



PHD CHAMBER
OF COMMERCE AND INDUSTRY

KEY TAKE AWAYS FROM ICS 2022



OPPORTUNITIES FOR GREEN HYDROGEN IN INDIA

Bergen, Norway- 30th and 31st August 2022

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AN INITIATIVE BY THE ENVIRONMENT COMMITTEE
PHD CHAMBER OF COMMERCE AND INDUSTRY

Key Take-Aways ICS 2022 – India, an Attractive Destination for Green Hydrogen- a Way Forward

At Bergen, Norway- 30th and 31st August 2022

1.0 Background:

International Climate Summit 2022 – Opportunities for Green Hydrogen India was successfully held in Bergen, Norway on 30th and 31st of August 2022.

The conference was organized by the PHD Chamber of Commerce and Industry, Invest India, H2Cluster (Norway), Norwegian Hydrogen Forum, Det Moderne India (DMI, Norway). The conference was sponsored by Greenstat, Norway and Alma Clean Power, Norway.

The Summit had in person participation of 200 delegates, 50+ delegates from India and some 150 Norwegian delegates. In addition, over 3000 participated virtually.

The Summit was the second in series, the first was held in Delhi last year with 200+ physical delegates from Norway and India, and 35,000+ digital participants.

The Summit underlined a growing bilateral cooperation between Norway and India on Green Hydrogen.

The Summit facilitated bilateral meetings with business partners and several MoU's were signed on the sidelines of the Summit.

The Summit had the largest Indian delegation to Norway ever and was the largest summit on Indian centric subject organized in Norway.

The conference received extensive coverage in the media in both countries.

2.0 The overall goals of the conference were:

- To show case India as one of the best destinations for production and development of Export Hub for Green Hydrogen.
- To identify the incentives required for setting up mega scale hydrogen plants in India for industrial and domestic consumption and export
- Opportunities for setting up and developing needed infrastructure to ensure safe transport, storage and end use of green hydrogen
- Cost effective technologies for setting up plants for the production of hydrogen on a medium and large scale
- R&D collaborative tie ups for hydrogen production, using PEM, Alkaline, AEM and Solid oxide technologies with Norwegian and European Research Labs
- Opportunities for international technological collaboration – ensuring the use of best practices throughout the entire value chain of Green Hydrogen

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- Setting up of Centre of Excellence covering process safety, mapping of available standards and policies with respect to International standards, using state of the art within software, training of manpower through VR and AVR in Hydrogen Production, Transportation and Applications
- Provide pathway for sustainable energy security

Some highlights:

The Indian government is strongly supporting the cause of renewable energy in order to meet its COP26 commitment of net zero emissions by 2070 with the focus on lowering the carbon footprint, cutting energy imports and focusing on green energy sources. Shri Nitin Gadkari, Minister Road and Surface Transport in his key note address stated that India has set a target of 500 GW of renewable energy by 2030 and that by 2050, India intends to create three-quarters of its hydrogen from renewable sources. The top aim for the government is to use green hydrogen in the cement and steel sectors, refineries, fertilizer industries, mining industries and transportation. The cost of hydrogen should be reduced by developing low-cost electrolyzers, green technology and integration of renewable energy production. Shri Gadkari emphasized that bilateral and multilateral cooperation will help India realize its potential to become the world's largest producer of green hydrogen and that India encourages investors, technology suppliers and R&D institutions to investigate prospects in green hydrogen production, supply chain and application in India.

The ICS2022 was inaugurated with the lighting of the lamp by Gurudev Sri Sri Ravi Shankar. He reminded the delegates that Norway and India have always stood for two things – Environment and peace, and that green energy is the only path to a sustainable and peaceful world.

The Norwegian Minister of Climate and Environment- Mr Espen Barth Eide, said in his address that Norway is ambitious in its pursuit of green hydrogen and that India and Norway share a common ground.

The Norwegian Minister of Trade and Industry, Mr Jan Christian Vestre shared that the country is currently scaling up hydrogen production at an industrial scale around the world and invited to a stronger bilateral cooperation on Green Hydrogen.

Elisabeth Sæther, State Secretary, Ministry of Petroleum, shared her insights of ground breaking projects scaling the H2 value chain.

The five parallel sessions were as below:

1. PARALLEL SESSION A: INVESTMENTS - Private and Governmental Opportunities. Moderated by Mr. Rajnish Kumar, Chairman BharatPe, ex-chairman of SBI
2. PARALLEL SESSION B: TECHNOLOGY - Challenges to Succeed Scaling. Moderated by Mr Daniel Ras-Vidal, CEO, Kjeller Innovation AS (H2Cluster)

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3. PARALLEL SESSION C: SAFETY - Guidelines and Capacity-Building. Moderated by Dr J.P Gupta, Summit Chair & Chair, Environment Committee, PHDCCI
4. PARALLEL SESSION D: DECARBONIZATION – Governmental Impact. Moderated by : Dr. Karen Landmark, Chief Strategy Officer Greenstat and Chair, Greenstat Asia
5. PARALLEL SESSION E: END USERS - Hydrogen Opportunities in the energy system. Moderated by Ms Rina Sunder, Founder, Det Moderne India

A Knowledge book on the Green Hydrogen potential for India authored by Dr J P Gupta, Chair ICS2022 and Dr Karen Landmark, Greenstat.

Day 2 – ICS-Industry Day

The industry day of ICS 2022 included both business presentations, guided tours and demonstration of sustainable technology solutions and technology. The Northern Lights project, based outside Bergen, is the world's first open-source CO2 transport and storage infrastructure. Currently under construction, this port base will receive captured CO2 from industry in Norway and Europe, and store it permanently in the seabed, 3000 meters below sea level. The Energy Park, owned by CCB Energy, aims to be Norway's best location for climate-friendly industries, centrally located along one of Norway's main sea routes. Here, hydrogen will be produced from natural gas with integrated CO2 capture at large scale.

The municipality of Øygarden and the Vestland region show that industry-friendly policy and clear sustainability targets can successfully create the conditions for green businesses and transition.

Green station demonstrated its user-centric EV charging facility and underlined the importance of end-user experience in creating enthusiasm for new climate friendly solutions. Presentations from Greenstat, Maritime Cleantech, Gexcon, Clara Venture Labs and Alma Clean Power gave participants an understanding of the deep technical competence in clean energy and hydrogen available in Norway. Rooted in long traditions with research and development, the new green opportunities are realized by dynamic, forward-leaning companies.

Suggestions for the Way Forward/ Key Takeaways

1.0 Urgent need to create an ecosystem for Green Hydrogen.

- Technologies for the production, storage, transportation and use are immature not only in India, but internationally as well. In view of this, it is a must to allow imports of plants and machinery without any duty and taxes, for the accelerated growth of Green Hydrogen. This will lead to flow of investment and also minimize the risk for new technologies by our local industrial houses. This will lead to faster growth in Green Hydrogen to make India self-Reliant.

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- India should allow import of technologies with no taxes till 2030 to achieve the target to set up by the Hon'ble Prime Minister of India to make India export hub by 2030.
- To give incentive to producers for Green hydrogen, it is suggested that the Government in addition to tax free import of knowhow and equipment, etc. till 2030 should also offer taxes holidays till 2030.
- Import of technologies and equipments duty free and providing tax incentives till 2030 will not only bring investments, technologies, and setting up large plants, but will create ecosystem in terms of knowledge, operation, trained manpower etc. in the country. Also, this will accelerate the production of Green Hydrogen locally. This is the need of hour for India for energy security as well as reduction in the use of fossil fuels.
- India has already acquired a leadership role in climate change and this step will be a win-win situation.
- The import of technologies duty free and the tax incentives till 2030 will build up in make in India technologies in cooperation with the leading companies and institutions worldwide.
- Make in India should only be applicable for matured technologies.
- Grey, Blue and Green Hydrogen Production should be introduced, so as to create ecosystem for hydrogen energy use in end applications.
- Introduce Carbon Tax
- Cap CO2 emissions 10 % reduction every year/ Charge excesses at high rates(eg . 90 % CO2 at 50 USD/ MT and Excess at 100 USD/MT)
- Increase renewable energy obligation

2.0 Standards and Regulations.

- International standards on production and use of Green Hydrogen exist The Government should accept the use of international safety standards and regulations while gradually adjust and add so they fit its home market towards 2030. This will also add to the speed in production and use of green hydrogen.
- Training of manpower, needing more than 1,00,000 in the next five years to handle and operate hydrogen and use.
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3.0 Setting up of Centre of Excellence (COE-Hs)

- The Government should incentivize the development of several Centre of Excellence in Hydrogen throughout the country. India has first class research institutes and laboratories that can be used for this purpose, in close cooperation with industry partners. This will strengthen international R&D collaboration, allowing the set-up of test facilities and pilot/demo projects. The existing COE set up recently (IIT Delhi and IOCL/Greenstat/SINTEF, Shriram Institute) can serve as capacity building facilities and assist in setting up new COE-Hs. The COE-H can offer services and training linked to the whole value chain of Green H₂, including testing of H₂ storage and necessary certification of cylinders.
- Centre of Excellences will also provide tie up with world class institutes in Hydrogen Safety including training on use of advanced computational tools (modeling, quantitative risk analysis-QRA and pre-incident planning) for design of intrinsically safe installations, identify and evaluate risks, guarantee their proper management, minimize the occurrence of accidents and establish response mechanisms for greater availability of assets.
- Customized VR based training on Hydrogen Safety to Stakeholders and first responders using 3D CFD CA for preparedness towards handling any hydrogen related emergency.
- Evolution of Risk Acceptance Criteria (RAC) for hydrogen sector – to compare with calculated risk from hydrogen value chain (production, handling, processing, transportation or application) to decide on preventive or protective risk reduction measures to bring down risk to acceptable levels.
- Implementation of process safety management systems to ensure the proper functioning of the assets.
- Human factor & human reliability analysis – to study, identify, quantify and reduce the human error.

4.0 Fusion of Ancient Wisdom with Technological Innovations.

- Dr. J. P. Gupta, Chair, PHD Chamber of Commerce and Industry offered a new pathway- a fusion or blend of ancient wisdom with modern technological innovation to mitigate climate change and promote sustainable development. He also proposed the concept of 3M. i.e. Message, Movement and Mission.

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M-1: Message

The message is one of peace and togetherness from the 1.4 Billion people of India.

M- 2: Movement

The movement, started by my Hon'ble Prime Minister, is to utilize the power of collective action and encourage individuals worldwide to undertake simple climate-friendly actions in our daily lives.

M-3: Mission

The mission, as India is perfectly positioned geographically to produce renewable energy around the year at the lowest cost, along with our significant resources in R&D and IT Professionals, is for us to become the No. 1 Global Producer and distributor of Green Hydrogen and become International Hydrogen Hub. This mission needs partnership, cooperation, and collaboration for accelerated growth. However, this mission cannot be accomplished independently.

Norway has more than 100 years of experience in Hydrogen Energy and is a trusted partner of India to co-operate to help emerge India as a self-reliant country in Green Hydrogen.

- His Holiness Sri Sri Ravi Shankar spoke on 'World is One Family'. Move from abundance (wastage) to thrift. He also spoke on Environmental problems, Selfishness, Greed and Apathy. We need spiritual and cultural transformation to deal with them.
- Dr. J. P. Gupta also made a clarion call for the start of mass movement for peace and harmony with Mother Nature to protect the planet.

5.0 To create the facilities for testing of cylinders.

- Existing parameters as well as the new International parameters should be certified by the agencies, which are acceptable to PESO, so that the ecosystem in the storage can take place.
- There are several large companies like: L&T, UMEO, Hexagon etc. they can segregate all kind of cylinders cryogenic to high pressure, but particularly for certification, all the parameters should be certified acceptable to PESO, but it is not available in our country, therefore, testing of cylinder facilities has to be established in private sector and public sector.

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6.0 Setting up of R&D center under the DRDO.

DRDO should work for a mission for development of all four type of local centric electrolyzers - making available the raw materials, parts, membrane, etc. which are more suitable to local conditions.

DRDO should take 4-5 Institute under itself- DRDO can make it a Centre like vaccination Centre established during Covid 2019. DRDO should work on the similar lines to make all these technology and knowhow available in our country asap. To set up and operate these R&D centers DRDO can have tie ups with R&D laboratories in India and Norway.

7.0 R&D on Methanol reforming on mission mode.

8.0 Achievements made so far.

- Signing of MOU's for setting up 12 MW Green Hydrogen plant by Nayara with Greenstat.
- Signing of LOI for Environment, Social, Governance (ESG) with Kreston SNR Advisors India and Greenstat, Norway.
- Signing of letter of intents with SINTEF of Norway (R&D) and Greenstat with Indian Oil Corporation in the Pipeline.
- Several letter of intents for setting up 1 MW plant in the pipeline.
- Three Centre of Excellences at IIT Delhi, SRIRAM Institute, Delhi and SRICT University, Ankleshwar of UPL already in operation.
- Several MOU's signed for feasibility studies with Greenstat.
- Centre for higher science in Green Energy is being set up at PHD Chamber of Commerce and Industry to provide consultancy service to MSME sector in Green Hydrogen.

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Notes

TOWARDS A GREENER FUTURE TOGETHER



There is an urgent need to address all issues pertaining to clean energy together, in order to find a set of balanced, positive and beneficial solutions for the future. Global cooperation is needed in exchange for technologies. All the countries need to come together to make green energy available at the earliest opportunity.

Dr. J.P. Gupta
Summit Chair and
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PHD CHAMBER OF COMMERCE AND INDUSTRY

About Us

PHD Chamber of Commerce and Industry (PHDCCI) has been working as a catalyst for the promotion of Indian industry, trade and entrepreneurship for the past 117 years. It is a forward looking, proactive and dynamic PAN-India apex organization. As a partner in progress with industry and government, PHDCCI works at the grass roots level with strong national and international linkages for propelling progress, harmony and integrated development of the Indian economy.

PHDCCI, acting as the “Voice of Industry & Trade” reaching out to more than 1,50,000 large, medium and small industries, has forged ahead leveraging its legacy with the industry knowledge across multiple sectors to take Indian Economy to the next level.

At the global level, we have been working with the Embassies and High Commissions in India and overseas to bring in the International Best Practices and Business Opportunities.

PHD Chamber has special focus on the following thrust areas:

- Banking, Financial Services & Insurance
- Food and Agriculture
- Health and Ayush
- Tourism and Hospitality
- Housing Infrastructure
- Ease of Doing Business
- MSME Sector

“Voice of Industry & Trade”

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