



An Introduction to Clean Hydrogen

ONLINE COURSE
14, 15 and 16 September 2021

REA
Supported by the REA



ABOUT

This course provides a comprehensive, time-effective and independent introduction to the subject of clean hydrogen. Covering all supply chain aspects, from competing production methods and storage and distribution challenges to sources of demand and market competition, we will cut through the hype and provide a rational perspective on the opportunities and risks ahead. The course will mix fundamental principles and metrics with up-to-date examples and trends, providing a knowledge base that you can apply wherever your hydrogen journey may take you. There will be plenty of opportunity for questions and discussion of the key issues.

The course trainer regularly delivers hydrogen training online. As the lead trainer for the World Hydrogen Leaders network, he delivers hydrogen-focused sessions two to three times per month. He also works with a number of leading event organisers to deliver both public and in-house courses on a regular basis to clients in Europe, South East Asia and other regions around the world.



WHO SHOULD ATTEND?

The course is suitable for anyone who wants to learn about hydrogen and to understand its potential practical application in Ireland.



COURSE DELIVERY

The course will be delivered on Zoom with discussion, case studies, practical sessions and presentations. The course consists of three sessions, and each session is a total of 3 hours' duration.



CERTIFICATION

Participants who successfully complete the course will be awarded a Green Institute Certificate of Completion.



WHY TRAIN WITH US?

- Our trainer is the lead trainer for the World Hydrogen Leaders network.
- Our course is delivered virtually but with a live tutor so you can interact, ask questions and get the most out of the training.
- Our online classes are limited to 12 people to enable meaningful engagement.
- Our small classes will let you interact with other participants and network while you learn.



COST

The fee for the course is €395 plus VAT.

The fee for REA members is €345. Use the Promo code 'REA' in the booking process to get the discount.

The fee includes a course pack, comprising all training materials, including case studies. Each student will also get their own personalised cloud-based account, which will house all of the training materials in one location. The course will be as interactive as possible given the medium of delivery.



BOOKING

To book a place on the course, please click on this link: <https://buytickets.at/greeninstitute/489421>



CANCELLATION POLICY

Places cancelled within 7 working days of commencement of the course must be paid in full. Substitutions may be made at any time at no additional charge. In the unfortunate event that you need to cancel your training (and give the relevant notice), we will provide you with a full refund.



DATES AND TIMES

14 September (09.00 to 12.00), 15 September (14.00 to 17.00) and 16 September (09.00 to 12.00).



QUERIES

If you have any queries about the course, contact the course director, Percy Foster:

T: 0868129260;

E: percy@greeninstitute.ie

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66 Delmere, Enfield, Co. Meath, Ireland

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COURSE CONTENT



SESSION 1 (14 SEPTEMBER): Assessing Key Hydrogen Market Applications

Hydrogen in industry

- Current and emerging hydrogen applications: a market opportunity assessment
- Examples of activity in key sectors, including steel making and refining
- The importance of hydrogen hubs and industrial clusters

Hydrogen in transport

- Fuel cells and their battle with batteries
- The importance of transport market segmentation and identifying comparative advantage
- Reviewing activity in lorries, trains, shipping and aviation

Hydrogen in heat and power

- The pros and cons of hydrogen as a route to the decarbonisation of heat
- Hydrogen replacement of natural gas turbines: why and when?
- Hydrogen as long-term energy storage



SESSION 2 (15 SEPTEMBER): Key Features of the Hydrogen Supply Chain

Hydrogen production

- The different 'colours' of hydrogen: grey, blue, green and turquoise
- Current hydrogen production status, including cost comparisons and forecasts
- Who is involved in hydrogen projects?
- A critical assessment of hydrogen in the context of alternatives to natural gas
- Quantifying the key numbers in scaling up hydrogen from renewable power
- The economics of electrolysis: input costs, load factors and output costs

Hydrogen as a fuel: storage and distribution challenges

- The physical properties of hydrogen – and why they matter!
- Hydrogen storage: the key challenges that need to be overcome
- Compression and liquification
- Storing hydrogen as or within other chemicals, such as ammonia or LOHCs (liquid organic hydrogen carriers)
- Blending hydrogen with natural gas
- Trading over long distances (international transport)



SESSION 3 (16 SEPTEMBER): Growing Clean Hydrogen Markets

Clean hydrogen policies, players and strategies

- Having failed before, why is hydrogen back as a trend now?
- Examining key countries' hydrogen strategies (Germany, China, Australia and others)
- The geopolitical and energy trading implications of hydrogen growth
- Policy and financial supports for clean hydrogen
- The oil and gas sector and clean hydrogen: its activities and motivations
- The hydrogen value chain

Growing hydrogen markets today and 'hydrogen economies' tomorrow

- Summary: segmenting the new market opportunities for hydrogen
- From the current numbers: what are realistic (and projected) rates of growth?
- Sector coupling, including the pros and cons of integrated approaches
- Getting started: analysing factors determining 'project deliverability'
- Location dependency: where and why will hydrogen make sense?
- Centralised or distributed: what will the future of hydrogen look like?



ABOUT GREEN INSTITUTE

The Green Institute specialises in education for professionals in the green arena.

Its founder, Percy Foster, has been involved in professional education and development in the green arena for over 20 years in Ireland and abroad. He has organised events ranging from an accredited composting course with a third-level college to international conferences and industry training courses, which amount to over 5000 training days.

Our network of associate trainers are committed to providing the highest quality learning experience for all of our learners through blended learning in the classroom, online and in house.

We provide CPD points for all of our learners.



ABOUT THE TRAINER

Dr John Massey is the founder and Managing Director of Grey Cells Energy Ltd.

He is an internationally renowned energy communicator and business educator, focused on the interconnected clean energy transition topics of renewable power, energy storage, energy system electrification and hydrogen. His own independent technology tracking, market assessment and opportunity/risk analysis is delivered to clients through a mix of business advisory work, small-group training and one-to-one executive coaching, both online and in person.

In the hydrogen sector, John is currently Lead Consultant and regular trainer to the World Hydrogen Leaders network and writes its 'The Week in Hydrogen' news column. He is also co-presenter of the 'New Energy Chinwag' podcast, which regularly covers hydrogen-related issues.

During more than 15 years as an independent energy expert, John has helped companies from large multinationals to innovative start-ups – totalling assignments in over 30 countries across five continents. Most recently he has presented clean energy training courses in Singapore, the UK, South Africa, the Philippines, the USA, Mexico, Spain and Dubai – and, of course, online to international audiences during 2020. Prior to founding Grey Cells Energy, John was Research Director for over 10 years at Informa, a US \$9 billion business intelligence provider, where he drove new market identification, analysis and project deployment work and managed teams in the UK and USA. He has a strong science background, holding a First Class Honours Degree in Natural Sciences from the University of Cambridge, a PhD in Earth Sciences and a Diploma in Economics and Sustainability from the UK Open University.

