

## N664: Developing Green Hydrogen Knowledge and Skills Across the Value Chain

Instructor(s): Sandy Petrie

Format and Duration

Classroom - 3 Days

Virtual - 5 Sessions

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### Summary

Production of hydrogen by hydrolysis is a key means of mitigating climate change by playing an important role in the elimination of harmful green house gas emissions. By providing power system, heat and fuel services, green hydrogen can be leveraged to decarbonize vital economic sectors across the global economy. The major economic challenge facing the uptake of green hydrogen is the production costs. Applying economies of scale, access to low-cost renewable electricity, technology efficiencies and government lead financial incentives and directives will help to bring down the production costs. This course empowers attendees to acquire knowledge to develop and apply their skills to support the nascent (but rapidly growing) industry of green hydrogen production, transport, storage and use.

### Learning Outcomes

Participants will learn to:

1. Identify and describe key green hydrogen value chain parameters.
2. Identify and consider green hydrogen opportunities implementation, enablers issues, challenges, barriers and risks.
3. Identify the requirements necessary to monetize green hydrogen, investment requirements and role of government.
4. Assess and address risks and benefits: technical, commercial and societal.
5. Discuss Global Examples of Green Hydrogen projects in development, or appraisal and identify key success factors.
6. Define and evaluate potential subsurface storage sites.

### Training Method

This is a classroom or virtual classroom course comprising a mixture of lectures, discussion, quizzes and interactive exercises.

### Who Should Attend

1. Technical and commercial professionals who will be evaluating/monetizing and developing the green hydrogen value chain.
2. First level leaders and others tasked with developing and/or assuring green hydrogen projects and opportunities.
3. Recent graduates who want to develop skills to support the green hydrogen economy.

### Course Content

#### Hydrogen overview

- Why hydrogen?
- What is hydrogen?
- The role of hydrogen in delivering net zero

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- Types of H<sub>2</sub> production: what is green hydrogen?
- Uses of hydrogen and its products
- Hydrogen safety - Stakeholder management
- Green Hydrogen Technologies
  - Green Hydrogen production
  - Hydrogen Storage
  - Hydrogen Distribution
- Value proposition
- Where is the momentum for green hydrogen
- Career development opportunities

### The Green Hydrogen Value Chain

- Issues, challenges, barriers, enablers, opportunities implementation
- Hydrogen production
  - Role of Renewables, Geographic location
  - Water Management
  - Seawater desalination
- Hydrogen Valleys
- Hydrogen Logistics
  - Integrating deep-water ports & hydrogen valleys
- Hydrogen Infrastructure
  - Hydrogen Electrolysis
  - Battery Storage
  - Hydrogen Storage (Surface)
  - Underground Hydrogen storage (UHS) – options, geology, locations
- Hydrogen Transport
  - Developing dedicated transport & storage infrastructure
    - Pipelines, re-purpose existing pipeline infrastructure
    - Shipping, Low carbon bunkering, Green shipping
- Hydrogen Export
  - Ammonia, e-methanol

### Investment requirements

- Dedicated Renewable energy capacity
- Hydrogen Conversion and Export Facilities
- Water Electrolysis Facilities

### Monetising green hydrogen

- Common Strategy
- Developing a hydrogen economy

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- Cost effective green hydrogen
- The role of government
- Stakeholder management
- Production and Export at scale
  - Importance of hydrogen valleys
  - Driving down production costs
  - Economies of scale
- Infrastructure logistics
- Developing a global market, Global Collaboration
- Jobs growth

### Global Examples of Green Hydrogen Projects

- In development (FID signed)
- Appraisal
- Key success factors

### Green Hydrogen Knowledge & Networks