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KEY BUILDING BLOCKS OF A GREEN HYDROGEN TRACKING SYSTEM IN UKRAINE

28.04.2026 | 4th Online workshop as part of the “German-Ukrainian Research Cooperation on the Certification of Green Hydrogen” (GerUCCHy) | Hamburg Institut and Institute of Renewable Energy at the National Academy of Sciences of Ukraine (IRE)

WORKSHOP AGENDA

Time	Agenda
09:30	Introduction of the German-Ukrainian Research Cooperation on the Certification of Green Hydrogen | Dr. Alexandra Styles (HIR)
09:40	Recommendations for the key building blocks of a green hydrogen tracking system in Ukraine | Timo Hoelzmann & Dr. Alexandra Styles (HIR)
10:05	Roadmap for the implementation of a green hydrogen tracking system in Ukraine | Dr. Alexandra Styles (HIR)
10:15	Questions & Discussion

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INTRODUCTION OF THE GERMAN-UKRAINIAN RESEARCH COOPERATION ON THE CERTIFICATION OF GREEN HYDROGEN

28.04.2026 | Dr. Alexandra Styles | Workshop: Key building blocks of a green hydrogen tracking system in Ukraine

ABOUT THE PROJECT

- The **“German-Ukrainian Research Cooperation on the Certification of Green Hydrogen (GerUCCHy)”** aims to provide science-based support for the development of a verification system for green hydrogen in Ukraine.
  - A cross-border, **internationally compatible hydrogen origin verification system** is an important link in the supply chain for certified green hydrogen between Ukraine and Germany and other EU countries
  - The project aims to build up the **necessary expertise** for the development and operation of such a system
- **Project duration:** June 2024 – May 2026
- **More information:** https://www.hamburg-institut.com/en/services/guarantees-of-origin/research-cooperation-gerucchy/

- The **research cooperation** is a partnership between two highly specialized, application-oriented research institutions:
  - **HIR Hamburg Institut Research gGmbH**
  - **Institute of Renewable Energy at the National Academy of Sciences of Ukraine (IRE)**
- Funding Agency: German **Federal Ministry of Research, Technology and Space (BMFTR)** within the framework of the guideline for funding international projects on the topic of green hydrogen (Funding code: 01DK24007)

With funding from the:
Federal Ministry of Research, Technology and Space

BACKGROUND

- **EU demand for imported renewable hydrogen** is forecast to be high, especially for hard to electrify sectors, such as heavy industry, aviation, and maritime transport
- EU regulation sets **rules for green hydrogen**:
  - Renewable Energy Directive (RED II/III): **targets** for renewable fuels of non-biological origin (RFNBO) in industry and transport
    - Detailed RFNBO criteria regarding renewable character of electricity inputs and required greenhouse gas (GHG) reductions => **Proof of Sustainability (PoS)**
  - RED and Gas Market Directive: suppliers must **disclose** the renewable energy share of gas supply to consumers, using **Guarantees of Origin (GOs)** for gas
    - Renewable origin of electricity inputs to hydrogen production needs to be proven by electricity GO cancellation
    - Climate accounting standards for companies as demand drivers on voluntary markets

- **Ukraine's green hydrogen opportunity:**
  - Potential to become a key trading partner for Europe
  - Current challenge: energy sector severely damaged by Russia's invasion, threatening energy security
  - Focus on renewable energy and green technologies as a strategic response
  - European demand and investment critical for developing Ukraine's green hydrogen economy
- Developing green hydrogen trade between Ukraine and Europe requires the **establishment of an internationally recognized verification and certification system:**
  - Crucial to ensuring the environmental integrity of hydrogen, supporting market development, and facilitating trade

TWO VERIFICATION SYSTEMS FOR GREEN GASES

	Gas disclosure	Target accounting
Focus	**Disclosure of gas supply to consumers**	**Accounting of renewable fuels** (bio-based, renewable fuels of non-biological origin) **towards Union targets**
Basis	RED III and the EU Gas Market Directive require the use of **Guarantees of Origin (GOs)** to track and disclose renewable gases supplied via gas or hydrogen networks	RED III formulates requirements for the sustainability of biomass, renewable properties of RFNBO, greenhouse gas savings; certification of RED III criteria also demanded by the Gas Market Directive
Type of proof	**Guarantees of origin (GOs)** with **information on energy attributes** at the time of production/grid feed-in	**Proof of Sustainability (PoS)**, plus any additional evidence required under national support schemes, as **proof of compliance with the criteria**
Chain of custody	**Book & Claim:** no coupling of attribute and energy commodity sales necessary; GOs cancelled for deliveries to end customers must correspond to the relevant grid characteristics	**Mass balancing:** certificates may only be traded together with the energy commodity; tracking of transactions and sustainability characteristics across the entire supply chain

Future coupling of GOs and PoS for the same gas delivery in the Union Database (UDB)

OVERVIEW OF THE FUTURE UKRAINIAN REGISTRY LANDSCAPE FOR RENEWABLE ENERGIES

Electricity GO registry (NEURC)

Issuance & Purpose

- **Guarantees of origin (GO)** for electricity from RES for disclosure purposes

Chain of custody

- **Book & claim**
  - no coupling of attribute and energy commodity sales necessary
  - exports beyond Ukraine depend on mutual recognition

Hydrogen registry (tbd)

Issuance & Purpose *(recommendation)*

- **Guarantees of origin (GO)** issuance for green hydrogen for disclosure purposes
- **Proof of Sustainability (PoS)** tracking for RFNBO for target accounting purposes

Chain of custody

- **Book & claim** for disclosure purposes
- **Mass balancing** for target accounting
- Recommendation: **Linkage of GO and PoS in "multi-purpose certificate"**
  - Prevents GOs and PoS for the same hydrogen quantity from being traded independently, to avoid double counting
  - Mass balancing chain of custody has to be kept for GO and linked PoS to enable RFNBO quantity to count towards targets

Biomethane registry (SAEES)

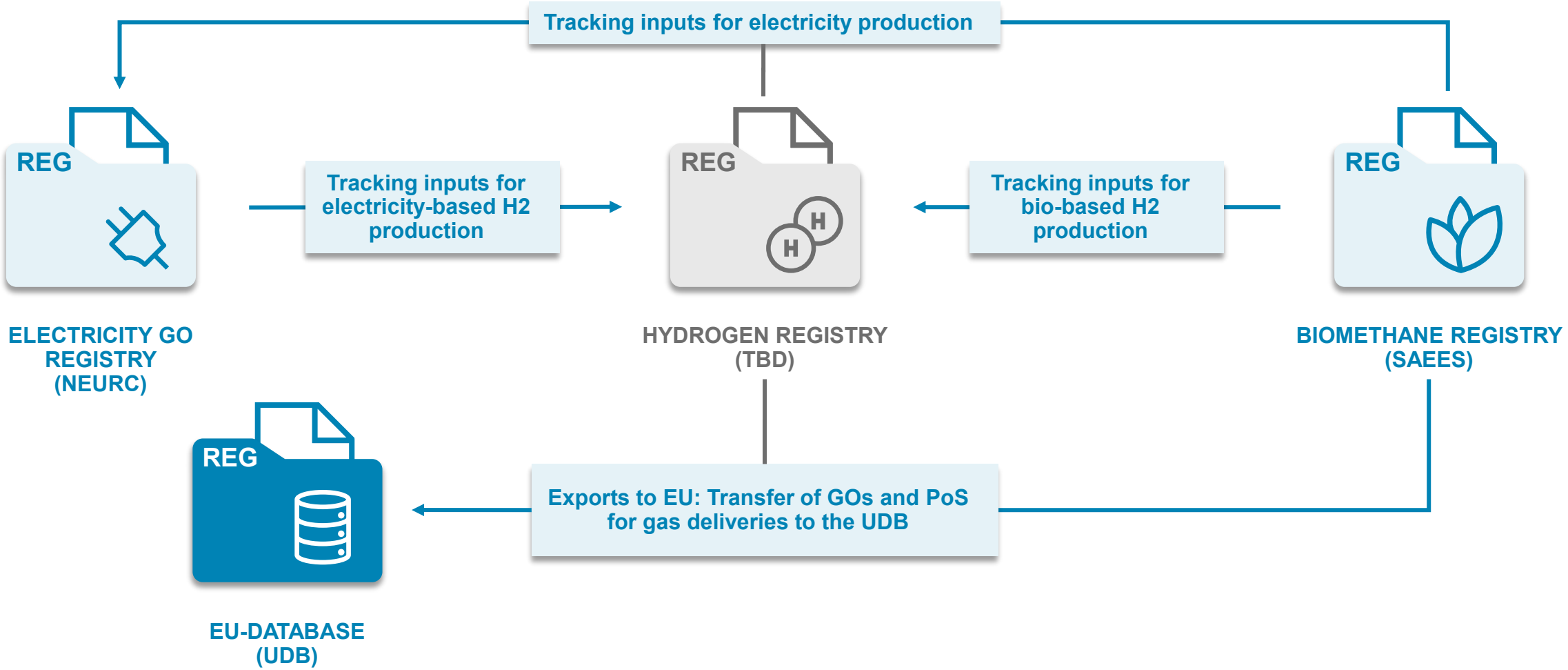
Issuance & Purpose

- **Guarantees of origin (GO)** issuance for disclosure purposes
- **Proof of Sustainability (PoS)** tracking for target accounting purposes
- PoS information used as a **basis for biomethane GO issuance**: producers must be audited under an international voluntary certification scheme concerning sustainability criteria to register in the Biomethane Registry

Chain of custody

- **Book & claim** for disclosure purposes
- **Mass balancing** for target accounting

COORDINATION NEEDS IN THE FUTURE UKRAINIAN REGISTRY LANDSCAPE FOR RENEWABLE ENERGIES



STARTING SITUATION FOR CERTIFICATION OF GREEN HYDROGEN IN UKRAINE

Status of the hydrogen economy in Ukraine

- Ukraine's hydrogen economy is still in its **infancy** (significantly shaped by the broader challenges currently facing the country)
- Ukraine possesses several **key aspects** to become a future **exporter of hydrogen** to the EU: energy partnerships with the EU, existing gas pipeline and storage infrastructure, high renewable energy potential, sufficient water availability
- Development is held back by a number of **unresolved issues**, such as: absence of guaranteed offtakers, lack of state support, high risk perception by investors, missing regulatory framework, uncertainties regarding the existing gas network, hydrogen projects in occupied territories, uncertain future domestic hydrogen demand
- Progress is experiencing **significant delays**, overall **timeline** for large-scale hydrogen deployment remains **uncertain**

Status of certification of electricity and hydrogen

- Significant progress on setting up a **Guarantees of Origin (GO) registry for electricity** from renewable energy sources and high-efficiency cogeneration units
  - Operated by the National Energy and Utilities Regulatory Commission (**NEURC**)
  - Ukraine has become a **member** of the Association of Issuing Bodies (**AIB**) and **applicant** of the European Energy Certificate System (**EECS**) Electricity Scheme
  - **Timeline** for becoming a full active member of the AIB's Electricity Scheme is still unclear
- **Biomethane registry** has become operational in February 2026, operated by the State Agency for Energy Efficiency and Energy Saving of Ukraine (**SAEES**)
- Set-up of a **hydrogen verification and tracking** system is still at a conceptual stage, because the legal framework is missing (but at drafting stage)

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RECOMMENDATIONS FOR THE KEY BUILDING BLOCKS OF A GREEN HYDROGEN TRACKING SYSTEM IN UKRAINE

28.04.2026 | Timo Hoelzmann & Dr. Alexandra Styles | Workshop: Key building blocks of a green hydrogen tracking system in Ukraine

SCOPE (TYPE OF PRODUCTS COVERED BY A CERTIFICATION SCHEME)

→ **Green hydrogen types:** Classification based on energy input and production pathway: Renewable, low-carbon, and fossil-based hydrogen (color taxonomy)

Renewable Hydrogen

Electricity-based hydrogen produced via electrolysis using renewable electricity, as well as hydrogen generated as a by-product of chlor-alkali electrolysis and biomass-based hydrogen.

Key Distinction regarding biomass as energy input:

- EU Hydrogen Strategy includes biomass-based input energy
- RFNBO term explicitly excludes biomass-based input energy

→ One central question for Ukraine's green hydrogen certification is the inclusion of biomass-based input energy

Low-carbon Hydrogen

Hydrogen from non-renewable sources which meets the GHG emission reduction threshold of 70% compared to a conventional fossil-fuel based benchmark.

- Technologies covered under the 70% GHG savings threshold:
  - Blue hydrogen from natural gas with carbon capture and storage (CCS)
  - Hydrogen using grid electricity (provided grid emissions are sufficiently low)
  - Hydrogen from methane pyrolysis
  - Nuclear-based hydrogen (pink hydrogen): specific EU methodology will follow soon

→ Another question for Ukraine's green hydrogen certification is the inclusion of low-carbon hydrogen products

RECOMMENDATIONS FOR DEFINING THE SCOPE IN CERTIFICATION SYSTEM IN UKRAINE

→ To achieve **maximum alignment with EU strategy and requirements**, the following recommendations are proposed for the scope of the certification system:

- **Fossil-based hydrogen** should **not** fall within the scope of the certification system
- **Renewable hydrogen** should be **prioritised**, with coverage of all relevant production pathways, including biomass-based hydrogen production (given the strong agricultural sector in Ukraine)
- Within the certification system in Ukraine a clear distinction is required between:
  - Renewable hydrogen within the RFNBO scope (without biomass-based input energy), and
  - the extended scope of renewable hydrogen based on biomass input
- Decision on **inclusion of low-carbon hydrogen** products **depends on time horizon** for the development of the certification system
  - If the certification system becomes operational in near future: it should also cover low-carbon hydrogen products
  - EU regulations on low-carbon hydrogen should serve as a guideline

SYSTEM BOUNDARIES (LENGTH OF SUPPLY CHAIN FOR THE GHG EMISSIONS CALCULATION)

→ **Distinction between two main system boundaries:** Well-to-Gate (focus on the sources of the fuel used in the production process) and Well-to-Wheel (covers additional emissions, those related to the hydrogen usage)

System boundaries in EU requirements

- DA (EU) 2023/1185: RFNBOs must exhibit life-cycle GHG emissions savings of at least 70% compared to a fossil fuel comparator
- Calculation methodology for emissions include electricity production, processing, and transportation

» EU green hydrogen regulations apply a **Well-to-Wheel** approach

System boundaries in voluntary EU RFNBO schemes

- Compliance with RFNBO criteria must be proven via EU recognized voluntary schemes
- All recognized schemes (CertifHy, ISCC,REDcert) consequently refer to the GHG calculation methodology from DA (EU) 2023/1185

» Voluntary schemes in RFNBO context apply a **Well-to-Wheel** approach

System boundaries in international landscape of hydrogen certification schemes

- There is currently no internationally agreed GHG calculation methodology for hydrogen
- Internationally, the Well-to-Gate approach is more commonly applied
- International Partnership for Hydrogen and Fuel Cells in the Economy (IPHE) established a methodology which is the most widely referenced standard
- It refers to **Well-to-Gate** system boundaries

RECOMMENDATIONS FOR UKRAINE REGARDING SYSTEM BOUNDARIES

EU-Level:

- Green hydrogen certification (notably DA 2023/1185) is based on a **Well-to-Wheel** GHG calculation methodology

International Level:

- Most international hydrogen certification schemes apply a **Well-to-Gate** calculation methodology

Recommendation for Ukraine:

- The design of a certification system in Ukraine should prioritize maximum alignment with the EU framework, as the EU is Ukraine‘s key export market for green hydrogen
- Ukraine‘s green hydrogen certification system should therefore adopt a **Well-to-Wheel** approach:
  - DA (EU) 2023/1185 should serve as the primary methodological reference

GOVERNANCE STRUCTURES

→ **Transparent and robust governance structures** ensure credibility of the certification system, minimize the risk of fraud and allow the reliable tracking and verification of sustainability claims (vital for market acceptance)

Principles of EN 16325 standard and EECS Rules

- EN 16325 standard: provides governance principles for GO schemes, aligned with EU legislation and voluntary schemes
- EECS Rules (Association of Issuing Bodies - AIB): defines principles for operating within the European Energy Certificate System (EECS) framework
- **Key governance elements** include:
  - Operational reliability and record keeping
  - Access and transparency
  - Integrity, regulation, and oversight
  - Monitoring and auditing, including inspection of production devices

Implementing Regulation (EU) 2022/996

- Specifies the rules for implementing the RED II directive
- Sets rules on governance and transparency for voluntary schemes + governance requirements for certification bodies operating on behalf of voluntary schemes
- Transferable to green hydrogen certification in Ukraine as they reflect EU good governance standards
- **Key governance aspects** include:
  - Legal and technical capacity
  - Impartiality and independence
  - Broad stakeholder representation
  - Conflict-of-interest prevention rules
  - Systems for non-conformities
  - Internal monitoring of compliance and audit quality
  - Complaint procedures

GOVERNANCE STRUCTURES

Governance requirements by voluntary schemes

- CertifHy EU RFNBO, ISCC EU, and REDcert-EU establish comprehensive governance and integrity frameworks
- Their governance structures enable EU-compliant implementation of good governance
- **Role of certification bodies and auditors:**
  - Certification bodies and auditors are central to system credibility
  - The three voluntary schemes define explicit requirements and responsibilities of certification bodies and auditors
  - Core responsibilities of certification bodies include risk management procedures, quality management, documentation management system
  - Requirements for auditors are mainly based on knowlegde requirements and qualifications

Governance lessons from the bioenergy sector

- Certification of bioenergy products shares similar challenges with the certification of hydrogen production
- Procedural issues and cases of fraud have undermined the credibility of bioenergy certification systems in the past
- **Key lessons learned from bioenergy certification** include:
  - Need for broadening the scope of sustainability criteria by including environmental, economic, social, and governance aspects in certification schemes
  - Stronger oversight to prevent fraud and ensure effective complaint systems
  - Regular on-site audits of production facilities
  - Clear state control and reporting powers over schemes and auditors
  - Harmonised definitions and methodologies to prevent misuse and fraud

GOVERNANCE STRUCTURES: NEXT STEPS FOR UKRAINE

- Ukraine needs to **advance the regulatory framework** required for a green hydrogen certification system
  - Current regulation is at an early stage, limited to initiatives and strategic documents
- Developing a certification system and an RFNBO registry requires:
  - Clearly defined responsibilities
  - Regulations with detailed implementing specifications
- **Regulatory development can take several years**, as shown by the German example:
  - Guarantee of Origin Registry Act (HkNRG) in force since 2023 (first draft: 2022)
    → Regulates GO issuance and transfer for gas, hydrogen, heating and cooling
  - Gas-Heating-Cooling Guarantee of Origin Registry Ordinance (GWKHV) in force since May 2024, defining registry operation by the German Environment Agency (Umweltbundesamt – UBA)
  - Technical implementation still pending (as of April 2026)

MUTUAL RECOGNITION: INTERACTION BETWEEN CERTIFICATION SYSTEMS IN EXPORT AND IMPORT COUNTRIES

→ **Crucial aspect for Ukraine** (as the export of green hydrogen plays a central role)

International initiative on a Mutual Recognition Framework

- Around 40 countries (including Ukraine) launched at the COP28 a Declaration of Intent on Mutual Recognition of Certification Schemes for Renewable and Low-Carbon Hydrogen and Hydrogen Derivatives
- The IEA Hydrogen TCP Certification R&D Task (Task 47) is developing a Mutual Recognition Framework for hydrogen and derivates
- Focus: Mutual recognition (acceptance of equivalence of certification schemes by competent authorities), not full harmonization or a single global scheme
- Modular approach with a general part (globally accepted minimum requirements) and a jurisdiction-specific part (location-specific requirements and methodologies)
- Mutual Recognition Framework will also define key certification scheme design principles

EU specific regulations for interaction between certification schemes

- RED III (Art. 31a): establishes the Union Database (UDB) for tracing renewable and recycled carbon fuels
- GOs for renewable gas are not tradable outside the Union Database (once transferred)
- Access to the Union Database is essential for cross-border trade by Ukraine to the EU
- Implementing Regulation (EU) 2022/996 contains further specifications regarding the cross-border trade (such as the handling and role of the mass balance approach)

MUTUAL RECOGNITION: RECOMMENDATIONS FOR THE CERTIFICATION SYSTEM IN UKRAINE

- Certification system design should account for **interactions between exporting and importing countries**, as cross-border trade of green hydrogen is highly relevant for Ukraine
- **Facilitating international trade** should be a core objective of Ukraine's green hydrogen certification system
- Developments under the IEA Hydrogen TCP Certification Task 47 of the **Mutual Recognition Framework** should be closely monitored
  - Once available, Ukraine should align its certification system with the fundamental principles, key design elements, and modular approach of the Mutual Recognition Framework
  - A **modular certification design** is recommended:
    - A general part covering globally accepted elements, and
    - an EU-specific part ensuring compliance with EU green hydrogen regulations
- To enable exports to the EU, the certification system must address **EU requirements for cross-border trade and mutual recognition**, including Ukraine's access to the **EU Union Database**

MULTI-PURPOSE CERTIFICATION SYSTEM DESIGN IN UKRAINE

- Hydrogen certification system has to provide **functionality for target accounting** (Proof of Sustainability for compliance with RFNBO criteria, mass balancing) **and disclosure** to end consumers (Guarantees of Origin, book & claim allowed)
- European member states face the same issue in setting up renewable gas GO registries and RFNBO PoS registries in coordination with existing PoS registries for biomethane; **search for solutions is ongoing**
- When setting up GO and PoS systems for RFNBO in Ukraine, **it is recommendable to combine both functionalities in one registry from the outset**: reduces administrative costs and helps to protect against double counting
- First examples of **multi-purpose certificates** integrating GOs and PoS are being implemented in the EU, e.g. Estonia and Czech Republic

COORDINATION BETWEEN GOS AND POS: EN 16325:2025

5.3.5 Additional optional information on a GO for Gas

A GO for Gas may also contain the following information:

a) information on compliance of the Gas with applicable sustainability requirements:

i. specified:

1. a reference to the legislative or other source that sets sustainability requirements;

2. a reference to the relevant sustainability certification scheme(s);

3. whether the abovementioned sustainability requirements are complied with; and

4. a reference to the relevant reports, certificates or other documents produced by the sustainability certification scheme(s);

NOTE 1 For the purpose of point a) i above the sustainability requirements can be found, for example, in the Renewable Energy Directive (EU) 2023/2413.

ii. unspecified

NOTE 2 Point ii above can be used, for example, where sustainability information is not available, or sustainability requirements are not in place.

5.3.8 Information on a cancellation request and a cancellation statement for the Gas GO

The cancellation request shall indicate whether the Gas GO cancelled corresponds to the relevant network characteristics.

Subject to the requirements of the Domain GO Scheme, an Account Holder may request the Issuing Body to record the **information on compliance of the Gas with applicable sustainability requirements**, on a cancellation statement with respect to the GO for which he requests the cancellation, (…).

Source: EN 16325:2025, Guarantees of origin related to energy

→ Similar rules in AIB (2025), EECS Rules Release 8 V1.10, O8.1.1(d)

INTERACTION BETWEEN GO AND POS: IMPLEMENTATION EXAMPLES

	Information regarding PoS on GOs	Remarks
Czech Republic	**Yes**	GO issuance for biomethane will only be granted if sustainability criteria are met Producers must submit their PoS ID to the HKNR by the 15th day of the month following gas production at the latest
Estonia	**Yes**	PoS certificates cannot be issued separately from GO: a statement confirming compliance with sustainability criteria is an integral and binding part of GO Mass balance as a chain of custody: gas fed into and withdrawn from the grid is tracked
Finland	**Yes**	Voluntary disclosures regarding compliance with sustainability criteria are permitted, including a reference to the auditor and the auditor's report
Italy	**Yes**	Gas GO will be issued with information on PoS
Latvia	**Yes**	GO can be supplemented with information that complies with the EU sustainability and GHG reduction criteria under the PoS of an EU voluntary scheme
Netherlands	**Partly**	Additional sustainability information may be included in the GO at the producer's request (e.g. biomass classification; information on GHG emissions verified by a certification scheme)
Portugal	**Planned**	Planned; in the transition period, measures will be in place to prevent double counting (issuing bodies for GO and PoS will inform each other of all certificates issued for gases; for imported PoS, proof of cancellation for the corresponding GOs will be required)

INTERACTION BETWEEN POS AND GOS: KEY STEPS FOR LINKING BOTH SYSTEMS

- **Feed-in to the gas grid:**
  - Grid operators (or market area managers) can provide **verified measurement data** to serve as the basis for the issuance of Gos, PoS and mass balance-based tracking
  - **Compliance with RFNBO criteria** (e.g. additionality, geographical and temporal correlation of electricity used) are already clearly verifiable at this stage and recorded in the PoS of certification schemes
  - **Reference to the PoS as an information field on GO** is possible (see EN 16325:2025)

- **Withdrawal from the gas network and consumption of the green attributes:**
  - End use is determined (e.g. for electricity generation, as a heating fuel, as a transport fuel) => **Verification of compliance with GHG reduction criteria**, preparation of the 'final' PoS for the 'final point of sale'
  - It is possible to include a reference to compliance with sustainability criteria in the **GO cancellation certificate** (see EN 16325:2025); e.g. a reference to the 'final' PoS
  - Ensuring that PoS and GO are not counted twice for the same gas consumption: **prevention of double reporting**
  - Gas withdrawal for trade between gas networks or conversion into intermediate products: **Continuation of the chain of custody**

STRUCTURE OF GAS-POS CERTIFICATES: ISCC EU SCHEME “SUSTAINABILITY DECLARATION”

I) General Information

- Name and address of the supplier
- Name and address of the recipient
- Related contract number
- Date of dispatch of the sustainable material
- Address of dispatch/shipping point of the sustainable material (applicable if different from the address of the supplier)
- Address of receipt/receiving point of the sustainable material (applicable if different from the address of the recipient)
- Name of the certification system and certificate number of the supplier
- Date of the issuance of the Sustainability Declaration
- Unique number of the Sustainability Declaration

II) Product related information:

- Type of product; the product group has to be reflected
- Raw material: Renewable electricity
- Country of origin of the renewable electricity: Country where renewable electricity was produced
- Scope of certification of the renewable electricity:
  - Statement: “The renewability of the electricity was verified according to Art. 3 and 4 of the Delegated Act on RFNBOs
- Quantity of delivered sustainable product in MWh (based on LHV), metric tons or m³ at 15°C
- Statement(s) “ISCC Compliant” and/or “EU RED Compliant” (if applicable)

III) GHG emission information

- Statement of an actual value in kg CO2eq per unit of product. For emissions from transport and distribution the means of transport and the transportation distance from the supplier to the recipient have to be included on the Sustainability Declaration

IV) If the processing unit produces final RFNBO the following information has to be added to the Sustainability Declaration:

- GHG emissions of the RFNBO in g CO2eq/MJ
- The relevant fossil fuel comparator in g CO2eq/MJ
- GHG emission savings (in per cent) compared to the relevant fossil fuel
- EU: Emissions from combusting the fuel in its end-use

Source: ISCC (2024), ISCC EU 202-6 Version 1.4

GENERIC INFORMATION ON EECS GOS: MANDATORY & VOLUNTARY INFORMATION

Mandatory generic information on EECS certificates (GOs)

- **EECS Product (energy carrier)**
- **Unique identification number**
- **Operational start date of the Production Device**
- **Start of production period**
- **End of production period**
- **Energy source**
- **Type of Originating Production Device**
- **Identity of the Originating Production Device**
- **Country of Issue**
- **Location of the Originating Production Device**
  - Latitude and longitude in accordance with the EECS Rules Fact Sheet “Geographical Coordinates”; and/or
  - Country, city, and postal code.
- **Capacity of the Originating Production Device**
- **Face value of the EECS Certificate**
- **Identity of the Originating Member**
- **Purpose of issuance**
  - Disclosure; and/or
  - Support; and/or
  - Target.

Mandatory generic information on EECS certificates (GOs)

- **Date of Issue**
- **Product type of the EECS Certificate**
- **Public support status**
- **Additional mandatory information**
  - Label scheme identifier
  - Dissemination level of Output
  - EECS conversion issuance indicator
  - Storage release issuance indicator
  - Production period interval length

Additional generic information on EECS certificates (GOs)

- **Additional production element capacity**
- **Carbon footprint of the Output**
- **Radioactive waste intensity (nuclear energy)**
- **GHG emissions for fossil fuel-based production**
- **Radioactive waste for nuclear-based production**
- **Input and technology types**
- **High-Efficiency Cogeneration indicator**
- **Storage system-related information**

Source: AIB (2025), EECS Rules Release 8 V1.10

INFORMATION ON EECS GAS GOS: MANDATORY INFORMATION

Guarantees of origin for gas are fundamentally based on the EECS framework for electricity guarantees of origin, subject to the general **exceptions for mandatory information** set out below.

- **EECS Product (energy carrier)**

An EECS Certificate in respect of Gas shall record the Energy Carrier by which energy is conveyed either as “Energy Gas” or “Hydrogen”, in the format specified in the Subsidiary Document “HubCom”.

- **Capacity of the Originating Production Device**

An EECS Certificate in respect of Gas shall record its Nominal Capacity as the capacity of that Production Device.

- **Scope of data for EECS Gas Certificates**

Data mentioned on the EECS Certificates for Gas, shall relate to the full qualifying Output as determined in O6.4. In particular, the Type of Gas as set out in section O7.1.3(a) shall reflect the composition of the full Output and not separate components of it. In applying this principle, the Type of Gas may refer to the main component from which it derives its calorific value.

- **Additional mandatory information for the Gas Scheme**

EECS Certificates corresponding to the Gas Scheme must specify the following information in respect of the Output, in the format specified in the Subsidiary Document “HubCom”:

  - **Type of gas**

The type of Gas, referring to the chemical composition of the produced Gas as identified in EECS Fact Sheet “Type of Gas”;

  - **Calorific value basis**

Whether the number of certificates is determined based on the lower or the higher calorific value of the Gas.

  - **Fossil auxiliary deduction indicator**

Whether or not auxiliary energy from non-renewable sources has been deducted from the net Output in the energy, eligible for GO issuing (this information is also called the Fossil Auxiliary Deduction Tag).

Source: AIB (2025), EECS Rules Release 8 V1.10

INFORMATION ON EECS GAS GOS: VOLUNTARY INFORMATION

Guarantees of origin for gas are fundamentally based on the EECS framework for electricity guarantees of origin, subject to the general **exceptions for voluntary information** set out below.

- **GHG emissions intensity of Gas Output**
- **GHG emissions savings for Gas Output**
- **Compliance with GHG emission savings criteria**
- **Compliance with sustainability criteria**
  - a reference to the legislative or other source that sets sustainability requirements
  - a reference to the relevant sustainability certification scheme(s)
  - an indication as to whether these criteria have been met
  - a reference to the certification body which confirmed that this is the case
  - a reference to the relevant reports, certificates or other documents produced by this certification body under the sustainability certification scheme(s)
- **Calorific value for Output calculation**
- **End-use of Gas**
- **Source shares for mixed Inputs**

- **Element description and operational start date**
- **Pre-Conversion Support**
- **Purity of Type of Gas**
- **Reference to physical composition criteria**
- **Advanced Biomass Feedstock indicator**
- **Compliance with specific criteria**
  - A name reference to the criteria type
  - A reference to the legislative source that sets the requirements (e.g., EU RFNBO, UK RFNBO, US 45V)
  - The driving criterion for compliance; a reference to the relevant certification scheme(s)
  - An indication whether such criteria have been met
  - A reference to/identification of the certification body that confirmed the (non-) fulfilment of such criteria
  - A reference to the relevant certification reports, certificates or other documents
- **EU Emissions Trading System (ETS) – Effort Sharing Regulation (ESR) eligibility indicator**

Source: AIB (2025), EECS Rules Release 8 V1.10

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ROADMAP FOR THE IMPLEMENTATION OF A GREEN HYDROGEN TRACKING SYSTEM IN UKRAINE

28.04.2026 | Dr. Alexandra Styles | Workshop: Key building blocks of a green hydrogen tracking system in Ukraine

SUMMARY OF RFNBO REGISTRY DESIGN OPTIONS

There are several options available to Ukraine for demonstrating and verifying compliance with the RFNBO criteria:

Option 1: Establish a national RFNBO registry

- Independent national registry for RFNBO similar to Germany‘s model (37th BImSchV, implementation ongoing)
- Enables recording, tracking & documentation of the origin and use of electricity from renewable sources
- Provide the necessary interfaces to certification bodies and the EU‘s Union Database (UDB)
- Allows combining PoS (target accounting) + GOs (disclosure to end consumers) in one registry → reduces administrative costs and helps to avoid double counting

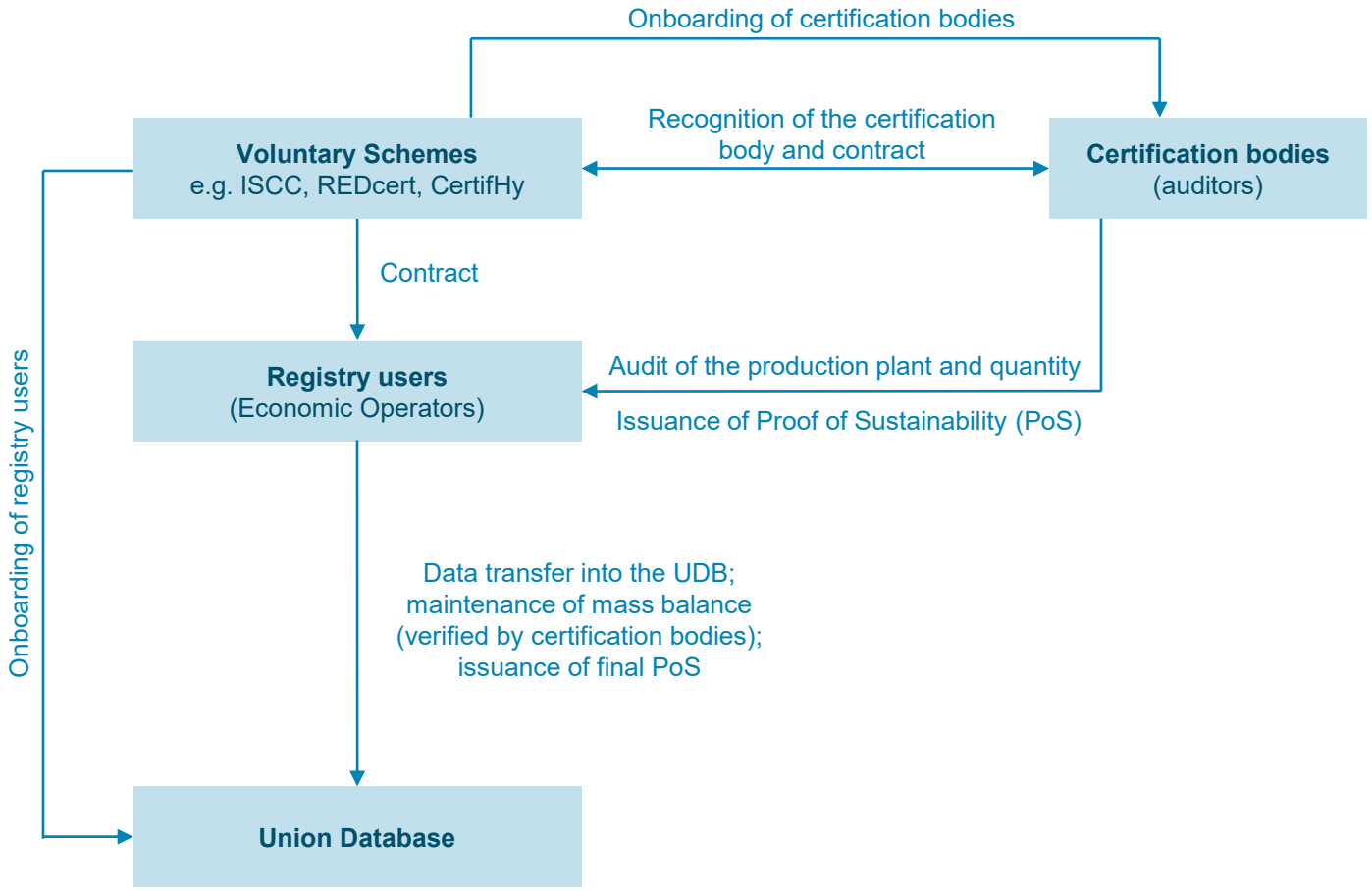
Option 2: Integrate RFNBO into existing national registries

- Integrate verification of RFNBO criteria into existing national registries:
  - Expand the scope of electricity GO registry (operated by NEURC) to include RFNBO; or
  - Extend the biomethane registry (operated by SAEES) to cover RFNBO verification; or
  - Merge energy carrier-specific registries for renewable energies
- Make use of synergies with existing structures and reduces administrative efforts

Option 3: Direct use of the Union Database (UDB)

- No national RFNBO registry
- Handle certification & verification entirely through the UDB and international voluntary certification schemes
- According to the EU Commission: opening up the UDB to Ukraine is being pursued
- Attractive option for exports to the EU internal market

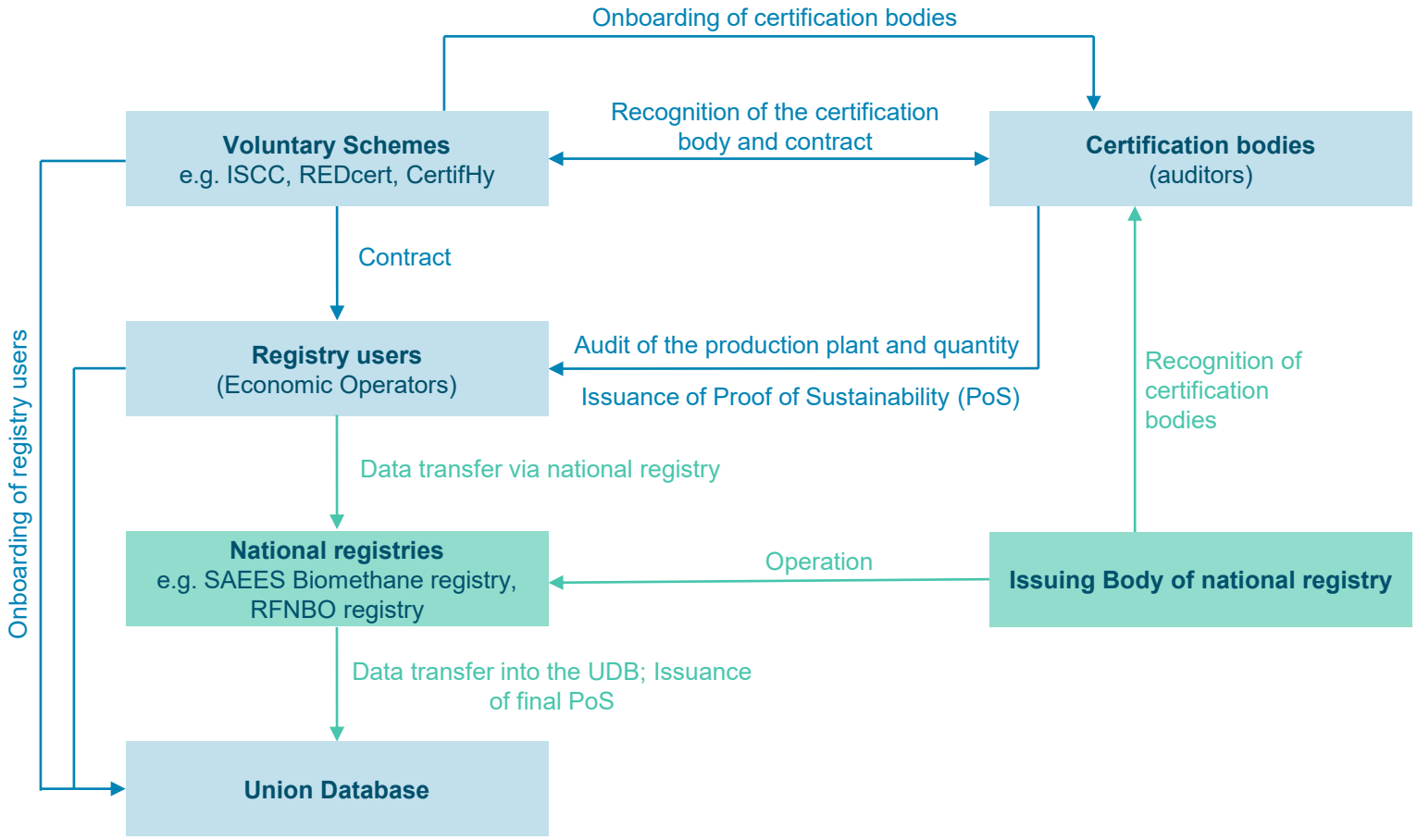
OPTION 3: DIRECT USE OF THE UNION DATABASE (UDB)



Source: own depiction, Hamburg Institut

- UDB records data on **transactions, sustainability characteristics, and GHG emissions** of fuels
- **Within EU:** onboarding of users via voluntary schemes is ongoing, but overall UDB tracking system is not operational yet
- **Chances of direct UDB use**: High compatibility of exports with EU regulation; can be implemented short-term using EU registry infrastructure (once UDB is fully operational) => low implementation costs
- **Limits of direct UDB use:** no coverage of domestic RFNBO use and exports to non-EU-regions; limited data sovereignty
- **Methodology for mass-balancing** of grid deliveries from non-EU countries needs to be further developed; recognition of Ukrainian grid-based mass balancing should be pursued in cooperation with voluntary certification schemes

OPTIONS 1 AND 2: NATIONAL RFNBO REGISTRY



Source: own depiction, Hamburg Institut

- National registry records data on **transactions, sustainability characteristics, and GHG emissions** of fuels and transfers data to the UDB
- Verification in cooperation with **voluntary schemes**, as with UDB
- Requires **technical interface** of national registry with UDB: PoS and GOs associated with exports into the EU need to be transferred into UDB
- **Chances of national registry:** covers domestic use and exports to any region; better overview for national authorities of production and transaction data; direct oversight of verification processes
- **Challenges of national registry:** adds layer of complexity; close coordination with UDB required to exclude double counting; implementation in EU ongoing, few “good practices” available yet

IMPORTANCE OF NATIONAL DISCLOSURE RULES TO REDUCE DOUBLE COUNTING RISKS

- In order to exclude double counting, export-oriented certification rules need to be combined with **domestic disclosure rules** on green attributes of energy supply
  - For electricity as well as gas supply: domestic green claims need to be based on **GO/PoS cancellation** or **residual mix**, not e. g. national statistical average renewable energy share
- Introduction of **mandatory gas disclosure** through the Internal Gas Market Directive (EU) 2024/1788
  - Adopted on 13 June 2024
  - Needs to be transposed into national law; implementation deadline for EU Member States by mid-2026
- The **designation of renewable gases must** be substantiated **with Guarantees of Origin (GOs)** in accordance with the Renewable Energy Directive
- **Obligation of gas suppliers** to disclose to customers:
  - Proportion of renewable gases in gas supply
  - Proportion of low-carbon gas in gas supply
  - Proportion of renewable hydrogen in hydrogen supply
  - Environmental impact of the gas supplied: at least CO_2 emissions

RECOMMENDATION FOR THE ROADMAP FOR THE IMPLEMENTATION OF A GREEN HYDROGEN TRACKING SYSTEM IN UKRAINE

Short Term

Focus: Enable EU exports and start with pilot projects

- ✓ Prioritise direct use of the Union Database (UDB) as transitional solution
- ✓ Cooperate with voluntary certification schemes to issue PoS
- ✓ Develop legal framework for hydrogen certification and disclosure (PoS/GOs)
- ✓ Coordination between NEURC, SAEES and relevant ministries on responsibility for national hydrogen registry
- ✓ Practical experience with certification while EU regulatory framework consolidates; capacity build-up and training

Medium Term

Focus: Build-up of a national hydrogen registry

- ✓ Integrate PoS + hydrogen GOs into one multi-purpose certificate registry
- ✓ Enable national target accounting + disclosure of domestically used RFNBO
- ✓ Leverage existing electricity GO registry or biomethane registry as starting point
- ✓ Further develop electricity GO registry to support conversion and efficient RFNBO verification

PUBLICATION OF PROJECT RESULTS

- **Project report** „Enabling green hydrogen trade between the EU and Ukraine: Principles of certification approaches and regulatory and market framework conditions“ available online
- **Presentations** of previous workshops available on project website
- **Final report on design recommendations** to be published early summer on project website
- **Final presentation of results**: Online session at the Annual Conference of the Institute of Renewable Energy at the National Academy of Sciences of Ukraine, May 20–22, 2026

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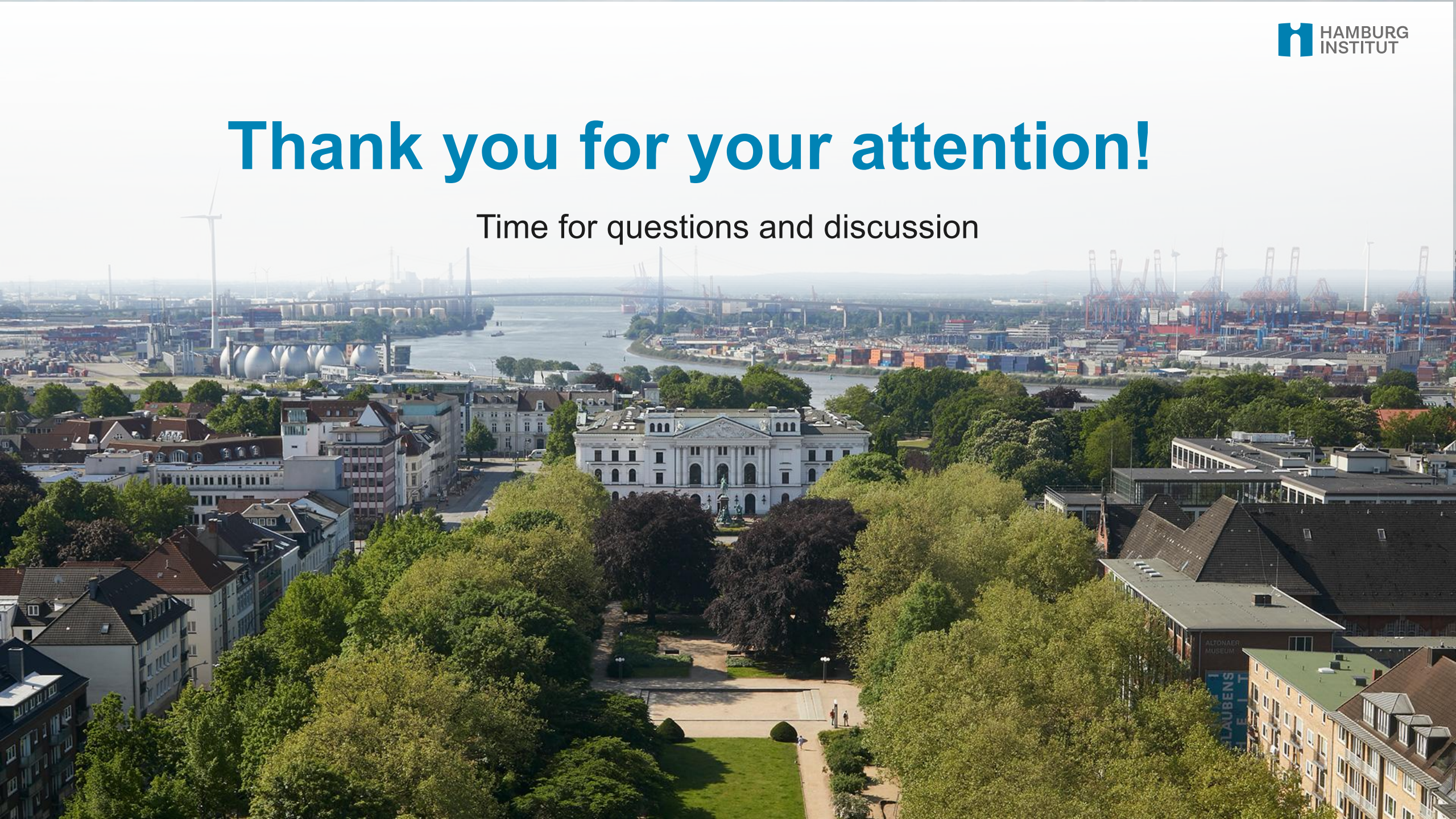
Thank you for your attention!

Time for questions and discussion



YOUR CONTACTS – WE ARE LOOKING FORWARD TO FURTHER EXCHANGE

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