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Online Training Programme

Green Hydrogen Specialist: Project Development and Economics

CONTENT

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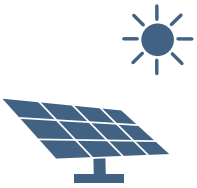
WHY COMPLETE THIS GREEN HYDROGEN PROGRAMME?

BUILDING A GREEN HYDROGEN ECONOMY

Global demand for green hydrogen and its derivatives has grown rapidly. In the near future, it has the potential to become a globally traded energy carrier. These developments are driven by increasing awareness of climate change, the importance of decarbonisation, and the search for alternative energy sources. Therefore, the technologies for producing and using green hydrogen are constantly evolving. Advances in electrolysis, hydrogen storage and use, and increased efficiency lead to cost reductions and improved performance capabilities. Governments and policymakers worldwide recognise the enormous potential of the green hydrogen economy, have introduced support measures and funding programmes, and are keen to reduce their dependence on fossil fuels and use green hydrogen for a sustainable energy future.

WHAT THIS PROGRAMME OFFERS PROFESSIONALS

Completing the e-learning programme, Green Hydrogen Specialist: Project Development and Economics, will enable participants to understand the complex economic and project development aspects of this key element in the transition to a low-carbon future. They will gain basic knowledge on hydrogen electrolysis, ammonia production, fuel cell power plants, transport options, and green hydrogen markets. The growing market for green hydrogen offers enormous investment opportunities. Private investors, companies, and financial institutions are increasingly willing to invest capital in green hydrogen projects. Learning about these topics will enable participants to prepare business plans, attract potential investors, and assess green hydrogen project profitability. These are necessary skills to increase the chances of effectively realising projects.



VALUABLE INSIGHTS INTO GREEN HYDROGEN MARKETS AND FINANCE

A quantitative assessment of projects' financial performance and profitability is essential to develop green hydrogen projects successfully. Cash flow projections based on sound assumptions need to be evaluated across different scenarios. Potential investors need to be convinced of the project's profitability, and decisions need to be grounded in solid financial principles. By completing this e-learning programme, participants can develop an understanding of international markets and export opportunities.

INFORMATIVE AND APPLICABLE PROJECT DEVELOPMENT CONTENT

This training programme provides a useful basis for setting up initial green hydrogen projects around the world, thus supporting the market ramp-up. Furthermore, it prepares participants to lead economic and political discussions on green hydrogen market development. They will be able to formulate the right questions about expanding the green hydrogen market and project-specific parameters, such as approval procedures.

Professionals in this e-learning programme will also learn essential facts about proven technological developments in green hydrogen. They can incorporate this information into their project development plans and present technological options that make their projects more competitive and profitable.

IS THIS PROGRAMME FOR YOU?

This training programme is designed specifically for key players, such as project developers and financiers. Project developers require the ability to plan financially viable projects, while financial institutions need comprehensive knowledge to evaluate these plans and identify potential risks. This is especially important as green hydrogen projects involve various risks, and thorough risk assessment is crucial to attract potential investors and ensure financial stability.

A unique feature of this six-month online programme is the opportunity to network with other professionals and experts. Thus, fostering potential collaborations or career opportunities.

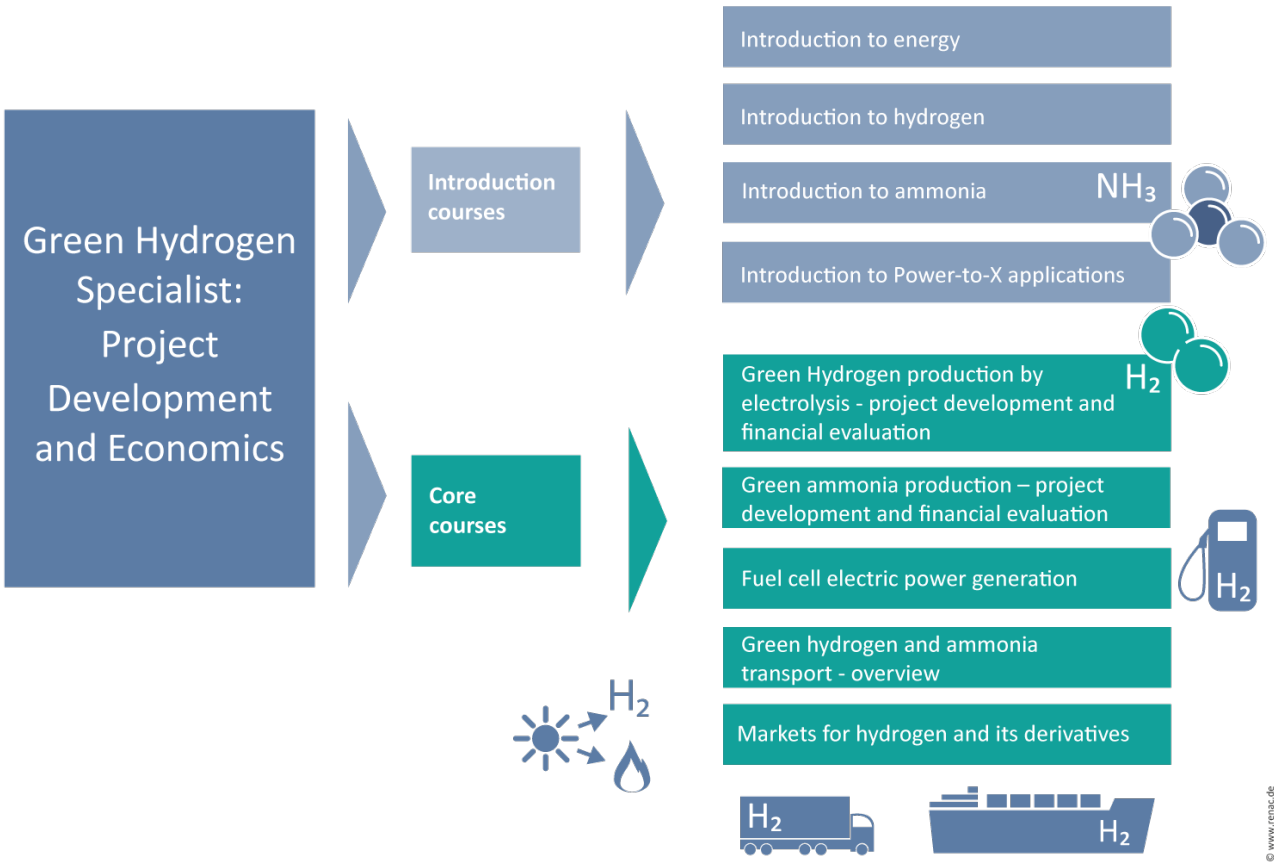


Figure: Green Hydrogen Specialist: Project Development and Economics training programme courses

PROGRAMME SUMMARY

The Green Hydrogen Specialist: Project Development and Economics online programme provides project developers and representatives from finance institutions with the necessary knowledge and skills to navigate the emerging field of green hydrogen economics and project development. Through a combination of 9 courses, programme aims to equip participantswith the expertise needed to capitalise on the growing opportunities in the green hydrogen market.

Certified by:

TARGET GROUPS

This programme is suitable for you if you are:

- An employee of a company that develops projects involving cutting-edge technologies, such as production of hydrogen using electrolysers.
- An employee of a bank, insurance company, or financial institution seeking to evaluate the financial aspects of green hydrogen, green ammonia, and fuel cell power stations.
- An employee of a company that makes informed decisions regarding opportunities for:
  - production of green hydrogen using electrolysers
  - production of ammonia from green hydrogen
  - transport of hydrogen and ammonia
  - production of energy from green hydrogen via fuel cells

Whether you are part of a company looking to venture into these exciting areas of project development or a financial institution seeking to assess the viability of financing such projects, this programme is designed to provide you with fundamental knowledge. You will be prepared to make informed decisions regarding project development and financing opportunities.

LEARNING OUTCOMES

By the end of this training programme, participants will have a good understanding of green hydrogen economics and project development. They will be equipped with the knowledge and skills to identify opportunities in the rapidly evolving green hydrogen sector. Whether you are a project developer or a finance institution looking to enter the green hydrogen market, this programme will provide you with the tools and insights needed to succeed in this promising industry.

After completing the training programme, participants should be able to:

- apply the basic principles of project development in the production of green hydrogen via electrolysis, green ammonia production, and for small fuel cell power plants,
- evaluate and implement sustainability aspects in project planning and operation,
- assess project economic viability and identify associate project risks,
- explain the various markets and transport options available for green hydrogen and ammonia,
- explain the fundamentals of hydrogen as an energy carrier and its potential in various applications and
- assess investment opportunities in the evolving green hydrogen economy.

PROGRAMME STRUCTURE

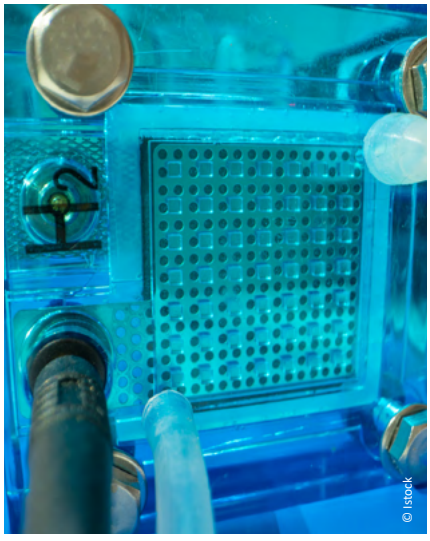
INTRODUCTION COURSES 20 hours	CORE COURSES 100 hours	EXAM AND CERTIFICATES 2 hours
▪ Introduction to energy ▪ Introduction to hydrogen ▪ Introduction to ammonia ▪ Power-to-X application	▪ Green Hydrogen production by electrolysis - project development and financial evaluation ▪ Green ammonia production – project development and financial evaluation ▪ Fuel cell electric power generation ▪ Green hydrogen and ammonia transport - overview ▪ Markets for hydrogen and its derivatives	▪ Exam and retake covering mandatory courses ▪ Evaluation considering final exam ▪ and assignments ▪ Certificate

WORKLOAD FOR PARTICIPANTS

Depending on prior knowledge, participants should expect to spend about 120 hours to successfully complete the course. This includes: Reading and understanding the material, watching videos, answering self-test questions, participating in virtual classrooms, and joining the Q&A forum. It also includes submitting short assignments, completing administrative work (familiarising with the Moodle platform and creating profiles, etc.), and successfully preparing for and taking an online exam.

PROGRAMME DETAILS

Figure: Green Hydrogen Specialist: Project Development and Economics training programme schedule of courses. Please note: schedule may change due to organisational reasons.



LANGUAGE

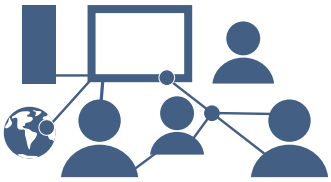
The programme language is English. All programme material (including course content, videos, pre-recorded lectures, assignments, and exams) is available in English.

FINAL EXAM / CERTIFICATE

Participants finish the programme by completing an online examination. Successful participants receive a certificate that they can use for their professional career.

RENAC E-LEARNING TRAINING PROGRAMME FEATURES

The Green Hydrogen Specialist: Project Development and Economics programme combines asynchronous and synchronous e-learning. Participants will have access to texts, assignments, and instructional videos, and they will have the opportunity to participate in virtual classrooms.



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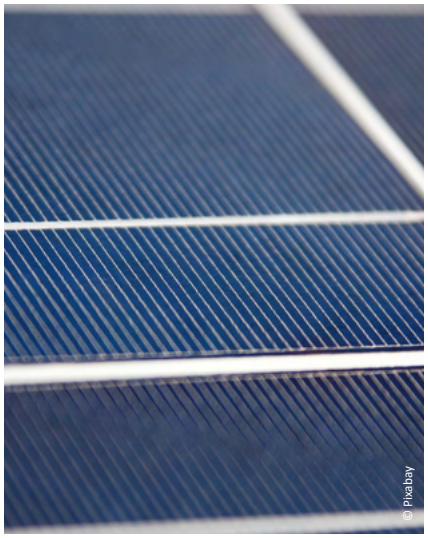
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INTRODUCTION TO ENERGY

After completing this course, participants should be able to:

- describe the global situation of energy supply and demand,
- differentiate forms of energy as well as energy and power, and
- name fundamental parameters, units and conversion factors related to energy topics.

Content

Development of the energy markets

- Introduction
- Energy supply and demand
- Fossil Fuels
- Renewable energy resources
- Outlook for energy supply

Physical basics

- Introduction
- Energy supply chain
- Forms of energy
- Energy and power
- Performance indicators for energy conversion
  - o Energy efficiency
  - o Coefficient of performance
- Capacity factor and full load hours

Units and conversions

- Introduction
- International System of Units
- Energy content of different fuels
- Conversion of energy units
- Key figures
  - o Power plants
  - o Solar heating technology
  - o Consumption
  - o Prices

INTRODUCTION TO HYDROGEN

After completing this course, participants should be able to:

- explain the basic components of a hydrogen-based energy system and infrastructure,
- describe the current uses of hydrogen, its production methods, and value chains,
- describe the opportunities and limitations of hydrogen as a future energy carrier and in developing a sustainable energy future, and
- understand the current status of hydrogen policies in the international arena.

Content

The element hydrogen (H)

- What is hydrogen?
- The hydrogen economy
- Global hydrogen use

Energy related properties of hydrogen

- Mass and volume related energy density
- Energy density of hydrogen in liquid and gaseous
- Density of hydrogen as function of temperature and pressure
- Energy content and weight of different fuels
- Higher and lower heat value of hydrogen

Types of hydrogen applications

- Mobile applications
- Energy sector applications
- Industrial applications

Hydrogen generation and fuel cells

- Hydrogen production pathways
- Hydrogen production via electrolysis
- Types of electrolysers
- Hydrogen production with steam reforming
- Other modes of hydrogen production
- Fuel cells

Hydrogen infrastructure

- Hydrogen transport and storage
- LOHC –Liquid Organic Hydrogen Carriers

System integration / sector coupling (Power-to-X) PtX

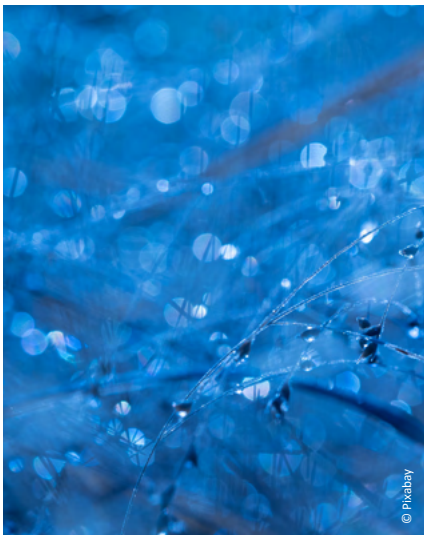
- System integration and green hydrogen

The cost of hydrogen

- The economics of hydrogen

International hydrogen strategies and roadmaps

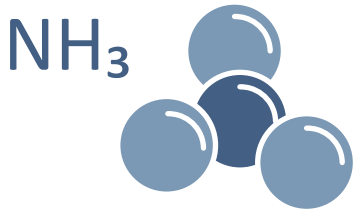
- Hydrogen strategies and roadmaps
- The EU hydrogen strategy
- The German National Hydrogen Strategy
- The renewable hydrogen roadmap of California, USA
- The hydrogen strategy in Australia
- Cross-border project: Netherlands-Germany H2 cluster



INTRODUCTION TO AMMONIA

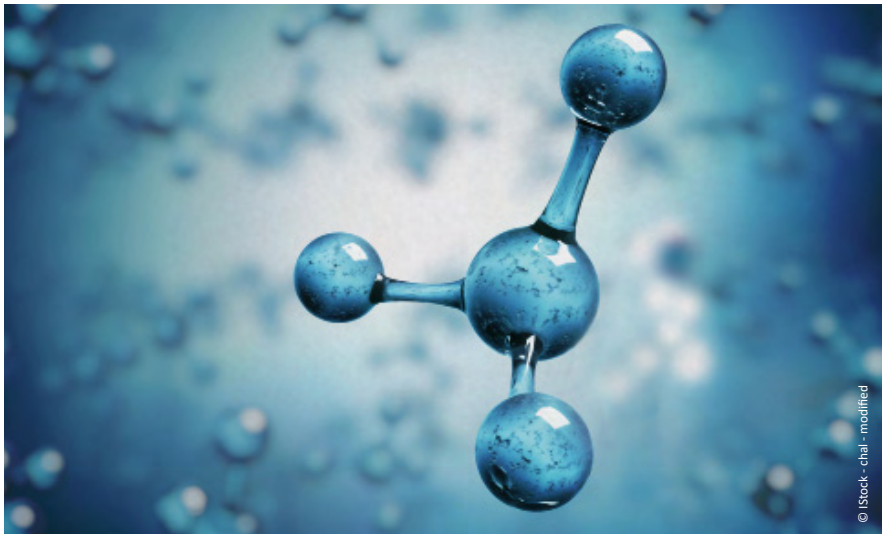
After completing this course, participants should be able to:

- describe the physical-chemical characteristics of ammonia,
- explore the novel applications of ammonia, its production methods, and value chains,
- understand different ammonia production technologies, and
- differentiate the colours of ammonia and the environmental impact associated.



Content

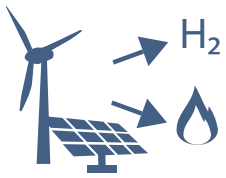
- Physical-chemical characteristics of ammonia
- Energy related properties of ammonia
- The global uses and demand for ammonia
- Developing fields of use for ammonia
- Ammonia production technology overview
- Nitrogen production technology overview
- Colours of ammonia



POWER-TO-X: APPLICATIONS AND COST DEVELOPMENTS

After completing this course, participants should be able to:

- explain the purpose of the concept of sector coupling as well as opportunities and challenges associated with the concept, and
- compare the status quo of available technologies for sector coupling in the heating/cooling sector and in the transport sector, as well as generally expected future developments regarding technology options and costs.



Content

Introduction to sector coupling

- Definition of sector coupling
- Opportunities and challenges associated with sector coupling
- RES shares in the power generation mix
- Direct versus indirect use of electricity
- Efficiency in different sector coupling technologies
- Electrification versus technology mix

Direct electrification in the heating and cooling sector

- Technologies and applications – overview
- Electric heat pumps – description of technologies and main cost drivers
- Cost comparison: sector coupling versus conventional technologies and future developments
- Electric heaters – description of main technologies and cost parameters
- Demand profiles and flexibilization strategies

Direct electrification in the transport sector

- Technologies and applications – overview
- Passenger cars – description of technologies
- Passenger cars – main cost drivers and expected future developments
- Passenger cars - cost comparison: sector coupling versus conventional technologies
- Passenger cars – infrastructure requirements
- Trolley trucks – technology description & infrastructure requirements
- Demand profiles and flexibilization strategies

Indirect use of electricity

- Renewable synthetic fuels and their applications
- Production of hydrogen from renewable electricity
- Electricity generation in fuel cells
- Relevant cost drivers for renewable hydrogen production
- Production processes for synthetic methane and synthetic liquid fuels and expected cost developments

Regulatory framework

- Supporting the profitability of sector coupling and incentivising flexibility

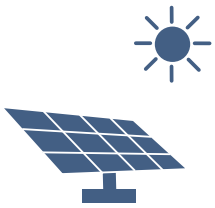
Power-to-X supply chain examples

- PtX supply chains
- Upstream supply chain: renewable energy, water, and transport
- Hydrogen production: inputs, outputs, and energy required by electrolysis
- Downstream supply chain: electricity from green methane stores in long-term
- Downstream supply chain: Long -distance flight using fuel produced with green hydrogen
- Downstream supply chain: steel produced with green hydrogen
- Downstream supply-chain ammonia fertilizer produced with green hydrogen
- Downstream supply chain: warm rooms in a building heated via district heating networks

GREEN HYDROGEN PRODUCTION BY ELECTROLYSIS - PROJECT DEVELOPMENT AND FINANCIAL EVALUATION - PART 1

After completing this course, participants should be able to:

- describe the main technologies used in green hydrogen electrolysis,
- successfully apply the basics of project planning and system sizing,
- apply important sustainability aspects in the planning, design and operation of hydrogen projects, and
- assess the economic viability of green hydrogen plants.



Content

Fundamentals of key onshore electrolyser plant components

- Electrolysis: the basic equation
- Basic plant layout
- Central process capacity: specific production
- System boundaries and inputs
- Electrolyser efficiencies
- Alkaline water electrolysis (AWE) electrolysers
- Electrolysers: Proton exchange membrane (PEM) electrolysers
- Electrolysers: Solid oxide (SOEC) and other electrolyser types
- Component sizing: relative and absolute
- Key performance indicators of hydrogen production

Impact of variable wind and photovoltaics on plant design and component sizing

- Power and efficiency
- Technical factors that impact efficiency
- The electrolyser to renewable energy ratio
- Storage, the grid and flexibility
- Making use of complementary wind and PV for hydrogen production

Simple design and sizing tool for important plant components (Excel-tool for basic engineering)

- Introducing a basic Excel tool
- Other tools (open source and paid)
- Design and sizing example: 1,000 t/a, 10,000 t hydrogen /a and 50,000 t hydrogen /a with electricity from wind and/or photovoltaics

Main plant components

- Safe design and hazardous area classification
- General guidelines around safe design
- Power supply and control
- Process control unit
- Water treatment
- Selection of electrolyser technology
- Compression and liquefaction of produced hydrogen
- Compressors for use with hydrogen
- Short term hydrogen storage at the electrolyser plant
- Buildings, piping

Filling stations for hydrogen transport

- Road and rail
- Maritime transport
- Transport via pipeline

International standards

- Hydrogen quality
- Safety standards – electrolysis

Sustainability

- Water consumption, desalination, sewage re-use
- Analysis of the carbon life cycle emissions of hydrogen from electrolysis
- Wastewater, emissions to air and waste heat of hydrogen electrolyser plants
- Land use
- Transport and infrastructure impacts
- Decommissioning

Operation and safety

- Special features for maintenance and operation
- Safe handling of explosive substances

Requirements for bankable business cases for green hydrogen with electricity from onshore wind and/or photovoltaics

- Requirements for bankable business cases
- The importance of offtake agreements
- Analogies: LNG and offshore wind
- Process – project finance
- Example: Wunsiedel, Germany
- Example: Gigastack, UK

GREEN HYDROGEN PRODUCTION BY ELECTROLYSIS - PROJECT DEVELOPMENT AND FINANCIAL EVALUATION - PART 2

Hydrogen business case inputs for electrolyser plants using electricity from onshore wind and/or photovoltaics

- CAPEX of plant components
- CAPEX projections
- Current OPEX and relevant variables
- Replacement intervals
- Calculating LCOH
- Impact of variable wind and/or photovoltaics power on LCOH
- Electrolysis by-products: oxygen and heat

Financial evaluation of business cases for hydrogen generation using electricity from onshore wind and/or photovoltaics

- Key performance indicators for the financial assessment
- Green hydrogen finance specialists
- Corporate or project finance?
- Leveraging
- Cost of capital
- Impact of variable wind and photovoltaic power on cash flow
- Cash flow sensitivity analysis
- Supply risk (electricity and water)
- Offtake risk
- Market risk
- Construction and completion risk
- The insurer's perspective
- Political risk and offtake
- The global subsidy landscapes
- Vertical integration

Preparing the financial evaluation

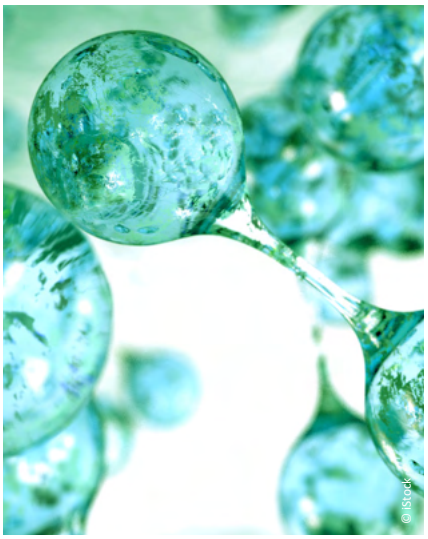
- Electricity costs
- The market price of hydrogen?
- Using a basic Excel tool for financial modelling
- Other tools (open source)
- Example of financial viability assessment: 1,000 t/a to 50,000 t hydrogen /a

Checklists

- Checklists for bankable business case
- Checklist: planning, permits, construction, operation, and decommissioning

Offshore wind to hydrogen electrolysis

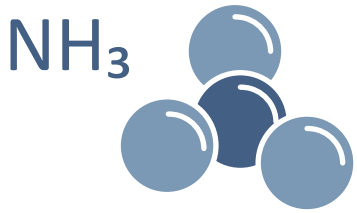
- Technology
- Advantages of offshore hydrogen production
- Advantages of transporting offshore electricity to land for onshore hydrogen production
- Risks and approaches to risk mitigation
- Examples of offshore wind and hydrogen projects



GREEN AMMONIA PRODUCTION – PROJECT DEVELOPMENT AND FINANCIAL EVALUATION

After completing this course, participants should be able to:

- describe the main technologies used in green ammonia production,
- understand basic project planning and sizing,
- apply safety and sustainability considerations in the planning and operation of green ammonia projects, and
- understand important factors that impact the economic viability of plants for green ammonia.



Content

Fundamentals of important plant components

- Plant layout
- The Haber-Bosch reaction, process conditions and catalysts
- Central process capacity and component sizing

Impact of variable wind and photovoltaics on plant design and component sizing

- Input flows and limits
- Flexibility, resilience, and productivity

Simple design and sizing tool for important plant components (Excel tool for basic engineering)

- Introducing a basic modelling tool concept
- Other tools (Open source and paid)
- Design and sizing a mid-sized green ammonia plant

Main plant components

- Power supply and control
- Nitrogen production
- Hydrogen supply
- The Haber-Bosch loop
- Compression, cooling and liquefaction
- Ammonia storage
- Ammonia quality

Filling stations for transport

- Road and rail
- Maritime transport
- Feeding station for ammonia pipelines

Sustainability

- Heat emissions – Waste or product?
- Carbon emissions – Life cycle analysis
- Local impacts and risks
- Decommissioning

Operation and safety

- Ammonia characteristics and dangers
- Safety standards for ammonia production and handling
- Avoiding accidents
- Operating requirements to safeguard equipment

Economic viability

- Current CAPEX and projections
- Current OPEX and projections
- Understanding the levelized cost of ammonia

Calculation tool for financial evaluation

- Calculating the levelised cost of green ammonia (LCOA)
- Sensitivity analysis
- Introducing the HySupply tool for LCOA analysis
- Sample LCOA calculation for a mid-sized green ammonia plant
- Offshore wind to ammonia

Financial evaluation of business cases

- Projections of markets and financing for green ammonia production
- Finance structures and agreements
- Finance and timing
- Risks and approaches to risk mitigation: supply risk, offtake risk and market risks

Checklists

- Checklists for bankable business cases
- Checklist: Planning, permits, construction, operation and decommissioning

FUEL CELL ELECTRIC POWER GENERATION

After completing this course, participants should be able to:

- describe the main technologies in fuel cell power generation,
- understand the basics of planning and sizing a fuel cell power plant,
- consider important aspects of sustainability in the planning and operation of fuel cell projects, and
- assess the conditions for economic viability of electricity from fuel cells.

Content

Fundamentals of important plant components

- Introduction to fuel cells
- Mass, energy, and efficiency
- Fuel cells: from cell to power plant
- The fuel cell power generation system
- Central process capacity
- Fuel Cells: Main types and suitability for centralised electrical generation
- Additional factors that influence the choice of technology
  - o The impact of fuel quality and availability
  - o Energy output, flexibility, and investment costs
- Component sizing: modules and scale
- Hydrogen needs for specific outputs

Main plant components

- Fuel processing and delivery
- Hydrogen storage
- Fuel cell stack
- Air circulation and delivery system
- Coolant and water circulation system
- Electric power conditioning

Operation & Safety

- Operations and downtime
- Special considerations for design and maintenance
- Safety training and standards

Sustainability

- Local emissions, land use, and related concerns
- Carbon footprint of energy
- Construction and decommissioning
- Minerals and materials impacts

Evaluation of business cases

- Key factors for financial performance - backup power
- Key factors for financial performance - grid feed power plants
- Risks and approaches to risk mitigation: supply risk
- Risks and approaches to risk mitigation: PPAs and Contracts for Difference (CfDs)
- Construction and completion risk

Economic viability

- CAPEX of fuel cell power plants
- OPEX and relevant variables
- Stack replacement
- Calculating LCOE: trends, projections, and market prices
- Assessing the competitiveness of electricity from a FCPP
- Summary to assist decision making

GREEN HYDROGEN AND AMMONIA TRANSPORT – OVERVIEW

After completing this course, participants should be able to:

- describe transport options (road, train, ship, pipeline) for hydrogen and ammonia,
- recognise the capacity and scale of transport infrastructure needed to achieve climate goals,
- understand advantages and limitations of various transport alternatives,
- describe the challenges of using ammonia as a hydrogen carrier, and
- discuss matters of energy efficiency and economic viability as they are impacted by hydrogen transport.

Content

Transport options (road, train, ship, pipeline)

- The forms of hydrogen
- Compressed and liquid hydrogen - state of the art
- Compressed and liquid ammonia - review
- Road transport
- Rail transport
- Maritime transport
- Pipelines (short & long distance)
- Transport safety

Typical capacities of transport options

- Smaller sale transport
- Large scale transport
- Large scale storage
- Energy density and transport efficiency
- Metering for hydrogen
- Infrastructure and bottlenecks
- International trade rules

From hydrogen blending in natural gas networks to a 100% hydrogen pipeline infrastructure

- Blending with NG
- Pipelines: re-use and new
- Pipeline safety
- Downstream extraction of hydrogen
- Pipelines to drive transition?
- Distribution networks – the European Hydrogen Backbone

Recovering hydrogen from ammonia

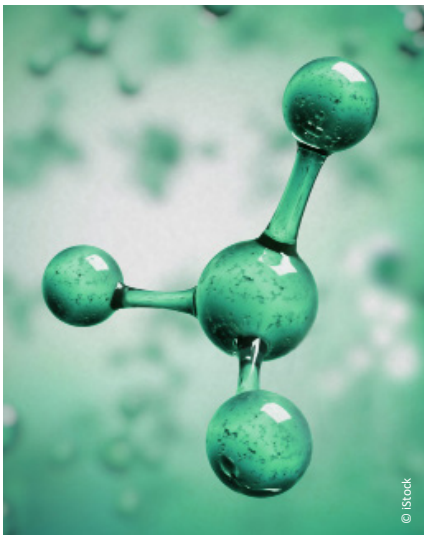
- Ammonia cracking for hydrogen
- Ammonia or hydrogen?
- LCA of ammonia and hydrogen via ammonia
- Economies of scale

Sustainability, risks, and risk mitigation

- Energy and emissions
- Spills, accidents, and safety
- Hydrogen leakage
- Safety standards in hydrogen transport
- Supply, offtake, and market risks
- Jettyless terminals for maritime transport

Economic viability

- Capital and operating expenditures
- Cost and competitivenes



MARKETS FOR HYDROGEN AND ITS DERIVATIVES

After completing this course, participants should be able to:

- describe various use cases for hydrogen and products derived using hydrogen,
- address the challenges in advancing from the current situation, taking into account the high ambitions reflected in announced projects and sector projections, and
- evaluate broader financing and market openings that hold the potential for a more impactful hydrogen sector.

Content

Current market and outlook for centralised and decentralised applications – Industry

- Oil refining
- Industrial feedstocks - ammonia and methanol
- Steel
- Industrial heat and other uses

Current market and outlook for centralised and decentralised applications - Transport

- Synthetic fuels
- Transport - personal and commercial road vehicles
- Heavy trucks
- Buses and trains
- Hydrogen for flight
- Maritime shipping – drivers of change
- Shipping – cleaner fuels and fuel cells
- Converting internal combustion engines

Current market and outlook for centralised and decentralised applications - Power and heat

- Space and home heating
- Blending with natural gas grid for domestic use
- Backup power and grid services
- Greening thermal power plants

Prioritising market actions

- Transport, heating, power
- Policy for industry
- Prioritising hydrogen uses for climate benefits
- Ammonia as a hydrogen carrier

Guarantees of origin and certification of green hydrogen and its derivatives

- The challenges of green certification
- Blue hydrogen as an interim solution
- National standards and harmonisation
- Green ammonia certification

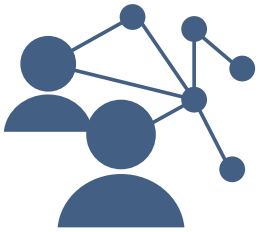
Economics and cost development

- Location and co-location
- The role of green hydrogen and its derivatives in decarbonising economies
- Projects planned and, in the pipeline
- Rolling out the pipeline

RENAC´S ONLINE ACADEMY

The Renewables Academy (RENAC) AG is a leading international provider of training, educational, and capacity building services on renewable energy technologies and energy efficiency. Since 2008, more than 25,000 participants from over 160 countries have taken part in RENAC training courses and programmes. We are convinced that knowledge and skills are the key to the sustainable development of clean and secure energy supplies and it is our mission to provide this knowledge and skills to as many people as possible.

As part of this mission, our Online Academy was founded in 2014. Today, RENAC´s Online Academy offers over 30 short courses and programmes, with participants learning with us from the comfort of their own homes around the globe.



RENAC Online helps you:

- Boost your professional career
- Study with flexibility following your own schedule
- Learn at any time and from any location

RENAC Online staff are:

- Certified e-learning trainers
- Experienced professionals
- In direct contact with industry

CERTIFIED EUROPEAN E-LEARNING MANAGER

Demo course

- We invite you to visit our online platform demonstration course: www.renac.de/demo-course

"I really enjoyed the course and the experience was well worth the money paid. Really good value for money. Many thanks and I would no doubt be back for another course in the very near future."

Ademola Thompson, Certified Renewable Energy Project Developer: Photovoltaics, 2020

LEARNING WITH RENAC ONLINE

Learning with RENAC Online is done asynchronously in two steps. First, participants work through each course's content, and then get the opportunity to apply the newly acquired knowledge and skills, consolidating them in their minds. In practice, both steps are accomplished in several ways. Programmes also contain written assignments with feedback from RENAC that not only further reinforce learning outcomes but may also complement their exam grades.

Text and images

Courses are organised into short, instructional chapters with illustrations. Learners are guided through the material step by step.

Videos

Recorded lectures cover some of the most important topics in a visual and engaging way.

Live virtual classroom

It is recommended that participants attend live virtual lectures, which are given by RE experts. During and after lectures, participants are invited to chat about topics and issues in the live online forum.

Online Forum

A discussion forum helps to support students and foster communication between them and with RENAC. This forum is monitored by RENAC staff and experts who can provide technical assistance and discussion about course topics.

Self-tests

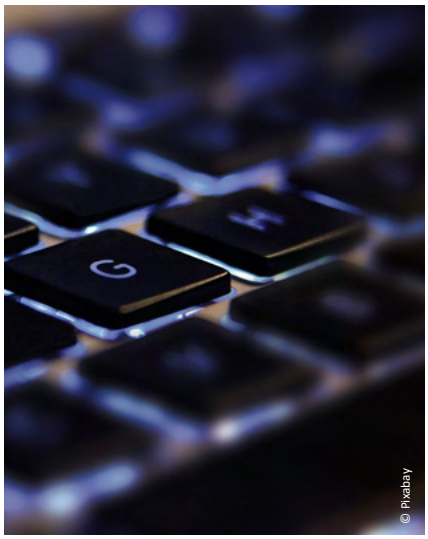
Self-tests within each course help participants assess their knowledge.

Assignments

Programmes contain written assignments with individual feedback from RENAC.

PLEASE NOTE

RENAC uses plagiarism detection software to detect its presence in submitted assignments. Plagiarism, using someone else's work or ideas as if they were your own, is unacceptable. When completing assignments, participants must acknowledge any work by others that has been included in their answers by referencing its authors.



PRACTICAL INFORMATION

START DATES
1 October 2023

DURATION
6 months

STUDY TIME
About 120 hours

LANGUAGE
English

ASSIGNMENTS

Programmes are designed for a continuous participation, from the beginning of the semester until the final exam, and contain short assignments. Assignments are short written essays or exercises involving other multimedia elements that need to be handed in by deadlines so they can count to improve the final grade of the exam.

TECHNICAL INFORMATION

You need to provide an email address in order to register and create your account, where you will receive course updates and feedback. You need access to a device with a reliable internet connection (at least 2 Mbit/s). This may be a mobile device, but we recommend using a computer. Live virtual lectures and orientation take place on Zoom, so you also need a headset or speakers to listen to the presentations.

REGISTRATION
You can register online at:
www.renac.de/online-academy

REGISTRATION DEADLINE
30 September 2023

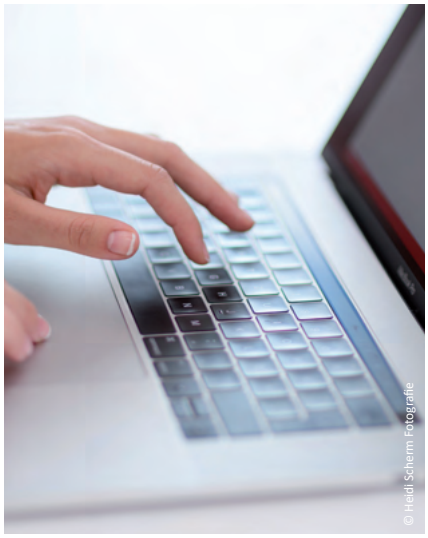
FEE
EUR 3.500 excluding tax

DISCOUNTS
Early bird 10%; group (2 or more) 5%; combination of both 15%; Alumni 10%

EARLY BIRD DISCOUNT DEADLINE
20 August / 20 February

PAYMENT METHODS
VISA, MasterCard, American Express, PayPal, or bank transfer

O1
Start of semester:
1 October 2023



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Renewables Academy Online

www.renac.de/online-academy