Hyvolution 30", 31" JANUARY & 1" FEBRUARY 2024 PARIS EXPO · PORTE DE VERSAILLES · FRANCE



Standardisation and certification: Rules, not colours, for a global hydrogen compass



In collaboration with





What does "clean" hydrogen mean?

Words like "renewable", "sustainable", "clean" and "low carbon" are non-descriptive and thus have different meaning for different stakeholders

How to create trust: it is "clean" hydrogen I am producing/buying/using? → Hydrogen needs rules, not colours!

Hydrogen doesn't care about color labels:

- Its molecule has the same properties regardless of the method of production
- Safety standards and regulations are color blind and technology agnostic
- Division and thus discrimination of production pathways by color coding is the wrong approach
- Decarbonisation is the key word!





Program overview

Standardisation

10:10 – **Keynote** on the fundamentals of standardisation and its strategic importance for industry: what is a standard? Who defines and implement a standard? How international standards are implemented?

Gilles THONET, IEC Deputy Secretary General

10:25 – **Round table** on the state of global hydrogen standardisation and its importance to build trust with customers, support market competition, cut costs and monetise intangible assets, such as a low carbon footprint.

11:15 – 11:35 Question and answers, with the public







Program overview

Certification

11:40 – Keynote on the fundamentals of certification and its strategic importance for industry: What is a certification scheme and a certificate? Why is it so important?

Daria NOCHEVNIK Hydrogen Council, Director for Policy and Partnerships and Task Leader of IEA H2 TCP Task 47 on certification schemes

11:55 – Round table on challenges for certification schemes mutual recognition, key criteria to be considered for a mutual recognition of schemes, tools and good practices to automatise certification recognition.

12:35 – 12:55 – Question and answers, with the public







Keynote on the fundamentals of standardisation and its strategic importance for industry: what is a standard? Who defines and implement a standard? How international standards are implemented? Why is it important for companies, including SME, to be involved in standard implementation?



Gilles THONET, IEC Deputy Secretary General









Standardization and its Strategic Importance for Industry

Gilles Thonet IEC Deputy Secretary-General

Hyvolution 2024 2024-01-31



Who is the IEC

Founded in 1906

174 countries (90 Members & 84 Affiliates)

30 000 experts

225 Technical Committees & Subcommittees

More than 11 000 publications

4 Conformity Assessment Systems

5 Regional Centres



What is an International Standard

- Rules, guidelines or characteristics developed by experts representing all stakeholders
- Based on international consensus
- Always voluntary

International Standards <u>are not</u> laws, regulations or policies; however, they can be (and are often) used, referenced or incorporated into laws, regulations and policies (e.g. electrical safety)

International Standards Development Organizations



H₂ standardization



How is an International Standard developed (IEC/ISO)

- Technical Committees (TCs) for specific fields of activity (e.g. IEC TC 105 – Fuel cell technologies)
- Members appoint technical experts in TCs
- Formal standards development process organized in several stages (from proposal to publication)
- Consensus among all parties involved, but consensus ≠ unanimity
- Members involved at each stage to comment and vote (one country, one vote)
- Average time to develop a standard: 3 years



How are International Standard used

Adoption

- National or regional adoption (e.g. CEN/CENELEC)
- Formal adoption process in some countries
- Used directly by reference in regulation

Regulation

- Safety
- Health
- Environment
- Electromagnetic compatibility ...

Benefits of International Standards



- Facilitate global trade
- Ease regulatory compliance
- Ensure interoperability
- Ensure safety
- Increase efficiency
- Achieve broader relevance
- Promote development and quality infrastructures





H₂ standardization

ISO TC 197 – Hydrogen technologies

Standardization in the field of systems and devices for the production, storage, transport, measurement and use of hydrogen

IEC TC 105 - Fuel cell technologies

Standardization of all fuel cell types and various associated applications such as stationary power systems, transportation, portable power systems, and general electrochemical flow systems and processes

H₂ conformity assessment





IECEx certified equipment scheme – Harmonized procedures for IECEx certification of equipment, components and systems associated with the production, dispensing and use of gaseous hydrogen



- Applying proven solution to H₂ technologies
- Personnel certification of competence according to ISO TC 197 and IEC TC 105 standards
- Certification of equipment associated with H₂ dispensing systems
- Certification of stationary and portable fuel cells



Get involved

Help create International Standards

Promote International Standards

Use International Standards







Thank you for your attention!









Eszter

BATTA

Andrei **TCHOUVELEV** H2 Council

Pierre SERRECOMBE European CEA Commission

Paulo E.

MIRANDA

H2BA



Frank

WOLAK

FCHEA



Guy **DE REALS** Air Liquide



Standardisation and certification: Rules, not colours, for a global hydrogen compass in collaboration with Paris, Wed. January 31st







Andrei TCHOUVELEV H2 Council



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Hyvolution Seminar: Standardization and Certification: Rules, not colours, for a global hydrogen compass ISO Activities on Hydrogen Safety & Sustainability Dr. Andrei V. Tchouvelev, Chair, ISO/TC 197/SC 1



ISO

ISO/TC 197 Hydrogen Technologies

SC 1 Hydrogen at Scale and Horizontal Energy Systems

Scope of ISO/TC 197:

Standardization in the field of systems and devices for the production, storage, transport, measurement and use of hydrogen Scope of ISO/TC 197/SC 1: Standardization of large-scale hydrogen energy systems and applications including aspects of testing, certification, sustainability and placement, and coordination with other relevant standardization bodies and stakeholders

ISO/TC 197 & SC1 Division of Scope



ISO/TC 197 Focus

- ✓ <u>Basic Requirements for Hydrogen</u> <u>Technologies</u>
 - ➢Production
 - ≻Storage
 - ≻Handling
 - ➢Built environment
 - Protocols and components including road vehicles and their fueling infrastructure





(Toyota website)

ISO/TC 197 / SC1 Focus

- Applications' requirements of Hydrogen technologies at large scale and in horizontal energy systems with H2 as a central link
- ✓ <u>Sustainability aspects</u> (GHG, H2GO, Cert)
- ✓ <u>Coordination</u> with TCs & stakeholders on:
 - Renewables and Energy Storage/Grid Balancing
 - Multi-fuel systems
 - Testing and certification of H2 components
 - Rail, maritime, aviation applications
 - Residential applications



(Toyota website)

SUSTAINABL **Global Issues require International Solutions** Participation within Established partnerships – *The Effective vehicle* GOALS



International Approach ensures **Safety**, Performance + Sustainability are fully addressed for the Global Community



Single International Approach instils Regulatory + Market Confidence

Use of Existing International Standards (and others coming) + International Certification/Verification and working with existing International Organizations, for any additional needs, prevents wasteful duplication, thereby

- Saves time,
- Keeps costs down
- Facilitates Global Trade + Innovation





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30th, 31st JAN & 1st FEB 2024

PARIS EXPO, PORTE DE VERSAILLES - FRANCE



Universidade Federal do Rio de Janeiro







HYDROGEN NEEDS RULES NOT COLOURS

Paulo Emílio V. de Miranda President Brazilian Hydrogen Association pevdemiranda@abh2.org.br

January 2024



Hydrogen Needs Rules, Not Colours; Brazilian Hydrogen Association; Hyvolution; 2024

BRAZILIAN NATIONAL HYDROGEN PROGRAM - PNH2



Hydrogen Needs Rules, Not Colours; Brazilian Hydrogen Association; Hyvolution; 2024









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ISO/TS 19870:2023 Published!

TECHNICAL ISO/TS SPECIFICATION 19870

> First edition 2023-11

Hydrogen technologies — Methodology for determining the greenhouse gas emissions associated with the production, conditioning and transport of hydrogen to consumption gate

Dechnologies de l'hairagène — Méthodologie pour déterminer les tentsions de qui à affet de serre associées à la production, ou conditionnement et au transport de l'hydrogène jusqu'au point de constituation

ISO

Reference manner (50/115 19870 2023(8) 10 (50 2023

New ISO standard on hydrogen unveiled at COP28

During COP28 in Dubai, the International Organization for Standardization (ISO) unveiled a new technical specification (ISO/TS 19870) as a foundation for harmonisation, safety, interoperability and sustainability across the hydrogen value chain.



ISO/19870:2023 IS

H₂ conversion

to H₂ carriers

 Providing Methodological requirement to determine the Carbon Footprint of Product (CFP) of Hydrogen

• Based on existing ISO standards

PARIS

Hyvolution

• To establish the CFP of Hydrogen from Cradle to any delivery gate up to consumption point



transport

NH3

LOHC

H₂ carrier

conversion to

H₂









Hyvolution PARIS

ISO/TS 19870:2023 is NOT

Defining what is acceptable in a given jurisdiction or for the purpose of a specific public policy

Thresholds, Labels (Colours) are defined by public policies or by the market



Harmonizing labels and thresholds only through negotiations between governments







Program overview

Certification

11:40 – Keynote on the fundamentals of certification and its strategic importance for industry: What is a certification scheme and a certificate? Why is it so important? What are the main hydrogen certification schemes already active globally, what are their differences and their common points? What are the rules and what are the certifications schemes valid in Europe? Who is involved in the certification process? What are the latest updates on the topic?

Daria NOCHEVNIK Hydrogen Council, Director for Policy and Partnerships and Task Leader of IEA H2 TCP Task 47 on certification schemes

11:55 – Round table on challenges for certification schemes mutual recognition, key criteria to be considered for a mutual recognition of schemes, tools and good practices to automatise certification recognition.

12:35 – 12:55 – Question and answers, with the public







Certification

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Task Leader of IEA H2 TCP Task 47 on certification schemes





Hydrogen Certification

Hyvolution Paris 2024

31 January



Certification - a crucial instrument for the hydrogen economy

Building consumer trust, facilitating demand creation, enabling trade



Unlocking the value of hydrogen with certification Different sustainability attributes may need to be evidenced for different

purposes/ compliance obligations



Hydrogen Certification 101: creating a common language on hydrogen certification globally

Released by IPHE and IEA H2 TCP with support from IRENA and contributions from the Hydrogen Council and the International Power-to-X Hub under the Breakthrough Agenda's Hydrogen Breakthrough priority action H.1 Standards and Certification.





Hydrogen Certification 101

What is certification?

Purposes of hydrogen certification: disclosure, corporate reporting and regulatory compliance

Key terms and concepts

Design elements of certification schemes

Mutual recognition of certification schemes

Fundamental design principles of certification schemes



Fundamental design principles



Main design elements of a certification scheme

Lucisdiction-Specific Unrisdiction-Specific Carbon Food Carbon Food Carbon Food Carbon Food Cool Carbon Food Cool Cool Carbon Food Cool Carbon Food Cool Cool Carbon Food Cool Cool Carbon Food Cool Carbon Food Cool Carbon Food Carbon Food Cool Carbon Food Cool Carbon Food Cool Cool Cool Cool Carbon Food Cool	: Requirements	by the Scheme	Carbon Footprint	Renewable Content	Use of Land/Water	Social Impact	Chain of Custody (book and claim or mass balancing) Scope and Boundry Conditions of the Certification Scheme (informed by methodologies, e.g. well-to-gate/well-to-tank)	ing) ication Scheme te/well-to-tank) ervision Rules parties)
Governance of the Scheme	Jurisdiction-Specific	Attributes Covered					Certification Issuing, Oversight and Supervision Rules (including audit by independent third parties)	
							Governance of the Scheme	

Fundamental Design Principles

Market fragmentation – key challenge

Jurisdictions currently developing their national/ regional certification schemes for hydrogen







COP28 Hydrogen Outcomes



COP28 Flagship Declaration of Intent on Mutual Recognition of Certification Schemes for Renewable and Low-Carbon Hydrogen and Hydrogen Derivatives

Covers 80% of future global market

 Declaration endorsed by nearly 40 countries representing prospective importers and exporters

Promotes reliability and trust

 Certification schemes key to evidence the sustainability attributes of hydrogen and its derivatives

Advances interoperability

 Mutual recognition of certification schemes is instrumental to avoid market fragmentation

Lays out implementation pathway

 IPHE & IEA H2 TCP to lead technical implementation and report progress at G20/CEM in Brazil

IEA H2 TCP Certification R&D Task: objectives In cooperation with IPHE

Build a community of practice

> Provide a platform for good practice exchange

Advance technical solutions for mutual recognition

Lay out the technical Mutual Recognition Framework



IEA H2 TCP Task 47: Building a community of practice

Engaging experts from governments, industry, SDOs and independent initiatives In cooperation with IPHE under the Hydrogen Breakthrough Agenda, H1 priority action

Certification scheme developers/ prospective issuing bodies

International organisations

Standard Development Organisations

Independent scheme owners

Pilot projects: e.g. HyXchange

Relevant international initiatives: H2Global

Auditors and IT experts



Hydrogen TCP



Certification







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Certification







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IPHE: a Global Government-to-Government Partnership to Accelerate Hydrogen and Fuel Cell Deployments

Hyvolution

PARIS







IPHE's Hydrogen Certification Mechanisms Taskforce (IPHE H2CM TF)

IPHE coordinator of Breakthrough Agenda's Hydrogen Priority Actions

IPHE H2CM TF launched in December 2022

- Co-leads Australia, France and Germany
- Summarize the principles and terminology of product certification
- Provide a summary of existing and emerging clean hydrogen certification mechanisms across the world
- Assessment of the common features that will facilitate mutual recognition and interoperability between different existing and emerging certification mechanisms

IPHE's work on hydrogen certification echoes the Dol signed at COP28

All signatories of the Dol can join IPHE work on hydrogen certification





Certification





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Hydrogen certification in the EU legislation and industry practice

Hyvolution Paris, 31 January 2024 Ruta Baltause, DG Energy

Decarbonisation and Sustainability of Energy Sources





EEA safety, health, and environmental protection requirements
EU legislation + harmonised European Standards (were integrated in the EU legislation)
Market
Requirements: EU Directive 2009/48/EC on safety of toys

regulation <u>Certification</u>: conformity assessment and EU Declaration of conformity, *certificate follows the product*

<u>Verification</u>: notified bodies accredited and supervised by the EU Member States + Market surveillance (authorities)

Requirements: Fair trade certification system

Market
premium by
industry,
labelCertification:Certification scheme authorised by Fair trade certification
system; certificate follows the product – mass balance
Certification bodies recognised and supervised by fair
trade label authorised certification scheme



EU policy
obligations,
subsidies,
tax rebatesRequirements:EU Renewable Energy Directive, ETS, CBAM, Gas and
Hydrogen package, ReFuelEU Aviation Regulation,
FuelEUMaritimeEU recognised voluntary schemes;Certificate follows the
product - mass balance methodVerification:Certification bodies, accredited and supervised by EU

Certification bodies, accredited and supervised by EU voluntary schemes and EU Member States

			Support for renewables' production by consumer	<u>Requirements</u> : <u>Certification</u> :	EU Renewable Energy Directive (Guarantees of Origin – no target accounting) EU Guarantees of Origin, tradeable certificates, <u>not</u> <u>following</u> the physical product along the supply chain - book & claim method
			premium	Verification:	Guarantees of Origin Issuing bodies authorized and supervised by EU Member States. Energy suppliers use of GO monitored by national regulators. Tracking and double accounting prevention – via national and EU data bases (Union's Data Base)
H			Industry	Requirements:	Industry corporate responsibility strategies/ reporting/ criteria/ industry initiatives
	H ₂ car	RES/ low- arbon/ fossil	corporate responsibility, sustainability	Certification:	Certification schemes (private) chosen by company/ industry initiatives, mainly – tradeable certificates, <u>not following</u> the product beyond its production - book & claim method
				Verification:	Certification bodies recognised by certification

<u>Verification</u>: Certification bodies recognised by certification schemes, accreditation bodies



Certification





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THE PURE PLAYER IN H2 & RFNBO CERTIFICATION

HYVOLUTION

2024



WHAT IS CERTIFHY ?

CertifHy[®] started as a European initiative to bring together public and private stakeholders to develop a common understanding of renewable and lowcarbon hydrogen, develop certification schemes and spark the European market for certified hydrogen.

Certif Hy

CertifHy®'s mission is to advance and facilitate the production, procurement and use of renewable, and low carbon hydrogen, fulfilling ambitious environmental criteria as well as decarbonization objectives, in order to protect the climate and improve living conditions of humankind. CertifHy[®] develops, operates and maintains certification schemes for low carbon and renewable hydrogen.

- CertifHy^{*} is a pure-player in hydrogen and e-fuels certification, since 2014.
- We have been operating a live certification scheme for the voluntary market for low-carbon and renewable hydrogen since 2017 – the CertifHy * NGC Scheme.
- CertifHy ^o Voluntary Scheme for Renewable Fuel from Non-Biological origin (RFNBO) certification according to the EU Renewable Energy Directive, Delegated Acts and Implementing Regulation is being assessed by the European Commission for official recognition.
- We are connected to European Policy makers via our schemes development and highly experienced in analyzing the policy framework for RFNBO and RFNBO Certification (including the Union Database).



CertifHy EU RFNBO precertification helps projects raise their maturity level and prepare for certification before Final Investment Decisions

STEP 1 PROJECT SETUP



STEP 3 AUDIT (CERTIFHYTM) STEP 4 REPORT ISSUANCE



 Specify and detail all requirements for the certification scheme pilot set-up and operations



Identify, collect and treat key input data for the auditing process (based on project documents and plans)



- Audit by CertifHy recognized Certification Body
- Deliver the audit report, providing information on the eligibility of the planned plant for certification



Deliver the full CertifHy[™] report according to its EU Voluntary Scheme with main learnings and recommendations



WHY JOIN CERTIFHY® STAKEHOLDER PLATFORM?

What is the Stakeholder Platform?

CertifHy®'s membership base is our Stakeholder Platform, which groups together key actors all along the hydrogen and derivatives' value chain.

From producers, processors to users to logistical facility operators, by participating in CertifHy's activities, our members are paving the way for a low-carbon economy.

Why join us ?

Ease your way into the certification world thanks to our team expertise and guidance in the hydrogen and e-fuels sector

Ξ

JOIN US

- Co-shape the future of CertifHy[®] : the pure-player in hydrogen and e-fuels certification
- Benefit from access to exclusive content : events, conferences, meetups and much more !
- Create business opportunities from networking with key industry leaders







OR SCAN THE QR CODE

PLATFORM@CERTIFHY.EU

PLATFORM AND PRECERTIFICATION

FOR MORE INFORMATION ABOUT THE CERTIFHY STAKEHOLDER

CONTACT US



Certification





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VERITAS

CERTIFICATION OF HYDROGEN & DERIVATIVES

LAURENCE BOISRAME HYDROGEN GLOBAL DIRECTOR

IEA H2 TCP TASK 47- WORKSHOP 24TH JAN 2024



Our mission SHAPING A WORLD OF TRUST



CREATED IN 1828

100+ years in the energy industry



BUSINESS TO BUSINESS TO SOCIETY

Quality, health & safety, environmental protection & social responsibility



FACT BASED UNDERSTANDING

Testing, inspection, certification & technical services



UNIQUE REACH, UNIQUE SCOPE UNRIVALLED GLOBAL PRESENCE AND SERVICE PORTFOLIO







countries





WHY? WHAT?

- To foster Hydrogen industry development and bridge the gap / missing international standard
- Leveraging on Bureau Veritas global footprint and longstanding experience in Certification.
- I BV has developed a VOLUNTARY PRIVATE CERTIFICATION scheme addressing production assets*
- I ONE single methodology applying GLOBALLY
- LCA/CFP methodology based on ISO 14040/44/67
- Applying to plants at DESIGN STAGE and OPERATIONAL

*assets producing hydrogen only and hydrogen + ammonia

A SCHEME RELYING ON 3 PILLARS Going beyond emissions intensity...

SAFETY

- Compliance with safety standards
- Application of best practices
- Process safety from design and construction until operations

SUSTAINABILITY

2

- Qualitative assessment of sustainability maturity through
 ESG criteria
- Extended environmental impact categories through LCA
- Water footprint

222

3

RENEWABLE

- 100% renewable electricity
- 2 CI thresholds:
 - 2kg CO2eq / kg H2*
 - 3kg CO2eq / kg H2**

*without capital goods **with capital goods







Certification





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