

# Renewable Energy Technologies - Hydrogen

## Sample Course: Hydrogen Technology in mobility systems for Technicians

The participants will get an introduction on Hydrogen Economy and related applications in mobility systems. The course contributes to the acquisition of relevant knowledge and competences of technicians for applying hydrogen technology in mobility systems. Specific focus is directed on adaptation of curricula, training programs and its implementation in line with application of hydrogen technology in mobility systems.

- **Content, elements, format and duration can be customized to the respective needs**

### Learning outcomes

On completion of this course participants will be able to

- analyse the CO<sub>2</sub> and energy balance of electric/e-fuels vehicles
- understand the main features of a hydrogen economy and how e-fuels can be applied in future mobility
- understand the most important parts and working principles of an electrolysis system and its application
- describe the differences between a battery and fuel cell electric vehicle and the types of fuel cells and apply selected solution in practice
- describe and apply recycling concepts for batteries and PEM fuel cells
- understand and apply requirements of occupational health and safety in hydrogen technology

### Contents

- Overview on electric mobility
- Applications of sector coupling, e-fuels, fuel cells
- Principles of electrolysis, water purification
- Closed loops and balances
- Transport and storage of hydrogen and electricity
- Occupational health and safety in hydrogen technology
- Small-scale applications of hydrogen technology (examples of existing technologies / outlook)
- Recycling methods for fuel cells and batteries

### Formats

Virtual format implemented with following main digital media (e-learning) elements:

- Learning Management Systems (Moodle etc.)
- Lectures/presentations via video stream (live or on demand)
- Collaboration and productivity software like MS 365 (Teams, Office) or Google Apps

- Group and one-on-one video calls for mentoring and discussion

The participant-centered and practical approach includes group and project work.

### Language

- English
- German
- Upon request: other languages with interpreters

### Target groups

- Management staff on system and institutional level of TVET
- TVET experts
- TVET teaching staff in TVET institutions and companies

### Participation requirements

- Basic ICT / computer skills, current Web browser, office applications
- At least 3 years of professional experience
- Fundamental skills in mathematics, physics or electrical engineering

### Duration

- 12 weeks self-learning seminars (2,5 hrs each)

### Equipment

- Notebook / PC (Linux, Mac, Win 10/11)
- Stable (preferred: fast) internet connection
- Integrated or external microphone
- Optional: webcam

### Certificate

The participants will receive a certificate of participation after successful completion of the course.

### Your contact

#### TVET Academy

Academy for International Cooperation  
Deutsche Gesellschaft für Internationale  
Zusammenarbeit (GIZ) GmbH

E [tvvet-academy@giz.de](mailto:tvvet-academy@giz.de)

I [www.giz.de/tvet-academy](http://www.giz.de/tvet-academy)

I <https://tvvet-academy.de>