



# Hydrogen technologies in standardisation

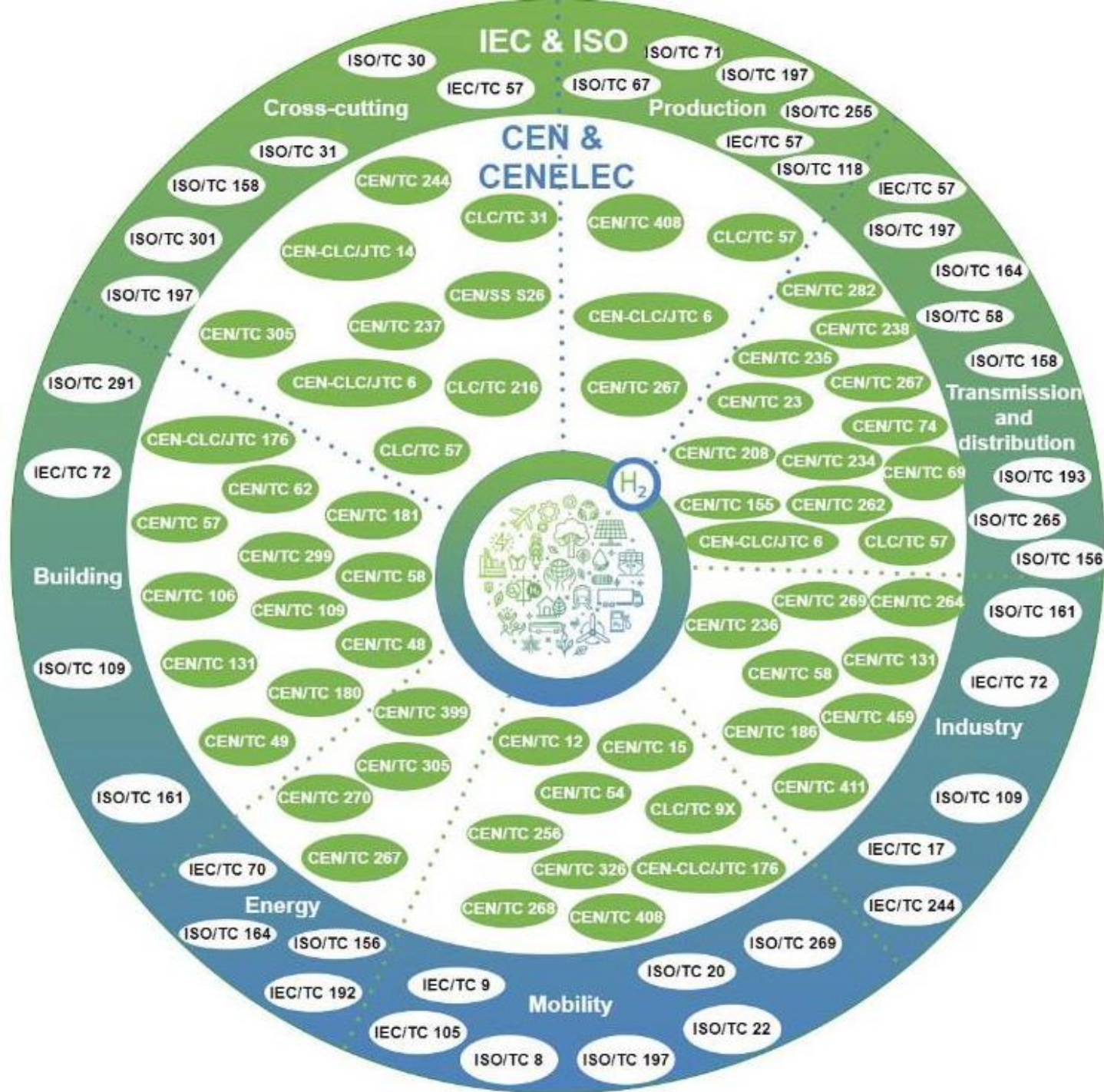
## Trends & Developments

# The role of standards

- Terminology
- Methodologies
- Certifications
- Technical sound measurements
- Enablers & accelerators
- Support new & emerging technologies
- Build trust & credibility
- Essential in climate action toolbox

**Alignment**  
**Coordination**  
**Harmonization**





# The complexity of H<sub>2</sub> standardisation ...



# EUROPEAN GAS REGULATORY FORUM

## Scaling up the EU hydrogen market

- Standardisation of hydrogen quality in hydrogen networks and end-use
- Development of **fit-for-purpose** technical standards
- The Commission has been invited to adopt a **standardisation mandate to CEN for hydrogen quality in dedicated hydrogen networks**



# European standardisation



- In **transition** to include hydrogen in the scope
- European Standardisation Technical Committees on NG considering H2 **compatibility**
- Equipment, fuel & networks

# CEN/TC 234 "Gas infrastructure"

## Survey on...

- the **impacts** of trace components/impurities and other quality parameters on the industrial processes and equipment **where hydrogen is used**
- information on **technical mitigation measures** at the industrial sites in order to **enable the use of the hydrogen from repurposed natural gas grids**

# CEN/TC 234 "Gas infrastructure"

## Work in progress...

- CEN/TR on the **acceptance of hydrogen** for the entire natural gas infrastructure
- Draft CEN/TR '**Consequences of hydrogen in natural gas infrastructure...**',
- **Conversion of natural gas pipelines** into hydrogen pipelines and the revision of gas infrastructure standards
- A series of draft standards for the **injection of renewable and decarbonised gases** (including **hydrogen**) into natural gas infrastructure



# CEN/TC 282 “Installation & Equipment for LNG”



- Discussions about **Decarbonisation ability of H2**
- How the environmental benefit of it can be assessed or **measured**
- LNG terminals facilities are being re-purposed in order to treat cryogenic liquefied gases – **hydrogen ready LNG infrastructure**
- Emphasis will be on energy carriers: **ammonia, methanol, and Liquid organic hydrogen carriers (LOHC)**



# CEN/TC 393 “Equipment for storage tanks and for filling stations”



- Filling stations, **nozzles and dispensers**
- **Leak detection** and leak prevention for double walled tanks in hydrogen standards.
- **Communication protocols** of the system with the tank to be filled
- **Multi-dispensing equipment** at service stations

# ISO/TC 67 - Oil and gas industries including lower carbon energy

## Hydrogen initiative – Challenges

- Extension of existing O&G standards for hydrogen and ammonia application
- Adequacy/ cost
- **Safety in operation (ATEX, drag effects, pressure-relieving and depressuring systems)**
- Material considerations
  - mixing in of H<sub>2</sub> in existing CH<sub>4</sub> infrastructure and storage
  - Harmonisation of testing fracture/fatigue (ASTM)



# ISO/TC 193 "Natural gas"

For revision to include H<sub>2</sub>...

- ISO 14532:2014 Natural gas — **Vocabulary**
- ISO 13734:2013 Natural gas — Organic components used as **odorants** — Requirements and test methods
- ISO 14111:1997 Natural gas — Guidelines to **traceability in analysis**
- ISO 15112:2018 Natural gas — **Energy Determination**



# CEN/CLC/JTC 06 - Hydrogen in energy systems

- **prEN ISO 24078**  
Hydrogen in energy systems – Vocabulary (2024)
- **prEN XXX**  
Safe use of hydrogen in built constructions (2025)

# CEN/CLC/JTC 14 - Energy management and energy efficiency in the framework of energy transition

- [prEN 16325](#)

Guarantees of Origin related to energy - Guarantees of Origin for Electricity, gaseous hydrocarbons, **Hydrogen**, and heating & cooling (2024)

- [prEN XXX](#)

Values and Benefits of Decarbonisation and Energy Performance Actions - A General Framework for Assessment (2025)

# ISO/TC 197 Hydrogen technologies



**33**  
Participating members

**18**  
Observing members

**18**  
Published standards

**19**  
Standards under  
development



# ISO/TC 197 Hydrogen technologies

Leading countries...



# ISO/TC 197 Hydrogen technologies

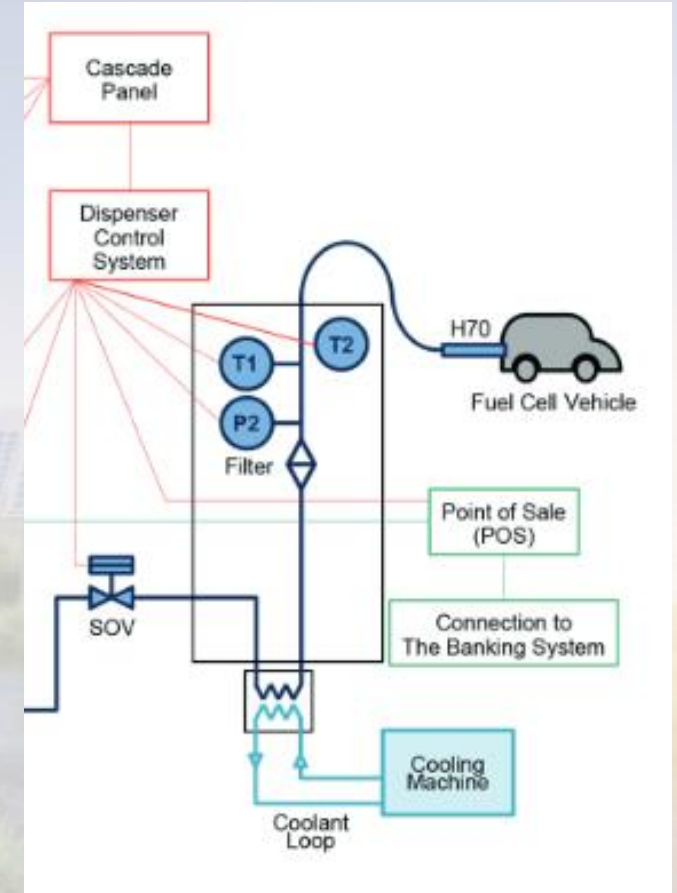
## Standardisation work fields

- Components and Vehicular Applications
- Built Environment and Safety
- Production, Storage and Handling
- Stationary and Fuel Cell Applications

# ISO/TC 197 Hydrogen technologies

## Current standardisation projects

- Cylinders and tubes for **stationary storage**
- Gaseous hydrogen
  - land vehicle **refuelling connection/ fuel tanks and TPRDs**
  - fueling station **dispensers/ compressors/ hoses/ fittings**
  - **Fuelling protocols** for hydrogen-fuelled vehicles





# ISO/TC 197 Hydrogen technologies

## Current standardisation projects

- Hydrogen **fuel quality**/ quality control
- Basic considerations for the **safety of hydrogen systems**
- Hydrogen **generators** using water electrolysis
- **Liquid Hydrogen**
  - Land vehicles fuel tanks
  - Land Vehicle Fueling Protocol

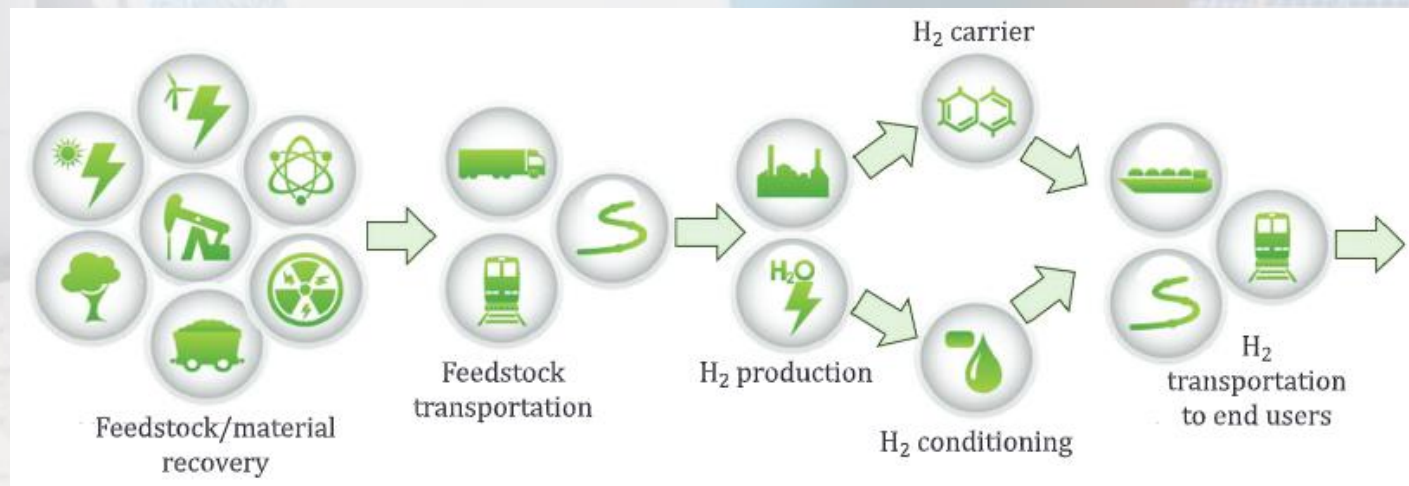


# ISO/TC 197 Hydrogen technologies

## Future standards...

### ISO/DTS 19870

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





**Thank  
You!**



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