ISO TC 197/SC 1 Report to ExMC 2024 Meeting

Conformity Assessment Activities

Safety, Sustainability and Conformity Assessment

Dr. ANDREI V. TCHOUVELEV
CHAIR, ISO/TC 197/SC 1
DIRECTOR SAFETY & REGULATORY
Hydrogen Council

ISO/TC 197 Hydrogen Technologies

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

Secretariat: SCC

Committee Manager: Mr Siasia Morel

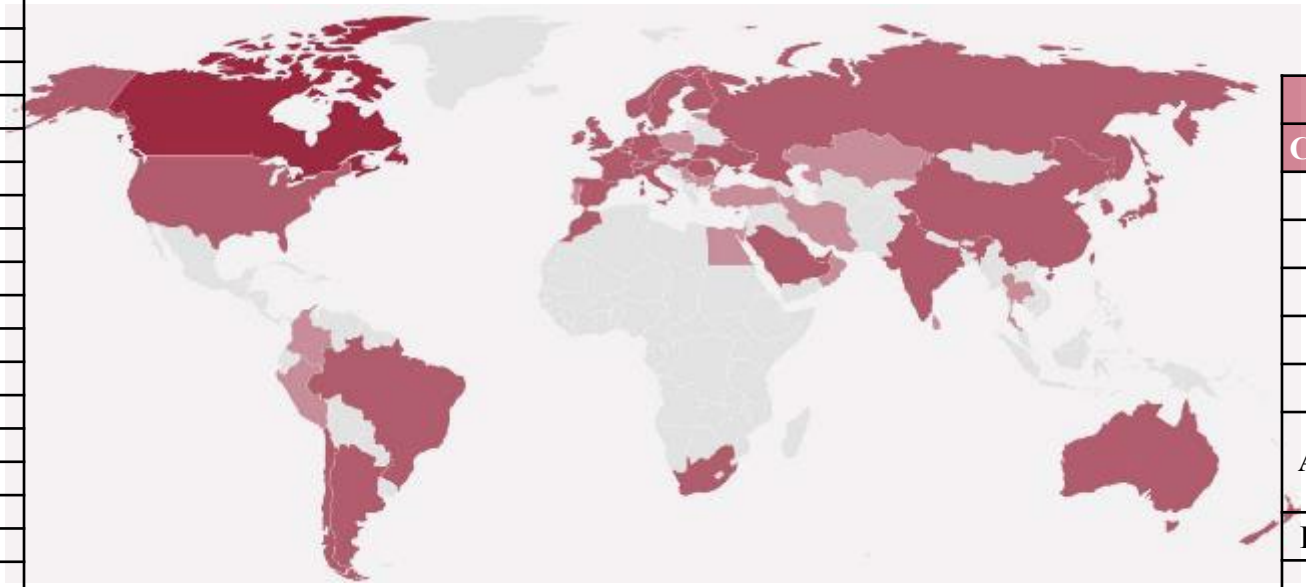
Chairperson (until end 2024): Mr Tetsufumi IKEDA

ISO Technical Programme Manager [TPM]:
Mrs Kirsi Silander-van Hunen

ISO Editorial Manager [EM]: Mr Arun ABY Paraecattil

ISO/TC 197 Hydrogen Technologies

PARTICIPATING MEMBERS (35)	
COUNTRY/TERRITORY	ACRONYM
Argentina	IRAM
Australia	SA
Austria	ASI
Belgium	NBN
Brazil	ABNT
Canada	SCC
Chile	INN
China	SAC
Czech Republic	UNMZ
Denmark	DS
Finland	SFS
France	AFNOR
Germany	DIN
Hungary	MSZT
India	BIS
Ireland	NSAI
Italy	UNI
Japan	JISC
Korea, Republic of	KATS
Morocco	IMANOR
Netherlands	NEN
New Zealand	NZSO
Norway	SN
Romania	ASRO
Russian Federation	GOST R
Saudi Arabia	SASO
Singapore	SSC
South Africa	SABS
Spain	UNE
Sweden	SIS
Switzerland	SNV
Ukraine	DSTU
United Arab Emirates	MoIAT-STR
United Kingdom	BSI
United States	ANSI



- Established in 1990
- 32 Plenary meetings
- Next meeting – Seoul, Dec. 2024

OBSERVING MEMBERS (18)	
COUNTRY/TERRITORY	ACRONYM
Bulgaria	BDS
Colombia	ICONTEC
Cyprus	CYS
Egypt	EOS
Estonia	EVS
Hong Kong Special Administrative Region of China	ITCHKSAR
Iran, Islamic Republic of	INSO
Israel	SII
Kazakhstan	KAZMEMST
Luxembourg	ILNAS
Oman	DGSM
Peru	INACAL
Poland	PKN
Portugal	IPQ
Serbia	ISS
Sri Lanka	SLSI
Thailand	TISI
Türkiye	TSE

ISO/TC 197 Plenary Week
Vienna, Austria, November 13-17, 2023

Program:

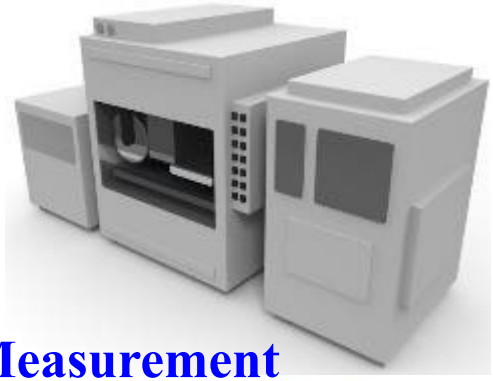
- ✓ Working group meetings
- ✓ Strategic planning meeting
- ✓ Plenary meetings (TC197 & SC1)

ISO/TC 197 Scope

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

Production

Storage



Measurement

Transport

Use

ISO/TC 197/SC1

Hydrogen at Scale and Horizontal Energy Systems

Scope:

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

Secretariat: SCC

Committee Manager: Ms Sara Marxen

Chairperson (until end 2025): Dr Andrei Tchouvelev

ISO Technical Programme Manager [TPM]:
Mrs Kirsi Silander-van Hunen
ISO Editorial Manager [EM]: Mr Arun ABY Paraecattil

ISO/TC 197/SC 1

PARTICIPATING MEMBERS (25)	
COUNTRY/TERRITORY	ACRONYM
Argentina	IRAM
Australia	SA
Austria	ASI
Belgium	NBN
Brazil	ABNT
Canada	SCC
Chile	INN
China	SAC
Denmark	DS
Finland	SFS
France	AFNOR
Germany	DIN
Italy	UNI
Japan	JISC
Korea, Republic of	KATS
Netherlands	NEN
Norway	SN
Russian Federation	GOST R
Singapore	SSC
South Africa	SABS
Spain	UNE
Sweden	SIS
Switzerland	SNV
United Kingdom	BSI
United States	ANSI

- Established in 2022
- 2 Plenary meetings
- Next meeting – Seoul, Dec. 2024

OBSERVING MEMBERS (7)	
COUNTRY/TERRITORY	ACRONYM
Colombia	ICONTEC
Czech Republic	UNMZ
Egypt	EOS
Morocco	IMANOR
Namibia	NSI
Poland	PKN
Ukraine	SE UkrNDNC

ISO/TC 197 & SC1 Division of Scope

ISO/TC 197 Focus

- ✓ Basic Requirements for Hydrogen Technologies
  - ➢ 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
- ✓ Sustainability aspects (GHG, H2GO, Cert)
- ✓ Coordination 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)

(Toshiba website)

IEA TCP Hydrogen and ISO/TC 197

Connecting PNR with Standards

IEA TCP Hydrogen Task 43 on Hydrogen Safety

Safety and RCS of Large-Scale Hydrogen Energy Applications

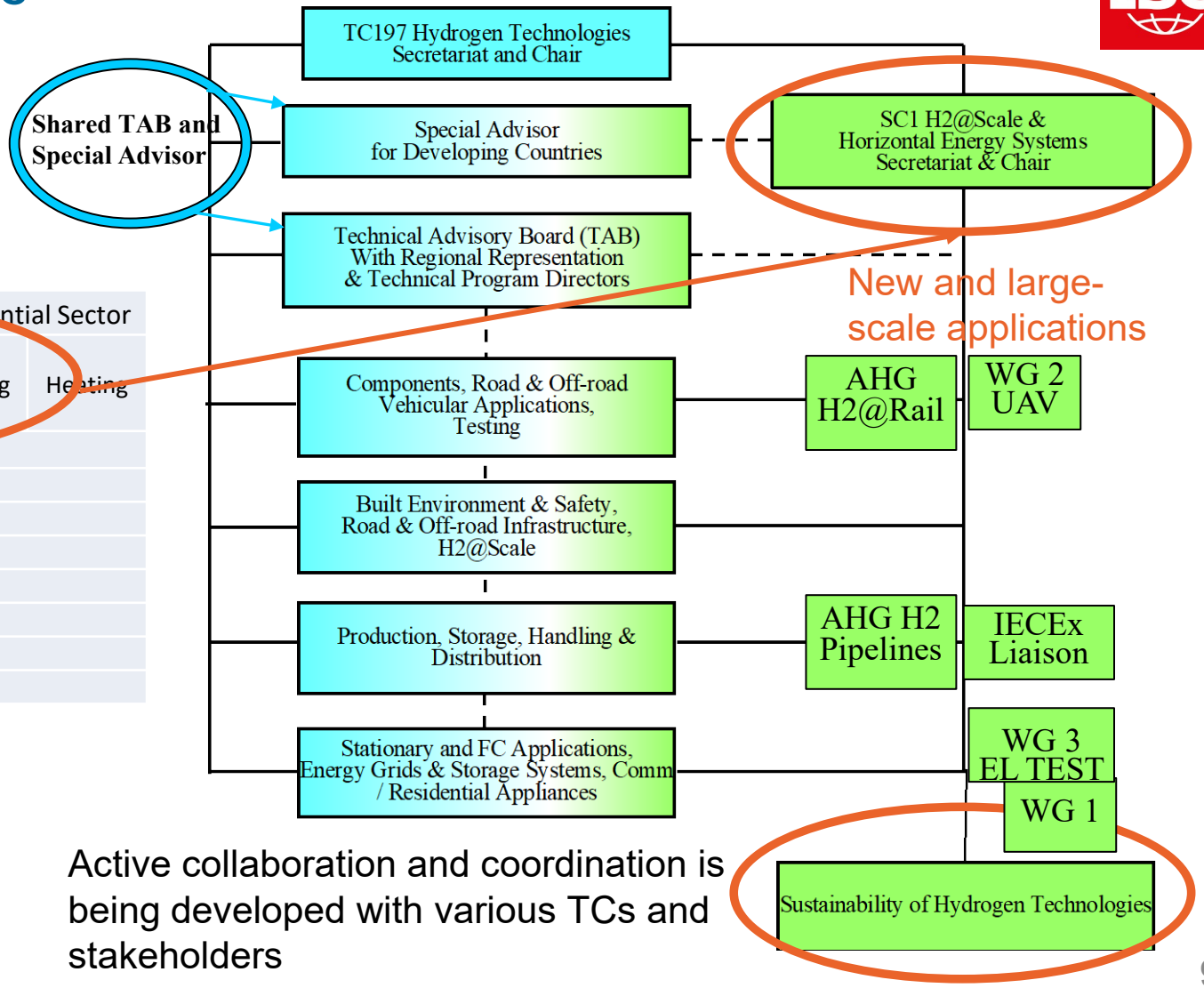
Focus on Common "Large Scale" and "Horizontal" Safety and Regulatory Aspects

Mobility Infrastructure					P2H with RES		Residential Sector	
Heavy duty road vehicles	Multifuel stations	Rail	Maritime	Aviation	Electrolysis	Energy Storage	Cooking	Heating
Common horizontal topics:								
Social (comprehensive) risk								
Safety culture and management system								
Safety distances								
Hazardous areas								
Confined environment: Enclosures, buildings, structures								
Hydrogen system safety								
Liquid and compressed hydrogen								

Kick off meeting – June 27, 2022
1st in-person meeting – October 17-21, 2022
2nd in-person meeting – February 27-March 3, 2023
3rd in-person meeting – September 18, 2023
4th in-person meeting – April 8-12, 2024

Hydrogen TCP

Program Level ISO/TC197 Organization Chart



Active collaboration and coordination is being developed with various TCs and stakeholders

ISO/TS 19870:2023 Published!

TECHNICAL SPECIFICATION

ISO/TS 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

Technologies de l'hydrogène — Méthodologie pour déterminer les émissions de gaz à effet de serre associées à la production, au conditionnement et au transport de l'hydrogène jusqu'au point de consommation

Reference number
ISO/TS 19870:2023(E)

New ISO standard on hydrogen unveiled at COP28

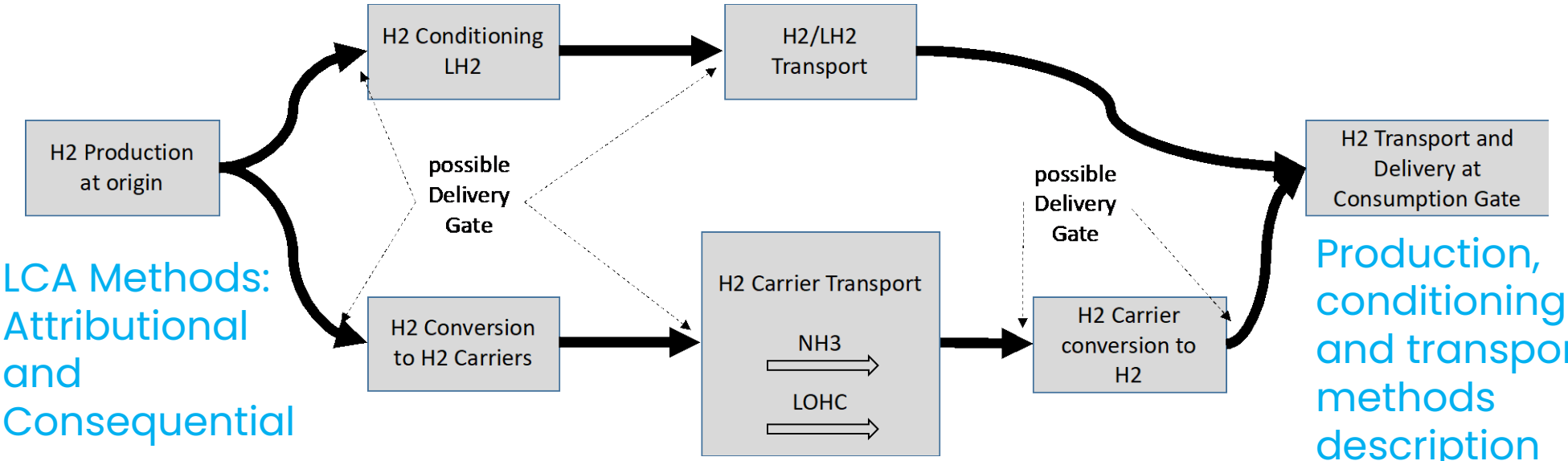
During COP28 in Dubai, the International Organization for Standardization (ISO) unveiled a new technical specification (ISO/TS 19870) as a foundation for harmonisation, safety, interoperability and sustainability across the hydrogen value chain.

Scope of ISO Methodology ISO/TS 19870:2023

To establish CFP (Carbon Footprint of Product) of Hydrogen along its supply chain: from Well to any Delivery gate up to Consumption gate.

Key ISO standards: 14044 (on LCA) and 14067 (on CFP)

Considered hydrogen supply chain



LCA Methods: Attributional and Consequential

Production, conditioning and transport methods description

ISO/TS 19870 Pub. Nov 30, 2023

ISO 19870-1, -2, -3, -4: 2024-26

Started, DIS Nov 2024

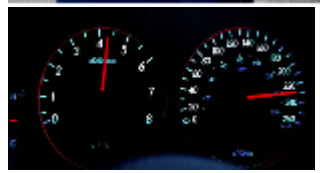
NOT in the Scope of the ISO Methodology

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 (Colors) are defined by public policies or by the market

Public authorities: Thresholds and labels. What is acceptable

Standards: How to measure



Harmonizing labels and thresholds should only be done through **negotiations between governments**

Global Issues require International Solutions

Participation within Established partnerships –

The Effective vehicle

Global SDOs & Regulators

ISO

IEC, IECEx, IECQ, IECRE, IECEE

OIML – Organisation Internationale de Métrologie Légale / International Organization of Legal Metrology

World Trade Organization

Key Strategic Partners

Hydrogen Council

IPHE – International Partnership for Hydrogen and Fuel Cells in the Economy

UNIDO

Hydrogen TCP

IRENA – International Renewable Energy Agency

- **WP.6**
- **H2 Task Force Sustainable Energy Division**

UNECE

Community + Stakeholders

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

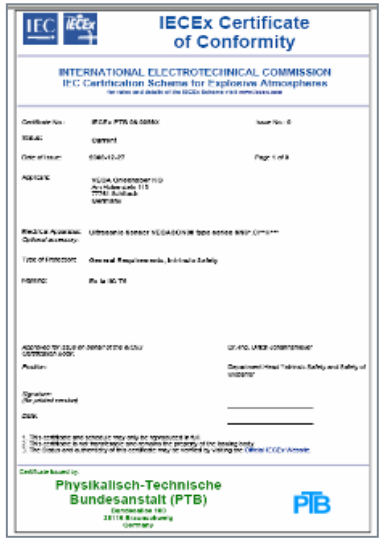
Single International Approach instils ***Regulatory + Market Confidence***

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**

IECEx Certificates of Conformity Scheme – Well Suited for Hydrogen Technical Field

Equipment



Ex Equipment, Components + Systems + Mechanical Equipment

Product testing + initial factory inspection + surveillance

Assemblies

Ex Equipment Unit Verification e.g. "Assemblies"

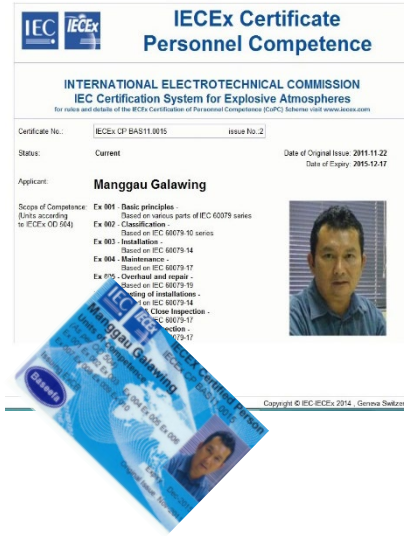
Services

Ex Services, e.g. Repair + Overhaul

Installation

Inspection

Personnel



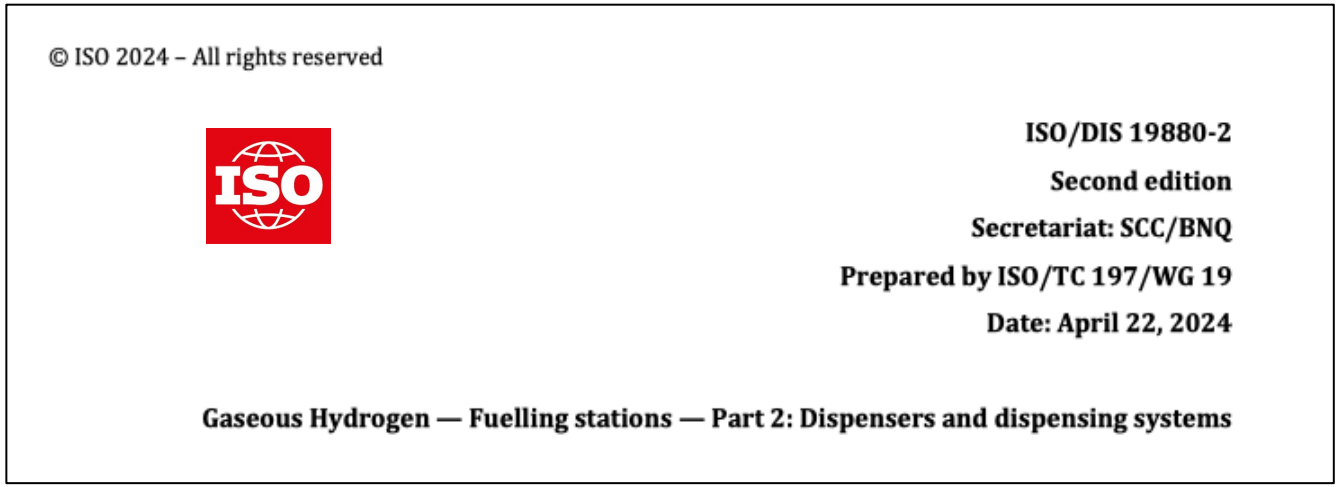
Ex Competent Person, with Photo ID Card

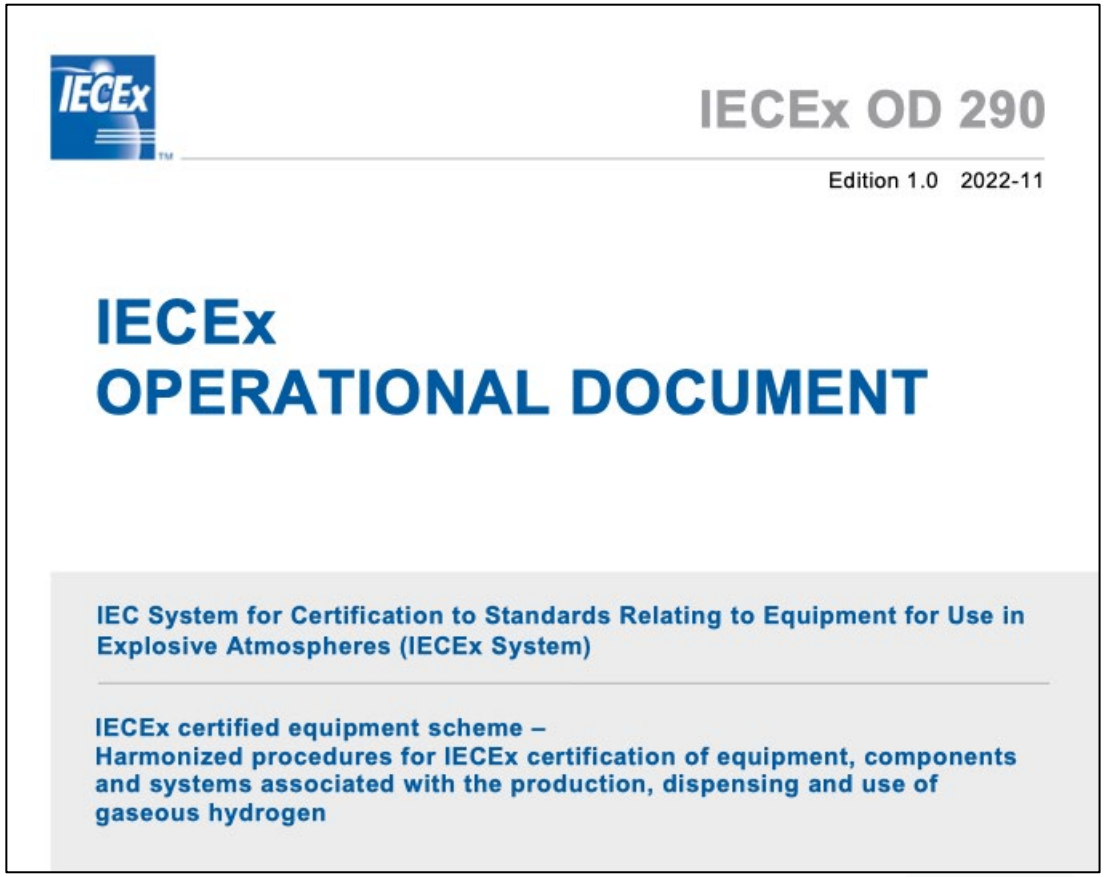
Started **1996**

Currently **over 100** IECEx Certification Bodies offer IECEx Certification **>140,000** Certificates + Reports issued including over 30,000 Certificates covering H2:
- Equipment
- Services
- Personnel Cert.

IECEx Certificates issued in 90+ Countries

Pioneering Approach to Certification of H2 Dispensers (via IECEx Operational Document OD 290)

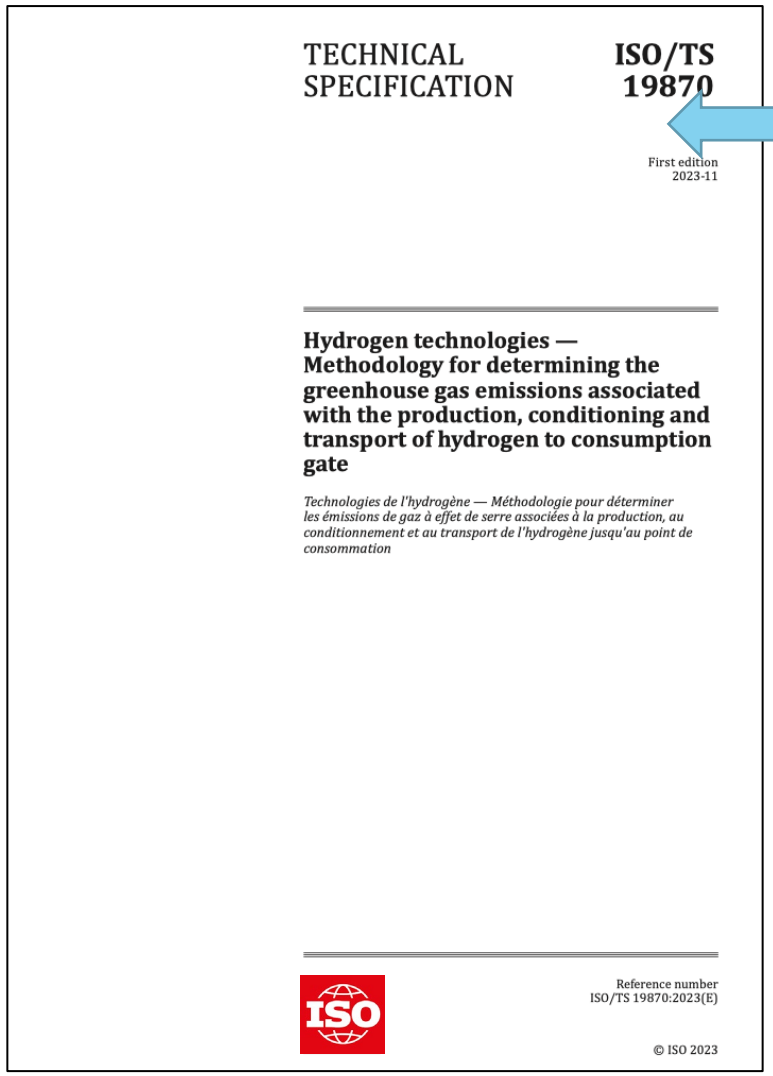




- ❑ IECEx OD 290 is NOT a specification, rather it is a scheme document to ensure consistency among aa test Houses and Certification Bodies when certifying H2 Dispensers
- ❑ OD 290 developed in close cooperation and input from ISO/TC 197 experts, and used in conjunction with IEC/TS 60079-46 *Equipment Assemblies*, until ISO 19880-2 is published
- ❑ Annex A "*Qualification and Routine Tests*" prided by ISO/TC 197 experts to align with DIS 19880-2.
- ❑ Satisfies immediate industry need to facilitate deployment and regulatory approvals of HRS.

Similar Approach Fits into H2 Product Certification Scheme (via IECQ CFP claims verification scheme)

www.iecq.org



TECHNICAL SPECIFICATION

ISO/TS 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

Technologies de l'hydrogène — Méthodologie pour déterminer les émissions de gaz à effet de serre associées à la production, au conditionnement et au transport de l'hydrogène jusqu'au point de consommation

Reference number
ISO/TS 19870:2023(E)

- ISO/TS 19870:2023 is based on ISO 14067 for CFP and ISO 14040 and 14044 for LCA.
- Based on ISO 14067, IECQ has launched a new service under its approved process (AP) scheme: the issuing of an IECQ carbon footprint of product claims verification.