



POLICY BRIEF: RECOMMENDATIONS FOR RENEWABLE HYDROGEN CERTIFICATION IN UKRAINE

Summary of key project results from the “German-Ukrainian Research Cooperation on the Certification of Green Hydrogen” (GerUCCHy)

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1 EXECUTIVE SUMMARY

Ukraine possesses significant potential to become a major exporter of renewable hydrogen to the European Union. Realising this potential requires the establishment of a credible, internationally recognised hydrogen certification system – a prerequisite for market access and investor confidence. The German-Ukrainian Research Cooperation on the Certification of Green Hydrogen (GerUCCHy), a joint project of Hamburg Institut Research (HIR) and the Institute of Renewable Energy (IRE) at the National Academy of Sciences of Ukraine, has produced science-based recommendations to support this process.

The EU regulatory framework establishes two different verification contexts for green gases such as green hydrogen: gas disclosure (based on Guarantees of Origin as tracking instrument for voluntary markets) and target accounting (based on Proofs of Sustainability to certify compliance with criteria allowing access to compliance markets). In the short term, Ukraine should prioritise enabling EU exports of renewable hydrogen that can be counted towards the EU's renewable energy targets. To make this possible, Ukraine should focus on the direct use of the EU's Union Database (in the short term without a national registry) and cooperate with international voluntary certification schemes to issue Proofs of Sustainability. Over the medium to long term, a national multi-purpose hydrogen registry – integrating both Guarantees of Origin and Proof of Sustainability – should be developed to serve both purposes (gas disclosure and target accounting). As part of the eventual establishment of a national registry, consideration should be given to integrating extended sustainability criteria that go beyond current EU requirements and are of particular relevance within the specific Ukrainian context.

2 BACKGROUND & PROJECT DESCRIPTION

Ukraine's Renewable Hydrogen Opportunity

European demand for imported renewable hydrogen and hydrogen derivatives is projected to grow substantially, driven by the need to decarbonise hard-to-electrify sectors such as heavy industry, aviation, and maritime transport. Ukraine is well-positioned to meet a significant share of this demand: it holds considerable renewable energy potential, an extensive gas pipeline and storage infrastructure, and existing energy partnerships with the EU and Germany.

At the same time, Russia's full-scale invasion of Ukraine since 2022 has severely damaged the country's energy infrastructure, forcing a strategic reorientation towards renewable energy and green technologies. This context makes the development of a renewable hydrogen economy not only an economic opportunity but a strategic response. European demand and investment are critical to realising this potential.

To access EU hydrogen markets, Ukraine must establish an internationally recognised certification system – one that ensures the environmental integrity of its hydrogen, supports market development, and facilitates trade between the EU and Ukraine.

The GerUCCHy Research Cooperation

The German-Ukrainian Research Cooperation on the Certification of Green Hydrogen (GerUCCHy) was established to provide science-based support for the development of a hydrogen certification system in Ukraine. The project is a partnership between:

- Hamburg Institut Research gGmbH (HIR)
- Institute of Renewable Energy (IRE) at the National Academy of Sciences of Ukraine

The project was funded by the German Federal Ministry of Research, Technology and Space (BMFTR) and ran from August 2024 to July 2026. Key activities included:

- Analysis of the fundamentals of tracking approaches for renewable energy and hydrogen
- Stocktaking of regulatory and market development of renewables and hydrogen in Ukraine
- Analysis of Ukraine's existing electricity tracking system and its adjustment needs for renewable hydrogen certification
- Recommendations for designing a tracking system for renewable hydrogen in Ukraine
- Examination of extended sustainability criteria for renewable hydrogen in the Ukrainian context

Project reports and presentations are available online: <https://www.hamburg-institut.com/en/services/guarantees-of-origin/research-cooperation-gerucchy/> or <https://www.ive.org.ua/language/en/german-ukrainian-scientific-cooperation-on-green-hydrogen-certification/>

3 REGULATORY FRAMEWORK CONDITIONS FOR RENEWABLE HYDROGEN CERTIFICATION IN THE EU

Two Verification Contexts for Green Gases

The main purposes of hydrogen tracking and certification are to provide transparency on product attributes to consumers (e.g. the origin from renewable energy sources), exclude double counting, enhance credibility and trust, demonstrate adherence to policy requirements and market standards, as well as facilitating trade. Within this broad scope, the EU regulatory framework differentiates between two distinct verification contexts for green gases, each serving a distinct purpose and market:

- Target accounting includes the accounting for national contributions to EU's renewable energy targets, as well as the proof of renewable inputs for instruments such as the European Emissions Trading System (EU ETS), Carbon Border Adjustment Mechanism (CBAM) and national support schemes.
- Gas disclosure to customers (e.g. informing on the share of renewable gases in gas supply) and voluntary markets for green gas products. Disclosure information, backed by tracking instruments which prevent double counting of green attributes, is also an important basis for sustainability reporting of companies.

Gas Disclosure: Guarantees of Origin (GOs)

Gas disclosure, governed by the Gas and Hydrogen Markets Directive (EU) 2024/1788 and the Renewable Energy Directive (EU) 2018/2001, last amended by Directive (EU) 2024/1711, obliges gas suppliers to inform final customers of the share of renewable and low-carbon gases in their supply. This is substantiated through Guarantees of Origin (GOs), issued and cancelled in state-appointed registries. Compliance with the stricter RFNBO criteria (see below) is not mandatory for disclosure purposes. The Book & Claim approach allows GOs to be traded independently from the physical energy commodity, provided that cancelled GOs correspond to the relevant grid characteristics (with a differentiation e.g. between pure hydrogen grids and blending in gas grids).

Target Accounting: Proof of Sustainability (PoS)

Target accounting, governed by the Renewable Energy Directive (EU) 2018/2001, last amended by Directive (EU) 2024/1711, requires that hydrogen qualifies as a Renewable Fuel of Non-Biological Origin (RFNBO) to count towards EU renewable energy targets. Key RFNBO criteria are defined by the Delegated Acts 2023/1184 and 2023/1185 and include:

- **Renewable electricity inputs:** proven through one of five approved scenarios (e.g. direct connection to renewable plant; grid with >90% renewable share; grid-sourced electricity meeting additionality, temporal, and geographical correlation requirements)
- **GHG emission savings:** a lifecycle greenhouse gas emission saving of at least 70% compared to a fossil fuel comparator must be demonstrated

- **Mass balancing:** certificates may only be traded together with the physical energy commodity; tracking of transactions and sustainability characteristics across the entire supply chain is required

Certification requirements for target accounting are considerably stricter than for disclosure – but the associated price premiums make compliance markets significantly more attractive for exporters than voluntary markets.

Close coordination is required between the issuance, transfer and cancellation of PoS and GO to exclude double counting of green attributes. For this purpose, data on transactions, sustainability characteristics, and GHG emissions of all liquid and gaseous renewable fuels which are to be counted towards EU targets will need to be entered into the EU's own Union Database (UDB), where GOs and PoS for the same gas delivery will be coupled. To date, however, the UDB is not fully operational yet with regard to RFNBO tracking.

4 FRAMEWORK CONDITIONS FOR RENEWABLE HYDROGEN PRODUCTION AND TRADE IN UKRAINE

Renewable Energy and Hydrogen Potential

Ukraine holds substantial renewable energy resources, particularly solar and wind power. Research by the IRE identifies the southeastern regions as having the greatest potential for large-scale renewable hydrogen production, based on an optimal balance between renewable energy potential and water resource availability. However, a significant share of existing renewable energy installations is located in currently occupied territories – a relevant constraint on near-term production.

Hydrogen Policy and Regulatory Status

A Draft Hydrogen Strategy of Ukraine until 2050, developed by a group of experts created by the Ministry of Energy, was submitted to the government in 2024, but is still pending approval. The strategy outlines three implementation phases: (1) enabling – establishing a regulatory framework and certification system; (2) industry formation – pilot projects and the start of exports; (3) sustainable development – targeting 10 GW of electrolysis capacity by 2050. Crucially, **Ukrainian legislation currently provides no regulatory framework** for the production, transportation, storage, and use of hydrogen.

Export Infrastructure and International Cooperation

The most promising way of hydrogen transportation is integration into Ukraine's existing Gas Transmission System (GTS). The *Central European Hydrogen Corridor* project – involving Ukraine, Slovakia, the Czech Republic, Austria, and Germany, with European Commission support – aims to transform the GTS for hydrogen transport. Ukraine's primary export destination is the EU, underpinned by a 2023 Memorandum of Understanding on strategic partnership regarding biomethane, hydrogen, and other synthetic gases.

Status of Certification Infrastructure

Ukraine has already established certification systems for electricity and biomethane:

- The electricity Guarantees of Origin registry is operational since 2024, managed by the National Energy and Utilities Regulatory Commission (NEURC)
- Ukraine has joined the Association of Issuing Bodies (AIB) and is an applicant to the European Energy Certificate System (EECS)
- The biomethane registry became operational in February 2026, managed by the State Agency for Energy Efficiency and Energy Saving (SAEES)

A hydrogen verification and tracking system remains at a conceptual stage, as the necessary legal framework is still at a drafting stage.

5 RECOMMENDATIONS FOR THE DESIGN OF A CERTIFICATION SYSTEM IN UKRAINE

The Case for a Multi-Purpose Certificate System

The certification and tracking system needs to cover the entire hydrogen value chain – from renewable electricity production, through hydrogen production and transport (pure or as a derivative), to end-use applications. The final GerUCCHy project report contains the analysis of key building blocks of a hydrogen tracking system and implementation recommendations. The focus of this policy brief lies on recommendations relating to overarching design principles of the certification system in Ukraine.

A key implication of the dual EU regulatory framework for green gases is that in the medium to long term, Ukraine's hydrogen certification system should serve both verification contexts – target accounting based on PoS and disclosure based on GOs. EU member states face the same issue as Ukraine in setting up new renewable gas GO registries and RFNBO PoS registries in coordination with existing PoS registries for biomethane. First examples of multi-purpose certificates integrating both instruments are being implemented in individual EU Member States (e.g. Estonia, Czech Republic). Ukraine should adopt this integrated approach when setting up a national certification system to minimise administrative costs and prevent double counting. For exports to the EU market, close coordination and interfaces are required with the UDB, into which both PoS and GOs associated with hydrogen deliveries need to be transferred.

Background: Verification of compliance with RFNBO requirements

Compliance with the RFNBO requirements must be demonstrated through internationally recognised voluntary certification schemes (e.g. ISCC EU, REDcert-EU, CertifHy EU RFNBO Scheme) which issue PoS as formal confirmation. These schemes define principles for RFNBO production, such as rules for electricity input, GHG emission calculation methodology, traceability requirements which are based on the EU RFNBO regulations from Renewable Energy Directive and the Delegated Acts 2023/1184 and 2023/1185.

For hydrogen to qualify as RFNBO under EU regulations, the electricity used in its production must be fully renewable. For electricity to qualify as fully renewable it must follow one of five approved input scenarios. Under the current Ukrainian grid configuration and regulatory context, two scenarios are the most feasible options for domestic hydrogen producers: electricity via direct connection to a renewable energy plant or grid-sourced electricity meeting additionality, temporal, and geographical correlation requirements.

As part of the “AccelerateEU” Plan the European Commission announced in April 2026 a review of the production criteria for renewable hydrogen, to respond to the slower than expected ramp up of the hydrogen market. Any resulting adjustment to the RFNBO criteria should be closely monitored by Ukraine.

Special challenges for Ukraine with regard to the RFNBO criteria include: war-related damage to electricity infrastructure disrupting reliable renewable energy generation and transmission; high geopolitical risk deterring investors; an electricity mix still substantially determined by fossil fuels; lack of regulatory framework on hydrogen; and the additional complexity of Ukraine's non-EU status, which creates barriers to mutual recognition and cross-border trade.

Registry Implementation Options

There are several options available to Ukraine for setting up a hydrogen certification system:

Option 1 – National Renewable Hydrogen Registry: A dedicated national registry for RFNBOs and other renewable hydrogen production pathways (e.g. based on biomass). This would allow combining PoS (target accounting) and GOs (disclosure to final customers) in one registry. The national registry would need to provide

the necessary interfaces to certification bodies and the UDB. It covers both domestic use and exports to any region and provides national authorities with direct oversight of production and transaction data. However, it adds a layer of administrative complexity and requires close coordination with the UDB.

Option 2 – Integration of Renewable Hydrogen into Existing National Registries: Expanding the scope of the existing electricity GO registry (NEURC) or the biomethane registry (SAEES) to include hydrogen GOs and RFNBO verification (PoS). This makes use of existing structures and reduces implementation efforts.

Option 3 – Direct Use of the EU Union Database (UDB): Handling certification and verification entirely through the UDB (once fully operational), in conjunction with international voluntary certification schemes. This offers high compatibility with EU regulation, low implementation costs, and can be implemented in the short term. Its limitations include no coverage of domestic renewable hydrogen use and exports to non-EU regions, as well as limited data sovereignty for Ukrainian authorities.

The Role of the Electricity GO Registry in RFNBO Certification

The existing electricity GO registry can play an important role in reducing the administrative burden of RFNBO criteria verification. Mandatory GO attributes (per EN 16325 and EECS rules) already support verification of additionality (operation dates and support status of renewable electricity installations), temporal correlation (production month), and geographical correlation (location of installations). Optional GO attributes could further support demonstration of hourly temporal correlation and the existence of Power Purchase Agreements (PPAs).

Priority action: The electricity GO registry must support timely electricity GO cancellation for inputs into RFNBO production to prevent double counting. When establishing a national renewable hydrogen registry, an interface should be created with the electricity GO registry to enable an electronic transfer of green attributes from cancelled electricity GOs to hydrogen GOs. Further development of the electricity GO registry to support more granular RFNBO verification should be pursued as an optimisation in the longer term.

Recommended Way Forward: A Phased Implementation Roadmap

The GerUCCHy project recommends a two-phase implementation for Ukraine's hydrogen certification system:

Short Term – Enable EU Exports and Start with Pilot Projects. The immediate priority is to establish the conditions for first renewable hydrogen exports to the EU, using existing infrastructure and international frameworks:

- **Prioritise direct use of the EU Union Database** as a transitional solution. Once the UDB is fully operational, this offers the fastest and lowest-cost route to EU market access with high regulatory compatibility.
- **Cooperate with international voluntary certification schemes** (such as ISCC, REDcert-EU, CertifHy) to issue PoS for Ukrainian hydrogen producers. Ukrainian biomethane operators are already being onboarded in the UDB via this route – the same approach should be extended to hydrogen.
- **Develop the legal framework** for hydrogen certification and disclosure in Ukraine, covering both PoS and GO instruments. This is a prerequisite for any domestic or national registry solution.
- **Clarify institutional responsibilities** by coordinating between NEURC, SAEES, and relevant ministries to determine which body will be responsible for operating the future national hydrogen registry.
- **Build institutional capacity:** use the period during which the EU regulatory framework is still consolidating to gather practical experience, train staff, and develop national expertise in hydrogen certification.

Medium to Long Term – Build a National Hydrogen Registry. Once the basic legal framework in Ukraine is in place and practical experience has been accrued, Ukraine should develop a full national hydrogen registry:

- **Establish a national multi-purpose hydrogen registry** that integrates PoS and hydrogen GOs, with a technical interface to the EU's UDB for the transfer of GOs and PoS associated with exports to the EU.
- **Enable national target accounting and disclosure** for hydrogen and other gases, ensuring that Ukraine's domestic renewable hydrogen supply can be tracked and reported in alignment with the EU framework.
- **Leverage existing registry infrastructure** – either the electricity GO registry (NEURC) or the biomethane registry (SAEES) – as a technical and institutional starting point for the hydrogen registry, in order to reduce implementation costs and build on established governance structures.
- **Further develop the electricity GO registry** to support energy carrier conversion tracking and more efficient RFNBO verification, including optional attribute fields for tracking hourly temporal correlation and PPA-based additionality.

6 EXTENDED SUSTAINABILITY CRITERIA FOR GREEN HYDROGEN

Beyond EU Compliance: The Case for Extended Criteria

EU regulation sets binding sustainability requirements for green hydrogen, focused on renewable or low-carbon origin and GHG emission thresholds. International certification systems, standard initiatives and market mechanisms (such as the Green Hydrogen Organisation's Green Hydrogen Standard 2.0) go beyond these requirements and address broader environmental, social, economic, and governance dimensions.

Broader sustainability criteria can foster positive outcomes including reduced ecological footprints, improved social welfare, and strengthened local economies. For Ukrainian producers, voluntary adoption of such standards can signal a commitment to holistic sustainability and enhance positioning in premium markets.

Recommendation for Ukraine: Three extended sustainability criteria to prioritize

The GerUCCHy project developed a three-dimensional decision matrix to prioritise extended sustainability criteria for the Ukrainian context. This results in the selection of three extended sustainability criteria recommended for priority integration when setting up a national hydrogen registry in Ukraine:

- **Water Use:** In the Ukrainian context, it is highly relevant that water use for renewable hydrogen production does not compete with reliable drinking water supply. Site selection for hydrogen plants should include an assessment of water resource availability for each individual project. Water use as a certification criterion would make sustainability benefits – such as the use of seawater desalination and wastewater – more visible and verifiable.
- **Land Use Rights:** The criterion is particularly relevant in Ukraine given that military actions have degraded and polluted large areas of agricultural land. When selecting sites for renewable hydrogen production, the interests of agricultural production must be considered. Land use rights as a certification criterion supports the definition of clear requirements for hydrogen production facilities regarding land access and rights.
- **Transparency, Accountability, and Anti-Corruption:** Large-scale investments required for hydrogen market development make robust accountability and anti-corruption standards essential for long-term sustainability. Critically, a small number of problem cases could undermine confidence in the entire Ukrainian hydrogen certification system and damage export prospects significantly. Prioritising transparency and anti-corruption standards in the certification framework is therefore recommended for risk-mitigation.

Recommended approach: A phased integration of extended sustainability criteria is advised, to avoid overburdening the market ramp-up phase. The three priority criteria above should be integrated first; further criteria (e.g. biodiversity, labour standards) can be incorporated in subsequent phases as the market matures.

7 SUMMARY OF POLICY IMPLICATIONS

Key Policy Messages

The GerUCCHy research cooperation delivers a clear set of policy messages for Ukrainian decision-makers:

- **A credible certification system is a market-access prerequisite.** Without a recognised hydrogen verification and certification system, Ukrainian renewable hydrogen can neither access EU compliance markets, where price premiums are highest, nor EU voluntary markets governed by disclosure regulations. For enabling renewable hydrogen exports, establishing such a system is a matter of priority.
- **The legal framework should be enacted as soon as possible.** The current absence of any regulatory framework for hydrogen in Ukraine is a critical barrier. Enacting the necessary legislation – covering hydrogen production, transportation, storage, use, and certification – is a first step towards developing renewable hydrogen markets.
- **Institutional coordination is essential.** The future Ukrainian registry landscape will involve multiple institutions (NEURC, SAEES, relevant ministries). Clear delineation of institutional responsibilities and robust inter-agency coordination mechanisms must be established to prevent fragmentation and duplication.
- **Ukraine should act now, using existing international frameworks.** The EU's UDB and international voluntary certification schemes provide an accessible, short-term pathway to first exports. Ukraine should not wait for a full national registry to be operational before enabling pilot projects and first commercial deliveries.
- **The EU regulatory framework will likely be adjusted – Ukraine should track it closely.** A review of RFNBO criteria is expected in Q2 2026 ("AccelerateEU" action plan). Ukraine should engage actively in the monitoring of the development of EU RFNBO criteria.
- **The integration of extended sustainability criteria should be considered.** While a phased approach is recommended, the architecture of the certification system should be designed to accommodate extended sustainability criteria. Extended sustainability criteria which are particularly relevant in the context of Ukraine should be prioritized when setting up a national registry in the medium to long term.

Conclusion

Ukraine has great potential for developing a renewable hydrogen economy – renewable energy potential, existing infrastructure, strong EU partnerships, and strategic political will. A robust, internationally compatible certification system is a key component for unlocking market access, attracting investment, and ensuring environmental integrity.

The GerUCCHy project provides a comprehensive, science-based roadmap for achieving this. The recommended two-phase implementation pathway – beginning with direct UDB connection and voluntary scheme cooperation and progressing to a national multi-purpose hydrogen registry – is pragmatic, cost-effective, and aligned with EU regulatory requirements. Its success will depend on legislative action, clear institutional coordination, and sustained engagement with EU partners.



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