

International workshop on

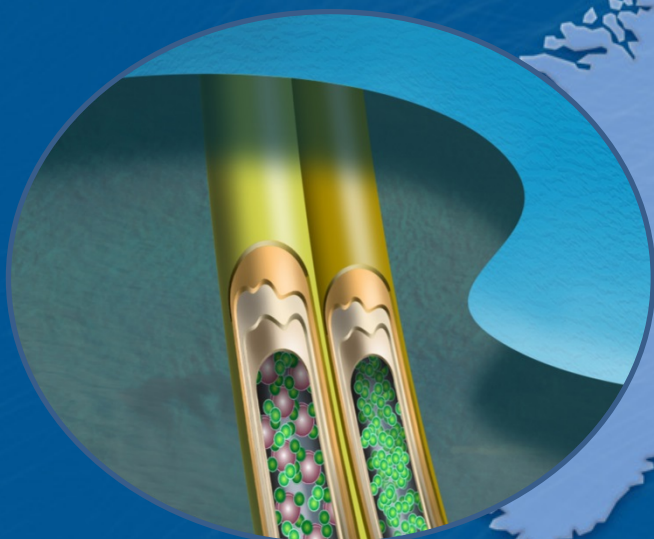
# Renewable Energy and Hydrogen Export

– *Global perspectives & Norwegian opportunities*  
Trondheim, Norway, March 24<sup>th</sup> 2015

The energy system of the future will have to rely on renewable energy sources (RES).

Norway has a vast potential of unexploited RES which may, over the coming decades, replace the substantial fossil energy export that has been pivotal for Norway's strong economy and high standards of living.

New opportunities are emerging and you are cordially invited to contribute to a workshop on the sustainable energy system of the future.



The workshop will unveil the potential for various stakeholders to engage in the transition from a fossil based to a more sustainable energy economy.

Key players & early movers will introduce the opportunities in a geopolitical context. The political framework and market potentials will be discussed, focusing on how obstacles may be overcome.

Industry, politicians and academia all play key roles in the puzzle towards a solution.

*See you in Trondheim in March!*



**Organizing committee:**

Anders Ødegård, SINTEF, Norway  
Steffen Møller-Holst, SINTEF, Norway  
Ulrich Bünger, LBST, Germany

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# Final Agenda

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- 08:30 Registration and coffee
- 09:00 **Welcome to Trondheim**  
Tore O. Sandvik, County Mayor, Sør-Trøndelag County Authority
- 09:15 **"The changing energy system" - Keynote introduction**  
Ulrich Bünger, LBST, Germany
- 09:45 **"Energy situation in Japan, challenges and future plans"**  
Akiteru Maruta, Technova, Japan
- 10:05 **"Enova's mission towards a sustainable energy future"**  
Geir Nysetvold, Enova, Norway
- 10:25 Coffee
- 10:50 **"Status and potential for wind power"**  
Harald Svendsen, SINTEF, Norway
- 11:10 **Cancelled: "Status and potential for small hydro power"**  
Knut Olav Tveit, Småkraftforeninga, Norway
- 11:30 **"Regulations, Codes & Standards for hydrogen handling and use"**  
Ikuo Hamanaka, DNV GL, Norway
- 11:50 **"Norway – still an energy nation in 2050?"**  
Steffen Møller-Holst, SINTEF, Norway
- 12:10 Lunch
- 13:20 **"Chances and perspectives for H<sub>2</sub> energy storage systems with PEM electrolyzers"**  
Gaelle Hotellier, Siemens, Germany
- 13:40 **"Hydrogen production in large scale"**  
Henning G. Langås, NEL Hydrogen, Norway
- 14:00 **"Hydrogen supply chain with long distance transport"**  
Motohiko Nishimura, Kawasaki Heavy Industries, Japan
- 14:20 **"Storage and transport of compressed hydrogen"**  
Per Sigurd Heggem, Hexagon Composites, Norway
- 14:40 Coffee
- 15:00 – 16:00 **Panel discussion and Q & A from the workshop attendees on**
- the role of hydrogen in the sustainable energy system,
  - the emerging market for hydrogen and hydrogen technologies and
  - the opportunities within export of renewable energy sources.



## Thanks to invited international speakers:



### **Gaelle Hotellier, Siemens AG**

Executive Vice President / Head of Business Segment Hydrogen Solutions, Industry Sector

Mrs. Gaelle Hotellier is currently managing the Hydrogen Solutions business unit at Siemens. This includes especially the PEM electrolyzer System, Solutions and Services for the electrochemical generation of hydrogen and oxygen (power to hydrogen) and its integration in various applications. A potential application of the PEM electrolyzer is its use as integral component for energy storage solutions. Furthermore, those systems can be implemented for industrial use of hydrogen and oxygen, as a dynamic load component for the power grid, for generation of hydrogen for fuel cell mobility applications (power to wheel) and for any combination of the described use-cases.



### **Motohiko Nishimura, Kawasaki Heavy Industries Ltd.**

Senior manager of hydrogen project department

Dr. Eng. Motohiko Nishimura earned his PhD in Engineering at Tokyo Institute of Technology. In addition to his hydrogen responsibilities at Kawasaki Heavy Industries, Ltd. (KHI), Dr. Nishimura also has significant expertise in the nuclear and motorcycle sectors where he contributed to several research papers. KHI has recently developed an innovative liquid hydrogen (LH2) plant in Japan and is currently working on the development of the first generation pilot scale LH2 carrier ship. Together with the development of LH2 and CGH2 truck trailers and a combustion chamber for the gas turbine for 100% hydrogen operation those activities are building blocks in KHI's business model of realizing future import of low-cost hydrogen from overseas to Japan. In this context, Norway has been identified as one potential country of origin for large scale hydrogen production suitable for such intercontinental export.



### **Akiteru Maruta, Technova**

Project Manager at Technova Inc

Dr. Akiteru Maruta is Project Manager at Technova Inc. (Japan), and is in charge of a series of energy related projects both in Japan and elsewhere in the world. He has been working for Japan Automobile Research Institute (JARI), Ministry of Economy, Trade and Industry (METI) and other national Japanese agencies. He is secretary for the Japanese delegation to IPHE and in IEA's hydrogen related activities. He has been an energy consultant since 1991 and a member of JARI/METI Fuel Cell Working Group since 1999. Technova Inc. provides research and consulting in the fields of energy & environment, transportation, and advanced technologies. In 2012 Technova especially worked on the HyGrid project, a study for the integration of hydrogen as energy carrier in the national Japanese energy system, both as fuel for transportation and for 0-emission stationary power production.



# Welcome to Trondheim

The workshop will be held in Trondheim, Norway,  
Meeting room: Fylkestingsalen at Fylkeshuset,  
Address: Erling Skakkes gate 14

Registration and further information, also about  
possible flights, hotels, VISA and more can be found:  
<http://goo.gl/ibBK1Q>

## Fee and Registration

The following participation fee includes lunch and refreshments during coffee breaks:

- Regular registration – NOK 800 (approx. EURO ~90)
- Norwegian Hydrogen Forum members and students – NOK 400

## Questions? Contact:

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*Looking forward to meeting you in Trondheim!*

