



SEMINAR

SCALING-UP HYDROGEN PRODUCTION: CRITICAL CHALLENGES AND BOTTLENECKS

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CONTACT



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DESCRIPTION

NATIONAL GOVERNMENTS, REGIONAL AUTHORITIES, CITIES, COMPANIES AND PRIVATE BUSINESSES GLOBALLY STRIVE TO ACHIEVE CLIMATE NEUTRALITY BY THE MIDDLE OF THIS CENTURY. HYDROGEN TECHNOLOGY IS LIKELY TO PLAY A KEY ROLE IN THIS ENDEAVOUR, PARTICULARLY FOR DECARBONISING HARD-TO-ABATE INDUSTRIAL SECTORS AND LONG DISTANT TRANSPORT, SUCH AS STEEL PRODUCTION, AVIATION AND MARITIME SHIPPING. MOREOVER, HYDROGEN CAN BE USED AS A POTENTIAL STORAGE MEDIUM FOR RENEWABLE ELECTRICITY TO STABILIZE FUTURE ELECTRICITY SYSTEMS THAT WILL BE DOMINATED BY VARIABLE RENEWABLE ENERGY SOURCES.

TO REALIZE ITS POTENTIAL FOR DECARBONISATION, CLIMATE-FRIENDLY HYDROGEN PRODUCTION WILL HAVE TO BE SCALED-UP RAPIDLY OVER THE NEXT TWO DECADES. IN THIS RESPECT, HYDROGEN PRODUCTION BASED ON RENEWABLE ELECTRICITY IS OFTEN AGREED TO BE THE ONLY TRULY CLIMATE-NEUTRAL OPTION IN THE LONG RUN. HENCE, HYDROGEN STRATEGIES AROUND THE WORLD EMPHASIZE THE NEED TO SCALE-UP ELECTROLYSER TECHNOLOGIES ALONG WITH NEEDED DEPLOYMENT OF RENEWABLE ENERGY. THESE AMBITIOUS TARGETS HAVE RAISED MANIFOLD QUESTIONS REGARDING COST, FEASIBILITY AND POSSIBLE TRADE-OFFS REGARDING THE USE OF RENEWABLES IN THE ELECTRICITY SECTOR, TO NAME A FEW. GIVEN SOME OF THESE HURDLES ON THE WAY TO A “GREEN” HYDROGEN ECONOMY, THERE HAVE BEEN CALLS TO DEVELOP THE SO-CALLED “BLUE” HYDROGEN AS A TRANSITIONAL TECHNOLOGY. BASED ON CONVENTIONAL HYDROGEN PRODUCTION FROM NATURAL GAS COUPLED WITH CARBON CAPTURE AND STORAGE (CCS) TECHNOLOGIES, THIS PRODUCTION ROUTE IS CONSIDERED BY SOME TO BE THE MORE COST-EFFECTIVE AND HENCE VIABLE ROUTE TO MEET THE TARGETED DEMAND FOR CLIMATE-FRIENDLY HYDROGEN. HOWEVER, SCALING-UP BLUE HYDROGEN AND RELATED CCS TECHNOLOGIES FACE THEIR OWN CHALLENGES AND TECHNOLOGICAL UNCERTAINTIES, RANGING FROM PUBLIC ACCEPTANCE PROBLEMS TO QUESTIONS REGARDING FEASIBLE CARBON CAPTURE RATES AND COST EFFECTIVENESS IN THE CONTEXT OF A CONSTRAINED NATURAL GAS MARKET.

IN THIS WORKSHOP, EXPERTS WILL COME TOGETHER TO TAKE A CLOSER LOOK AT THE SPECIFIC CHALLENGES AND UNCERTAINTIES SURROUNDING BOTH “GREEN” AND “BLUE” HYDROGEN. THE AIM IS TO BRING TOGETHER THE EVIDENCE BASE AS WELL AS STIMULATE DISCUSSIONS FOR COMPARING AND ASSESSING THESE TWO PRODUCTION PATHWAYS.

PROGRAMME

9.00

WELCOME ADDRESS

Anna Sabatzki, *Attaché*, Federal Foreign Office

9.15

INTRODUCTION TO THE SEMINAR

Aliaksei Patonia, *Fellow/ Research Fellow*,
Research Institute for Sustainability/
Oxford Institute for Energy Studies

9.30

HYDROGEN: SOME KEY QUESTIONS TO ASK

Martin Lambert, *Head of Hydrogen Research*,
Oxford Institute for Energy Studies

10.00

COFFEE AND NETWORKING

10.15

PANEL 1. SCALING-UP GREEN HYDROGEN: CHALLENGES AND UNCERTAINTIES

- What are the main challenges and bottlenecks for scaling-up the deployment of electrolysers and related renewable energy capacities?
- What are the main technical challenges and bottlenecks related to green hydrogen production?
- What are critical components, raw materials and technologies associated with green hydrogen production that may result in future dependencies for the EU?

CHAIR

Rahmat Poudineh, *Head of Electricity Research*,
Oxford Institute for Energy Studies

SPEAKERS

Jacopo Maria Pepe, *Head of the Geopolitics of
Hydrogen Project*, German Institute for
International and Security Affairs (SWP)

Kirsten McNeill, *Senior Manager*, Sunfire GmbH

Tim Cholibois, *Strategist*, Enapter GmbH

12.15

LUNCH

13.15 **PANEL 2. SCALING-UP BLUE HYDROGEN: CHALLENGES AND UNCERTAINTIES**

- What is the status of blue hydrogen technology and its deployment?
- What do we know about its effectiveness in reducing greenhouse gas emissions?
- What are the main technical challenges and bottlenecks related to blue hydrogen production?

CHAIR Martin Lambert, *Head of Hydrogen Research*, Oxford Institute for Energy Studies

SPEAKERS Lea Döpp, *Researcher*, GFZ Potsdam

Philipp Hauser, *Advisor for Scientific Collaborations*, VNG AG

Ralf Dickel, *Senior Visiting Research Fellow*, Oxford Institute for Energy Studies

Sonja Thielges, *Research Associate*, German Institute for International and Security Affairs (SWP)

15.15 **COFFEE AND NETWORKING**

15.30 **DISCUSSION: THE GEOPOLITICS AND GEOECONOMICS OF GREEN AND BLUE HYDROGEN. WHAT'S AT STAKE?**

- What are the geopolitical and geoeconomic implications of the two production pathways for climate-friendly hydrogen?
- What are the key advantages and disadvantages?
- What are implications for hydrogen policy in Europe?

CHAIR Rainer Quitzow, *Research Group Leader*, Research Institute for Sustainability

SPEAKERS Sven Morgen, *Consultant Political Affairs*, German Hydrogen and Fuel Cell Association (DWW)
Maria Pastukhova, *Senior Policy Advisor*, E3G

Simon Schulte, *Senior Manager-Business Development*, Uniper Hydrogen GmbH

Yana Zabanova, *Research Associate*, Research Institute for Sustainability

Christine Falken-Grosser, *Head of Division*, Federal Ministry for Energy and Climate

17.30

CLOSING REMARKS

Rainer Quitzow, *Research Group Leader*, Research Institute for Sustainability

Aliaksei Patonia, *Fellow/ Research Fellow*, Research Institute for Sustainability/ Oxford Institute for Energy Studies

DISCUSSANTS

Margarita Balmaceda, *Fellow*, Research Institute for Sustainability/ Harvard University

Fabian Barrera, *Project Manager PtX South America*, Agora Energiewende

Benjamin Baur, *Stakeholder Dialogue Officer*, acatech – National Academy of Science and Engineering/ H2-Compass

Andreas Christidis, *Researcher*, Reiner Lemoine Institute

Matthias Deutsch, *Programme Lead Hydrogen*, Agora Energiewende

Monika Falk, *Vice President Regulation, Markets & Economics*, E.ON

Benno Fladvad, *Social Justice Fellow*, Research Institute for Sustainability

Kristina Fürst, *Research Associate*, Research Institute for Sustainability

Rosa Melissa Gehrung, *Research Assistant*, German Institute for International and Security Affairs (SWP)

Leandro Janke, *Project Lead Hydrogen*, Agora Energiewende

Valerie Kwan, *Stakeholder Dialogue Officer*, acatech – National Academy of Science and Engineering/ H2-Compass

Veronika Lenivova, *Research Fellow*, Fraunhofer IEG

Christian Lorenz, *Senior Manager Solutions Design Green Gas*, E.ON

Hendrik Meller, *Project Director of German Global Hydrogen Diplomacy*, German Agency for International Cooperation (GIZ)

Almudena Nuñez, *Research Associate*, Research Institute for Sustainability

Raffaele Piria, *Senior Fellow*, Ecologic Institute

Beatriz Couto Ribeiro, *Fellow*, Research Institute for Sustainability

Alexandra Tost, *Research Associate*, Research Institute for Sustainability

Andrea Triki, *Senior Expert in Hydrogen and Gas Policy*, German Energy Agency (DENA)

Willem de Vries, *Business Developer PtX*, Enertrag SE

Neelke Wagner, *Policy Advisor for Hydrogen*, Klima-Allianz Deutschland

USE OF INFORMATION

YOU MAY USE THE INFORMATION THAT YOU HEAR IN THIS SEMINAR BUT YOU MAY NOT QUOTE THE SOURCE OR THEIR AFFILIATION, NOR ATTRIBUTE THE INFORMATION TO RIFS/OIES.



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