

EXPERTS FROM INDIA & JAPAN DISCUSSED COLLABORATIONS FOR INNOVATIONS ON HYDROGEN BASED TECHNOLOGIES

Relevant for: International Relations | Topic: India - Japan

Experts from India and Japan discussed possibilities of collaboration for promotion of hydrogen-based technologies as well as related innovations, trends, concerns, and solutions at a webinar on De-carbonisation: Exploring the Hydrogen Prospects and Innovative Technologies.

"Challenges for India-Japan hydrogen research is cost reduction and improved performance for fuel cells, hydrogen storage, challenges for viable green hydrogen process routes, significant investments required for research infrastructure and support for commercialisation," Rangan Banerjee, Forbes Marshall Chair Professor, Department of Energy Science and Engineering, IIT Bombay pointed out.

Distinguished Professor Kojima Yoshitsugu, National Science Centre for Basic Research and Development, Hiroshima University, said that ammonia could be a potential hydrogen carrier because of its high hydrogen densities. "Direct combustion of ammonia is also possible without emission of carbon dioxide. The heat of combustion of ammonia is above 1.3 times of liquid hydrogen," he added.

The webinar jointly organised by the Embassy of India in Japan, Department of Science & Technology (DST), Government of India along with The Institute for Global Environmental Strategies (IGES), Japan, and The Energy and Resources Institute (TERI), India, on 19th April 2021 provided a platform for the experts to deliberate on the most recent innovations, trends, and concerns as well as practical challenges encountered and solutions.

Sugiyama Masakazu from Research Centre for Advanced Science and Technology, The University of Tokyo, Japan, spoke about renewable hydrogen for disruptive decarbonisation.

"Hydrogen enables high efficiency and zero or near-zero-emissions operations. Green hydrogen will be good for industrial processes, production of chemicals, iron and steel, food and semiconductors and refineries and we should explore opportunities for co-innovation in accelerating green hydrogen to reduce dependency on petroleum import," said Nandkumar Janardhanan, Research Manager, Climate and Energy, IGES.

Dr Raghuram Chetty, Professor, Department of Chemical Engineering, India Institute of Technology, Madras, highlighted the IIT Madras Research Park, which facilitates the promotion of R&D by the institute in partnership with industry, assisting in the growth of new ventures and promoting economic development. He also elaborated on the challenges in the usage of fuel cells, like non-existence of hydrogen fuel infrastructure and difficulties related to hydrogen storage and transportation.

S Dasappa, Indian Institute of Science, Bangalore, underlined about a sustainable route of generating hydrogen using biomass, hydrogen from a range of sources, utilisation, dispensing, storage and distribution and creates a level playing field for all sources of green hydrogen.

Prof Tatsuoki KONO, Ph.D., Institute for Materials Research, Tohoku University, said, "Hydrogen gas is a fuel with plenty of potentials. But because it is highly combustible, managing it safely is key. Advantages of hydrogen Energy system is that hydrogen gas is generated using

a renewable energy source, instead of fossil fuels, it is stored in a safe way, overcomes challenges such as the intermittency of sunshine, and a clean, alternative power source."

Shailendra Shukla, Professor, and Founder Coordinator, Center of Excellence in Energy Resources and Development, Department of Mechanical Engineering, IIT (BHU), said that the potential scale of hydrogen demand growth in India is significant. "Costs of green hydrogen will start to compete with fossil fuel-derived hydrogen by 2030, at the latest. Hydrogen should be targeted at those sectors where direct electrification is not well-suited," he added.

Shibata Yoshiaki, Manager, Electric Power Industry & New and Renewable Energy Unit, The Institute of Energy Economics, Japan, stressed on the importance of green hydrogen and energy of system integration.

"Green hydrogen shall play a very important role. Along with pilots, NTPC is pursuing efforts with various stakeholders to shift to green hydrogen/green ammonia/green methanol, industries - fertilisers/refining, long-range heavy-duty transportation, blending into gas grids, energy storage," said Mohit Bhargava, National Thermal Power Corporation.

The experts agreed that hydrogen could be a good alternative because of its capability of producing lower emissions and less pollution and looked forward to collaborations between groups in India and Japan to that end.

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