From policy to reality: how RED III is creating a premium market and why e-methane is the winning choice

This White Paper explores the latest status of RED III implementations and the strategic positioning of RFNBO fuels in them.

It further outlines the strategic window available for companies to secure RFNBO certified e-methane offtakes to capture the high value business case.

Case for Capturing RFNBO Value Now

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EXECUTIVE SUMMARY

The time has come – the rapidly maturing RFNBO market presents concrete opportunities for early movers in the offtake market.

In 2025, the European RFNBO (Renewable Fuels of Non-Biological Origin) market entered a new, decisive phase. Under the EU Renewable Energy Directive (RED III), key Member States are converting EU-level targets into binding national transport sub-quotas, reinforced by substantial non-compliance penalties. Arguments for this kind of higher-than-expected incentives and penalties include strengthening EU energy security, maintaining limited impact on overall fuel prices, and enabling hydrogen project investment decision - **in short, supporting European economic growth**.

By 2030, RFNBO demand in the road transport sector is expected to exceed **30 TWh annually**. In major markets such as Germany, regulatory design already implies RFNBO values well above 600 EUR/MWh. At the same time, production growth is lagging behind mandated demand. This combination of high value and constrained supply creates a clear opportunity for early movers, that secure long-term RFNBO supplies -such as e-methane offtakes -during 2026.

This white paper provides an update on RFNBO mandates across Europe and assesses its implications for market participants. As Germany shapes price formation across Europe, we present an example calculation showing how regulatory mechanisms could drive e-methane values in the German road transport sector to well over **600 EUR/MWh by 2030**.The overall value is considerably higher than the cost of bringing e-methane to market, creating a significant margin opportunity for early movers in the offtake market.

In a rapidly tightening, compliance-driven regulated market, right timing is essential to remain competitive. E-methane represents a ready RFNBO pathway, based on proven technology, existing transport infrastructure and functioning business models to get the RFNBO e-methane fast to market. 2026 is a pivotal year for energy companies and obligated parties to act now, secure certified RFNBO e-methane offtakes, and lock in the high value the market design presents 2030 onward.

Key Takeaways

- RFNBO demand in transport is legally mandated and penalty-backed.
- Germany will set the benchmark price point for Europe.
- RFNBO value is structurally determined by regulatory design.
- E-methane provides the fastest RFNBO pathway for compliance.
- 2026 a window of opportunity to secure FRNBO volumes before supply tightens.

THE BIG PICTURE – EUROPEAN RFNBO MANDATE TRANSLATES INTO LEGALLY BINDING NATIONAL LEGISLATION

Recent months have been interesting times for hydrogen project developers, offtakers and financiers, as EU member states have taken rapid steps in national implementation of EU Renewable Energy Directive (RED III) in their national legislations.

Amid the frequent updates of RFNBO (renewable fuel of non-biological origin, including renewable hydrogen and its derivatives) sub-quotas and non-compliance penalty levels from Germany and other major EU countries, the market updates have largely missed the wider implications to RFNBO fuel offtakers and producers.

"From EU-Level Mandate to Binding National Legislation -
Unlocking E-Methane Opportunities especially in Road Transport"

The price formation logic in the RFNBO market is becoming extremely clear and RFNBO fuel market values are widely exceeding expectations. This creates a highly interesting business case for fuel distributors and energy companies to enter high margin RFNBO fuel market by signing long-term offtakes with e-methane projects.

To validate this argument, in this white paper, we focus on RFNBO market values within the road transport segment under RED III, as it currently provides the most compelling and transparent value proposition. More specifically we focus on e-methane, due to its flexible use case, and easy delivery to market through the existing European gas network.

1% EU MANDATE DRIVES OVER 30 TWh RFNBO DEMAND BY 2030

The size of RFNBO fuel market in transportation use is largely determined in EU Renewable Energy Directive (RED III) that sets a binding target for EU member states to use at least 1% of RFNBO fuels in transportation by 2030. Key member states have moved decisively since summer of 2025. In Germany, the proposed penalty levels of non-compliance have been increased from 70 EUR/GJ to 120 EUR/GJ, prompting other member states, such as France to increase the proposed penalty from 80 EUR/GJ to 110 EUR/GJ.

In addition to pushing penalties of non-compliance, key member states have consistently set their national targets for RFNBO fuel use higher than RED III minimum of 1% by 2030. As a consequence, the expected regulation -driven demand for RFNBO fuels in transportation segment surpasses 30 TWh by 2030 and is firmly backed by penalties of non-compliance, as illustrated in the next table.

RFNBO[1]		
Country	sub-quota (2030)	market size (2030) TWh
Germany	1.2 %[2]	9
Poland	1%[3]	8
Spain	1.5% (+1% flexible)[4]	8
France	1%	7
Italy	1%	4
Belgium	4%	1.5
Netherlands	1.45%	1.5
Nordics	Avg. 2%	2.5
	Total	**41.5 TWh**

EU member states' decisiveness to implement RED III requirements with higher-than-expected percentages, and record-high penalty levels can be explained by three factors.

First, although the offtake price point for RFNBO fuels will be considerably higher than for fossil and biofuels, the overall impact on pump prices is expected to be minor. In Finland, an analysis made for the Finnish Ministry of Economy and Employment[5], assessed that 3% binding mandate for RFNBO fuels, with estimated procurement cost of ~350 EUR/MWh, increased pump prices by approximately 3c/litre, or 1.5%.

Second, in addition to its long-term commitment to CO2 emission reduction, EU and its member states are serious about improving energy security and reducing emissions with renewable hydrogen. EU countries already have the experience of wind and solar energy costs developing from extremely high to being the most economic sources of electricity. Similar development curve for hydrogen is expected over the long-term.

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[1] Source: Latest National RED III implementation status as of 30.1.2026 based on Ren-Gas market intelligence

[2] On 30 January 2026, the Bundesrat adopted its opinion on the amendment to the Germany's GHG quota act, including a recommendation to increase the RFNBO sub-quotas for 2030 from 1.2% to 2.5%.

[3] Poland started a consultation until February 9 and proposed 1% RFNBO sub-quota

[4] 1.5% (+1% flexible) for oil refiners; 1% (+1.5% flexible) for other fuel suppliers. Flexible quota can be met through RFNBOs and advanced biofuels and until 2030 also through low-carbon hydrogen

[5] Selvitys hallitusohjelman uusiutuvien polttoaineiden jakeluvelvoitetta koskevien kirjausten vaikutuksista ja RED III -direktiivin kansallisesta toimeenpanosta. 12.2.2024: https://valtioneuvosto.fi/documents/1410877/196402993/Jakeluvelvoiteselvitys_HO_REDIII_12022024_AFRY.pdf

Finally, in increasing the RFNBO non-compliance penalties, policy makers recognize that the hydrogen project cost increases have delayed FIDs. The CAPEX increases are a feature of a new market where engineering consultants and equipment suppliers lack proven, standardised design and easy "cost libraries" to base their work on. This has led to unreliable cost estimates by projects until multi-million-euro engineering work (FEED studies) has been completed. On the other hand, project developers work with limited budgets during early project phases, causing them to underestimate their project costs until late stages. High non-compliance penalties under RED III allow for projects to move forward with higher offtake price levels.

"EU states' decisiveness to set higher than expected incentives/penalties:

- **3% RFNBO mandate, only 3c/litre increase in pump prices**
- **EU advances RFNBO fuels to strengthen energy security**
- **EU states set high penalties to get projects past FIDs"**

For energy companies, the new market reality presents a great opportunity but also some concerns. High demand, and high value point for RFNBOs make an excellent business case on the RFNBO market. On the other hand, the market has a shortage of mature projects that have completed engineering and have realistic path to come online before 2030. Therefore, energy companies and fuel distributors should move fast to confirm their RFNBO sources already during 2026 to capture the business opportunity.

"From 1% EU Mandate to 30 TWh Market — High Incentives and Scarce Projects Shape RFNBO Opportunity"

RFNBO VALUE FORMATION

Although the RFNBO market is still emerging, its value formation is already transparent and analytically determinable. Moreover, despite different national implementations of RED III, the value of any RNFBO fuel in the transport sector is based on three components in most EU member states.

"By purchasing a single MWh of RFNBO fuel,
you get the benefits of all three components:

1. **Energy Value (incl. ETS II)**
2. **Main obligation ticket value**
3. **RFNBO sub-quota value. "**

1. Energy Value

The first component of total RFNBO fuel value for the end-user (including the avoided cost of ETS II).

It is the value of actual energy, comparable to a similar fossil fuel product, e.g. diesel or LNG. In case of e-Methane, the Energy Value consists of respective natural gas price index (e.g. TTF or THE) and the ETS II cost to account for the fossil CO2 emissions, once the transport sector joins the ETS scheme.

Natural gas hubs are very liquid markets with transparent daily price quotes available. Also swapping gas between the hubs through the interconnected European natural gas pipeline is very straightforward, and forward contracts are widely available.

Transportation sector is not part of the normal ETS scheme, but EU is working on ETS II scheme which would apply to the transportation sector among others. EU targets the full launch of the scheme in January 2028.

2. Main Obligation Value (Ticket)

In addition to energy value, RFNBO fuel is always counted as renewable fuel under RED II and III legislations. In other words, when a fuel distributor (the so-called obligated party) supplies RFNBO fuels to the transportation sector, it fulfils both its main obligation of supplying renewable fuels (such as biofuels or bio-methane) and RFNBO fuels, with the same molecules. Consequently, RFNBO fuel market value also includes the value of biofuel through the so-called main obligation quota.

The fuel distributors have a choice of either directly distributing renewable fuels to meet their share of the national renewable fuel obligations or buying so called "tickets" from other distributors who have over-filled their obligation. The main obligation quota tickets are widely traded practically within each EU country, and especially in the larger countries main obligation ticket markets are very liquid and trading takes place for several years forward. Prices are typically quoted on daily basis by specialized market information providers.

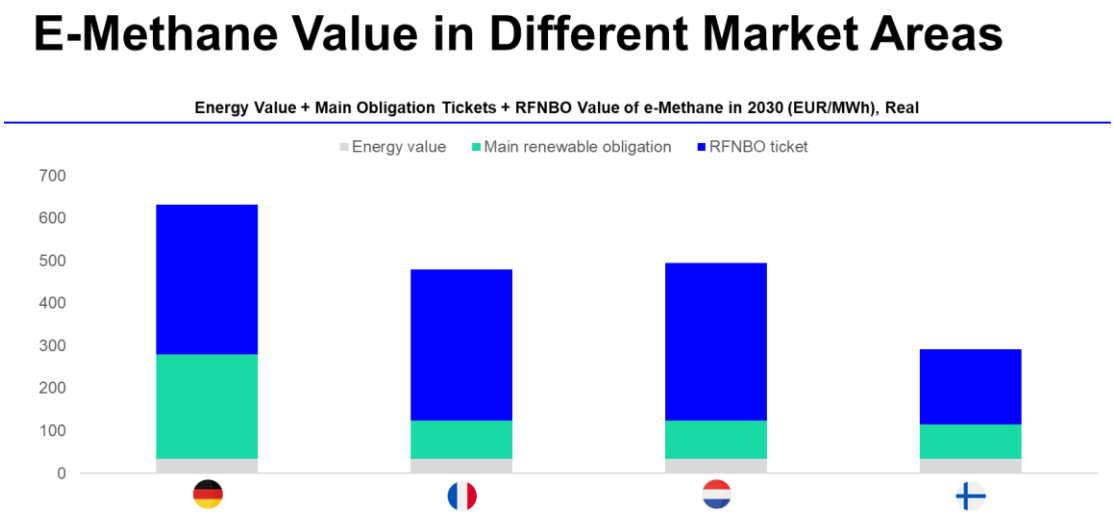
In addition, some countries give RFNBO fuels additional multipliers to give them preference over e.g. regular biofuels based on food crops, similarly to advanced biofuels (Annex 9A). For example, in Germany the RFNBO fuels are set to have 3x multiplier until 2037. The use of multipliers increases the value of RFNBO fuels further.

3. RFNBO Sub-quota Value (Ticket)

Finally, as part of national RED III implementations EU countries have set their national sub-quotas for the minimum amount of RFNBO fuels to be distributed on the transportation sector. Obligated parties can fulfill this quota only with RFNBOs, or by acquiring separate tradeable RFNBO sub quota tickets from obligated parties that have oversupplied their share of the national mandate.

While main renewable obligation tickets are widely traded and plenty of market data is available, RFNBO sub-quota ticket market is only being established. However, most EU countries have set a specific national penalty for the obligated parties for missing their RFNBO sub-quota. In practice, national penalty level sets an alternative cost for obligated parties, in case they do not source RFNBO fuels for distribution. As the market is expected to be short of RFNBO fuel supply, the price of RFNBO ticket is expected to rise close to the penalty level in all countries.

The total value of RFNBO fuel for the obligated parties in a certain market is the sum of all these three components (or four if you count the energy and associated ETS II separately). The graph below illustrates the full value of RFNBO fuel in key EU markets, based on the expected price of each value component.

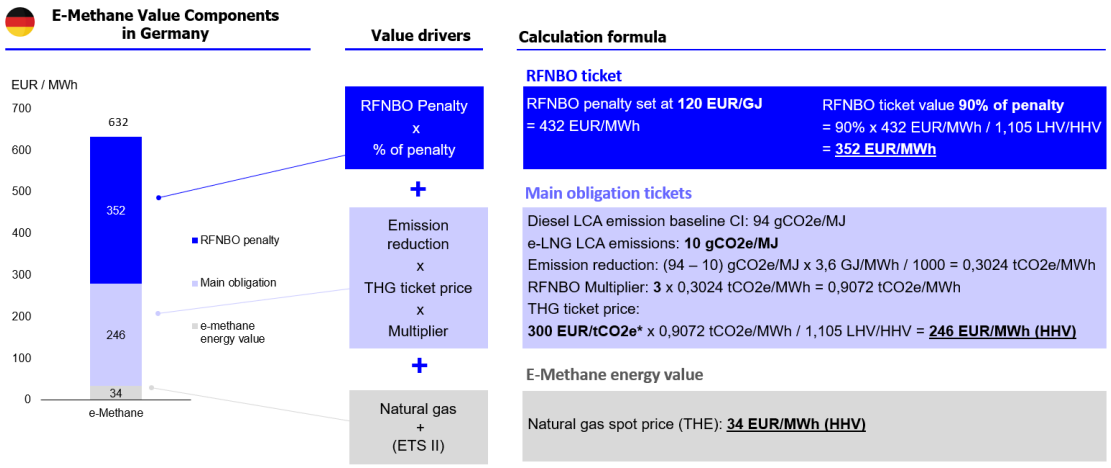


Source: Energy value: TTF estimate of 33.5 EUR/MWh. Main renewable obligation: Ren-Gas market intelligence on expected main obligation ticket price, including multipliers and national variations. RFNBO ticket value: Estimated 90% of penalty value in each national implemented / draft law as of Jan 30, 2026.

CASE EXAMPLE - GERMANY

Value stack of e-Methane under latest German RED III regulation draft

To illustrate the value structure with a concrete regulatory example, this chapter draws on the latest German RED III draft (Bundesrat vote on January 30, 2025) as an example. The graph below shows how the value of e-methane would be structured in the German road transport sector when used as a drop-in fuel for existing CNG cars or LNG trucks



1. Energy Value:

In Germany the fossil equivalent for e-Methane is the natural gas index THE. On February 5th, 2025 the THE price was 33,5 EUR/MWh (HHV) [6]:

Total Energy Value = Natural gas spot price (THE) = **33,5 EUR/MWh (HHV)**

2. Main Obligation Value

The German main obligation quota market (THG quota) is quite liquid and daily price quotes are widely available from brokers and market information providers. In recent years the THG quota prices have been very volatile ranging from below 100 EUR/CO2ton all the way near the 600 EUR/CO2ton cap price. In beginning of February 2026, the THG prices traded between 225 – 470 EUR/CO2ton depending on the year of delivery (vintage)[7] . For simplicity, we assume 300 EUR/CO2ton as the THG quota price, which is within the range of recent publicly available estimates[8].

[6] https://tradingeconomics.com/commodity/germany-natural-gas-the

[7] https://14degrees.de/news/thg-quotenmarkt-preisentwicklung-ergebnisse-der-bundesratssitzung-zum-red-iii-entwurf/

[8] https://14degrees.de/news/thg-quotenmarkt-preisentwicklung-ergebnisse-der-bundesratssitzung-zum-red-iii-entwurf/

The carbon intensity (CI) of the renewable fuel is needed to calculate the amount of THG quotas received per unit of renewable fuel delivered. For e-Methane we have assumed 90% reduction, with carbon intensity of 10 gCO2/MJ. This number is deducted from the German diesel reference diesel carbon intensity (94 gCO2/MJ) to achieve net saving.

Finally, since the RED II implementation the German system has included a 3x multiplier for THG quota reduction from RFNBO fuels. Under the latest draft the 3x multiplier is set until 2037 and then decreasing gradually towards 1.

Another interesting fact about the German RED III draft is that in case the main obligation market would ever be oversupplied (this happened with advance biofuels from abroad flooded the market recently) any extra supply would be automatically added to the following year quotas. Therefore, going forward temporary jumps in supply (and crashes in price) automatically increase the future quotas creating support for long-term demand and thus, long-term stable prices (or at least avoid short-term market crashes).

Based on above, the total Main Obligation Value including respective energy conversions is calculated as follows:

Total Main Obligation Value =

300 EUR/CO2ton x (94 – 10) gCO2e/MJ (LHV) x 3,6 GJ/MWh / 1,105 (natural gas HHV/LHV conversion) =

300 EUR/CO2ton x 0,82 tCO2/MWh (HHV) =

246 EUR/MWh (HHV)

3. RFNBO Sub-quota Value

The German RED III draft includes RFNBO sub-quota penalty set at 120 EUR/GJ. The trading on German RFNBO -sub-quota tickets is expected to start later this year as the RED III draft include retrospective mandates starting already Jan 1, 2026. The market information providers are expected to start publishing similar daily quotes for the RFNBO tickets soon after the trading starts similarly as they publish today for advanced biofuel sub-quota.

In the 2029 - 2030 timeframe the RFNBO sub-quota is set to increase substantially and the market is widely expected to be short, given the delayed FID decisions of many European hydrogen projects. Until the daily RFNBO sub-quota prices become available, the best way to estimate the value of the RFNBO sub-quota is to set it as %-share of the penalty level. High percentage means that the market would be short on RFNBO supply and the sub-quota price is close to the penalty level. Low percentage means that market would be oversupplied with RFNBO fuels and operators would mainly get remunerated through the main obligation ticket.

When EU introduced the biofuels into national blending mandates and the supply was constrained, the tickets traded in range 90-95% of the penalty payment in Germany. The small discount to full penalty level was due to the transaction costs (contracting, transfers etc.) involved in trading tickets, whereas some obligated parties simply decided to pay the penalty instead. Interestingly, some national implementations fail to meet the EU

level requirements, which leads to legal proceedings, and in those countries the sub-quota price could be even higher than penalty (some don't even set one). Given the current situation where many of the previously announced large hydrogen projects have been cancelled or postponed, we have assumed that the RFNBO sub-quota price would be set at 90% of the relevant penalty value.

Total RFNBO Sub-quota Value =

120 EUR/GJ (LHV) x 90% x 3,6 GJ/MWh / 1,105 (LHV/HHV conversion) =

352 EUR/MWh (HHV)

"Summarizing all three value drivers together,

we arrive at total value of e-Methane of

632 EUR/MWh (HHV)."

Key Takeaways:

From the example calculation above, it is clear that German RED III creates an attractive price point for RFNBO fuels, especially for e-methane (see the next section for a more detailed e-methane analysis).

The high value point also ensures that volumes enter the German market. Germany is likely to set the price point also for wider Europe, where the total volumes are multiples of the German market.

The additional benefit of e-Methane is that it can be easily traded through the existing European gas transmission network to any country with the highest need for RFNBO sub-quota. It will take time for Europe to build enough RFNBO production capacity and the limited amount of ready-to-build RFNBO projects are expected to be contracted very soon.

WHY E-METHANE IS THE PREFERRED RFNBO FUEL TO START WITH

Among RFNBO fuels, e-methane provides a practical, flexible solution for capturing the high value in RFNBO fuel markets.

The main advantage of e-methane is its full compatibility with existing natural gas infrastructure, allowing rapid deployment without major changes. Pipelines, storage facilities, LNG terminals, and end-use equipment can use e-methane without redesign or additional investment.

"The existing natural gas infrastructure and market benefit e-methane offtakers in three ways:

- **Direct access to the high-value transport segment,**
- **Geographic flexibility to optimise market pricing,**
- **Multiple alternative markets providing downside risk mitigation."**

First, many EU countries already operate heavy road transport systems based on CNG and LNG vehicles, and the number of CNG and LNG trucks has potential to grow in the coming years. By distributing e-methane as CNG or LNG transport fuel, fuel distributors and obligated parties gain direct access to the full RFNBO value stack (expected to approach 700 EUR/MWh in Germany, as shown in the previous section).

Moreover, for energy companies without refinery capacity to meet RFNBO quotas through refinery hydrogen, e-methane offers an alternative pathway to access high-value RFNBO tickets.

Second, e-methane can be transported efficiently through the existing European gas network without requiring new infrastructure investments. For offtakers, this creates significant upside potential (and risk mitigation), as volumes can be allocated across EU Member States to capture the highest available RFNBO value. Arbitrage opportunities between national compliance markets are therefore expected to be significant.

Finally, e-methane itself can be used in refinery RFNBO hydrogen production through steam methane reforming, as well as in LNG-based marine transport. E-methane also carries the valuable component of biogenic CO2, which can be valorized in CCUS purposes, if captured. The broad and already existing use base reduces dependency on any single segment and ensures stable demand.

E-methane allows energy companies and fuel distributors to decarbonize their business using a renewable molecule that maintains the physical and operational characteristics of natural gas. At the same time, significant uncertainty related to hydrogen or ammonia infrastructure development timeline and cost is avoided.

E-methane production relies on mature, commercially proven technologies such as electrolysis, carbon capture, and methanation. Compared to other synthetic fuels, it involves fewer components, lower implementation risk, and supports cost-efficient storage and transport.

At scale, e-methane connects low-cost renewable regions with European demand centers. Production can be located where renewable power and biogenic CO2 are available, using existing gas networks for cross-border delivery. This supports cost-efficient supply and strengthens EU energy resilience.

2026 – UNIQUE WINDOW OF OPPORTUNITY FOR SECURING E-METHANE OFFTAKE

As described earlier, it is evident that RED III will be implemented into national laws, compliance targets will be set to last up to 2040, and penalties for non-compliance will become clearer and more strict. At the same time, there are only a limited number of mature, FID-ready projects available to be built to generate supply.

"This combination of regulation driven demand and limited supply creates a window of opportunity that is unlikely to repeat once the first wave of contracts has been signed."

RED III is becoming implemented with enforceable quotas, with Germany setting tighter-than-expected RFNBO sub-quotas and penalties, establishing a benchmark that other markets are likely to follow.

In Germany, the THG quota framework extends to 2040 and includes a clearly defined RFNBO sub-quota trajectory: 1.2% by 2030, rising further toward 8% by 2040. RFNBO fuels benefit from a 3× multiplier, reinforcing demand incentives. Crucially, non-compliance is not symbolic; it is backed by a penalty of €120 per GJ, applicable from as early as 2026.

"As a result, regulation-driven RFNBO demand in the transport sector alone is projected to exceed 30 TWh annually by 2030. It does not depend on voluntary participation or temporary subsidy programs."

On the supply side, production capacity is not expanding at the speed required by regulation. Meeting 30 TWh of annual RFNBO demand would require approximately 60 mid-scale 200 MW power-to-methane plants (electrolyser capacity), or around 10 gigawatt-scale facilities. However, only a limited number of 100–200 MW hydrogen projects are realistically expected to reach Final Investment Decision (FID) in 2026.

Lead times are binding. Reaching FID typically requires 24–36 months of development , including permitting, FEED and financing, followed by 24–48 months for construction. In practice, projects that do not secure FID 2026 are unlikely to deliver material volumes before 2030. At the same time, many announced projects have been delayed or cancelled due to financing gaps, permitting constraints, rising CAPEX, lack of PPA, and shortages of biogenic CO2. Although the technology can scale, supply in early 2030s will remain structurally limited.

"The challenge is not project announcements,
but scarcity of bankable RFNBO projects that can come online by 2030."

Elevated RFNBO prices reflect structural market design, not short-term speculation. Regulation and pricing now support project bankability through long-term offtakes. Delaying decisions increases exposure to spot premiums or penalties. If e-methane were secured at 250–300 EUR/MWh versus ~600 EUR/MWh in penalties, the spread would be structural and leaves room for value sharing between different market participants.

“Given the binding trajectory under RED III, structural oversupply is unlikely, making early offtake a rational compliance strategy for obligated parties.”

E-methane projects provide delivery security as well as geographic flexibility, strengthening compliance risk management. As a drop-in fuel, volumes can be allocated across different EU markets, reducing single-country regulatory exposure.

Together, delivery certainty and cross-border allocation flexibility make early e-methane offtakes a robust strategy for managing long-term RFNBO compliance obligations.

“A critical alignment has emerged across the value chain: developers require long-term offtakes in 2026 to reach FID, while obligated parties must secure RFNBO volumes for 2030 compliance.”

About Ren-Gas

Ren-Gas is a pioneer in the hydrogen economy, focused on turning climate goals into concrete projects. Ren-Gas turns hydrogen economy plans into real, bankable projects. We optimise the full e-methane value chain, from design to operations, to deliver reliable, cost-effective and scalable green fuel for our partners.

"We are Finland's leading hydrogen economy project developer, building a decentralized production network for renewable e-methane across the country. Our project portfolio includes six projects, with combined annual RFNBO e-methane output of 3 TWh, and electrolyser capacity of 750 MW. All projects make use of Finland's optimal conditions and are managed through a centralised control room for efficient, real-time optimisation. Together they show that large-scale decarbonisation can be both practical and profitable."

The first project in Tampere (180 GWh pa) is in ready-to-build stage, with comprehensive front-end engineering and design (FEED) study completed, main equipment and EPCm contracts negotiated, and input and interconnection contracts signed. The project CAPEX estimate and feasibility have been endorsed in financiers' due diligence process.

Following Tampere, the next three projects in the Ren-Gas portfolio already have environmental permits in place and benefit from Ren-Gase's scalable, repeatable project concept that enables faster implementation.

For more information or to discuss e-methane offtake opportunities, please contact:
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For more information visit our web page: www.ren-gas.com

Ren-Gas Portfolio

Plant	Location & Partner	Size	Status	Investment Grants
	Tampere	2 x 50 MW el. capacity 2 x 180 GWh e-methane p.a.	Ready-to-build	46 M€
	Lahti	100 MW el. capacity 360 GWh e-methane p.a.	EIA complete, env. permit received	45 + 28 M€
	Kotka	3 x 50 MW el capacity 540 GWh e-methane p.a.	EIA complete, env. permits received	41 M€
	Kerava	50 MW el. capacity 180 GWh e-methane p.a.	EIA complete, env. permit received	
	Pori	3 x 100 MW el. capacity 1080 GWh e-methane p.a.	EIA process on-going	
	Mikkeli	50 MW el. capacity 180 GWh e-methane p.a.	EIA process on-going	

Project Locations

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