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H2 Academy

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H2 ACADEMY by DVGW

DVGW VOCATIONAL TRAINING

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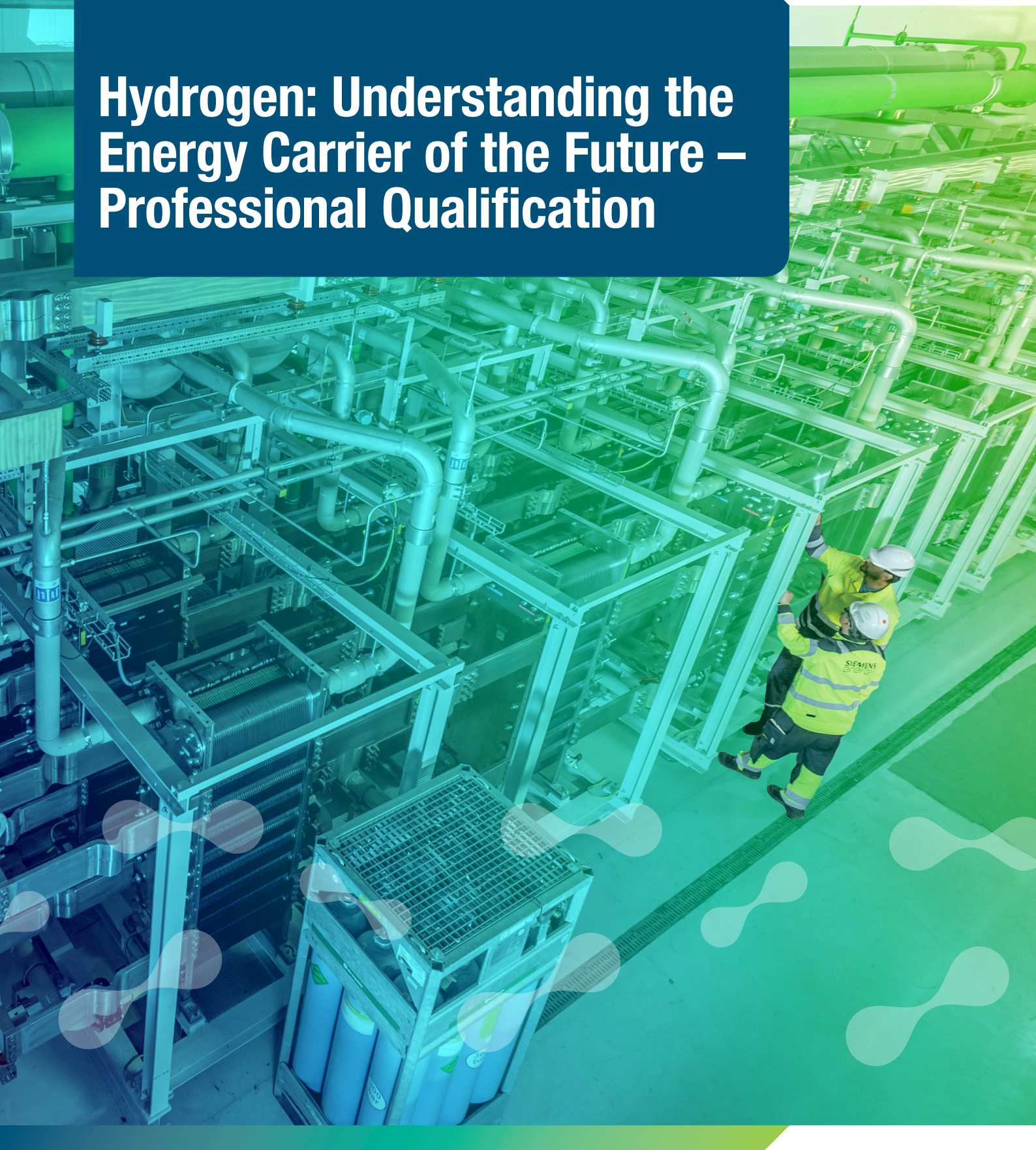
Hydrogen: Understanding the Energy Carrier of the Future – Professional Qualification



The DVGW at a glance

Quality, safety, innovation

The German Technical and Scientific Association for Gas and Water (abbreviated DVGW) is a technical and scientific association that supports the gas and water industry. Its main focus is on safety, hygiene and environmental protection. The DVGW is economically independent and politically neutral. It works closely with numerous European partners and is involved in international research collaborations. Due to its expertise in Germany, the DVGW is also an important player in shaping European and international standardisation. The association creates generally recognized technical rules for these areas. In doing so, it relies on research results from its own and initiated research projects It certifies products, services and experts for gas, hydrogen and drinking water.

Through its training and continuing education programmes, the DVGW provides instruction on the latest technical findings. With the DVGW Congress and other events, it enables extensive exchange within and between industries. Find out more about the DVGW Group, our objectives and services, our sustainability initiatives and our history.

A strong Community

91 %
of gas network operators in Germany are DVGW members.

73 %
of drinking water in Germany is provided by DVGW members.

The DVGW represents …

… the operators of **more than 1 million km** of pipeline network…

… **66.000** employees …

… **7.3 billion euros** annual capital investment

Our Objectives

We are setting the course for the climate-neutral and reliable energy system of tomorrow and want...

- the decarbonisation of the gas supply while maximising security of supply
- the switch to new, climate-neutral gases such as hydrogen and biomethane
- the transformation of the existing gas infrastructure into a key element for the energy transition

We will continue to ensure a reliable and hygienically safe water supply in the future and work for…

- a sustainable and safe supply of drinking water for the population
- ensuring the high quality of the German water supply
- the development of a resilient water management system hat can withstand the challenges of climate change

H2 Academy by DVGW

The H2 Academy by DVGW imparts practical hydrogen know-how „from the industry for the industry".

We offer training tailored to your specific requirements. Our programs cover the entire hydrogen value chain, providing comprehensive knowledge across all relevant topics. You can chosse between online or on-site formats to suit comprehensive training needs. We address both national and international subjects, with an expanding portfolio of English-language content available. Get in touch with us, and we will customise the training measures to meet your individual goals.

'DVGW is actively shaping the energy transition – through the use of climate-neutral gases.'

Hydrogen plays a key role as a versatile energy carrier that can be used across all sectors, making it essential for a successful transformation. In this context, the qualification of skilled professionals is of vital importance – both nationally and internationally. With the H2Academy by DVGW, the association offers a comprehensive training portfolio that covers the entire hydrogen value chain. Notably, the academy also provides English-language courses, specifically designed to meet the needs of international professionals.

Prof. Dr. Gerald Linke
Vorstandsvorsitzender / CEO
DVGW German Technical and Scientific Association for Gas and Water

Hydrogen: Understanding the Energy Carrier of the Future from the Ground Up – Professional Qualification

- Modular training formats in English
- Based on research and exchanges with European experts

Module 1
Introduction to the hydrogen economy (e-learning)

Module 2
Basics, applications, handling and safety of hydrogen (e-learning)

Module 3
Hydrogen 360° – from production to appliction (classroom training)

The H2 Academy is a joint development of Siemens Energy and DVGW

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H2 Academy by DVGW – Module 1 of 3

Introduction to the hydrogen economy

Target Audience

This course is suitable for anyone who wants to gain a fundamental understanding of the hydrogen economy – regardless of prior knowledge, professional background, or industry. It is designed for all individuals who are interested in learning how hydrogen is produced, used, and integrated into future energy systems.

Duration

120 min

Course Objectives

The hydrogen economy is becoming a key component of the global energy transition. This compact e-learning course provides a clear understanding of the fundamental relationships, technical processes, and strategic considerations necessary to grasp the hydrogen economy. Participants gain a comprehensive overview of applications, technologies, and economic perspectives across the entire hydrogen value chain.

- **Climate Change – Solutions and Strategies**
  Introduction to the challenges of climate change and the role of hydrogen in sustainable energy systems.

- **Sector Coupling**
  Understanding how hydrogen interconnects the electricity, heating, and mobility sectors and enables decarbonisation.

- **Perspectives and Development Steps**
  Market trends, political frameworks, and technological and economic future prospects.

- **The Element Hydrogen**
  Physical and chemical basics, properties, and safety considerations.

- **Electrolysis**
  Overview of electrolysis technologies and their importance for producing green hydrogen.

- **Compression of Hydrogen**
  Technologies and processes for compressing hydrogen for transport and storage.

- **Synthesis Processes of Hydrogen Derivatives**
  Production of ammonia, methanol, and e-fuels – their roles and applications.

- **Re-Electrification**
  Converting hydrogen back into electrcal energy, e.g., through gas turbines or fuel cells.

- **Final Test**
  Short assessment to check the learning progress.

H2 Academy by DVGW – Module 2 of 3

Basics, applications, handling and safety of hydrogen

Target Audience

This course is designed for:

- Professionals in the energy and gas sectors
- Technicians, engineers, and planners
- Safety offices and occupational health professionals
- Project managers and decisionmakers
- Employees of authorities, municipalities, and permitting bodies

Duration

1 day

Course Objectives

This e-learning course provides a comprehensive understanding of hydrogen as an energy carrier and its role in the energy transition. Participants gain structured knowledge of hydrogen technologies, safety requirements, regulatory frameworks, and the technical aspects of storage, transport, and processing.

Chapter 1: Hydrogen – Fundamentals, Properties, and Applications

- Hydrogen as part of the energy transition
- Role in future energy systems
- Hydrogen colours (e.g. green, blue, turquoise)
- Physical and chemical properties
- Safety-related characteristics
- Hydrogen applications in mobility (e.g. FCEV)
- Stationary and industrial applications – Introduction to H_2 infrastructure

Chapter 2: Safety, Regulations & Legal Framework

- Safety-related properties of hydrogen
- Typical hazards and risk assessments
- Protective measures and safe handling
- Occupational health and organisational safety requirements
- Legal foundation and the national hydrogen strategy
- DVGW hydrogen strategy and current status of the rulebook revision
- Key standards and codes:
  - G 221 – Guideline for the application of DVGW codes
  - G 491 – Gas pressure regulation stations & pressure vessels

Chapter 3: Storage, Transport, and Processing of Hydrogen

- Measuring instruments: calibration and hydrogen compatibility
- Fundamentals of hydrogen compression
- Hydrogen liquefaction: processes, energy demand, logistics
- Transport options: pipelines, trailers, cryogenic systems
- Storage and distribution in the gas infrastructure
- Power-to-Gas and coupling with renewable energy
- Gas infrastructure flow dynamics: the 20 m/s guideline
- Synthesis processes for hydrogen derivatves (ammonia, methanol, e-fuels)

Chapter 4: Final Examination & Certification

- The e-learning course concludes with a mandatory final exam covering the content of all three chapters.
- Upon successful completion, participants receive a certificate confirming their qualification.

H2 Academy by DVGW – Module 3 of 3

Hydrogen 360° – From production to application

Target Audience

This course is designed for:

- Professionals in the energy and gas sectors
- Technicians, engineers, and planners
- Safety offices and occupational health professionals
- Project managers and decisionmakers
- Employees of authorities, municipalities, and permitting bodies

Duration

3–4 days

Content

See below and choose your topics along the value chain. The length of topics depends on your individual specifications.
Feel free to contact us on conception matters: **h2academy@dvgw.de**

Course Objectives

Benefit from the expertise of our specialists and gain comprehensive qualifications along the entire value chain. Our certification course is designed for professionals and executives from industry/trade, utility companies, and other economic sectors who already have basic knowledge of hydrogen or natural gas.

- **Introduction**
  - Globale Role of Hydrogen
  - Physical and Chemical Properties
  - Gas Blends
  - Material Compatibility
- **Production**
  - Electrolysis
  - Reforming
  - Pyrolysis
  - Greenhouse gas emissions
- **Regulatory Requirements & Compliance**
  - Codes and Standards
  - Occupational Health, Safety, Risk
- **Transport & Infrastructure**
  - Transport of Hydrogen
  - High pressure transport grids
  - Low pressure distribution grids
- **Compressor Stations**
  - Compressor Stations
  - Gas Storage Systems
- **Grid Management**
  - First Experience of the Transformation Process of a local Gas Grid
  - Grid Control
  - Network Balancing
- **Safety, Regulation & Hydrogen Integration**
  - Explosive Atmospheres
  - Gas Pressure Regulation and Metering Stations
  - Custody Transfer and Fiscal Metering
  - Gas Pressure and Flow Regulators
  - Custody Transfer and Fiscal Metering
- **Power-to-X & Hydrogen Applications**
  - Power-to-Ammonia
  - Power-to-Liquids (Methanol, SAF, Olefins, E-Fuels)
  - Mobility
  - Hydrogen Re-Electrification

H2 Academy by DVGW

'The H2 Academy is an excellent curriculum to understand the hydrogen economy and to learn about the key technologies of the hydrogen value chain.'

The H2 Academy was developed in conjunction between Siemens Energy and DVGW to close the training gaps of Siemens Energy employees in hydrogen topics. The best experts of Siemens Energy, DVGW and third party companies contributed to the contents. The training modules show the highest participant ratings among all corporate trainings in our company.
I look forward to welcome you on a H2 Academy training!

Dipl. Ing. Erik Zindel
Vice President Hydrogen & Decarbonization Strategy by Siemens Energy and
Program Director of H2 Academy

Contact us

We will customise the training measures to meet your individual goals.
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