NORMUNGSROADMAP WASSERSTOFFTECHNOLOGIEN

DIN DKE DVGW NWB VDA VDI VDMA

Building a Safe Hydrogen Economy: The Role of Standardization

Gefördert durch:
Bundesministerium für Wirtschaft und Klimaschutz
aufgrund eines Beschlusses des Deutschen Bundestages

The importance of standards in hydrogen safety

- Ensures consistent safety protocols across all hydrogen technologies
- Facilitates safe handling and transportation of hydrogen
- Minimizes risks associated with hydrogen
- Enhances public trust and acceptance
- Standards improve interoperability and compatibility between different systems and components

Great! We already have a lot of standards…

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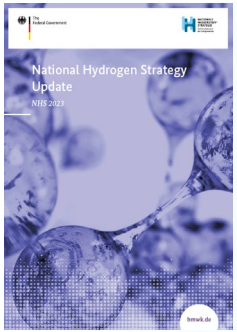
- … we are using hydrogen for a long time!
- However:
  - New applications
  - New (much larger) scale
  - New users
- **What do we actually have?!**

Standardization Roadmap Hydrogen Technologies

Standards – an essential prerequisite for the ramp-up of hydrogen technologies



Source: German Ministry of Economic Affairs and Climate Action (BMWK)

Active support and participation in the **international development and harmonisation of standards for transport applications** for the storage, transport and use of hydrogen and its derivatives as well as fuel cell systems.

Creation of appropriate framework conditions: coherent regulatory conditions at national, European and, if possible, international level will support the market ramp-up. They will primarily include efficient planning and approval procedures, **uniform standards and certification systems** that are adequately equipped, in addition to coordinated administration at all levels.

Strengthen EU leadership in international fora for **technical standards**, regulations and definitions on hydrogen

Pre-normative research, including the safety dimension, should be tailored to assist deployment plans and **enable improved, harmonised standards**.

Source: European Commission

Framework conditions "Standardization Roadmap Hydrogen Technologies"

PROJECT DURATION

January 2023 – December 2025

PROJECT PARTNERS

DIN, DKE, DVGW, NWB, VDA, VDI, VDMA

FUNDING

Federal Ministry for Economic Affairs and Climate Action

The goals are…

- … Covering the entire value chain of H_2 technologies
- … Coordination of all national technical rule-setting organizations and networking of relevant stakeholders
- … Establishment of a coordinated national approach as a basis for European and international standardization activities
- … Networking with all relevant initiatives and projects in the field of H_2 and standardization
- … Strategic initiation and support of urgent standardization projects

Working within the framework

Analysis of the status quo and needs

- Elaboration of a comprehensive overview of the standardization, comittee and project landscape
- Identification of needs within standardization and pre normaitve need for research

Recommended actions

- Derivation of specific standardization projects
- Recommendation and priorization of standardization projects

Implementation

- Initiation and implementation of funded standardization projects
- National
- European
- International

Structure of the committees

Elaboration of the topics within the working groups

WC PRODUCTION

SWC PRODUCTION PLANTS
- WG Electrolysis
- WG Other production methods
- WG Total system integration

SWC HYDROGEN QUALITY
- WG Hydrogen composition
- WG Verification and sustainability aspects

WC INFRASTRUCTURE

SWC TRANSMISSION AND DISTRIBUTION GRIDS
- WG Piping
- WG Transmission pipelines
- WG Plant engineering
- WG Distribution networks

SWC STORAGE
- WG Stationary and mobile pressure vessels
- WG CCU/CCS *
- WG Underground gas storage
- WG Liquefaction

WC APPLICATION

SWC POWER SUPPLY AND REVERSIBLE FUEL CELL
- WG Fuel cells
- WG Power plants, turbines, CHP plants

SWC INDUSTRY
- WG (petro)chem. Industry
- AG PtX
- WG Thermoprocessing equipment
- WG Steel Industry

SWC HEAT
- WG Domestic applications
- WG Controls
- WG Commercial applications

SWC MOBILITY
- WG Filling systems
- WG Road vehicles
- WG Railway vehicles
- WG Shipping
- WG Aviation
- WG Special vehicles

WC QUALITY INFRASTRUCTURE

SWC MEASUREMENT TECHNIQUE
- WG Gas analysis
- WG Hydrogen measurement technology and billing methods

SWC MATERIALS
- WG Metallic materials
- WG Composites and plastics

SWC COMPONENTS
- WG Components for infrastructure
- WG Components for application and technologies

WC FURTHER TRAINING, SAFETY, CERTIFICATION

SWC SAFETY
- WG Safety design principles
- WG Cyber Security
- WG Explosion protection
- WG Safety and integrity management
- WG Product certification
- WG Further training

*The CCU/CCS working group was put on hold.

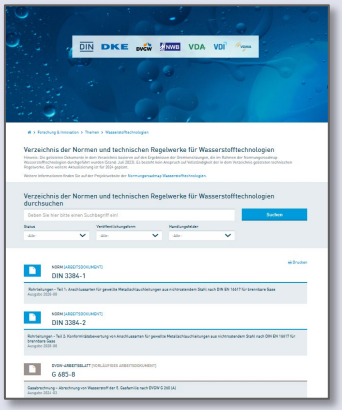
- *Topics relating to carbon utilization were included in WG 3.2.2 PtX.*
- *Topics relating to carbon capture were included in WG 1.1.2 Other types of generation.*
- *Topics relating to carbon storage were removed from the scope of the standardization roadmap.*

Outlook and milestones

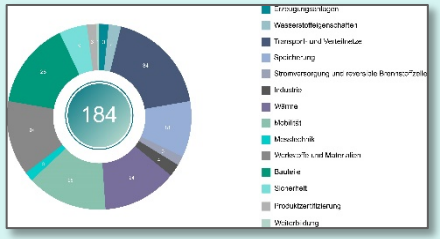
Consolidation & concretization of the roadmap for the technical rule-setting of hydrogen technologies

Results

Project results



Standards database for hydrogen technologies



Overview of recommendations for action for pre-normative research

Overview of recommend-dations for action for technical rule-setting

Overview of implementation projects

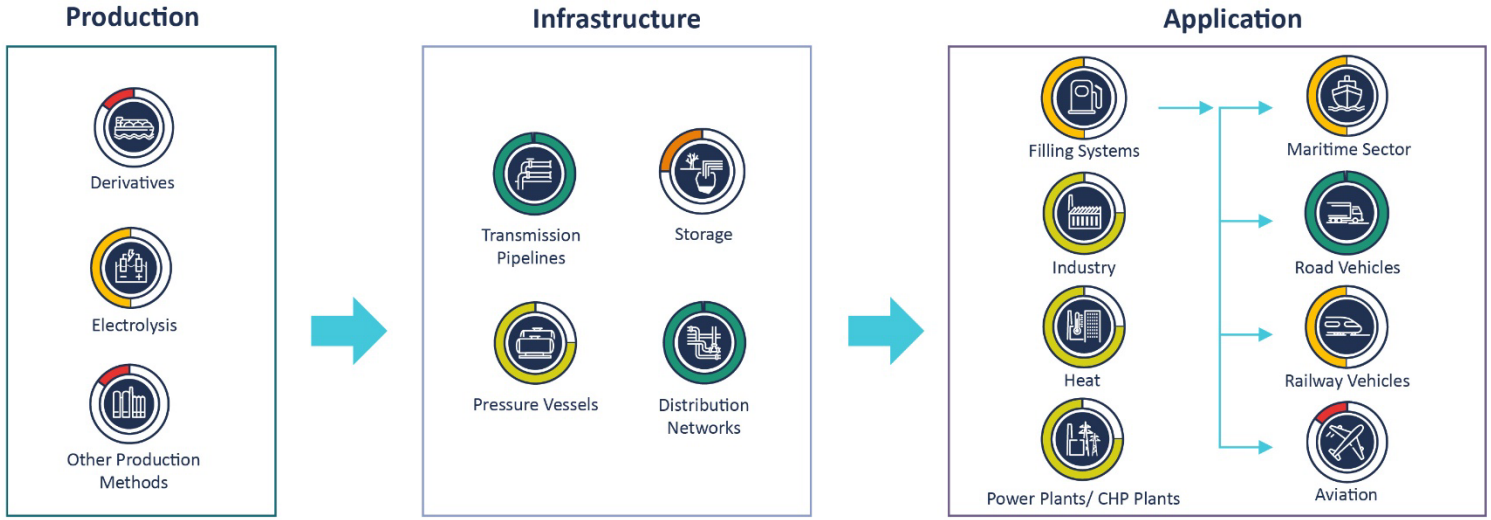
Standardization Roadmap Hydrogen Technologies 2024

Click here for the project website

You can download the Standardization Roadmap Hydrogen Technologies here on our project website:

Standardization Roadmap Hydrogen Technologies

Status of technical rule-setting



Projekt DIN TR xxx

Further training, certification, safety

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Entry into the H2 value chain - qualification requirements in accordance with the legal framework

Type of project: National project - New project

Scope:

- Objective: All players in the hydrogen value chain must be familiar with the legal requirements and qualification requirements in order to prepare for new functions as energy carriers and storage facilities
- Content: Comprehensible presentation of the legal framework and qualification requirements for the production, transportation and use of hydrogen to facilitate familiarization

Background/requirement:

- Challenges in the risk assessment of hydrogen releases: complex dispersion at different temperatures and varying impact assessment models
- Need to adapt the VDI 3783-2 guideline for specific hydrogen considerations, including the identification of hazard areas
- Consideration of limitations and special features in the application of the VDI 3783-1 and VDI 3783-2 guidelines

Project VDE 0100-7XX

Production

Electrical protection measures for hydrogen generators based on the electrolysis of water

Type of project: National project - New project

Scope:
- Special requirements for circuits for water electrolysers
- Concepts for the protection of persons and systems, no assessment of the explosion risk or the electrolyzer

Background/requirement:
- Water electrolysis requires high current in the water, which violates electrotechnical standards and makes pilot projects necessary
- Standardization of connection requirements for water electrolysers to support market players and scale up the technology

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Project VDI 4635-1

Application

VDI 4635 Power to X; Sheet 1 - General aspects

Type of project: National project - New project

Scope:

- VDI Standard 4635 Sheet 1 - Power-to-X as an umbrella for technologies for converting electricity into other forms of energy storage or chemical products
- Power-to-X as a modular system with definitions, questions and context for all parts

Background/requirement:

- VDI Guideline 4635 Sheet 1- Power-to-X for standardized terms and principles in the field of electricity conversion
- Power-to-X as an introduction to the other sheets in the guideline series
- Summarizes general aspects e.g.: approval, **safety and secutity**

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Standardization roadmap for hydrogen technologies

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Further information

You can find more information on Projektwebsite

The registration for collaboration is possible on the collaboration platform DIN.ONE