



National Institute of Solar Energy, an autonomous institution of Ministry of New and Renewable Energy (MNRE), is the apex National R&D institution in the field of Solar Energy.

NATIONAL INSTITUTE OF SOLAR ENERGY

NATIONAL WORKSHOP ON HYDROGEN ENERGY AND FUEL CELLS 23-24 JANUARY, 2017

BACKGROUND

Hydrogen is attracting considerable attention globally as a clean and green energy carrier for transport sector and also for stationary power generation. In India, Ministry of New and Renewable Energy (MNRE) is the Nodal Ministry for the subject related to Hydrogen Energy and Fuel Cells. MNRE has been supporting Research, Development and Demonstration (RD&D) activities in the country through academic institutions, research organizations and industry for more than two decades. As a part of its overall RD&D activities relating to Hydrogen Energy and Fuel Cells, a solar photovoltaic powered hydrogen production capacity of 5 Nm³/hr along with necessary facilities for compression, storage and dispensing have been set up at the National Institute of Solar Energy (NISE), Gwal Pahari, Gurgaon in 2014.

This facility is currently being used for providing hydrogen fuel to five hydrogen-diesel dual fuel vehicles, developed by Mahindra & Mahindra (M&M) under another project supported by the MNRE. It is also planned to demonstrate hydrogen fueled three wheelers developed by Banaras Hindu University (BHU), Varanasi and M&M, which use metal hydride and composite cylinders respectively for hydrogen storage. In addition, NISE is in the process of setting up its fuel cell laboratory. To begin with PEMFC would be tested in the laboratory. In future, NISE plan to work on hydrogen production through biological route and decomposition of water using a central receiver facility to be used for concentrating solar energy. The NISE may also explore usage of hydrogen for operation of telecom tower and ATM.

OBJECTIVES

The National Workshop intends to provide a platform to researchers from academic institutions, research laboratories and industry and also professionals to interact on the following areas of hydrogen energy and fuel cells:

Hydrogen Production using Solar Energy, Biological Route and Biomass Gasification

Hydrogen Storage in solid state materials and in high pressure vessels

Use of hydrogen; hydrogen blends with other gaseous fuels and hydrogen-diesel dual fuel in IC engine for vehicles and stationary power generation

PEMFC for stationary power generation, including its use in telecom towers

Hydrogen refueling stations for automobiles

Day 1: Monday 23rd January 2017

Session - I : Hydrogen Production (10.30 to 11.45 AM)

- Hydrogen Energy & Fuel Cell programme in India: Dr. P C Maithani, Adviser, MNRE, New Delhi
- Overview of Hydrogen Production Technologies : Prof K. K Pant, IIT Delhi
- Photo-catalytic Hydrogen Production: Prof. Sahab Das, Dayalbagh Educational Institute, Agra
- Electrolytic Hydrogen Production: Shri Gaurav Tiwari, Eastern Electrolyser, Noida

Session –II : Hydrogen Production (12.00 to 1.115 PM)

- Biological Hydrogen Production : Prof. Debabrata Das, IIT Kharagpur
- Hydrogen Production through Biomass Gasification : Prof. S. Dasappa, IISc, Bengaluru
- Bio-inspired photo catalyst for H₂ production : Dr. Abhishek Dey, IACS, Kolkata.

Session-III : Hydrogen Storage (2.00 to 3.15 PM)

- Hydrogen storage overview with special emphasis on metal hydrides : Prof. O. N. Srivastava, BHU, Varanasi
- Hydrogen storage in composite cylinders: Dr. Satheesh Kumar, Scientist-G, ISRO, Thiruvanthapuram
- Hydrogen Storage in Organic Hydrides : Dr. Rajesh Biniwale, NEERI, Nagpur

Session – IV : Field Visit to H₂ Refueling Station and other projects of NISE (3.30 to 5.00 PM)

Day 2: Tuesday 24th January 2017

Session – V : Applications of H₂ in Vehicles (10.30 to 11.45 AM)

- Hydrogen fueled IC Engine for 3 wheelers and Mini Buses : Prof. L M Das, IIT Delhi
- Dual Fuel Engines : H-CNG and H₂-Diesel : Shri Jeevan Das, M&M, Chennai
- Hydrogen Fueled Vehicle development at BHU, Varanasi: Prof ON Srivastava, BHU, Varanasi

Session –VI : Fuel Cells and its Applications (12.00 to 1.45PM)

- Overview of Fuel Cell Technologies : Dr. A. Verma, IIT Delhi
- Hydrogen Fuel Cell Vehicle Development by Tata Motors: Dr. M Raja, Tata Motors, Pune
- Use of PEMFC in Telecom Towers : Shri Vipul Shah, Essential Energy, Bengaluru

Session- VII : Hydrogen Refueling Stations & Safety Issues (2.30 to 4.00 PM)

- H-CNG / Hydrogen Stations - Experience of IOCL: Shri. Sauhard Singh, IOCL, Faridabad
 - Hydrogen Station at NISE: Mr. Arun. K, Air Products, Pune
 - Hydrogen Energy and Safety Issues: Shri R.P.Singh , PESO, Faridabad
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Eligibility for the participation:

- Principal investigator of RD&D projects supported by the Ministry of New and Renewable Energy in the area of hydrogen energy and fuel cells.
- Research scholars working in RD&D projects supported by the Ministry of New and Renewable Energy in the area of hydrogen energy and fuel cells. Research scholars should forward their nominations through the principal investigator for the project.
- Other professionals interested in hydrogen energy and fuel cells will have to pay registration fee of Rs.10,000/- for attending the workshop. This amount will be paid to National Institute of Solar Energy on acceptance of nomination. The details for the payment of registration fee will be provided at the time of acceptance of the nomination.

VENUE: **National Institute of Solar Energy , Gwal Pahari , Gurgaon- Faridabad Road, Gurgaon 122003**

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