antwerp-Bruges (portofantwerpbruges.</u> com)

3.2. Transport target

The data presented in section 2.2.2 are originating from StatBel for 2022. With the targets applying to the land, maritime and aviation transport sector, the overall RFNBO target for transport is **21 – 34 kilotons of RFNBO (hydrogen equivalent) per year by 2030**.

The total energy consumption in the transport sector in Belgium is 209.6 TWh out of which 98.8 TWh stemming from land transport (road, rail), 90.4 TWh from maritime transport (inland shipping and international bunkering) and 20.4 TWh from air transport (inland aviation and international bunkering). REDIII provides the option for Belgium, due to its important international bunkering position to cap the target to 13 % of the gross final energy consumption (55.8 TWh). Hence, the 1% RFNBO target for transport and 1,2% RFNBO target for maritime applies to 175.0 TWh (cap) or 209.6 TWh (no cap) results in 53 - 68 kilotons of RFNBOs as hydrogen equivalent. Consider the general multiplication factor of 2, the physical amount is 26 - 34 kilotons of RFNBOs as hydrogen equivalent. An additional multiplication factor of 1,5 may be applied when RFNBOs are delivered to the maritime and aviation sector resulting in a physical amount of 21 - 27 kilotons of RFNBOs as hydrogen equivalent.

As mentioned before, it is estimated that a demand of **250 kt of RFNBO per year by 2030** can be obtained through the uncapped use of RFNBOs in the refinery route through the two refineries in Belgium, hence the need for a dedicated RFNBO refinery sub-target.

4 • OPTIONS FOR THE IMPLEMENTATION FRAMEWORK

4.1. Mix of carrots & sticks

Although the targets are very ambitious, with the right implementation framework and enabling conditions reaching them is not impossible. A combination of "**sticks and carrots**" can be considered to ensure the target is reached.

4.1.1. Carrots

Crucial pieces of the regulatory puzzle have already been brought together (e.g., DAs on RFNBO, H2 and gas package, etc.). However, an obligation to fulfil the target, if any, would only be reasonable if key remaining policies are rolled out in parallel with the industry target implementation. These will make the expectations that the industry can reach the target realistic. These elements include: **1) EU and national funding 2) public procurement rules, and 3) product requirements**¹⁵, **4) trade deals**. Besides, simplified permitting rules and ambitious infrastructure rollout plans, a trustworthy and transparent standardisation process and RFNBO certification system will also be crucial. An obligation without those incentivising conditions could dramatically threaten the EU industry's competitiveness.

In reality, sufficient OPEX and CAPEX support will be the best suitable support measures that will allow a successful implementation of the RFNBO sub-targets. The other "carrots" presented below, are rather soft measures that can complement a robust support framework. They should thus be of secondary order. Product requirements and trade deals should be done at EU level and will thus not be treated below.

1) Funding and tax incentives

Primarily, the consumption of clean hydrogen in industry and the production of low-carbon basic materials downstream should be incentivised by direct funding support at EU and national level considering the cost gap between the consumption of clean hydrogen and conventional hydrogen (or other fossil-fuel based solutions) across industrial sectors.

• At EU level, the establishment of the Hydrogen Bank's first leg for domestic production and its first auction are a first important step in fostering overall EU hydrogen market. However, its second leg for hydrogen consumption (and an import dimension) needs to be ironed out as soon as possible, come with a substantial budget and provide visibility to the industry with a clear calendar of auctions.

¹⁵ Not necessarily just requirements, but more generally ways to value the use of green energy down the line, eg through green labelling



- At national/regional level, Belgium/the regions should provide the financial means to their industry with to reach the RED III sub targets. Bridging the delta between fossil based hydrogen and RFNBO hydrogen consumption in industry could help triggering this switch. The "transitie-instrument" that is being developed within 'Klimaatsprong'¹⁶ should serve as the main tool for CAPEX and OPEX support in Flanders. Additionally, Belgium can use the auction-as-a-service model in the framework of the European Hydrogen Bank or choose to participate in the German H2Global scheme.¹⁷ If all exemptions are implemented, a rough estimate of 66-74 Kton of RFNBO/year by 2030 for industry in Belgium and 30 kilotons for direct use in transport would be needed. This number can only be reached if for example Kairos@C will be implemented, for this project to be successful additional support for the low carbon hydrogen consumers will be needed based on the cost difference between blue and grey hydrogen (including support ETS IF). This combined with a big delta between fossil and RFNBO hydrogen one can form an idea of the amounts of support that will be necessary just to decarbonize the current use of hydrogen (no new users, no transport, no refinery route, ...).
- In neighbouring countries, we see the Dutch Stimulation of Sustainable Energy Production and Climate Transition (**SDE++**) scheme and the **German Klimaschutzverträge** as positive steps in this direction. Similarly, in the United States, the Inflation Reduction Act represents a significant move towards such initiatives.
- Belgium can support lower production cost for import projects by the accelerated deployment of double tax treaties (e.g. Oman), reduced import taxes, etc. to encourage Belgian developers in sourcing molecules at more competitive rates abroad, destined for Belgian industry (conditional tax deals?)

2) Public procurement

To create a self-sufficient hydrogen ecosystem in the EU, the ramping up of the demand side is essential. Beyond setting incentivizing market rules and standards, governments and public authorities at all levels, should be at the forefront of the effort to stir demand for low-carbon products, including clean fuels and feedstocks. **National public procurement schemes should be reviewed so that they include ambitious product requirements or environmental performance standards in industrial good purchases. By doing so, they can lead the creation of markets for low-carbon goods**. As such, public procurement contracts for works which require significant volumes of e.g. steel, cement, aluminium or glass should require that the procurement meets an increasing share of green/low-carbon steel, cement, aluminium, or glass purchased for public infrastructures. In combination or as an alternative, public procurement of these products could only be allowed if those products' embedded emissions are below a certain threshold. In any case, provision of carbon intensity information on procured goods should become systematic as soon as possible.

¹⁶ <u>Presentatie VLAIO Klimaatsprong 21 september 2023.pdf.</u>

¹⁷ More information on action-as-a-service and H2 Global on: European Hydrogen Bank - European Commission (europa.eu).





4.1.2. Sticks

Just like in other EU market and regulatory mechanisms (EU ETS, FuelEU, ReFuelEU, etc.), an EU-coordinated **penalty systems could be put in place by Member States to prevent non-compliance**. The penalty fee could in this case be higher as the cost of compliance and should not pre-empt the company from concretely complying with its obligation. The upcoming guidance from the Commission on RED III implementation should encourage a minimal streamlining of such system, to avoid excessive fragmentation amongst countries. **Revenues from these penalties should flow back to the sectors** to finance decarbonisation initiatives.

In any case it is crucial to take into account the **difference between industry and refineries** in terms of ability to absorb these penalties and to add cost to their end products. While parts of the European industry fears the immediate repercussions on global competitiveness and loss of market share, other parts of the economy may be in a better position to pass through costs to the final consumer without repercussion in terms of market share because they do not operate in an international competitive market. This ability to pass along costs easily is only valid for refineries, and not the rest of the transport sector. Direct use of hydrogen in mobility still needs regulatory and financial support to create a level playing field with fossil fuels.

5 • POSITION OF THE BELGIAN HYDROGEN COUNCIL

As a starter, we would like to recall the broad spectrum of the hydrogen value chain that is the membership of the Belgian Hydrogen Council. Uniting the Waterstof Industrie Cluster in Flanders and H2 Hub in Wallonia, we **represent the entire value chain going from production to end use**.



BHC membership throughout the value chain

As such, we represent companies working on RFNBO-projects, as well as companies working on low carbon hydrogen production. We have members working on the required infrastructure, like terminals, pipelines, refuelling stations, and technology players like electrolyser suppliers and suppliers of components for these electrolysers. Last but not least, we represent the current and future hydrogen end users like petrochemical and steel industry. It should be noted that especially the competitiveness of the current hydrogen users in industry (e.g. chemistry) is threatened. All policy measures should make an impact analysis on the competitiveness of these sector and should assure they can remain competitive considering they operate in a global context and use hydrogen as a feedstock for which there is no alternative. In this position paper, we bring the following two principles together:

• Protecting our industry (current and future users) by establishing and maintaining a level playing

¹ European Commission, REPowerEU Plan Communication, 18 May 2022, URL: <u>https://eur-lex.europa.eu/legal-content/EN/</u>

field in a context of international trade and competition

Kickstarting the clean hydrogen market to get the cost reductions we need over time

5.1. RFNBO sub-target for industry

The implementation of the 42% RFNBO sub-target for industry cannot be considered without taking into account the ongoing crises (energy, materials, inflation, ...) affecting the industrial fabric of the EU, particularly sectors such as the chemical sector, which is the current and future user of hydrogen and will most impacted by the 42% target.

With a current significant price gap between fossil based and renewable hydrogen, the European industry fears the immediate repercussions on global competitiveness if this price gap is not bridged by government intervention, at least until renewable hydrogen is sufficiently available and competitive.

Moreover, incentivizing schemes exist in other economical regions around the world, that create a positive investment climate for low carbon technologies and related value chains, with which EU and Belgian industry needs to compete in an international market. Implementing the RFNBO sub quota on company level combined with penalties if the company misses the target could be detrimental in this regard. Discussions in the Netherlands already show that implementing a company level target would pose significant risks to individual companies and threaten their competitiveness. Measures should be taken into account the safeguard EU and Belgian flexibility and resilience and preserve its industrial fabric. **This is why the Belgian Hydrogen Council recommends to allow for as much flexibility as possible in implementing the RFNBO sub-target in a cost effective way for industry.**

The position described above should translate into the following RED implementation framework for industry in Belgium:

- Maximization of flexibilities and exemptions allowed by the Directive:
 - Broad definition of by-product and intermediate hydrogen (that is not included following the calculation rules)
 - Deduction from denominator of quantities of low carbon hydrogen via recital 62
 - Deduction from denominator of quantities of ammonia via recital 63
 - Maximal flexibility vis-à-vis low carbon hydrogen¹⁸
- Implementation of the target at Member State level
- No penalties on companies
- No credit trading system as that would add extra cost for companies
- Maximum OPEX-support, for all hydrogen that counts towards the 42% target according to its specific decarbonization potential and based on GHG abatement.. ¹⁹

¹⁹ Meaning RFNBO hydrogen + the low carbon quantities coming from Kairos@C.



¹⁸ The realization of the quota becomes increasingly difficult if new blue hydrogen (projects like H2BE), which plays a central role in the industrial ramp-up, increases the denominator of the quota and thus increases its level of ambition. Against this background (the inflation of the denominator due to the lack of recognition of blue and other forms of low-emission hydrogen), it is advisable to make the most possible use of the options provided for excluding intermediate and by-products in the national implementation of the industrial target.



5.2. RFNBO sub-target for transport

Refinery route

The goal of the RFNBO sub-targets stemming from RED for industry and transport was to kickstart the renewable hydrogen market by ending the chicken and egg dilemma:

- No producer will follow through with a project when no offtake is secured
- No offtaker can start investing if supply (at competitive cost) is not reassured

However, for this dilemma to be effectively solved, the projected demand of RFNBO hydrogen in 2030 needs to be sufficiently high to:

- Get scale and thus cost reduction in electrolyser technology and eventually the price of hydrogen (LCOH) as such;
- Start the construction works for the needed infrastructure (pipeline, terminals, crackers, refueling stations, etc).
- And eventually get clean hydrogen available at competitive prices to end users.

The 66-74 kiloton of RFNBO projected to be needed in 2030 in Belgium to comply with the industry target may not provide a sufficient market signal if this target is implemented at Member State level without any penalties for companies and without a secondary credit market. **RFNBO producers and technology providers** need security and a clear vision at sufficient offtake in 2030 and beyond in order get projects going and FIDs taken.

In this regard, European refineries can play a crucial role to kick-start the hydrogen market and to meet the 2030 targets of the RED directive on renewables in transport by using RFNBO hydrogen as an intermediate product (refinery route). As described above, the advantage is that the refinery sector has a cost structure that allows to pass along additional costs due to RFNBO use to the end customer (no risk of carbon leakage). The additional cost for the customer will be very limited compared to other renewable energy solutions . As already mentioned above, up to **250 Kiloton** (which is the natural cap) of additional RFNBO hydrogen demand could be unlocked via the RED transport target in a very cost efficient way by 2030 by stimulating the refinery route in Belgium. Similar quantities across the EU could provide the certainty that RFNBO producers and technology players need to implement pioneering projects and to help European demand taking off, create economies of scale for technology, help production projects to take FIDs and get infrastructure roll out (like backbone and terminals) started. This is why **all members of the Belgian Hydrogen Council are unanimously in favour of stimulating the refinery route to a maximum extent**.

It is important to ensure also the **direct use of hydrogen** has its place and will be incentivised (see below). This is why a **separate target for refineries without cap or correction factor**, as part of the RNFBO transport sub-target²⁰, looks like the best implementation option. In our calculation section, we already showed that the refinery route could "only" help Belgium reach 13% of its overall transport target (8,4 TWh / 60,9 TWh = 13%), leaving sufficient room for direct use of hydrogen in transport and other renewable energies. More importantly, the limited supply of (European) biofuels; the cap on conventional biofuels and high ambitions for advanced biofuels are so far insufficient to meet full target. Applying a "correction factor" of 0,2-0,4, as was initially proposed in the Netherlands, or a cap in whatever form would only hinder the development of the global, European and Belgian RFNBO market and could lead to missing the overall 29% RES target in RED. The BHC thus strongly advocates against this.

The position described above should translate into the following RED implementation framework for refineries in Belgium:

- All RFNBO consumed in refineries used to produce fuels needs to be eligible for the RED transport target. Seen the various configurations and continuous variations in the operations of refineries we recommend fixing the quantity at 100% of the non-energy use. The general transport sub-target of at least 1% stemming from article 25 from the RED should be transposed to also incentivize direct use of hydrogen (and its derivatives like e-fuels) in transport.
- A dedicated energy refinery sub-mandate as foreseen in RED III should be defined without any ceiling, cap or correction factor. The mandate level reflecting a substantial part of the national Belgium refining capacity is estimated at ~3%. The upper value of a the RFNBO consumption is technically/ chemically limited by the refinery's need for hydrogen (in % of energy content of the transport energy consumption).
- Beside the general incentive/penalty in RED for transport, a dedicated incentive/penalty at ~10 €/kgH2 level needs to be associated with the RFNBO-transport sub-mandate to ensure its physical fulfilment by fuel suppliers. For example, Germany has foreseen a level of penalty for RFNBO at ~14 €/kgH2²¹.

Direct use of hydrogen in transport

As already touched upon above, it is important for Belgium to ensure also the **direct use of hydrogen** has its place and will be developed. Today, there still is an important funding gap in the transport sector both in terms of CAPEX and OPEX. We see neighbouring countries developing strong financial support mechanisms, leading to competitive distortions if Belgium does not match these mechanisms and leaving the transport sector in the inability to fulfill its RFNBO targets.

The position described above should translate into the following RED implementation framework for direct use of hydrogen in transport in Belgium:

- OPEX support for direct uses of RFNBO in transport
- CAPEX support for trucks, busses and hydrogen refueling stations

Which will only lead to a requirement of 1,7 TWh (= 34 kton) of RFNBO and will by itself not suffice to kickstart the market.
 According to the draft BImSchV that is under approval in the Bundestag in Germany: triple counting for RFNBO with 600 €/tCO2 penalty (3 * 600 €/tCO2 * 94 gCO2/MJ * 70% * 120 MJ/kg H2 ≈ 14 €/kg H2)





- Zero road tax ("kilometerheffing") for zero emission trucks
- Increased tax deduction for investments in hydrogen refueling stations

Maritime sector

Belgium is home of one of the largest bunker hubs worldwide. Each year ca. 90 TWh (more than 7,7 million tons of oil equivalent) are bunkered in Belgium. Supply of the maritime industry amounts to nearly 43% of the total delivered fuels in Belgium.²² The maritime sector stands for a difficult transition towards climate neutrality (goal within EU and IMO), since it is seen as a hard-to-abate sector. To ensure RFNBO's reach maritime transport, a **separate target for maritime is essential**. It ensures the maritime sector doesn't compete with other transport modes to reach the ambition put forward within RED, limiting the competition with transport modes with a higher willingness to pay or transport modes who are favored with certain multipliers to achieve their goals. It also ensures the maritime bunker market can grow their RFNBO market on its own and suppliers who do not deliver or exclusively deliver to the maritime market are ensured with a level playing field, resulting in a fair and equal competition. In addition, specific renewable fuels that are excluded within other policy frameworks (e.g. food/feed biofuels not accepted within Fuel EU Maritime) can be limited specifically to the sector.

In general, the **level playing field in the Hamburg - Le Havre range, with Port of Rotterdam** in particular should be ensured. If this level playing field does not exist and Belgium imposes 1/1 targets on our bunker sector, we risk delocalisation of the Belgian bunker market. The Belgian Hydrogen Council therefore warmly welcomes the MoU that was signed between Belgium and The Netherlands on the implementation of RED in the maritime sector (except for the proposals on refinery rout – see above).

More specifically, "maritime sector" leaves some margin of interpretation to whereas inland shipping should be included in the scope or not. In the Netherlands, inland shipping is included. For reasons of establishing a level playing field and a harmonised approach throughout Europe, the Belgian Hydrogen Council recommends Belgium to do the same.

With regards to setting up a **crediting system**, like the HBE mechanism in The Netherlands, it is important to note that this already had an important impact on the bunkering market. In Belgium, there has been no HBE system or similar incentives for maritime transport. For Dutch-based fuel suppliers enrolled in the HBE system, supplying biofuels in the Netherlands has been a lot more profitable (extra return via certificates) compared to supplying biofuels in Belgium (no return via certificates). As a result, end-use prices for biofuels in the Netherlands have been cheaper than in neighbouring countries, including Belgium. Shipping companies wishing to buy biofuels therefore bunkered in the Netherlands (Rotterdam), rather than in Antwerp or Zeebrugge. It is therefore crucial that **Belgium sets up a crediting system swiftly and opts in the maritime sector**.

²² Through the alternative formula for maritime member states, the target scope for maritime is reduced to 50,9 TWh, still accounting for 25% of the overall transport target.





The position described above should translate into the following RED implementation framework for maritime in Belgium:

- Formulation of a **specific separate** RFNBO sub-target for maritime sector with the ability to be traded through credits. Inland shipping should be included in the scope, as was done in NL.
- Ensure the **level playing field** in the Hamburg Le Havre range, with Port of Rotterdam in particular. If this level playing field does not exist and Belgium imposes 1/1 targets on our bunker sector, we risk delocalisation of the Belgian bunker market.

5.3. Beyond RED III – towards a more comprehensive and technology neutral decarbonization strategy

The BHC position described above is what we see as to be the best way of implementing the current final text of the RED III, although some serious errors were made in the design of the text.

The RFNBO-sub quota for industry has the potential to have significant impacts, in terms of competitiveness, on both Belgian and European industry. Therefore, the hydrogen consumption targets for industry should be revised to permit the consumption of low-carbon hydrogen, as well as RFNBO hydrogen, in order to meet those targets a more **comprehensive and technology neutral decarbonisation strategy**, going beyond RED III, will leave industry more flexibility to achieve the 2030 targets and 2050 climate goals. For this reason, the promotion of renewables should go hand in hand with a broader decarbonization strategy that allows us to reap the benefits of all climate-friendly solutions. Action in this sense must be taken quickly to secure the longevity of the industrial sector.

The position described above should translate into the following recommendations::

- In general, European legislation on decarbonisation should be formulated in a technology neutral way
 and climate legislation specifically should focus on GHG reduction. Member States and every individual
 company, should be encouraged to pursue all pathways toward climate neutrality taking into account
 the specific national context, cost structure, investment cycles and preferences.
- Based on this principle of technology neutrality, every technology should be eligible for operational support according to its specific decarbonization potential and based on GHG abatement. For hydrogen, this means that low carbon hydrogen in the sense of the upcoming delegated act should be supported.
- 2028 is mentioned as a milestone for evaluating and reassessing the Directive and RFNBO delegated acts. This date should be an opportunity to carefully reassess the RFNBO criteria, evaluating their efficacy in guaranteeing the renewable origin of RFNBOs and contributing to the uptake of renewable molecules production in Europe and the world. The assessment may lead to an adaptation of the criteria on additionality, temporal and geographical correlation or a delay of the 2028 exemption end date, to facilitate the ramp up to economies of scale in the RFNBO production and without penalising the early movers prior to the revision (grandfather clause to be foreseen).



6 • CONCLUSION & RECOMMENDATIONS

The BHC therefore suggests the following guidelines on the implementation framework for the transport and industry RFNBO sub-targets:

Preliminary recommendations

Preconditions

 Regardless of which implementation method is chosen, there are a number of preconditions that must be met for RED III to be successfully implemented (availability, quality, cost reduction, speed, infrastructure, certification, product labelling, ...). Visibility should be urgently created on a full RED III regulatory framework in Belgium (industry, transport, refinery route, etc).

European cooperation

• **Coordination and cooperation** with neighbouring countries and EU Member States on the implementation of the RFNBO sub-targets is crucial.



Ambitious implementation of the RFNBO transport sub-target

Credit trading mechanism

• Swiftly implement an **ambitious credit trading scheme** as is required by article 25, 4. of RED.

Direct use of RFNBO in transport

- The general transport sub-target of at least 1% stemming from article 25 from the RED should be transposed to incentivise also **direct use of hydrogen (and its derivatives like e-fuels) in transport**.
- Foresee OPEX support for all direct uses of RFNBO in transport.
- CAPEX support for trucks, busses and hydrogen refueling stations to level the playing field vis à vis our neighbouring countries.
- Install fiscal incentives like a zero road tax ("kilometerheffing") for zero emission trucks and an increased tax deduction for investments in hydrogen refueling stations.

Refinery route

- Define a **dedicated RFNBO refinery sub-target**, without any ceiling, **cap or correction factor**. The mandate level reflecting a substantial part of the national Belgium's refining capacity is estimated at 3% of the total energy amount used in transport, which could unlock 250 Kiloton of RFNBO hydrogen on the Belgian market.
- All RFNBO H2 consumed in refineries to produce fuels **should be eligible for the RED transport target**.
- A **dedicated incentive/penalty at ~10 €/kgH2** level needs to be associated with the RFNBOtransport sub-mandate to ensure its physical fulfilment by fuel suppliers.

Maritime sector

- Formulation of a **specific separate RFNBO sub-target** for maritime sector with the ability to be traded through credits. **Inland shipping** should be included in the scope, as was done in NL.
- Ensure the level playing field in the Hamburg Le Havre range, with Port of Rotterdam in particular. If this **level playing field** does not exist and Belgium imposes 1/1 targets on our bunker sector, we risk delocalisation of the Belgian bunker market.

Flexible and cost effective implementation of the RFNBO industry sub-target Implementation level • The industry sub-target should be kept at Member State level. No penalties shall be put on companies. Flexibilities and exemptions • Maximisation of flexibilities and exemptions allowed by the Directive: • Broad definition of by-product and intermediate hydrogen (that is not included following the calculation rules) • Deduction from denominator of quantities of low carbon hydrogen via recital 62 • Provide clarity on the application of recital 63 for integrated ammonia plants • Maximal flexibility vis-à-vis low carbon hydrogen • No credit trading system that would add extra cost for companies

Operational support

 OPEX-support for all hydrogen that helps to achieve the RFNBO sub-targets (RNBO + Kairos@C) according to its specific decarbonization potential and based on GHG abatement.

Towards a more comprehensive and technology neutral decarbonization strategy

Technology neutrality

In general, European legislation on decarbonisation should be formulated in a **technology neutral** way and climate legislation specifically should focus on GHG emission reduction. Member States and every individual company should be allowed to pursue all pathways toward climate neutrality taking into account the specific national context, cost structure, investment cycles and preferences.

Operational support

• Based on this principle of technology neutrality, **every technology should be eligible for operational support** according to its specific decarbonization potential and based on GHG abatement. For hydrogen, this means that low carbon in the sense of the upcoming delegated act should be supported.

RFNBO criteria

 Careful reconsideration of the RFNBO definitions may be necessary in order to adapt the criteria on additionality, temporal and geographical correlation to a more flexible definition and delay the 2028 additionality exemption date, to facilitate the ramp up to economies of scale in the RFNBO production.

