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# Additional Costs of Green Hydrogen from RFNBO Electricity Criteria

Discussion Paper from the  
Cooperation Forum Electrolysis

# Imprint

## Publisher



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## Discussion Paper from the Cooperation Forum Electrolysis

Part of the Initiative of the FfE Cooperation Forums

## Published On

19.06.2026

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## Please cite as

FfE (2026): Additional Costs of Green Hydrogen from  
RFNBO Electricity Criteria  
Discussion paper from the Cooperation Forum  
Electrolysis

**DOI:** 10.34805/ffe-18-26

Version Number Template: TL20230613

# Contents

|                                                                                                                 |           |
|-----------------------------------------------------------------------------------------------------------------|-----------|
| <b>Additional Costs of Green Hydrogen from RFNBO Electricity Criteria</b>                                       | <b>4</b>  |
| <b>1 Background: How is green hydrogen defined according to the EU's Delegated Act?</b>                         | <b>5</b>  |
| 1.1 Four options for fully renewable electricity                                                                | 5         |
| 1.2 Additionality and Temporal Correlation                                                                      | 6         |
| 1.3 Ongoing review of hydrogen production criteria                                                              | 6         |
| <b>2 Quantifying the Cost Impact of RFNBO Electricity Criteria on Green Hydrogen Production</b>                 | <b>7</b>  |
| 2.1 Analytical Framework and Methodology                                                                        | 7         |
| 2.2 Cost Effects of Temporal Correlation                                                                        | 8         |
| 2.3 Cost Effects of Additionality                                                                               | 9         |
| 2.4 Interpretation and Key Cost Drivers                                                                         | 10        |
| 2.5 Limitations and Implications                                                                                | 10        |
| <b>3 Practical Insights from Participants of the Cooperation Forum Electrolysis</b>                             | <b>12</b> |
| 3.1 Critical Aspects of RFNBO Electricity Criteria                                                              | 12        |
| 3.2 Perceived Implications of Adjusting RFNBO Electricity Criteria                                              | 13        |
| <b>4 Positions of Policymakers and Industry Associations in the Ongoing Review of RFNBO Production Criteria</b> | <b>14</b> |
| 4.1 Joint Letter by Germany, Spain, the Netherlands, Poland and Austria                                         | 14        |
| 4.2 Position Paper of the German Association of Energy and Water Industries (BDEW)                              | 14        |
| <b>5 About the Cooperation Forums Initiative</b>                                                                | <b>16</b> |
| <b>6 References</b>                                                                                             | <b>17</b> |

# Additional Costs of Green Hydrogen from RFNBO Electricity Criteria

**RFNBO electricity sourcing criteria play a central role in shaping the conditions for green hydrogen production in Europe and are currently subject to an accelerated review process by the European Commission.**

The production of green hydrogen in the European Union is defined by the **RFNBO electricity sourcing criteria** set out in the Delegated Act 2023/1184. These criteria determine under which conditions electricity used for electrolysis can be classified as fully renewable, with **additionality**, **temporal** and **geographical correlation** as central design elements.

While designed to ensure environmental integrity and system consistency, the criteria also directly shape the cost structure, operational flexibility and procurement options of hydrogen projects. In light of growing concerns regarding their impact on project feasibility and costs, the European Commission has **brought forward the review of the framework to 2026**.

The analysis presented in this paper combines **modelling-based insights**, **practical perspectives from industry participants in the Cooperation Forum Electrolysis** and **selected stakeholder positions** to assess the cost implications of the current framework. The following key messages summarize the main findings of this paper.

1

## **The current RFNBO electricity sourcing criteria lead to significant additional costs for green hydrogen.**

Both modelling-based analysis and practical insights indicate that the electricity sourcing requirements materially increase hydrogen production costs and thus have a strong impact on project economics.

2

## **Additionality and temporal correlation affect costs through different mechanisms and with different magnitudes.**

While temporal correlation primarily limits operational flexibility and reduces electrolyzer utilization, additionality alters the underlying cost basis of electricity procurement. In most cases, additionality emerges as the more significant cost driver.

3

## **The combination of these criteria constrains viable business models and slows down the market ramp-up.**

The regulatory requirements lead to lower utilization, higher capital intensity and restricted procurement options. As a result, robust business cases are more difficult to establish and project implementation is delayed.

4

## **Policymakers and industry see a need for adjustments to improve project economics and market dynamics.**

Both industry perspectives and policy positions indicate that targeted adjustments – in particular regarding additionality, temporal correlation and their grandfathering periods – are necessary to reduce costs and enable investment in green hydrogen production.

# 1 Background: How is green hydrogen defined according to the EU's Delegated Act?

The Delegated Act 2023/1184 describes the criteria that electric power must fulfil for hydrogen produced from it to be designated as legally renewable. These criteria are currently under review by the European Commission.

The Renewable Energy Directive (RED) sets targets at the European Level for the reduction of greenhouse gas emissions. To meet these targets several alternative fuels and energy carriers are specified, including synthetic fuels produced from renewable electricity, also called Renewable Fuels of Non-Biological Origin (RFNBO). Hydrogen, when produced from renewable electricity via electrolysis, falls into this category.

The criteria under which electricity for the production of RFNBO can be considered renewable are not set out in the RED itself, but in the **Delegated Act 2023/1184** (European Commission, 2023), which entered into force on 10 July 2023.

## 1.1 Four options for fully renewable electricity

The Delegated Act defines **four procurement pathways** through which electricity can be considered fully renewable for the production of green hydrogen. These options, illustrated in Figure 1, differ in their

technical set-up and regulatory requirements, but all aim to ensure that hydrogen production is based on renewable electricity without increasing emissions elsewhere in the system.

### I. Direct connection to a renewable energy (RE) plant

Electricity supplied directly from a renewable installation to the electrolyzer, without using the public grid, qualifies as fully renewable. A grid connection of both assets is permitted, provided that appropriate metering ensures traceability of electricity flows. From 2028 onwards, such installations must comply with the principle of **additionality** (see Section 1.2), meaning that new renewable capacity must be built specifically for hydrogen production.

### II. Grid electricity in high-renewable bidding zones (> 90 %)

In bidding zones with a very high share of renewable electricity, grid consumption can be classified as fully renewable **without further procurement conditions**. This applies if the renewable share exceeded 90 % in at least one of the previous five calendar years. However, the operating hours of the electrolyzer are limited in proportion to the renewable share in the electricity mix.

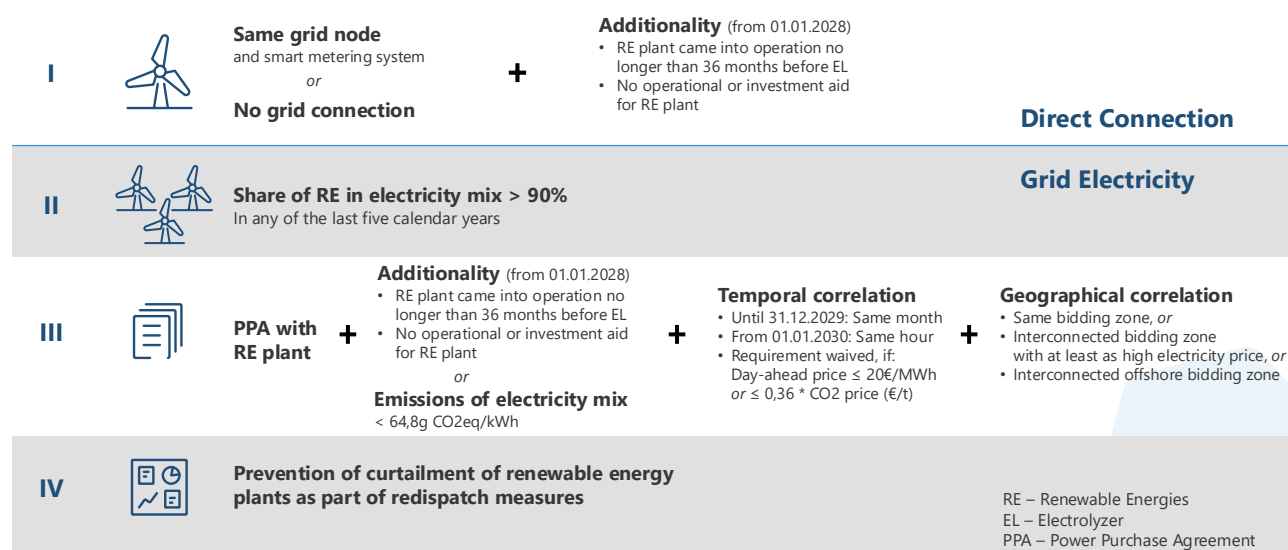


Figure 1: Overview of power procurement pathways for green hydrogen production

### III. Procurement via Power Purchase Agreements (PPA)

Renewable electricity can also be sourced via PPAs between hydrogen producers and RE plants (or aggregators). In this case, electricity is delivered via the public grid but must fulfil requirements on **temporal** and **geographical correlation** as well as, in principle, **additionality** (see Section 1.2). These criteria are intended to ensure that renewable generation and consumption are closely aligned and system-consistent.

### IV. Use of electricity from avoided redispatch of RE plants

Electricity that would otherwise be curtailed due to **grid congestion** (redispatch) can be used by electrolyzers and is considered fully renewable. This pathway enables the utilization of available renewable generation that cannot be transported due to network constraints, thereby increasing overall system efficiency.

## 1.2 Additionality and Temporal Correlation

Among the four procurement pathways outlined above, the PPA-based option (Case III) is widely considered the most relevant in practice. It allows flexible sourcing via the public grid, but at the same time introduces the most stringent regulatory requirements. In particular, compliance with the principles of **additionality** and **temporal correlation** is decisive for classifying electricity as fully renewable in this case.

#### Additionality

The principle of additionality requires that the renewable electricity used for hydrogen production originates from **newly installed renewable energy capacity**. The objective is to prevent existing renewable generation from being diverted to hydrogen production, which would otherwise need to be replaced by fossil-based electricity elsewhere in the system.

In practice, this means that the renewable asset must have come into operation **36 months before the electrolyzer**. Compliance with additionality becomes mandatory from **2028** onwards. However, additionality is not required if the electricity is sourced from a bidding zone with a sufficiently low grid emission intensity (below 64.8 g CO<sub>2</sub>eq/kWh).

#### Temporal Correlation

Temporal correlation ensures that renewable electricity generation and hydrogen production are aligned in time. Under this principle, the electrolyzer may generally only consume electricity in periods when corresponding renewable generation is available.

The regulation distinguishes between two regimes:

- Transitional phase (until **31 December 2029**): **monthly balance** between renewable generation and consumption is sufficient.
- Full implementation (from **2030** onwards): strict **hourly matching** is required, meaning electricity must be consumed in the same hour in which it is generated.

In addition, an important **price-based exemption** exists:

- Electricity consumption is also permitted in hours with particularly low market prices, even if direct matching is not fulfilled. Concretely, this applies to hours in which the day-ahead electricity price is below 20 €/MWh or below 0.36 times the CO<sub>2</sub> price per tonne, reflecting periods of high renewable availability.

Together, additionality and temporal correlation are designed to ensure that hydrogen production contributes to the expansion of renewable generation and remains consistent with overall system decarbonization. At the same time, these requirements introduce additional complexity and cost, which are analysed in the following sections.

## 1.3 Ongoing review of hydrogen production criteria

The criteria for the production of RFNBO-compliant hydrogen are currently subject to an ongoing review process at European level. While the regulatory framework originally foresaw an evaluation towards 2028, the European Commission has, in the context of the AccelerateEU energy action plan, announced a targeted review already in the **second quarter of 2026**, thereby significantly bringing forward the timeline (European Commission, 2026).

This accelerated review reflects increasing concerns regarding the practical implementation of the framework. In particular, the interaction of additionality and temporal correlation is widely discussed in terms of its impact on project feasibility, system integration and production costs. At the same time, the review aims to ensure that the regulatory design remains aligned with the overarching objectives of decarbonization and the integrity of the electricity system.

## 2 Quantifying the Cost Impact of RFNBO Electricity Criteria on Green Hydrogen Production

The additional costs resulting from the electricity sourcing criteria for RFNBOs are a recurring element of the debate. The actual additional costs vary considerably from project to project. This paper outlines one possible way of approaching their quantification by means of a modelling-based approach.

The method applied here uses an optimization model that determines the cost-optimal hydrogen supply configuration for all NUTS-3 regions in Europe. The model and the scenario set-ups used are described below before the results for the year 2030 on the additional costs are presented and discussed. Finally, the limitations of the present approach and their implications are addressed.

### 2.1 Analytical Framework and Methodology

The quantification builds on the HyPTraDE model (FfE, 2026), which is based on PyPSA and further developed in the course of the last years. The model is a project-level techno-economic optimization model for hydrogen production that endogenously optimizes investment and dispatch decisions for electrolyzers, renewable energy generation and storage. It is resolved at NUTS-3 level across Europe and uses an hourly temporal resolution. Most recently the model was extended in particular to represent RFNBO-relevant electricity procurement pathways and regulatory constraints, enabling a structured comparison of hydrogen production costs under different electricity sourcing options and levels of regulatory stringency.

| Scenario                          | Description                                                                                                                                       |                                                                                       |
|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| <b>LCOE offgrid</b>               | <ul style="list-style-type: none"> <li>No grid connection</li> <li>Pricing of Renewable Assets using the LCOE Method</li> </ul>                   |  |
| <b>PPA offgrid</b>                | <ul style="list-style-type: none"> <li>No grid connection</li> <li>Pricing of Renewable Assets using capture prices</li> </ul>                    |  |
| <b>PPA ongrid</b>                 | <ul style="list-style-type: none"> <li>Grid connected benchmark</li> <li>No matching constraints</li> <li>Allowed in &gt;90% RES zones</li> </ul> |  |
| <b>PPA ongrid hourly matching</b> | <ul style="list-style-type: none"> <li>Hourly Matching</li> <li>Exemption for low price hours*</li> <li>From 2030</li> </ul>                      |  |

\*Exemption applies if spot price < 0.36 \* ETS Price or < 20 €/MWh

Figure 2: Overview of scenarios and model configurations used for the evaluation of the additional costs

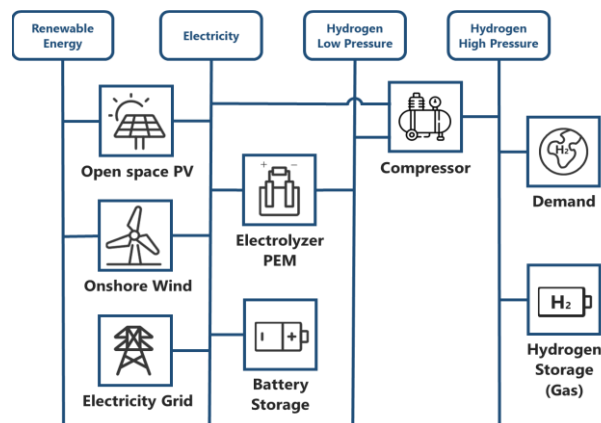


Figure 3: Model framework to assess the additional costs

The analytical framework distinguishes between off-grid and on-grid configurations as well as between different electricity pricing and matching assumptions. The scenarios used here can be summarized as follows: **"LCOE offgrid"** represents an off-grid benchmark in which renewable electricity is valued on the basis of levelized costs of electricity; **"PPA offgrid"** represents an off-grid case with capture prices for wind and solar and therefore values close to potential PPA prices; **"PPA ongrid"** represents a grid-connected case with capture prices for wind and solar, without temporal matching restrictions and the possibility for energy trading; and **"PPA ongrid hourly matching"** represents a grid-connected case in which electricity procurement must comply with hourly temporal correlation. This scenario architecture makes it possible to isolate the cost effect of individual regulatory requirements through pairwise comparison of otherwise closely related cases.

For the interpretation in this discussion paper, the difference between the average of the results of all regions per country of **"PPA ongrid hourly matching"** and **"PPA ongrid"** is understood as the additional cost caused by temporal correlation. Analogously, the difference between **"PPA offgrid"** and **"LCOE offgrid"** is interpreted as the additional cost associated with additionality. This does not imply that the model captures every real-world effect of the regulatory requirements in full detail; rather, these scenario differences provide a pragmatic approximation of the incremental cost burden attributable to the respective criteria within the model framework.

It should be noted that, while the present methodology allows an isolated assessment of the additional costs associated with the two criteria, these costs cannot be added up because they are derived with the help of two different baseline scenarios.

## 2.2 Cost Effects of Temporal Correlation

The results for the hydrogen production costs in the **"PPA ongrid"** scenario and the additional costs associated with the temporal correlation criterion are shown in Figure 4. The analysis covers all countries in which the share of renewable electricity generation is below 90 %, based on Eurostat data (eurostat, 2026).

First of all, it should be noted that the baseline scenario already exhibits very large differences in hydrogen production costs, ranging from 4.30 €/kg H<sub>2</sub> in Ireland to 13.56 €/kg H<sub>2</sub> in Romania. The key drivers here are the market values of renewable energy,

which tend to be high in countries with a comparatively low penetration of wind and solar and vice versa.

Depending on the country, the additional costs associated with temporal correlation range from 0.21 €/kg H<sub>2</sub> in Ireland to 2.11 €/kg H<sub>2</sub> in Slovenia. As a general observation, countries with high hydrogen production costs also tend to exhibit high absolute additional costs. The relative increase in costs ranges from 5 % to 18 % and also tends to be higher in countries with higher baseline production costs.

The cross-country pattern indicates that the cost effect of hourly temporal correlation is driven by the interaction of renewable resource quality, generation profiles, electricity market conditions and the flexibility value of grid access in the baseline case. Countries such as Ireland, which combine favorable wind conditions with comparatively stable full-load-hour profiles, can align electrolyzer consumption and renewable generation more easily and therefore face only limited additional costs from hourly matching. In these locations, the renewable portfolio already provides a relatively good fit for hydrogen production, reducing the need for extensive overbuild or storage.

By contrast, the additional costs increase in countries where renewable availability is less well aligned with demand, where solar-dominated profiles create stronger intraday mismatches, or where the unrestricted on-grid case benefits more strongly from market-based optimization and electricity trading. In such settings, hourly matching reduces the possibility to procure electricity flexibly across time and shifts the system towards more capital-intensive

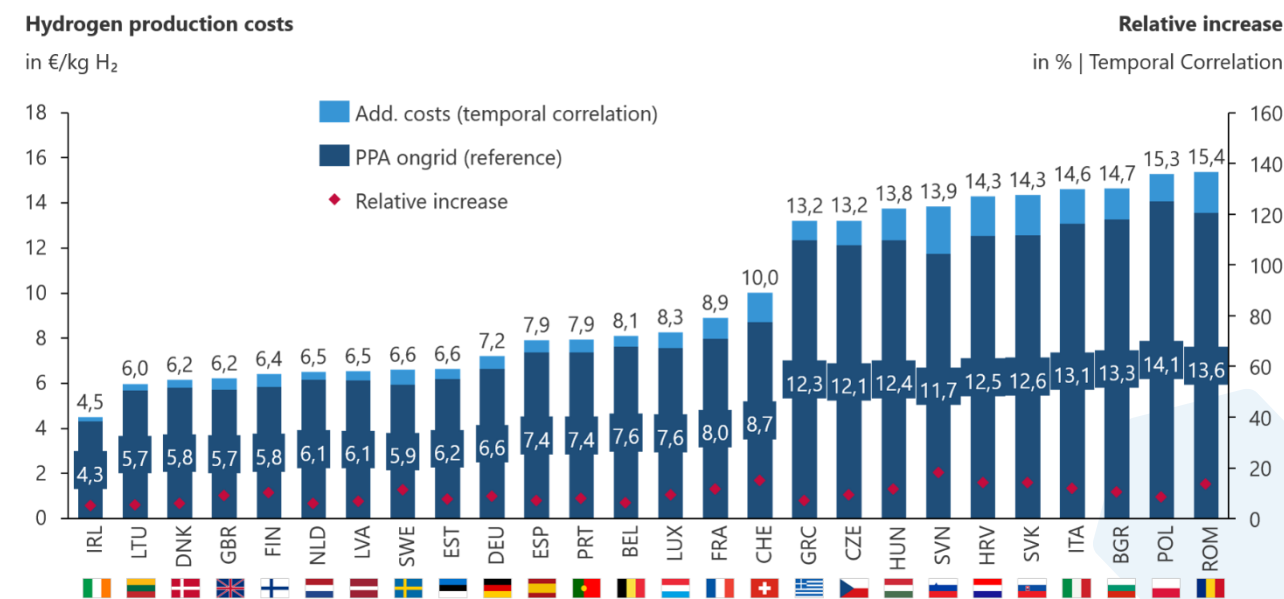


Figure 4: Hydrogen production costs with and without additional costs due to temporal correlation

configurations. This typically implies higher dedicated renewable capacities, additional storage, curtailed renewable output in surplus hours and lower electrolyzer utilization, all of which increase hydrogen production costs. The fact that countries with already high baseline hydrogen costs also tend to show higher absolute and relative increases suggests that temporal correlation amplifies pre-existing structural disadvantages rather than affecting all locations evenly. In economic terms, the requirement is therefore least burdensome in already favorable production regions, while it further amplifies existing differences in renewable resources and market conditions. From a policy perspective, this uneven impact is relevant because a uniform regulatory rule translates into very different effective burdens across Member States and may therefore influence where RFNBO projects are realized in practice.

## 2.3 Cost Effects of Additionality

The results for the hydrogen production costs in the "LCOE offgrid" scenario and the additional costs associated with the additionality criterion are shown in Figure 5. This analysis covers all countries in which the share of renewable electricity generation is below 90 % (eurostat, 2026) and the Greenhouse Gas emission factor of the electricity production is higher than 64.8 g CO<sub>2</sub>eq/kWh, based on JRC data (JRC, 2026).

In contrast to temporal correlation, the cost effect of additionality is measured here as the difference between an off-grid benchmark with levelized renewable electricity costs and an off-grid case in which renewable electricity is valued at capture-price-based

PPA levels. The figure indicates that the baseline hydrogen production costs already differ substantially across countries and that the additional cost associated with additionality is positive in all cases, but varies considerably in magnitude.

The cross-country pattern suggests that the cost effect of additionality is driven above all by the difference between physical renewable generation costs and the market value of renewable electricity available through PPAs. Where capture prices are close to underlying generation costs, the incremental burden of sourcing electricity from newly built renewable assets remains comparatively limited. Where capture prices are substantially higher than the corresponding levelized costs, however, the additionality requirement translates into a noticeably larger cost premium for hydrogen production. In economic terms, the criterion therefore reflects not only the cost of building new renewable capacity, but also the opportunity cost of securing exclusive access to that electricity under market conditions.

This differs conceptually from temporal correlation. While hourly matching mainly affects operational flexibility, additionality changes the valuation basis of renewable electricity procurement itself. As a result, countries with favorable renewable resources do not automatically face the lowest incremental costs if these resources are already strongly valued in the power market. Conversely, countries with higher technical generation costs may still show a moderate additionality effect, if the spread between LCOE-based and capture-price-based valuation remains limited. The figure therefore points to an important distinction: the burden is a market-value question and not

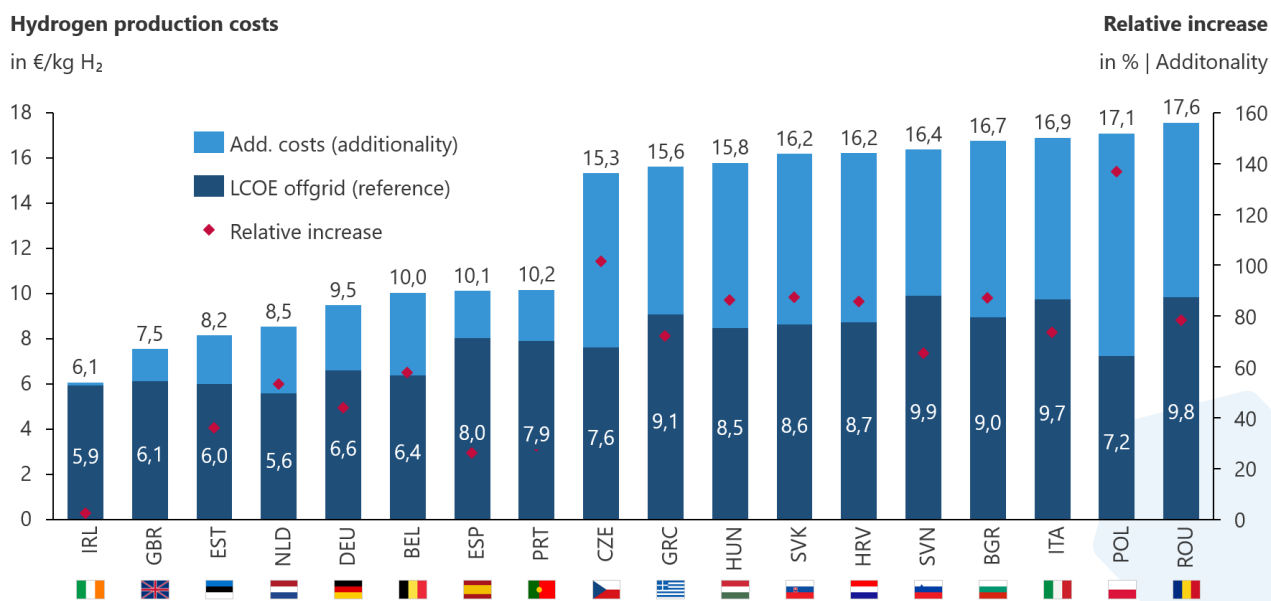


Figure 5: Hydrogen production costs with and without additional costs due to additionality

solely a resource question. It depends on how scarce attractive renewable generation is in the respective electricity system and how strongly competing demand or market conditions drive up the value of new renewable output.

From a hydrogen market perspective, this means that additionality tends to reinforce differences in project economics across locations, but through a mechanism different from that of temporal correlation. It primarily increases the cost of renewable electricity procurement rather than constraining dispatch hour by hour. For project developers, this raises the relevance of long-term PPA design, renewable asset availability and local market conditions. For policymakers, the results underline that a uniform additionality rule can generate heterogeneous effects across Member States depending on renewable market structures and capture-price dynamics. In practice, this may influence where RFNBO projects are most likely to be realized and whether some locations face structurally weaker business cases despite comparable decarbonization ambitions. Overall, the results indicate that additionality contributes a material cost component to green hydrogen production and that its impact should be assessed not only from the perspective of environmental integrity, but also with regard to regional competitiveness and the pace of market ramp-up.

## 2.4 Interpretation and Key Cost Drivers

Taken together, the results show that the RFNBO electricity criteria affect hydrogen costs through two different mechanisms.

**Temporal correlation** mainly increases costs by limiting operational flexibility: it requires closer alignment between renewable generation and electrolyzer consumption and therefore raises the need for balancing options such as storage, renewable overbuild and higher system coordination. The most important drivers are renewable generation profiles, the wind-solar mix, the value of grid interaction in the baseline case and the resulting electrolyzer utilization. Countries with stable wind-based profiles tend to be less affected, while more volatile systems face higher cost increases.

**Additionality**, by contrast, affects costs mainly through the valuation of electricity procurement rather than dispatch restrictions. In the modelling framework, its effect is approximated by the spread between levelized renewable generation costs and capture-price-based PPA valuations. The decisive

driver is therefore the market premium on renewable electricity, which reflects not only resource quality but also scarcity and competition in the respective power market. This explains why additionality can lead to substantial cost increases even in otherwise favorable locations.

A key overall insight is that **additionality leads to higher cost increases than temporal correlation in most countries**. This is plausible because additionality changes the underlying price basis of renewable electricity procurement itself and thereby affects every unit of electricity used for hydrogen production. Temporal correlation, in contrast, mainly adds a flexibility constraint to an already existing procurement option. While this operational restriction can still be material, especially in systems with poor profile alignment, its effect is often smaller than the cost premium resulting from having to rely on newly built renewable capacity valued at PPA capture prices instead of levelized generation costs.

In other words, temporal correlation increases costs mainly by making hydrogen production less flexible, whereas additionality increases costs by making renewable electricity itself more expensive. Both criteria therefore reinforce existing regional differences in hydrogen economics, but additionality appears to be the more powerful driver in the majority of cases considered here.

For the broader policy debate, this distinction is important: if the objective is to reduce barriers for the early market ramp-up of green hydrogen while maintaining environmental integrity, the results suggest that the design and timing of additionality requirements may be at least as relevant as, and in many cases even more relevant than, the transition from monthly to hourly temporal correlation.

## 2.5 Limitations and Implications

The results presented above should be interpreted as a structured approximation of the cost effects of RFNBO electricity criteria rather than as a precise forecast of future project economics.

A first limitation concerns the modelling of **additionality**. In the analytical framework, the benchmark case values renewable electricity on the basis of LCOE, while the additionality case uses capture-price-based PPA valuations. This provides a transparent way to isolate the cost impact of sourcing electricity from newly built renewable assets, but it may overstate the incremental burden in some contexts. In practice,

even existing or unsubsidized renewable plants may have the option to market electricity directly and therefore realize prices above pure generation costs. As a result, the true cost difference between a benchmark procurement option and an additionality-compliant PPA may be smaller than suggested by the stylized comparison used here.

A second limitation relates to the modelling of **grid-connected procurement**. In the on-grid cases, the model allows electricity trading, including the sale of electricity in certain hours, because this can be economically rational in an optimization framework. In reality, however, not every electrolyzer operator will pursue such strategies to the same extent, as they require commercial capabilities, risk management and a willingness to accept higher market exposure. This means that the baseline value of unrestricted grid interaction may be somewhat lower in practice than in the model, and the additional costs of hourly temporal correlation could therefore differ from the values shown here. Another important limitation is that the optimization outcome also depends strongly on the assumed **demand profile**. In the present set-up, hydrogen demand is modelled as constant over time. In practice, however, it is at least possible, that the demand is flexible and could be shifted to hours with more favorable renewable availability or electricity prices. Depending on the degree and basis of this flexibility, the additional costs associated with temporal correlation could therefore be lower than shown here, but in some cases also higher if demand flexibility is limited or poorly aligned with renewable generation patterns. More broadly, all calculations refer to the year **2030** and thus to one specific scenario for renewable deployment, electricity market design and capture-price formation. Since market values for wind and solar depend strongly on the future power mix of each country, the cross-country cost effects are sensitive to broader system developments. In addition, while the input database used by FfE is generally robust, data quality and granularity differ across countries, which can affect the precision of country-level comparisons.

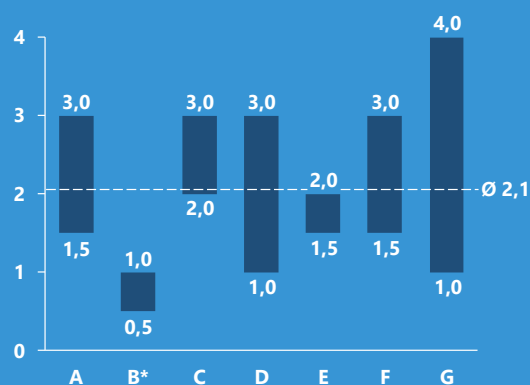
These limitations do not invalidate the central finding that both criteria create relevant additional costs and that additionality tends to be the stronger driver in many countries. They do, however, imply that the results should be read primarily as an indicator of relative mechanisms and orders of magnitude. For policy-makers, this means that the analysis is most useful for understanding where and why regulatory design creates cost pressure, rather than for deriving exact future hydrogen prices. For project developers, the findings underline that local market conditions, procurement strategies and regulatory details will remain decisive for the actual business case.

### 3 Practical Insights from Participants of the Cooperation Forum Electrolysis

This section presents the perspectives of companies participating in the Cooperation Forum Electrolysis on the RFNBO electricity sourcing criteria. In particular, it summarizes assessments of the additional costs associated with these requirements, highlights aspects perceived as particularly critical in practice and outlines expected implications of potential adjustments to the regulatory framework.

From the perspective of companies participating in the Cooperation Forum Electrolysis, the electricity sourcing criteria also lead to additional costs in hydrogen production under real-world conditions. Based on participant assessments, the average additional cost is close to 2.1 €/kg H<sub>2</sub>, with reported ranges spanning 0.5 to 4.0 €/kg H<sub>2</sub> and reported averages spanning 0.75 to 3.0 €/kg H<sub>2</sub>.

Estimated Additional Costs of RFNBO Electricity Criteria Based on Participant Assessments in €/kg H<sub>2</sub>



\* only monthly correlation considered

#### 3.1 Critical Aspects of RFNBO Electricity Criteria

The requirements for **additionality** and **temporal correlation** are widely identified as particularly critical elements of the current RFNBO electricity sourcing framework. Both criteria affect project economics by reducing the operational flexibility of electrolyzers and constraining electricity procurement strategies.

**Additionality** is widely perceived as a key structural constraint on electricity sourcing for RFNBO-compliant hydrogen. By linking hydrogen production to newly built renewable assets, it systematically limits the use of existing renewable generation, including in particular **subsidy-expired installations** that are otherwise available in the market. As a result, potentially cost-efficient electricity sources cannot be utilized, even where they would be compatible with overall system decarbonization. At the same time, identifying and securing suitable new renewable assets that meet the regulatory criteria is described as complex and time-consuming, which can delay project development and reduce planning certainty. In addition, the requirement constrains the implementation of diversified or multi-source procurement strategies, as electricity sourcing must be tied to specific assets and contractual arrangements. In combination, these factors reduce procurement flexibility and contribute to higher hydrogen production costs.

**Temporal correlation**, particularly in the transition to hourly matching, is seen as a key factor affecting the utilization of electrolyzers and the associated cost structure of hydrogen production. By restricting electricity consumption to periods with simultaneous renewable generation, it reduces achievable full-load hours and limits economically efficient plant operation. To compensate for this effect, project configurations often rely on **over-contracting (over-booking)** of renewable electricity volumes, meaning that larger capacities are secured to increase the probability of sufficient simultaneous generation. While this approach can partially mitigate utilization losses, it implies that, at times, more electricity is procured than can be used for hydrogen production. The resulting excess volumes must be curtailed or otherwise managed, increasing the effective cost of electricity supply. In combination with the need for additional renewable capacity and, potentially, further flexibility options, this leads to higher capital requirements and reduced overall system efficiency.

The obligation to source grid electricity via **power purchase agreements (PPAs)** is also identified as a relevant constraint in the current framework. By tying electricity procurement to specific renewable assets and long-term contractual arrangements, it limits the ability to access short-term wholesale market

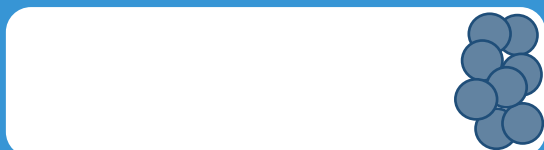
opportunities, in particular in periods of low electricity prices. As a result, hydrogen production cannot fully benefit from favorable spot market conditions and instead relies on pre-contracted electricity volumes that may be priced above short-term market levels. This reduces procurement flexibility and contributes to higher effective electricity costs, thereby reinforcing the overall cost impact of the RFNBO electricity sourcing criteria.

### 3.2 Perceived Implications of Adjusting RFNBO Electricity Criteria

The participants of the Cooperation Forum Electrolysis widely emphasize the need for targeted **adjustments** to the regulatory framework, or, alternatively, for an **extension of existing transitional periods**. Such measures are considered necessary to improve project viability by reducing the costs of producing green hydrogen.

Greater flexibility in the regulatory framework is expected to **improve the economic viability** and implementation dynamics of hydrogen projects. In particular, adjustments to additionality and temporal correlation are seen as enabling higher electrolyzer utilization and lower production costs. This is associated with shorter project development timelines, an increased likelihood of successful project realization and a stronger investment case overall. At the same time, participants emphasize that the objective is not to weaken fundamental design elements of the framework, but rather to **simplify and clarify the regulatory requirements**, reduce existing uncertainties and provide a more reliable basis for investment decisions.

**"Should RFNBO Electricity Criteria be adjusted as part of the review?"**



No, ...

Neutral

Yes, ...

... a potentially lengthy adjustment process would create new uncertainties. The industry can live with the existing framework despite the challenges.

... the existing regulations must be adapted or, alternatively, transitional periods must be extended to enable viable business models.

## 4 Positions of Policymakers and Industry Associations in the Ongoing Review of RFNBO Production Criteria

Positions of stakeholders highlight that, while the current RFNBO criteria ensure environmental integrity, they are increasingly perceived as a constraint on the timely ramp-up of the hydrogen market. The ongoing review therefore focuses in particular on the balance between regulatory stringency, economic feasibility and system integration.

Different stakeholders have provided input to the ongoing review of the RFNBO electricity sourcing criteria. While there is broad agreement on the importance of accelerating hydrogen deployment to meet climate and industrial policy objectives, views diverge on how the existing framework should be adapted.

In particular, the requirements on **additionality** and **temporal correlation** are widely discussed with regard to their impact on production costs, investment conditions and system integration. The following sections summarize selected positions from policymakers and industry associations, illustrating key lines of argument in the current debate.

### 4.1 Joint Letter by Germany, Spain, the Netherlands, Poland and Austria

In a joint letter to the European Commission by several Member States (Austrian Ministry for Economy, Energy and Tourism, German Ministry for Economic Affairs and Energy, Dutch Ministry of Economic Affairs, Polish Ministry of Climate and Environment, & Spanish Ministry for the Ecological Transition, 2026), the current RFNBO criteria are identified as a **key barrier to the market ramp-up** of renewable hydrogen. The signatories emphasize that, despite substantial policy support, the hydrogen market is not developing at the required pace, with delayed investment decisions, limited contract activity and high production costs.

From their perspective, the existing framework does not sufficiently reflect current economic realities. In particular, they highlight that the combination of regulatory requirements and market conditions results in

**prohibitively high production costs** and slows down project development.

Against this backdrop, the letter calls for a timely and targeted revision of the Delegated Act, with the objective of accelerating the hydrogen market ramp-up while maintaining the overall climate ambition.

#### Key proposed adjustments include:

- Extending the **transitional phase** for **additionality** requirements, including an extension **until 2035** and maintaining grandfathering provisions for early projects.
- Increasing flexibility in **temporal correlation** by extending the use of **monthly correlation until at least 2035** and assessing a continuation beyond that period.
- Assessing a **reduction of the threshold for exemptions** in high-renewable electricity systems (currently set at 90 %), thereby extending the applicability of the exemption regime.

At the same time, the signatories underline the importance of a focused revision **without reopening the entire regulatory framework**, in order to avoid additional uncertainty for ongoing projects and investment decisions.

### 4.2 Position Paper of the German Association of Energy and Water Industries (BDEW)

The position paper by the German Association of Energy and Water Industries (BDEW) similarly identifies the current RFNBO electricity sourcing criteria as a **major constraint on hydrogen market development**, particularly due to the requirements on additionality and hourly temporal correlation (BDEW, 2026).

According to the association, these requirements lead to **significant increases in hydrogen production costs**, limit operational flexibility and restrict the system-supportive use of renewable electricity.

In quantitative terms, the **additional costs** are estimated at up to **2.40 €/kg of hydrogen** under current conditions.

The BDEW therefore argues for a more flexible and investment-oriented regulatory design, which better reflects current market conditions and supports the early phase of the hydrogen ramp-up.

**Key proposed adjustments include:**

- Extending the **transitional phase** for **additionality** requirements by postponing their full application to **2035**.
- **Maintaining monthly temporal correlation** by avoiding the introduction of hourly matching from 2030 or postponing it to 2035.
- **Reducing the threshold for exemptions** from electricity sourcing criteria **from 90 % to 80 %** renewable share.
- **Increasing flexibility in CO<sub>2</sub> accounting and electricity sourcing**, including more granular approaches to reflect system conditions.

Overall, the BDEW emphasizes that a **more pragmatic and flexible approach** would reduce production costs, improve system integration and strengthen competitiveness, while still supporting the overarching goal of decarbonization.

## 5 About the Cooperation Forums Initiative

Explaining rather than demanding.  
Finding solutions together.  
Strengthening the economic location.

Guided by this principle, **more than 120 companies** from key sectors as well as the energy industry are working together on practical solutions for grid connection and grid integration. Grid connections are becoming a bottleneck for industrial transformation and new applications. Delays and a lack of transparency have a direct impact on investment decisions and on the competitiveness of Germany as a business location.

In five separate cooperation forums, the issue of grid-connection bottlenecks and other fields of action related to increasing electrification are addressed:

- Cooperation Forum on Large-Scale **Battery Storage**,
- Cooperation Forum on the Electrification of **Logistics**,
- Cooperation Forum on the Electrification of **Industry**,
- Cooperation Forum on **Electrolysis**,
- Cooperation Forum on **Data Centres**.

The cooperation forums are complemented by an overarching cross-cutting forum involving **transmission and distribution system operators** on a selective basis.

For each identified field of action, the cooperation forums offer a protected space for **structured exchange**, objective discussion and the joint development of solutions. These are **scientifically supported** by in-depth analyses of current challenges. The **solution components developed jointly** are therefore both practical and capable of attracting consensus.

### CROSS-CUTTING FORMAT: TRANSMISSION AND DISTRIBUTION GRIDS

Large-Scale Battery  
Storage



Electrification of  
Industry



Electrolysis



Electrification of  
Logistics



Data  
Centres



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