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GOVERNMENT OF INDIA MINISTRY OF POWER

GOVERNMENT OF INDIA MINISTRY OF NEW AND RENEWABLE ENERGY

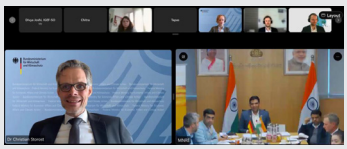
आर्थिक कार्य विभाग DEPARTMENT OF ECONOMIC AFFAIRS

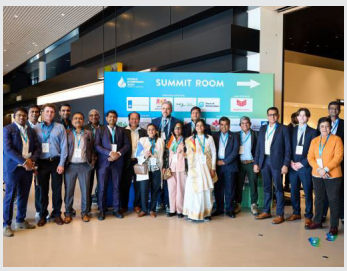
Contents

1 Introduction

Mr. Stefan Kliesch
Head of Energy Team
KfW, New Delhi

2 Events and Activities





Contents

Contents

3 Developments in Indo-German Energy Cooperation

Contents

4 Quote of the Month from India and Germany

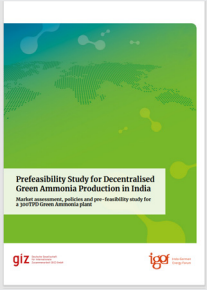
5 Energy Transition News

Contents

6 Publications

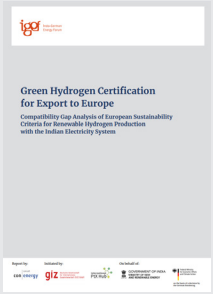
Green Hydrogen Production from Offshore Wind in Tamil Nadu and Gujarat

Page 49



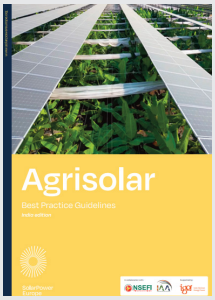
Prefeasibility Study for Decentralised Green Ammonia Production in India

Page 49



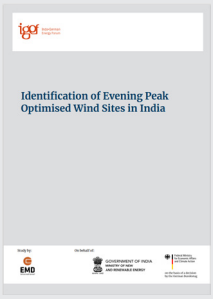
Green Hydrogen Certification for Export to Europe

Page 49



Agrisolar Best Practice Guidelines

Page 50



Identification of Evening Peak Optimised Wind Sites in India

Page 50

7 Upcoming Events

Alexander von Humboldt Stiftung/Foundation

German Chancellor Fellowship for Tomorrow's Leaders at German Solar Association BSW in Berlin

Page 51

SES Senior Experten Service DER WELT EXPERTEN DIENST

Retired German Energy Experts Offering Their Support to Indian Institutions

Page 51

develoPPP Where business meets development.

Information about DeveloPPP

Page 52

H2Uppp
International Hydrogen Ramp-up Program

Information about H2Uppp

Page 53

1 Introduction

Mr. Stefan Kliesch
Head of Energy Team, KfW
New Delhi

> "Together, India and Germany are driving forward the green energy transition. As KfW, we are delighted to contribute to a future shaped by clean energy."

Mr. Stefan Kliesch is the Head of the Energy Team at KfW's Delhi office. He also serves as the Sector Coordinator for Energy under the German Development Cooperation in India, on behalf of the German Federal Ministry for Economic Cooperation and Development. With a master's degree from Sciences Po Paris, he is an accomplished international development specialist. Previously, he managed KfW projects in West Africa, with a focus on conservation of protected areas as well as agricultural finance.

Together with his team, Mr. Kliesch is supporting the sustainable and inclusive energy transition in India on its way to carbon neutrality. Under the Indo-German Financial Cooperation, KfW promotes the construction of solar, hydropower and wind parks, finances activities under the Green Energy Corridor Program and Revamped Distribution Sector Scheme and supports energy efficiency projects on demand side. Currently, Mr. Kliesch and his KfW colleagues oversee a portfolio amounting to EUR 5.4 billion, driving the green energy transition in India.

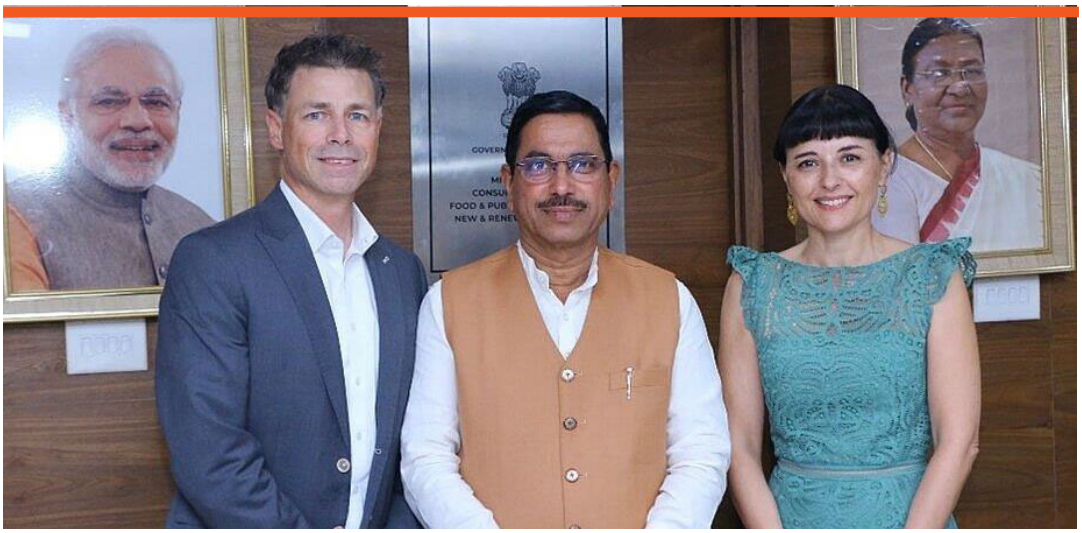
Mr. Kliesch is renowned for his dedication to combating global warming and his commitment to biodiversity protection.

2 Events and Activities

H2Global Foundation Team Visits India

5 August 2024 | New Delhi, Gujarat, Mumbai

Dr. Susana Moreira, Executive Director and Co-Chair of the Board at H2Global Foundation, and Mr. Timo Bollerhey, Executive Director of HINT.CO GmbH and Co-Creator of H2Global, visited India from 5 - 9 August 2024, to raise awareness about the HINT.CO mechanism. This initiative aims to bridge market gaps in clean hydrogen and low-emission fuels, which currently face limited production due to low demand and high costs.



Shri Pralhad Joshi, Minister of New and Renewable Energy with Dr. Susana Moreira, Executive Director and Co-Chair of the Board of H2Global Foundation, and Mr. Timo Bollerhey, Executive Director of HINT.CO GmbH and Co-Creator of H2Global.

Their visit began in Delhi with key meetings at the Ministry of New & Renewable Energy (MNRE), where they met Shri Pralhad Joshi, Minister of New & Renewable Energy, along with Shri Ajay Yadav, Joint Secretary (Hydrogen and Rooftop Solar), and Dr. Prasad Chaphekar, Deputy Secretary (Hydrogen), Ministry of New & Renewable Energy. They also engaged with industry leaders and hydrogen associations to discuss market developments.

Secretary Shri Bhupinder Singh Bhalla, Ministry of New & Renewable Energy (MNRE) with Dr. Susana Moreira, Executive Director and Co-Chair of the Board of H2Global Foundation and Mr. Timo Bollerhey, CEO of HINT.CO GmbH and Co-Creator of H2Global.

In Gujarat, they connected with Indian developers to explore opportunities in ongoing and upcoming tenders. These discussions underscored India's potential to become a global green hydrogen hub. A key highlight was their meeting with Shri Arun Mahesh Babu, Managing Director, Gujarat Power Corporation Limited (GPCL), who provided insights into large-scale hydrogen projects in the country.

Dr. Susana Moreira, Executive Director and Co-Chair of the Board of H2Global Foundation, and Mr. Timo Bollerhey, CEO of HINT.CO GmbH and Co-Creator of H2Global, met with private players and stakeholders in New Delhi.

Shri Arun Mahesh Babu, Managing Director, Gujarat Power Corporation Limited (GPCL) along with Dr. Susana Moreira, Executive Director and Co-Chair of the Board of H2Global Foundation, and Mr. Timo Bollerhey, CEO of HINT.CO GmbH and Co-Creator of H2Global, were hosted by the Green Hydrogen Organisation for an evening business reception with government and private sector entities.

Their final stop was Mumbai, where they met with public-sector undertakings (PSUs) and held discussions with Ms. Abha Shukla IAS, Principal Secretary (Energy), Government of Maharashtra. The conversation focused on how the HINT.CO mechanism could create mutual benefits for India and international partners. For more information on H2Global, visit here. A webinar on the H2Global pilot auction results is available here.

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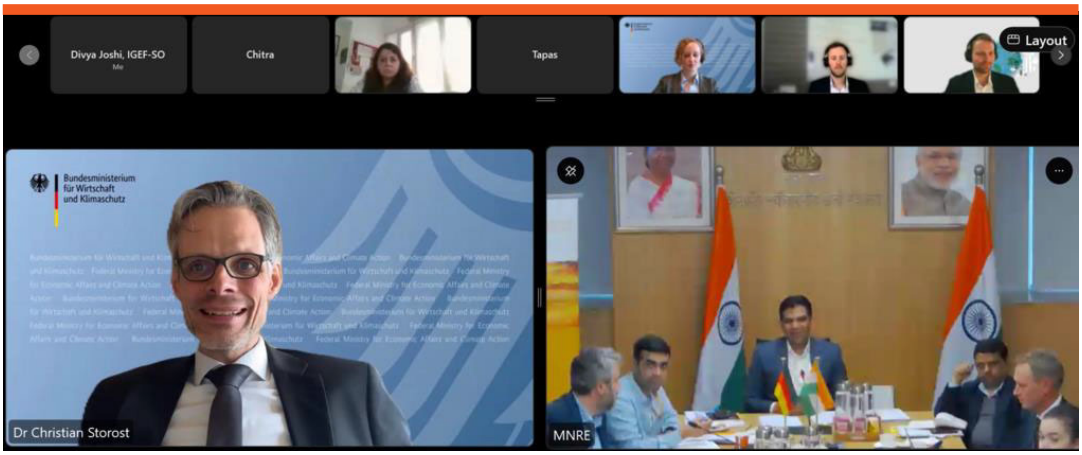
Indo-German Green Hydrogen Task Force Meeting

5 March 2024 | Hybrid

The Indo-German Green Hydrogen Task Force met on March 5, 2024, at Atal Akshay Urja Bhavan under the co-chairmanship of Shri Ajay Yadav, Joint Secretary, Green Hydrogen, International Relations & Climate Change, Ministry of New & Renewable Energy (MNRE), and Dr. Christian Storost, Head of Division, Funding Instruments and Hydrogen Initiatives, Ministry for Economic Affairs and Climate Action (BMWK).

Dr. Storost opened the meeting by acknowledging the Task Force's efforts in advancing the green hydrogen market. He highlighted Germany's continued reliance on green hydrogen imports, estimated at 1.5–3 MMT. Shri Yadav welcomed participants, outlining India's National Green Hydrogen Mission (NGHM) and government incentives. He noted a strong interest in RE-INVEST and expressed optimism about finalising the roadmap.



Dr. Christian Storost (left) and Shri Ajay Yadav (centre right) opened the meeting.

Dr. Prasad Chaphekar, Deputy Secretary, Hydrogen Division, MNRE, provided an overview of NGHM, which aims to establish 125 GW of renewable energy capacity and cut carbon emissions by 50 MMT.

Mr. Mathis Weller, Deputy Head of Division IIB1, BMWK, presented Germany's updated National Hydrogen Strategy (July 2023). The strategy targets 10 GW of domestic electrolyser capacity by 2030 and explores various hydrogen types, including blue, orange, and turquoise. It also emphasises streamlined approval processes to accelerate market growth.

MNRE and IGEF Task Force members in New Delhi.

Task Force Subworking Group Heads shared updates on key activities, including meetings, trade fairs, business and government delegations, workshops, and knowledge sessions.

The meeting concluded with discussions on next steps, upcoming events, and future ministerial meetings to solidify the roadmap for Indo-German green hydrogen collaboration.

Business Delegation on Green Hydrogen to Rotterdam and Rhine-Ruhr Metropolitan Region

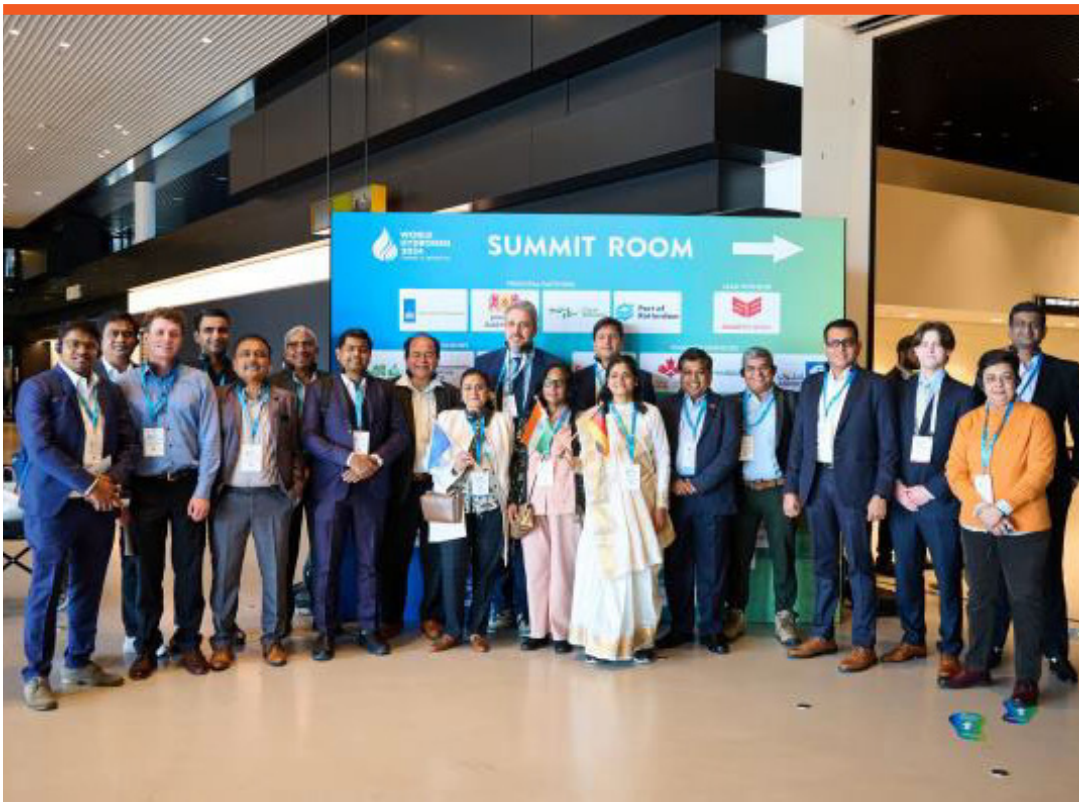
13-18 May 2024 |Netherlands and Germany

The Indo-German Chamber of Commerce (IGCC) and the Indo-German Energy Forum Support Office (IGEF-SO) organised a business delegation to the Netherlands and Germany, focusing on green hydrogen from 13 - 18 May 2024. The delegation attended the World Hydrogen Summit & Exhibition 2024 in Rotterdam (May 13–15) and explored key hydrogen projects in the Rhine-Ruhr region.

World Hydrogen Summit & Exhibition 2024 in Rotterdam

The delegation began with a guided tour of the exhibition, engaging with experts from companies such as VDMA, SFC Energy, Uniper Hydrogen GmbH, Linde, Siemens Energy, Thyssenkrupp Nucera, and RWE. For the first time, India had set up its own pavilion at the Summit, hosted by the Ministry of New and Renewable Energy (MNRE). The pavilion was inaugurated by Shri Bhupinder Singh Bhalla, Secretary, MNRE, on 12 May. On May 14, IGEF-SO, in collaboration with MNRE and other partners, organised two exclusive networking events focusing on green hydrogen project development in India. During the EU-India Networking reception, Shri Bhalla reaffirmed India's commitment to becoming a global green hydrogen hub.

Participants of the delegation at the World Hydrogen Summit & Exhibition in Rotterdam.



Shri Bhupinder Singh Bhalla during the EU-India Networking Reception.

To provide insights into Europe's hydrogen developments, Mr. Johannes Eng, Corporate Development and Strategy, Port of Duisburg, presented on hydrogen imports and infrastructure in the Rhine-Ruhr region. The delegation also toured the Port of Rotterdam, including ammonia terminals (Koole, OCI, Gunvor), an offshore wind energy transformer station, and the Hynetwork hydrogen pipeline. They visited Shell Energy and Chemicals Park Rotterdam, Europe's largest refinery, as well as upcoming electrolyser projects from Shell, BP, and Air Liquide, totaling 650 MW.

Green hydrogen developments in the Rhine-Ruhr metropolitan region

On May 16, the delegation visited:

- WILO S.E. (Dortmund): Explored the H2POWERPLANT, which uses rooftop solar energy for electrolysis to generate green hydrogen, later converted back into electricity as needed. A company presentation was followed by an augmented reality factory tour.
- Hydrogen Competence Centre (Herten): A former coal mine repurposed for hydrogen infrastructure testing. Experts shared insights into ongoing projects and test facilities.

The delegation in front of the H2POWERPLANT on the Wilo factory site in Dortmund.

On May 17, the group visited ZBT (Zentrum für Brennstoffzellen Technik GmbH) in Duisburg, a key research center for fuel cell and electrolysis technologies. Experts discussed hydrogen applications, upscaling electrolysis, and standardisation efforts. The tour included a visit to the hydrogen test field and refueling station.

The delegation gained first-hand insights into Europe's green hydrogen sector, infrastructure, and technological advancements. The World Hydrogen Summit & Exhibition 2024 provided valuable networking opportunities, fostering potential Indo-European collaborations in green hydrogen.

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High-ranking Government Delegation at the 10th Berlin Energy Transition Dialogue (BETD) 2024

19 - 20 March 2024 | Berlin, Germany

Shri Bhupinder Singh Bhalla, Secretary, Ministry of New & Renewable Energy (MNRE), led an Indian delegation to the 10th Berlin Energy Transition Dialogue (BETD) held on March 19 - 20, 2024. He was joined by Shri Lalit Bohra, Joint Secretary, MNRE, and Shri Abhay Bakre, Director General, Bureau of Energy Efficiency (BEE), Ministry of Power (MoP). BETD serves as a key global platform for discussions on energy transition, bringing together governments, businesses, and civil society. This year's event saw participation from ministers representing Namibia, Oman, Uruguay, Bangladesh, and other nations.

During the conference, Shri Bhalla spoke as a panelist in the session "A Global Renewables & Energy Efficiency Target – Commitment to Action." He joined high-ranking officials in discussing global energy targets and the role of effective policies in achieving them.

The panellists and moderator of the session on "A Global Renewables & Energy Efficiency Target-Commitment to Action"

In addition, on March 19, Shri Bhalla addressed the 7th Make in India Mittelstand (MIIM) Exchange Platform, hosted by the Embassy of India in Berlin. Sharing the stage with Dr. Andreas Nicolin, Deputy Director General, Federal Ministry for Economic Affairs and Climate Action (BMWK), and private sector representatives, he highlighted India's initiatives in renewable energy and investment opportunities. MIIM, part of the Make in India Initiative, supports German Mittelstand and family-owned businesses exploring entry into the Indian market.

1st Pilot Awareness Raising Workshop for Farmers on PM KUSUM Component A

15 May 2024 | Narayangaon, India

GIZ India, in collaboration with ICAR-ATARI, organised a training workshop to introduce farmers to the benefits of KUSUM Component A, a scheme promoting solar energy in agriculture. Around 45 farmers attended the event, where Mr. Anil Meher, Director, KVK Narayangaon, highlighted how the scheme could help reduce irrigation costs and create additional income through solar electricity generation.

Dr. D.K. Singh, Principal Scientist at Indian Agricultural Research Institute (IARI), further explained how solar and wind energy could significantly lower agricultural production costs. He discussed how renewable energy could make farming more affordable and sustainable, reducing expenses on irrigation, machinery, and farm management while benefiting both farmers and the environment.

The workshop shed light on the growing potential of AgriPV–a system that allows farmers to grow crops while generating solar power, enhancing land productivity. Discussions focused on the importance of supportive policies and financial incentives to encourage its adoption.

A key focus was the technological integration of solar panels with farming. Farmers explored optimal panel orientation, spacing, and crop selection to maximise sunlight use without affecting crop yields. Vertical AgriPV systems, ideal for high-density crops like fruits and vegetables, were introduced as a promising innovation.

Durability and maintenance of solar panels were also emphasised. Experts shared best practices for regular cleaning and periodic inspections to ensure panels remain efficient over time. Participants

Participants of the 1st Pilot Awareness raising workshop in Narayangaon.

also learned about grid connectivity, net metering policies, and how collaborating with DISCOMs could simplify electricity sales.

A crop suitability matrix was presented, helping farmers choose crops based on light requirements and shading effects, ensuring maximum yield while efficiently utilising solar energy.

Looking ahead, the workshop highlighted how AgriPV can boost rural livelihoods, reduce reliance on conventional energy, and promote sustainable farming. As India moves towards its renewable energy goals, initiatives like AgriPV will play a vital role in ensuring energy security and a greener future.

The event served as a valuable platform for knowledge-sharing and collaboration among farmers, researchers, and policymakers. With continued support, AgriPV has the potential to transform Indian agriculture, making it more resilient, productive, and environmentally sustainable.

On June 10, 2024, GIZ India and KVK Hayathnagar in Hyderabad hosted a one-day awareness

2nd Pilot Awareness Raising Workshop for Farmers on PM KUSUM Component A

10 June 2024 | Hyderabad, India

workshop to inform farmers about the potential of Agriculture Photo Voltaic (AgriPV) systems under the Pradhan Mantri Kisan Urja Suraksha evam Utthan Mahabhiyan (PM KUSUM) Component A. This initiative is designed to encourage sustainable energy practices in agriculture, reduce costs, and improve productivity.

PM KUSUM Component A aims to promote the installation of solar power projects on barren or cultivable lands, providing farmers with financial incentives to generate solar power. This energy can be used for their own needs, with any surplus sold back to the grid, offering an additional income stream.

The workshop brought together 30 farmers from various parts of Telangana. It had two main goals: to educate farmers about the benefits and operation of AgriPV systems under PM KUSUM Component A and to identify farmers who could benefit from integrating renewable energy into their farming practices.

Farmers were given detailed information about PM KUSUM Component A and had the opportunity to visit a 10 kW AgriPV system at PJTSAU Telangana, where they could see the technology in action.

The event also featured distinguished speakers, including Dr. Shaik N. Meera from ICAR-ATARI, Dr. M. Srinivasa Rao from ICAR-CRIDA, and Dr. D K Singh from IARI. These experts discussed how renewable energy could reduce operational costs and create new income opportunities for farmers.

Dr. D K Singh highlighted the need to leverage solar and wind power to reduce cultivation costs, while Dr. Shaik N. Meera emphasised how PM KUSUM could lower both cultivation and irrigation expenses. He also called for greater flexibility in the policy to support different farming methods, including group farming initiatives.

Mr. Rahul YVK, GIZ, setting the context of the workshop.

Input and discussion at the second Pilot Awareness raising workshop for farmers in Hyderabad.

The workshop wrapped up with an engaging discussion, where farmers shared their insights and suggestions for improving the adoption of AgriPV systems across India. Their feedback, from technical improvements to implementation strategies, will help refine future versions of the program.

Overall, the workshop served as an important platform for sharing knowledge and fostering collaboration among stakeholders dedicated to promoting sustainable agriculture through renewable energy. By tapping into solar power under PM KUSUM, India's farmers are poised for greater resilience, profitability, and environmental responsibility in the future.

3rd Pilot Awareness Raising Workshop for Farmers on PM KUSUM Component A

26 June 2024 | Jodhpur, India

The third KVK Training on KUSUM Component A, focused on AgriPV, was organised by GIZ India in collaboration with ICAR-CAZRI, develoPPP, and ProSoil on June 26, 2024. The workshop was attended by around 35 farmers and included a site visit to the AgriPV plant at ICAR-CAZRI.

The aim of the workshop was to raise awareness among farmers about the KUSUM scheme, highlighting its economic benefits and AgriPV's potential in arid and barren regions. The session also addressed practical challenges and shared success stories from current beneficiaries of the scheme.

Launched by the Government of India, the Pradhan Mantri Kisan Urja Suraksha Evam Utthaan Mahabhiyan (PM-KUSUM) Component A scheme is designed to promote solar energy use among farmers. It helps provide financial security by enabling farmers to generate electricity for their own use and sell surplus power to the grid. This initiative not only reduces farmers' dependency on crop yield for income but also contributes to cutting carbon emissions, promoting sustainable agricultural practices.

Mr. OP Yadav, Director of ICAR-CAZRI, emphasised the vital role of farmers in the nation's development, stating that India's progress depends on the advancement of its farmers. He stressed the importance of focusing on farmers' economic growth for the overall development of the country.

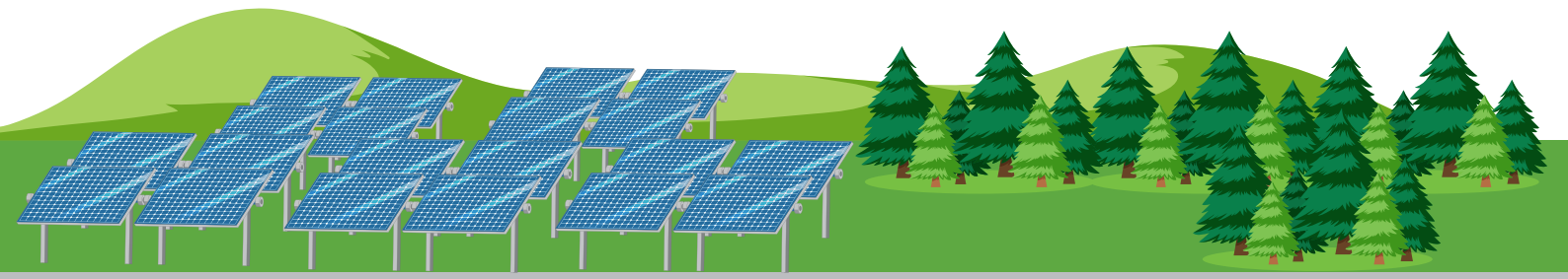
Farmers provided insightful suggestions to enhance the implementation of the KUSUM Comp A, bringing focus towards improving financing options for AgriPV adoption.

Site visit to the AgriPV plant at ICAR-CAZRI.

Farmers made several key recommendations during the session, including integrating the KUSUM Component A scheme with the Agriculture Infrastructure Fund (AIF) to make financing easier and more affordable for farmers. They also called for subsidies to support the installation of solar plants, particularly for small-scale farmers.

In terms of technology, the adoption of wind brake systems to reduce dust and transmission losses was widely endorsed as a way to lower operational and maintenance costs in the region. Farmers also suggested improving grid capacity and connectivity, with a focus on ensuring that farmers are central stakeholders in the process. They further highlighted the importance of local-language awareness and training programs to drive the widespread adoption of renewable energy solutions.

The third KVK training session in Jodhpur proved to be a major success, offering valuable insights and fostering significant collaboration toward advancing AgriPV technology in India.



4th Pilot Awareness Raising Workshop for Farmers on PM KUSUM Component A

4 July 2024 | Ludhiana, India

GIZ India, in collaboration with ICAR-ATARI, Ludhiana, organised a one-day awareness workshop for farmers on July 4, 2024, at ATARI, Ludhiana. Around 40 farmers from neighbouring villages attended the session, where they received comprehensive information about the KUSUM Component A scheme. The workshop facilitated knowledge-sharing and first-hand discussions, helping farmers gain a deeper understanding of AgriPV and its benefits.

KUSUM Component A focuses on AgriPV, enabling farmers to generate electricity through solar panels. This initiative not only reduces agricultural electricity costs but also provides farmers with an additional income stream by allowing them to sell surplus power back to the grid. Ultimately, the scheme aims to improve farmer livelihoods, support economic growth, and contribute to India's transition to renewable energy.

The workshop was designed to engage medium and large farmers, educating them on AgriPV's potential under KUSUM Component A while also gathering their feedback and perspectives. Farmers currently benefiting from the scheme shared their experiences, helping assess its advantages and practical challenges.

Participants of the 4th Pilot Awareness raising workshop for farmers in Ludhiana.

The event was presided over by Mr. Parvender Sheoran, Director of ICAR-ATARI, Ludhiana, who emphasised the need to expand renewable energy while maintaining a balance with coal-based electricity to safeguard the environment. Highlighting Punjab's extensive irrigation–where nearly all cultivable land is utilised–he pointed to Ladakh's vast barren lands as a promising region for AgriPV deployment. He encouraged participating farmers to share their learnings with their communities.

During discussions, farmers raised concerns about low tariff rates and the financial viability of AgriPV, particularly for small-scale farmers, stressing the need for better economic incentives under PM-KUSUM Component A.

Given Punjab's fertile soil, abundant water, and high agricultural productivity, farmers also debated the shift from traditional paddy cultivation to vegetable farming. In this context, Vertical AgriPV emerged

as a potential solution, allowing for efficient land use while accommodating large-scale farming equipment. The session also explored the need for accessible financing options to support AgriPV adoption in the state.

The workshop proved to be a valuable platform for knowledge exchange, offering practical insights and fostering collaboration toward sustainable agriculture and renewable energy integration.

Business Roundtable Meet on "Green Hydrogen" at Intersolar India

20 February 2024 | Gujarat, India

The 12th business roundtable on green hydrogen was organised by the Indo-German Chamber of Commerce (IGCC) in collaboration with the Indo-German Energy Forum (IGEF-SO) on February 20, 2024, during the Intersolar India exhibition and conference in Gandhinagar, Gujarat.

Ms. Shivani Chaturvedi, Regional Director of IGCC, welcomed participants and highlighted Germany's ongoing demand for energy imports, including green hydrogen and green ammonia. She emphasised the opportunities this presents for businesses exploring the sector's potential.

Mr. Tobias Winter, Director of IGEF, moderated the discussion, encouraging an open exchange on the topic. He provided insights into Germany's "National Hydrogen Strategy" and funding opportunities available for green hydrogen projects, such as the International Hydrogen Ramp-Up Program (H2Uppp). The session attracted participants from the solar industry eager to learn about market prospects and financial support for green hydrogen initiatives.

Participants from the 12th Business Roundtable on Green Hydrogen

H2Uppp, commissioned by the German Federal Ministry for Economic Affairs and Climate Action (BMWK), supports green hydrogen project development in selected countries, including India. The program operates through a public-private partnership model, offering grants of up to 2 million EUR for Indo-German green hydrogen projects. Additionally, the PtX Development Fund provides up to 30 million EUR per project to support industrial-scale production, transport, storage, and processing of green hydrogen.

For further details, interested stakeholders can contact Ms. Shivani Chaturvedi at shivani.chaturvedi(at)indo-german.com.

Train-the-Trainers Program on Green Hydrogen Power-to-X: Electrolyser and Fuel Cell Installation

12-16 February 2024 | Gujarat, India

In collaboration with GIZ India, the Indo-German Energy Forum (IGEF-SO), Renewables Academy (RENAC), Enapter, h2e Power Systems Private Limited, SFC Energy AG, and FC TecNrgy, the Gujarat Energy Research and Management Institute (GERMI), Gandhinagar, hosted a pioneering five-day Train-the-Trainer program from February 12 - 16, 2024. Titled "Green Hydrogen PtX – Electrolyser and Fuel Cell Installation," this first-of-its-kind hands-on training brought together 21 participants from academia, government, and the private sector.

Dr. Akash Davda, Head of New Technology Management at GERMI, opened the session by introducing GERMI's work and outlining the program's objectives, setting the stage for an enriching learning experience.

Mr. Kuldeep Sharma from GIZ India emphasised the importance of energy efficiency and transition, highlighting the strong collaboration between GIZ and GERMI.

The training was led by Dr. Rui Yuan Yong from SunGreenH2 and Mr. Philipp Endres from Enapter. Dr. Yong provided a foundational understanding of green hydrogen technology, covering fuel cell specifications and system operations. Mr. Endres focused on hydrogen plant safety and provided an in-depth analysis of different electrolyser types and their efficiency.

GERMI's team shared insights into the global and Indian hydrogen landscape, India's National Green Hydrogen Mission, and the regulatory framework governing the sector. Mr. Himanshu Desai from GERMI explained the process of designing solar PV systems to meet electrolyser electricity demands. Additionally, Ms. Heena Mandloi from the Ministry of New and Renewable Energy (MNRE) outlined key government schemes and guidelines aimed at fostering a supportive environment for green hydrogen initiatives.

Participants at the Green Hydrogen Training Facility at the Gujarat Energy Research and Management Institute (GERMI) campus

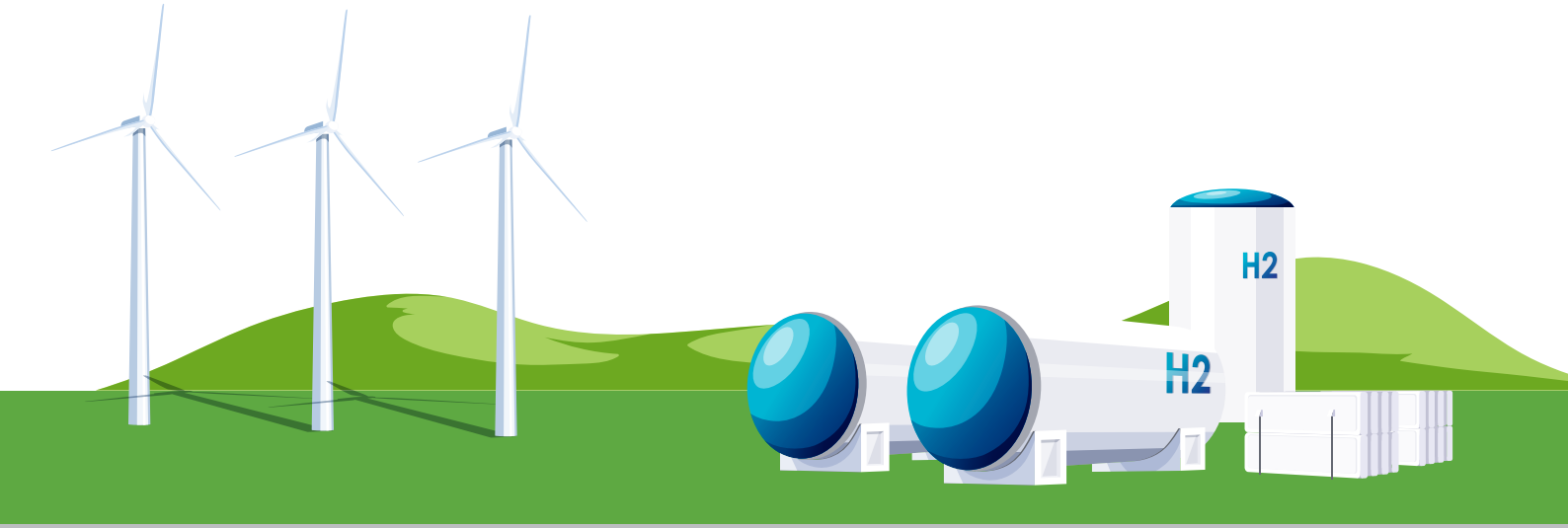
A key highlight of the training was the installation of a Green Hydrogen plant at the GERMI campus. This facility, integrating electrolysers, lithium-ion batteries, fuel cell stacks, and a solar PV system, marks a significant milestone in Gujarat and India's green hydrogen capacity-building efforts.

Technical specifications:

- Electrolyser capacity: 2.4 kW each (total 4 Electrolyser installed)
- Fuel cell capacity: 2.5 kW, 48V output
- Hydrogen production rate of each Electrolyser: 0.5 Nm3 per hour
- Green hydrogen production rate per hour: 2 Nm3 (cumulative)
- Solar installed capacity: 7kWp

To assess learning outcomes, a comprehensive test was conducted, and participants who successfully completed the program were awarded trainer certifications. Dr. Biswajit Roy, Director General of GERMI, personally interacted with the participants, recognizing their commitment and presenting their certificates.

Building on this successful initiative, GERMI has since conducted three additional five-day training sessions, further expanding knowledge dissemination and empowering more stakeholders in green hydrogen and fuel cell technology.



Launch of Agrisolar Best Practice Guidelines- India Edition

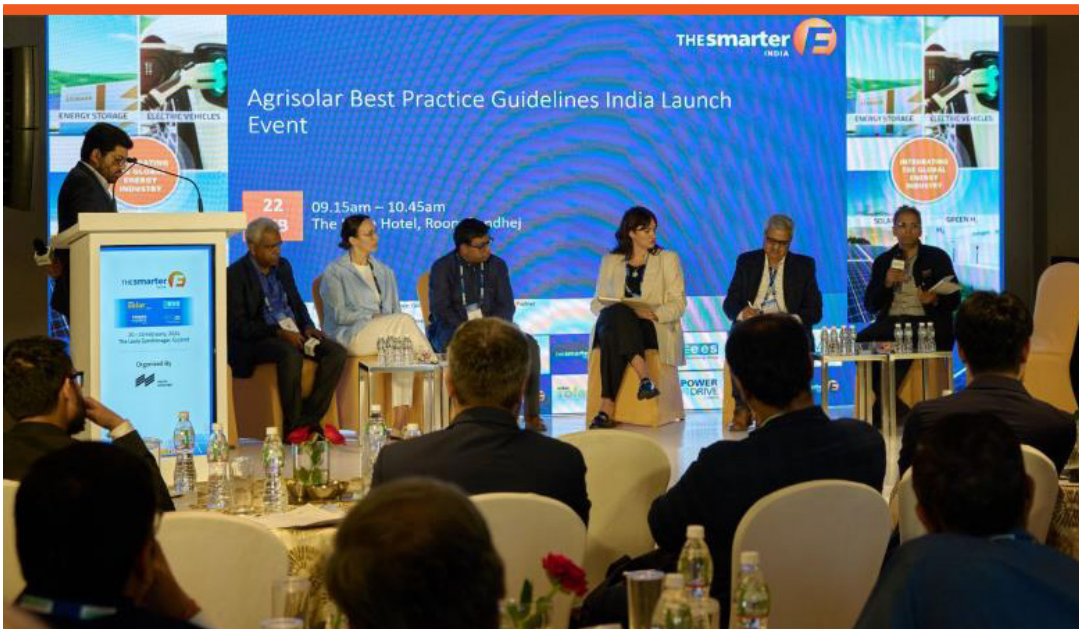
22 February 2024 | Gujarat, India

The Indo-German Energy Forum (IGEF-SO), in collaboration with the National Solar Energy Federation of India (NSEFI), India Agrivoltaics Alliance (IAA), and Solar Power Europe (SPE), officially launched the "Agrisolar Best Practice Guidelines – India Edition" on February 22 in Gandhinagar.

Mr. Tobias Winter, Director of IGEF-SO, opened the event with insights into the evolving Agrivoltaics landscape in India. This was followed by Mr. Suhas Sathyakiran from the India Agrivoltaics Alliance and Ms. Lina Dubina from Solar Power Europe, who shared key aspects of the guidelines, specifically adapted to India's agricultural and energy needs.

Building on Solar Power Europe's original framework, these guidelines mark a major step toward integrating solar energy with agriculture in India, fostering sustainability and innovation in the sector.

A panel discussion, moderated by Mr. Shubhang Parekh from NSEFI, featured experts including Mr. Vivek Saraf (SunSeed APV), Mr. Gulabsingh Girase (GroSolar), Mr. Suhail Shaikh (Voltaics Alpha), Ms. Lina Dubina (Solar Power Europe), and Ms. Alyssa Pek (Global Solar Council). The discussion covered topics such as climate change impacts on Indian agriculture and best practices in Agrivoltaics, focusing on Engineering, Procurement, and Construction (EPC) as well as Operations & Maintenance (O&M).



Panel discussion about Agrivoltaics in India as a sustainable energy and agriculture solution.

Mr. Prasoon Anand from NSEFI wrapped up the event, applauding the collaborative effort behind the guidelines. These recommendations serve as a roadmap to maximize the benefits of Agrivoltaics, creating new opportunities for farmers, businesses, and sustainable energy growth. The event underscored the importance of cooperation and knowledge sharing in advancing India's renewable energy transition.

International PtX Hub

India's Debut: Train-of-Trainers on Green Hydrogen and Power-to-X

27 February - 7 March 2024 | New Delhi and Gujarat, India

The International Power-to-X Hub and the Indo-German Energy Forum (IGEF-SO) hosted India's first eight-day Train-of-Trainers program on green hydrogen and Power-to-X (PtX) from February 27 to March 7, 2024, in New Delhi and Gujarat. The program aimed to equip 14 renewable energy professionals with the knowledge and skills to become trainers in this emerging field.

Led by Prof. Dr. Christoph Menke, with innovative teaching methods from didactics expert Mr. Michael Zillich, the training provided in-depth insights into renewable PtX. Indian trainers Ms. Bidisha Banerjee, Dr. Deepak Yadav, and Mr. Vivek Jha played a crucial role as mentors, fostering an interactive learning environment.

Prof. Dr. Menke, main lecturer, during the Train-of-Trainers programme.

The program began in Delhi with an introduction by Mr. Philipp Wittrock (International PtX Hub) and Mr. Clemens Antretter (IGEF-SO), followed by lectures on PtX's role in energy policy and the Indian electricity and hydrogen landscape. Participants were introduced to the atingi platform, a digital learning tool by GIZ GmbH.

The training also included site visits to FC TecNrgy (FCT) and SFC Energy, where participants explored cutting-edge hydrogen and methanol fuel cell solutions for net-zero projects, micro-grids, and rural electrification. Live demonstrations at FCT's production and R&D facilities showcased real-world applications of hydrogen energy solutions.

Participants at the site visit to FCT and SFC Energy, Gurugram.

The second phase, held at the Gujarat Energy Research and Management Institute (GERMI), focused on hands-on training. Dr. Akash Davda introduced GERMI's work, and Dr. Biswajit Roy engaged with participants on India's renewable energy landscape. Divided into working groups, participants practiced implementing the seven training modules, receiving peer and trainer feedback.

A key highlight was the visit to the Green Hydrogen Training Centre and a 1 MW solar PV plant at GERMI. The Green Hydrogen plant installation, integrating electrolysers, lithium-ion batteries, fuel cell stacks, and a solar PV system, marked a major milestone in India's green hydrogen capacity-building efforts.

Key technical specifications of the GH2 facility:

- an electrolyser capacity of 2.4 kW each (a total of 4 electrolysers installed);
- a fuel cell capacity of 2.5 kW and 48 V output;
- a hydrogen production rate for each electrolyser of 0.5 Nm3 per hour;
- cumulative green hydrogen production rate per hour of 2 Nm3
- 7 kWp solar installed

The program also featured expert lectures on coal gasification (Mr. Vivek Jha) and biomass-based hydrogen production (Dr. Piyali Das, TERI), highlighting alternative hydrogen production pathways for India. Additional presentations included an overview of the AgriPV project in Manwath, Parbhani, and insights into Andhra Pradesh's renewable energy policies by Mr. Kartikeya Anand. With this successful training, the focus now shifts to mobilising trained trainers and implementing renewable PtX training programs across India.

H2Uppp
International Hydrogen
Ramp-up Program

Green Hydrogen & PtX Production Training - For Project Developers and Technical Project Managers

18 - 23 March 2024 | New Delhi, India

The International Hydrogen Ramp-up Programme (H2Uppp) and Indo-German Energy Forum (IGEF-SO) jointly organised two on-site capacity-building sessions on Green Hydrogen and Power-to-X (PtX) Production in New Delhi from March 18–20 and March 21–23. Designed for project developers and technical project managers, the training sessions brought together around 50 participants from private, government, and research organisations.

Led by Ms. Swarnim Srivastava and Mr. Sidharth Jain from MEC Intelligence (MEC+), the sessions focused on the techno-economic aspects of green hydrogen and PtX production. Topics covered included renewable energy potential, hydrogen production technologies, plant design, economic viability, regulatory frameworks, offtake structures, supply chain maturity, and value engineering strategies to enhance project economics.

Participants engaged in hands-on activities using an Excel-based tool for planning green hydrogen production plants and a modeling tool for calculating green ammonia production costs. Through interactive group exercises, they applied these tools to real-world project scenarios, fostering practical understanding and collaboration.

The training provided valuable insights into India's green hydrogen market, exploring both opportunities and challenges. Developed under the H2Uppp Programme of the German Federal Ministry for Economic Affairs and Climate Action (BMWK), the initiative supports green hydrogen projects in emerging economies as part of Germany's National Hydrogen Strategy. The training concept and materials were developed by the Fraunhofer Institute for Energy Economics and Energy System Technology (Fraunhofer IEE) and implemented by GIZ GmbH.

Participants and trainers at the first capacity building Green Hydrogen and Power-to-X (PtX) Production Training.

International PtX Hub

Renewable Power-to-X Training

20 - 22 March 2024 | New Delhi, India

The Indo-German Energy Forum (IGEF-SO) and the Power-to-X (PtX) Hub hosted a three-day Power-to-X training on Green Hydrogen and its derivatives from March 20–22, 2024, in New Delhi. The training brought together 15 participants from government, private sector, and academia, with sessions led by Dr. Deepak Yadav from the Council on Energy, Environment and Water (CEEW) and technical experts from GIZ, including Mr. Krushna Kaant Gupta, Mr. Karan Arora, and Mr. Kumar Abhishek.

The course provided a deep dive into the PtX value chain, covering technologies, production processes, economics, and infrastructure while following the PtX Hub's Environmental, Economic, Social, and Governance (EESG) Framework. Participants explored renewable PtX's role in future energy systems and its economic potential.

Sessions covered key topics such as production pathways for green hydrogen derivatives like ammonia and methanol, cost trends for electrolysers and PtX products, and the infrastructure needed for transportation, storage, and trade. The course also examined demand markets, value chains, and business models.

A dedicated module focused on sustainability criteria, applying the EESG Framework to assess PtX sustainability and related standards. The final discussions revolved around policies, regulations, and India's National Green Hydrogen Mission, which aims to establish the country as a global hub for Green Hydrogen production, use, and export.

The training concluded with an interactive Q&A, where participants engaged in discussions on whether Green Hydrogen is just a passing trend or a viable long-term solution, reflecting on its challenges and future possibilities.

Participants from the academia, government, and the private sector at the Basic Renewable Power-to-X Training in New Delhi.

H2Uppp
International Hydrogen
Ramp-up Program

RWE

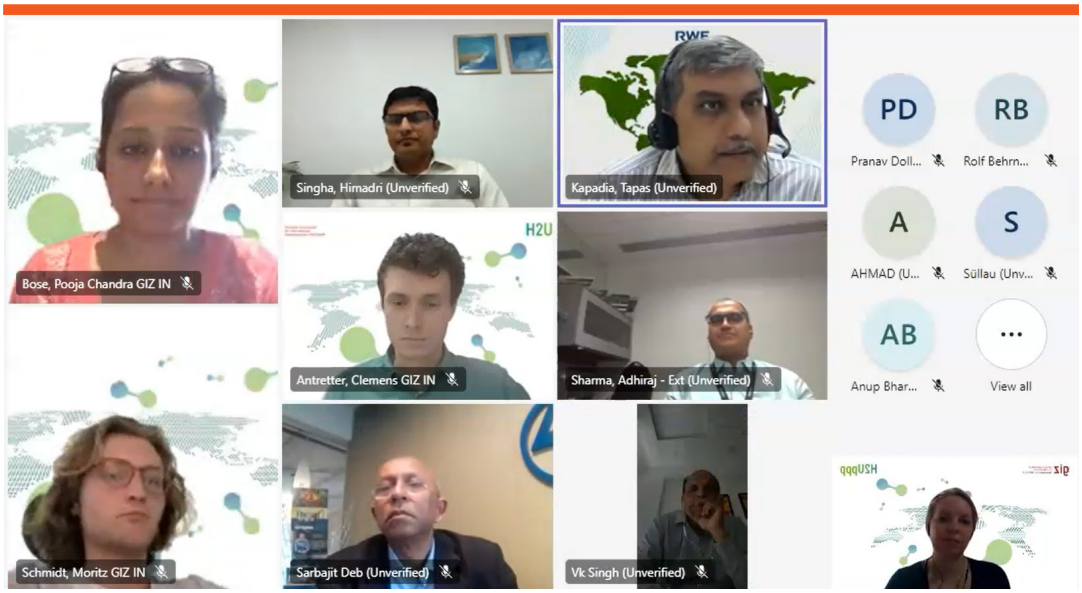
Webinar on Green Ammonia (gNH3) Supply Chain - Production, Storage & Export from India via Seaborne Transport to the European Union

22 March 2024 | Virtual

The International Hydrogen Ramp-up Program (H2Uppp), in collaboration with RWE Supply & Trading and the Indo-German Energy Forum (IGEF-SO), hosted a webinar on Green Ammonia Supply Chain – Production, Storage, and Export from India to the European Union (EU) via seaborne transport on March 22, 2024.

As India aims to become a global hub for green hydrogen (GH2) and its derivatives under the National Green Hydrogen Mission, green ammonia production for both domestic use and export is gaining attention. In this context, GIZ partnered with RWE Supply & Trading under the H2Uppp program to assess the feasibility of producing, storing, and exporting green ammonia from India to the EU.

In his opening remarks, Mr. Tapas Kapadia, CEO of RWE Supply & Trading India Pvt. Ltd., thanked H2Uppp for initiating the study, emphasising its role in understanding the infrastructure, opportunities, and challenges of green ammonia transport to Europe. Experts from Deloitte, Mr. Himadri Singha and Mr. Adhiraj Sharma, presented an overview of the study, followed by insights from a techno-economic assessment and export infrastructure analysis.



Mr. Tapas Kapadia, CEO at RWE, welcomed the participants of the webinar.

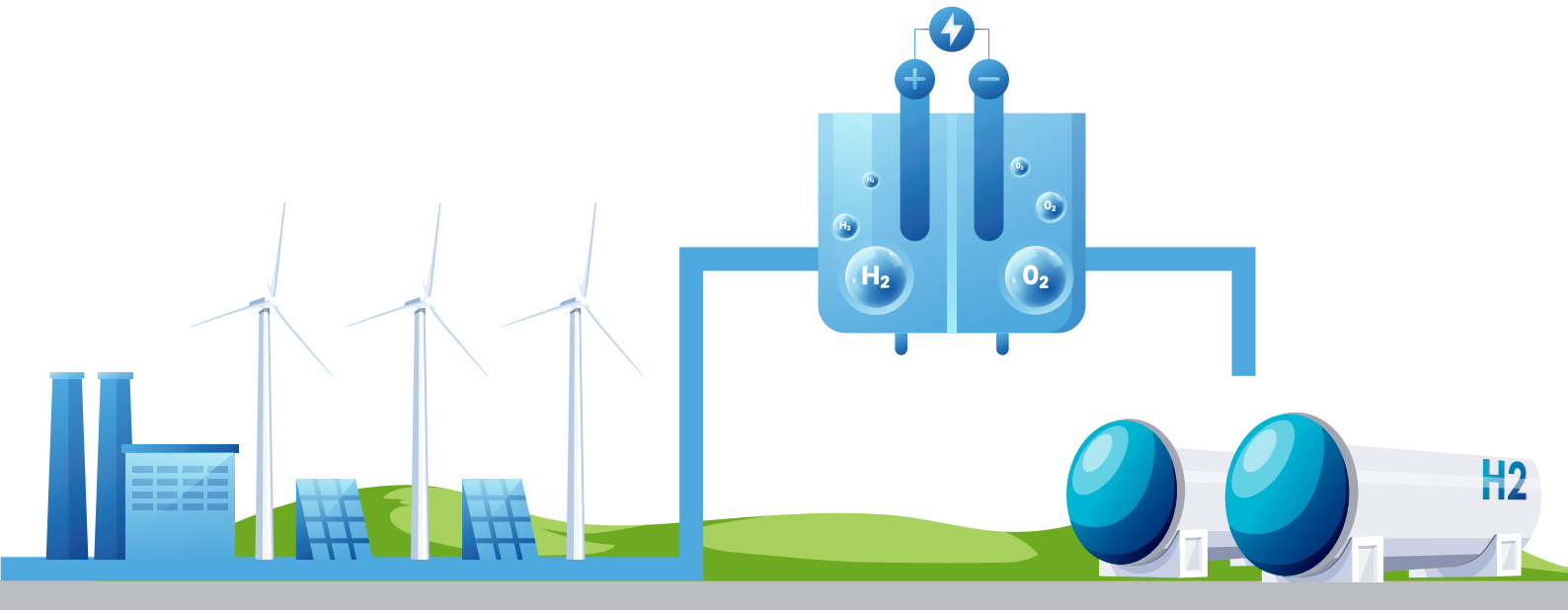
With the EU expected to import over 10 MTPA of green hydrogen by 2030, India has the potential to become a key export hub, supported by initiatives like the Strategic Interventions for Green Hydrogen Transition (SIGHT) and the electrolyser manufacturing incentives by the Ministry of New & Renewable Energy (MNRE). India's green ammonia production capacity is projected to reach approximately 20 MTPA.

Deloitte's assessment focused on a 600 kTPA green ammonia facility, analysing renewable energy (RE) configurations, electrolyser utilisation, and levelised cost of ammonia (LCOA). The study highlighted the importance of selecting optimal RE plant locations, balancing battery energy storage systems (BESS), and leveraging grid power to improve competitiveness. Mr. Sharma detailed the seaborne transport options for exporting green ammonia from India to Europe, providing insights into existing global trade routes and

port infrastructure. He also addressed safety considerations for export facilities.

With over 120 participants, the session featured discussions on storage, plant sizing, and trade logistics. The webinar concluded with closing remarks from Mr. Tobias Winter, Director, IGEF-SO, and Mr. Kapadia. For more details, access the Deloitte study presentation here. A recording of the webinar is available here. Learn more about H2Uppp here.

On 12 March 2024, the Indo-German Energy Forum Support Office (IGEF-SO) and the Indo-German Support Project for Climate Action in



Workshop on Decarbonisation of India's Public Sector Enterprises (PSEs) and Role of Green Hydrogen

12 March 2024 | Hybrid

India organised a workshop on "Decarbonisation of India's Public Sector Enterprises and the Role of Green Hydrogen" on behalf of SCOPE (Standing Conference of Public Sector Enterprises).

The workshop introduced Indian Public Sector Enterprises (PSEs) to the role of climate co-benefits in climate action and provided insights into India's ongoing decarbonisation efforts. As part of the event, the study "Decarbonising India – Potential for Electrification across India's Economy & Assessment of Electricity Needs", conducted by PwC on behalf of IGEF-SO, was pre-released.

During the inaugural session, discussions focused on recent policy and regulatory developments supporting green hydrogen adoption. Mr. Ajay Yadav, Joint Secretary, Ministry of New and Renewable Energy (MNRE), emphasised green hydrogen's crucial role in India's energy transition and outlined key government initiatives under the National Green Hydrogen Mission since 2022. He highlighted the importance of such workshops in showcasing progress, financing options, and fostering collaboration between PSEs and MNRE. Mr. Sandeep Kumar Gupta, Chairman of SCOPE and CMD of GAIL, stressed PSEs' responsibility in driving domestic green hydrogen demand and the need for techno-commercial studies.

Pre-release of the study on Decarbonising India.

Ms. Ruchika Drall, Deputy Secretary, Ministry of Environment, Forest and Climate Change (MoEFCC), spoke about financial opportunities such as the Avana Sustainability Fund and encouraged PSEs to engage with the Leadership for Industry Transition (LeadIT) 2.0 initiative. She also highlighted the role of Indo-German cooperation in fostering technology exchange and industry learning. The workshop marked a key step in advancing climate action for PSEs by showcasing green hydrogen technologies and innovative low-carbon solutions like low-carbon cement for decarbonisation. Watch the full session here.

3

Developments in Indo-German Energy Cooperation

District Cooling at ASHRAE Region XV Chapters' Regional Conference

20 - 22 September 2024 | Udaipur, India

Blue is the New Green!

As urbanisation accelerates globally, the connection between energy production and water management–known as the energy-water nexus–has become a pressing sustainability challenge.

District Cooling systems provide an effective solution, reducing energy and water consumption by up to 40% compared to conventional methods. When integrated with renewable energy, their environmental impact is even greater.

To promote District Cooling adoption, GIZ India's Energy Efficient Cooling Programme partnered as a knowledge supporter for the first ASHRAE Region XV Chapters' Regional Conference. This three-day event explored the intersection of energy conservation and urban sustainability.

In the GIZ-hosted panel discussion, Innovative Approaches to District Cooling for Urban Habitats, experts highlighted the importance of collaboration among stakeholders and supportive policies to scale up District Cooling technologies. Mr. Nitin Jain, Project Head for Energy Efficiency at GIZ India, reaffirmed GIZ's commitment to working with the Bureau of Energy Efficiency (BEE) to develop strategies for reducing the energy intensity of urban cooling. Mr. Piyush Sharma, Energy Advisor at GIZ India, introduced the upcoming District Cooling Hub, a joint initiative with BEE and the UN Environment Programme, designed to serve as a centralised knowledge platform for District Cooling in India.

For more information, contact Mr. Piyush Sharma, Piyush.Sharma(at)giz.de.

Panel Discussion on District Cooling.

Regional Workshop on Cooling India's Cities

28 June 2024 | Chennai, India

On 28 June 2024, GIZ India, in collaboration with the Bureau of Energy Efficiency (BEE) and Tabreed India, hosted the Regional Workshop on Cooling India's Cities in Chennai. Held under the Energy Efficient Cooling project, the workshop brought together key stakeholders to address India's rising temperatures and the growing demand for sustainable cooling solutions.

Key takeaways from the workshop included:

- Understanding District Cooling (DC): With the potential to reduce energy consumption by 40-50%, DC technology was explored through case studies on greenfield and brownfield projects, highlighting its feasibility in Tamil Nadu, particularly Chennai.
- Policy and Practice Ecosystem: Discussions focused on challenges and opportunities within the cooling policy landscape, emphasising the need for a long-term vision and adaptable technologies.
- Building Networks: The event fostered collaboration among government officials, private sector leaders, developers, researchers, and media to accelerate the adoption of energy-efficient cooling solutions.

Why Tamil Nadu?

- Rising Heat Challenges: Rapid urbanisation has intensified extreme summer temperatures, increasing the need for efficient cooling.
- High Energy Consumption: Cooling accounts for over 50% of household energy use in Chennai.
- Proactive Initiatives: Tamil Nadu is at the forefront of sustainable cooling with projects like the FinTech City DC system and a ₹1000 Cr. Green Climate Fund dedicated to energy transition.

Insights from the workshop will contribute to Tamil Nadu's climate action efforts and energy-efficient cooling strategies. GIZ India remains committed to advancing sustainable cooling technologies and strengthening stakeholder engagement for impactful solutions.

For more information, contact Mr. Piyush Sharma, Piyush.Sharma(at)giz.de and Ms. Lena Kliesch, lena.kliesch(at)giz.de.

Roundtable on District Cooling.

Two-day Residential Training and Induction Program for Urja Mitras

30 - 31 May 2024 | Delhi, India

Urja Mitras, appointed by BEE at cluster level, were trained to assist SMEs with the implementation of energy efficiency measures.

The project Energy Efficiency in Industry and Data organised a two-day residential training and induction program for Urja Mitras. The Urja Mitras are appointed by BEE at the cluster level and play an important role in assisting SMEs with the implementation of energy efficiency measures. Their responsibilities include conducting audits, providing guidance, facilitating coordination with vendors/ service providers/ OEMs, and supporting implementation within industries. The aim of the project is to build the capacities of the Urja Mitras, enabling them to continue supporting industries even beyond the project's duration. This effort contributes to BEE's long-term sustainability initiatives for energy efficiency in SME industries. Presently, there are 18 Urja Mitras stationed across India in various clusters.

For more information, contact Mr. Piyush Sharma, Piyush.Sharma(at)giz.de.

Urja Mitras during the workshop.

Floating Solar Photovoltaic - A Rising Tide of Innovation and Virtual Reality Based Training Simulators on Energy Efficiency for MSME Workforce Opportunity

3 May 2024 | IIT Madras, India

GIZ, in collaboration with IIT Madras, organised a one-day roundtable discussion on Floating Photovoltaics (FPVs) under the Indo-German Solar Energy Partnership – Innovative Solar (IGSP IN-Solar) project. This initiative aims to explore innovative solar deployment opportunities essential for achieving India's 500 GW renewable energy target by 2030.

Floating PV has been identified as a key technology under the IGSP IN-Solar project. A recent GIZ study estimated a potential of 206 GW of floating solar in India; however, adoption remains slow due to various challenges.

To address these barriers, GIZ and the School of Sustainability at IIT Madras convened experts from government, academia, think tanks, developers, financiers, and multilaterals for a focused discussion. The roundtable explored ways to maximise FPV's benefits, mitigate challenges, and develop an actionable roadmap for large-scale deployment.

The discussions at IIT Madras have laid a strong foundation for future initiatives, fostering collaboration and innovation in India's floating solar sector.

For more information, contact Ms. Komal Bai – komal.bai(at)giz.de.

FPV roundtable Discussion on "Floating Solar Photovoltaic: A Rising Tide of Innovation and Opportunity" at IIT Madras.

Workshop on Compressed Biogas Market in India

29 April 2024 | New Delhi, India

Recognising the vast potential of Compressed Biogas (CBG) in India, KfW, in collaboration with PricewaterhouseCoopers (PwC), conducted a joint workshop on "CBG Market in India" on 29 April

2024 in New Delhi. The event brought together over 200 participants–both in-person and virtual–from diverse sectors to shape the future of sustainable CBG development in India.

The workshop covered key aspects of the CBG market, including existing policies and incentives, offtakes under the SATAT scheme, CBG-CGD synchronisation, technology innovations, and financing options. Discussions also addressed challenges and opportunities in utilising municipal solid waste (MSW), agricultural residues, and cow dung as feedstock.

Esteemed panelists included Dr. Gaurav Mishra (Scientist-F, MNRE), Mr. Ashish Gupta (Chief General Manager, GAIL), Mr. Manikandan CKN (Chief Manager, IOCL), and Mr. Jai Kumar Gaurav (Senior Advisor, GIZ), alongside experts from SIDBI, Praj Industries, Indian Potash Limited, and Srinivas Waste Management Services. Their insights provided valuable direction for accelerating CBG adoption in India.

The organising team, comprising Mr. Subodh Kumar (Former Executive Director, IOCL), Dr. Thomas Gietzen and Mr. Bernhard Schenk from KfW, and Mr. Vaibhav Singh and Mr. Prateek Girdhar from PwC, added depth to the discussions.

Notable attendees included Mr. Rajesh K Mediratta (MD & CEO, Indian Gas Exchange), Prof. V.K. Vijay (National Coordinator, Unnat Bharat Abhiyan), Dr. Parveen Dhamija (Former Advisor, Skill Council for Green Jobs & Former Scientist-G, MNRE), and Dr. Mahendra Kumar Garg (Consultant, UIT Rajasthan).

With participation from key organisations such as MNRE, SIDBI, ONGC, IOCL, IGFE, World Bank, IGEF-SO, GIZ, and CSE–alongside CBG plant developers, state nodal agencies, financial institutions, and academic and research institutions–the workshop offered a comprehensive perspective on India's evolving CBG ecosystem.

This collaborative initiative fostered knowledge exchange and problem-solving, paving the way for transformative advancements in India's CBG sector and a greener energy future.

For more information, contact Mr. Stefan Kliesch – Stefan.kliesch(at)kfw.de and Mr. Ramana Reddy – Ramana.reddy2(at)kfw.de.

Workshop on Compressed Biogas Market in India held on 29 April 2024 in New Delhi jointly by KfW and PwC.

4th Training Program on 'Digitalisation, Data Analytics and Change Management' for DISCOMs

13 - 15 March 2024 | Bhubaneswar, India

In 2023, GIZ India, on behalf of the Federal Ministry for Economic Cooperation and Development (BMZ), in collaboration with Power Finance Corporation Ltd. (PFC), launched a specialised training program under the Indo-German Energy Program. This initiative aims to equip senior management of public DISCOMs in India with the knowledge and skills to harness smart meter data and digital tools for improved distribution network efficiency. The program also includes case studies and best practices from national and international utilities.

The 4th edition of the training program was held from 13–15 March in Bhubaneswar, Odisha. In his inaugural address, Shri Saurav Kumar Shah (Executive Director, PFC) highlighted the urgency of digitalisation and the need to leverage smart meter data for effective network monitoring and operations. He emphasised that strong leadership within DISCOMs is crucial for successfully implementing digitalisation policies.

As part of the training, a half-day site visit was organised at TP Central Odisha Distribution Limited (TPCODL), where participants explored the Smart Meter Testing (MRT) lab, SCADA center, and training facility. Notably, the TPCODL MRT lab is entirely managed by a team of highly skilled female engineers, showcasing a gender-transformative approach in the energy sector.

A total of eight domestic and two international training programs are planned under this initiative.

For more information, contact Mr. Kuldeep Sharma – Kuldeep.sharma(at)giz.de.

Session on Demand Response at ISUW 2024 (3rd India-Germany Smart Energy Workshop)

14 March 2024 | New Delhi, India

As part of India Smart Utility Week 2024, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) hosted the 3rd India-Germany Smart Energy Workshop on 14 March 2024 at Hotel Lalit, New Delhi. The workshop focused on demand response policies and regulations, addressing gaps, and sharing best practices from both India and internationally.

Under the Energy Transition with DISCOMs project, GIZ is working on designing and implementing demand response pilots within the Indian electricity distribution system. The initiative also includes the development of key knowledge documents, such as a handbook on Demand Response implementation in India.

Demand response helps manage energy consumption based on grid load, reducing peak loads and lowering peak power purchases, thus enabling utilities to provide reliable and sustainable power. The session was attended by utilities and regulatory commissions and moderated by Mr. Ashok Kumar Rajput from the Central Electricity Authority (CEA). GIZ also supported the India Smart Utility Week (ISUW) as a country partner.

For more information, contact Mr. Kalle Wulf – kalle.wulf(at)giz.de.

Mr. Kalle Wulf (GIZ, Advisor Energy Transition with DISCOMs) receives appreciation from Mr. Reji Kumaar Pillai (India Smart Grid Forum, President) for GIZ's support of ISUW 2024 as a country partner.

Members of the panel discussion of the 3rd India-Germany Smart Energy Workshop on the topic of demand response. From left to right: SC Saxena (Executive Director, POSOCO), Avinash C. Kumar (Assistant Vice President, BRPL), Mukesh Dadhich (Head of Sustainability & Clean Technology, BYPL), G Ganesh Das (Head of innovation and R&D, Tata Power-DDL), Ashok Kumar Rajput (CEA), Amit Kumar Singh Parihar (Director-Clean Power, Shakti Foundation), Rajesh Dangi (Secretary, DERC), Kulbhushan Kumar (Partner Grant Thornton Bharat LLP), Sunil Sharma (GIZ).

ISGF Innovation Awards 2024

15th March 2024 | New Delhi, India

The distribution sector faces various data-related challenges, including managing large volumes of diverse data, ensuring its quality and security, and integrating information from different sources. Extracting meaningful insights requires skilled analytics, while adhering to regulatory compliance and ensuring data privacy further complicates the process. These challenges significantly impact operational efficiency and decision-making. Inaccurate or disorganised data can result in inefficiencies, higher maintenance costs, and customer service issues.

The Development Partnership with the Private Sector (DPP) Smart Technology Platform, aimed at improving power distribution system reliability, is a collaboration between BSES Yamuna Power Limited (BYPL) and GIZ. This develoPPP.de public-private partnership focuses on enhancing power supply reliability in central and eastern Delhi by introducing a digital platform for data integration, which serves multiple business applications.

A key element of the project is the Data Hub, which integrates data from various systems, applications, and databases to streamline data management across the organisation. By centralising data, the Data Hub ensures seamless data flow, making it easier to manage, transform, and access data. This unified approach improves decision-making and operational efficiency.

The develoPPP BYPL project received a 'Certificate of Merit' in the Smart Technology - Electricity Distribution category at the 8th Edition of the ISGF Innovation Awards 2024. Out of 260 entries, the project was recognised for showcasing the vital role of data in providing additional benefits beyond the standard functionality of power distribution companies (DISCOMs) in India. It highlights the critical importance of digitalisation in adapting the distribution sector to the changing energy landscape and emphasises the value of data hubs in enhancing power distribution.

At ISGF Innovation Awards 2024.

Virtual Reality Based Training Simulators on Energy Efficiency for MSME Workforce

14 March 2024 | PAN India (mostly industrial clusters for Steel and Paper)

The MSME sector faces significant challenges in enhancing energy efficiency, primarily due to the workforce's limited technical expertise. Employees often lack knowledge of key energy efficiency concepts and do not have access to hands-on training that shows cause-and-effect relationships without risks. Traditional classroom training is often insufficient in addressing these gaps. To overcome these challenges, the Digi-Twin project has developed a digital training platform focused on energy efficiency in MSMEs.

Digi-Twin's virtual models replicate real-world industrial equipment, allowing users to simulate actual scenarios and understand their impact on energy consumption. These VR-based digital twin models act as portable training tools for various equipment, including boilers, furnaces, pumping systems, compressors, and electrical drives. They offer a hands-on, risk-free environment for exploring energy efficiency principles.

The models allow users to interact with the systems as if they were real, with inputs being simulated based on actual equipment feedback, providing accurate reflections of changes in the setup.

Targeted training sessions are being organised across over 20 clusters, aiming to train over 2,500 MSME workers in adopting sustainable practices. The training has already commenced and will continue throughout the year.

For more information, contact Mr. Ayan Ganguly – ayan.ganguly(at)giz.de and Mr. Piyush Sharma – piyush.sharma(at)giz.de.

Participants of Digi-Twin VR-Training.

Dissemination Workshop on Gender Sensitisation in Industries

12 March 2024 | Belgaum Foundry Cluster

On 12 March 2024, the Energy Efficiency in Industry & Data program, in collaboration with the Bureau of Energy Efficiency (BEE) and the Belgaum Foundry Cluster, organised a dissemination workshop on Gender Sensitisation in Industries.

Gender equality is a key focus for GIZ, and as part of this initiative, the project began training on Gender Sensitivity within MSMEs in the steel sector in Belgaum and Kolhapur. The goal was to increase awareness and understanding of gender equality and women's empowerment, aiming to foster behavioral change and integrate a gender perspective into daily operations. These gender sensitisation trainings are crucial in addressing biases and creating an inclusive, positive work environment.

A total of 20 training sessions were conducted in 20 units across Belgaum and Kolhapur, reaching over 400 participants, with 70% of them being women.

To share the outcomes and impact of these trainings, a dissemination workshop was held for unit owners, senior management, supervisors, and HR personnel. The workshop highlighted the following key learnings:

- Equal pay parity
- Importance of a diverse workforce
- Formation of women representatives in units
- Creating a conducive work environment
- Employee-friendly HR policies
- Recognition through awards and appreciation

For more information, contact Ms. Priyanka Chandra – priyanka.chandra(at)giz.de.

Women participants in Belgaum cluster.

Energy Storage for Renewable Energy Integration in India (StoREin) Kick-Off

6 March 2024 | New Delhi, India

India's renewable energy journey is gaining momentum, aiming for an ambitious target of 50% non-fossil fuel capacity by 2030. With projections foreseeing a surge to 2380 GWh of storage capacity by 2047, energy storage systems stand as a key enabler for larger renewable energy integration and grid stability.

To facilitate this transition, the Indo-German project 'Energy Storage for Renewable Energy Integration in India (StoREin) under IKI (BMWK) was kicked off. The project is jointly implemented by GIZ and the projects partner Ministry of New and Renewable Energy (MNRE) and a consortium of Fraunhofer IEE, IIT Bombay, TERI and WRI India. It aims to enhance the viability of Energy Storage Systems at a grid scale level in India. The launch was in Delhi in the presence of representatives from MNRE, BMWK, IKI, GIZ and the projects consortium. During the event, the participants exchanged ideas on the project goals, how to foster collaboration among stakeholders and discussed the pivotal role of Energy Storage in India's energy landscape.

By focusing on the policy and regulatory landscape, demonstration projects, technical analysis, and research networks, the project will contribute to SDG 7, ensuring access to affordable, reliable, sustainable, and modern energy for all. Under the project's engagement in capacity building and awareness-raising, a focus is laid on SDG 5, achieving gender equality, and empowering all women and girls. The StoREin project contributes to GIZ's commitment of promoting a clean and fair renewable energy transition in India, in line with the objectives of the Green and Sustainable Development Partnership (GSDP) signed between India and Germany.

For more information please contact Mr. Bernhard Voelcker, bernhard.voelcker(at)giz.de.

StoREin Consortium in discussion with Joint Secretary of MNRE, Shri Dinesh Dayanand Jagdale.

4 Quote of the Month from India and Germany

Quote of the Month from India

Shri Pralhad Joshi
Hon'ble Union Minister for New and Renewable Energy, Govt. of India

"India's Renewable Energy Sector is a leading global force and is rightly positioned to achieve and overtake the target of 500 GW by 2030."

Source: PIB

Quote of the Month from Germany

Dr. Robert Habeck
Federal Minister for Economic Affairs and Climate Action, Govt. of Germany

"The expansion of renewables safeguards jobs in Germany and creates new ones. In this way, the energy transition is making a key contribution to Germany's prosperity and competitiveness."

Source: BMWK

5 Energy Transition News

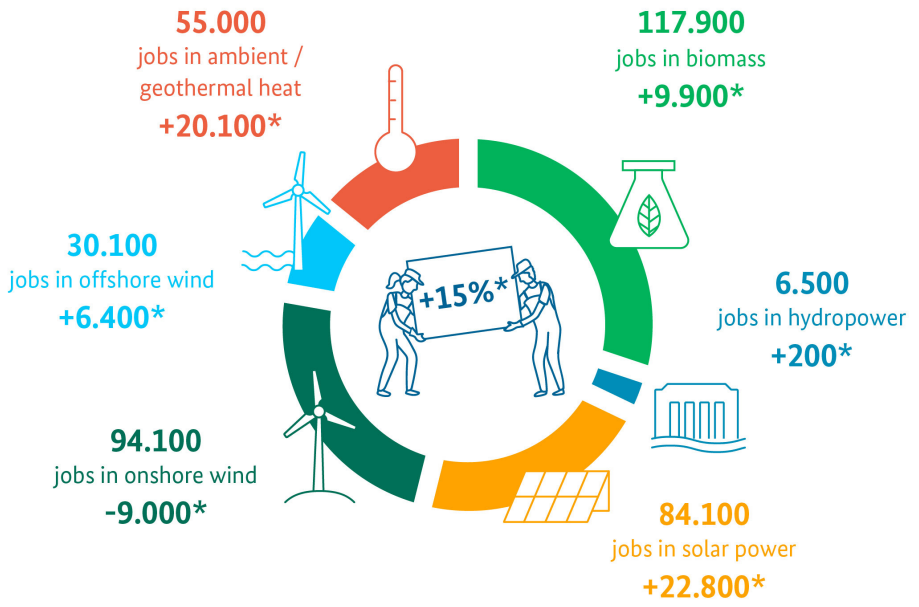
Renewable energies employed around 387,000 people in 2022

The number of employees working on the energy transition in Germany keeps growing. For 2022, the statistics show the largest proportion since 2012 and the largest annual rise since 2006.

©Federal Ministry for Economic Affairs and Climate Action

A boost to employment: almost 15% jobs in renewable energies

Renewable energies provided around 387.000 jobs in 2022



Gross employment in renewable energies in 2022 (provisional, rounded figures)
*year-on-year

In 2022, 50,400 people had the good fortune to get a new job in the context of the energy transition. The number of employees working on renewable energy thus reached a new high of 387,000 in 2022, up by an impressive 14.9% from the year before.

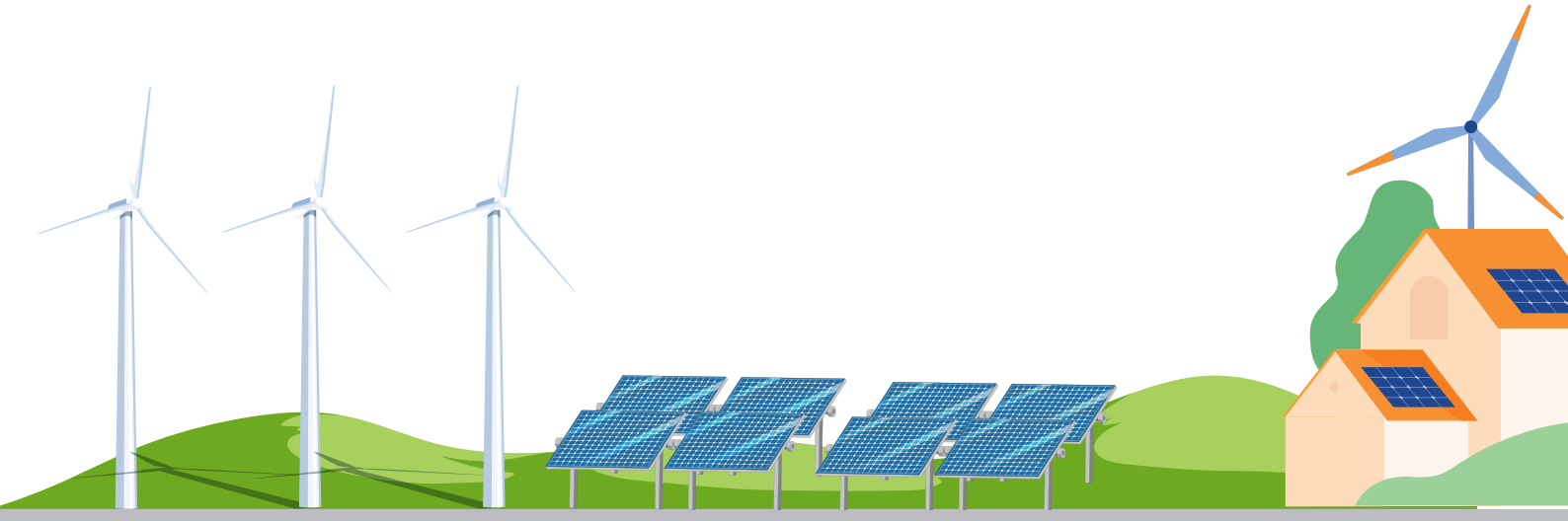
The energy transition has long since become a driving force for jobs, and contributes to prosperity in Germany: "By introducing the energy transition, the Federal Government has not only set the course for a fundamental restructuring of our energy supply. The expansion of renewables safeguards jobs in Germany and creates new ones," said Minister Habeck in response to the latest figures.

Here's a look at the individual technologies:

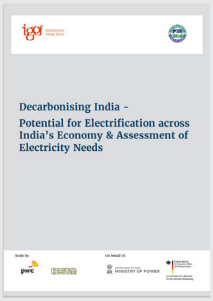
The number of people working on solar energy (84,100 employees in 2022) rose by 22,800. This means that around 22% of all the people working on renewable energy were employed in the "solar sector". Most of these jobs were in the field of photovoltaics, although employment also rose considerably in the area of solar thermal energy.

In contrast, around 9,000 fewer people worked in onshore wind in 2022 than the year before (2022: 94,100 employees). At 24%, though, the onshore wind sector still provides a large proportion of the jobs in the energy transition. Employment in offshore wind energy grew, with more than 6,400 extra jobs being created in 2022 (up to 30,100 people). This corresponds to a share of 8% of all renewable energy jobs.

In the case of ambient / geothermal heat, the statistics recorded 55,000 employees, a share of 14%. This marked an increase of 20,100 from the year before, triggered largely by the rising number of heat pumps. The number of jobs in biomass has remained consistently high for quite some time, and amounted to 117,900 employees in 2022 (9,900 more jobs than in 2021). This equates to a share of 30%.



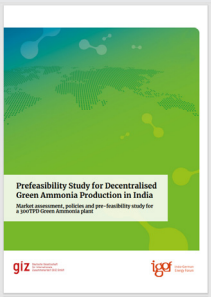
6 Publications



Green Hydrogen Production from Offshore Wind in Tamil Nadu and Gujarat

The report aims to explore the potential of offshore wind energy for green hydrogen production in India, supporting the National Green Hydrogen Mission's goal of producing 5-10 million metric tonnes of green hydrogen annually by 2030.

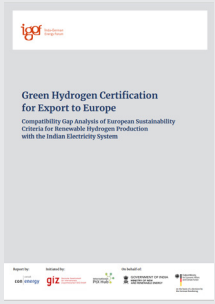
The full report is available for download here.



Prefeasibility Study for Decentralised Green Ammonia Production in India

The study sets out to test a hypothesis to assess if the lack of economies of scale can be mitigated via minimisation of hydrogen transportation costs through Decentralised production. A feasibility assessment of small-scale green ammonia production has been undertaken to understand the techno-economics of a 50 TPD decentralised green ammonia plant.

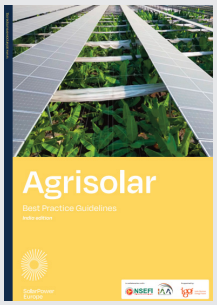
The full report is available for downloaded here.



Green Hydrogen Certification for Export to Europe

The goal of this study is to point out compatibility issues and uncertainties between the rules set in the delegated act and energy systems of countries outside the EU aiming to export renewable hydrogen to Europe. Especially the criterion for geographical correlation and more specifically the concept of bidding zones is subject to this study and will be elaborated in detail.

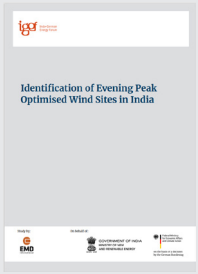
The full report is available for download here.



Agrisolar Best Practice Guidelines

This report, a collaborative effort between SolarPower Europe, the National Solar Energy Federation of India (NSEFI), and the Indo-German Energy Forum (IGEF), provides comprehensive guidelines for the implementation of Agrisolar projects in India. With India being the fourth largest solar market globally, the report emphasises the need for innovative applications like Agrivoltaics to meet the country's ambitious solar energy targets.

The full report is available for download here.



Identification of Evening Peak Optimised Wind Sites in India

The objective of the current study is to identify and describe "peak wind speed generation clusters", which are areas throughout India, both onshore and offshore that fulfil the following criteria: First, the wind generation profile of the site is constantly high throughout the year during peak demand hours. Second, the wind sites shall show a high electricity generation profile on an annual average.

The full report is available for download here.

7 Upcoming Events

German Chancellor Fellowship for Tomorrow's Leaders at German Solar Association BSW in Berlin

The Alexander von Humboldt Foundation is searching for the Indian leaders of tomorrow. The German Chancellor Fellowship offers you an opportunity to take the next step in your career in Germany – irrespective of your field of work. In order to apply, develop your own project idea and find a host of your choice to mentor you. Once your host has confirmed, you can apply for a fellowship. German Solar Association BSW in Berlin has already offered to be a host for you. The Chancellor of the Federal Republic of Germany is the patron of this fellowship programme. The Foundation grants up to 50 German Chancellor Fellowships annually – up to ten for each country.

If you are interested in a fellowship with the German Solar Association BSW you should get in touch with Ms. Luz Alicia Aguilar via aguilar(at)bsw-solar.de.

Retired German Energy Experts Offering Their Support to Indian Institutions

You are a freshly retired German engineer with experience in Energy Efficiency and already familiar with India's rich culture? Become part of the largest retired expert's database of the world, a group of more than 10 000 experts offering their German know-how to the world free of cost.

You are an India-based company or institution looking for a German expert to lower your expenditures for Energy?

Senior Experten Service (SES) India is constantly matchmaking German experts and Indian institutions in several potentially supported fields and is also able to finance such expert visits. SES is the worldwide leading organisation for voluntary assignments carried out by retired specialists and executives.

For further information please click here or contact Mrs. Sharon Mogose via sharon.mogose(at)indo-german.com.

Information about DeveloPPP

DeveloPPP.de is a mechanism by the German Federal Ministry for Economic Cooperation and Development (BMZ) to promote the involvement of the private sector in its development work. The BMZ provides financial and technical support to companies that want to become active in developing and emerging countries or already are, and whose investment has long-term benefits for the local population. The company bears at least half of the total project costs.

Interested companies cooperate with one of the two public partners that implement the program on behalf of the BMZ: DEG - Deutsche Investitions- und Entwicklungsgesellschaft GmbH or Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH. The companies receive individual advice, benefit from regional market knowledge of the locations worldwide and gain access to local networks and political decision-makers.

Projects cover a wide range of sectors, such as training local skilled workers, piloting innovative technologies and demonstration plants, securing value chains and improving ecological and social standards in production plants.

Four times a year, companies can submit their project ideas to DEG or GIZ. The project should be developmentally effective and go beyond investments in the company's core business. To be eligible for funding, companies must have an annual turnover of at least 800,000 EUR, employ no less than 8 people and have a minimum of 2 audited annual financial statements. The duration is up to 3 years.

For further information please click here.

Information about H2Uppp

H2Uppp

International Hydrogen Ramp-up Program

The H2-Uppp programme accompanies and supports efforts to ramp up the market for green hydrogen (H2) and power to X (PtX) applications in India and other selected developing countries and emerging economies in cooperation with the private sector. Unlike other hydrogen support initiatives, H2- Uppp focuses on the early stages of green hydrogen project development.

H2-Uppp aims to identify, prepare and accompany the implementation of projects for the production and use of green hydrogen and power-to-X application, and to raise awareness and promote knowledge transfer for the development of projects relating to green hydrogen. Together with the partner countries, this approach enables GIZ to identify cost-effective production paths and uses, pinpoint project opportunities along the value chain and develop business models.

To achieve the programme objectives, H2- Uppp focuses on three fields of action: In field of action 1 (Networking & Project Scouting), H2-Uppp supports companies in identifying project ideas and building networks, for example with project partners or potential off-takers. Partners from the private and financial sectors are also offered training on green hydrogen, and public-private dialogue is strengthened through conferences and trade fairs. In field of action 2 (PPP – Public-Private Partnerships), H2-Uppp works with private companies to jointly implement pilot projects in the field of green hydrogen and power-to-X. Formal public-private-partnerships (PPPs) are set up for this purpose (see following section). In field of action 3 (Know-How and Capacity Development), H2-Uppp accompanies the various project ideas with in-depth studies and technical trainings. Through specialist conferences, the activities of local institutions are further strengthened and joint measures are developed to ensure a successful market launch.

The programme has been commissioned by the German Federal Ministry for Economic Affairs and Climate Action (BMWK). Support is provided for PPPs along the entire hydrogen value chain (production, storage, conversion, transportation and usage). It is important that the PPP project focuses on public-benefit activities and contributes to the promotion of sustainable development in the project country. To be eligible for funding, companies must contribute at least 50% of the volume of the PPP project and comply with sustainability standards during the project.

For further information on H2-Uppp, on support opportunities or to receive the PPP application form, please contact H2Uppp(at)giz.de.

8 DISCLAIMER

The views expressed in this newsletter are solely those of the Indo-German Energy Forum (IGEF) Support Office team. The IGEF Support Office cannot assume any responsibility for the contents of other websites linked in this newsletter.

The Support Office of the Indo-German Energy Forum provides liaison services for all stakeholders. It serves as a first point of contact both to the Indian and German governments as well as companies seeking to get involved in the process. The Support Office answers queries regarding proposals for the IGEF dialogue or IGEF projects and any other subject relevant to the private sector.

9 CONTACT INFORMATION

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