

INDO-GERMAN ENERGY FORUM NEWSLETTER

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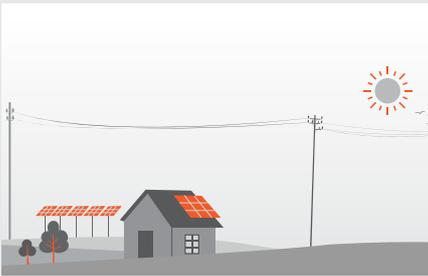
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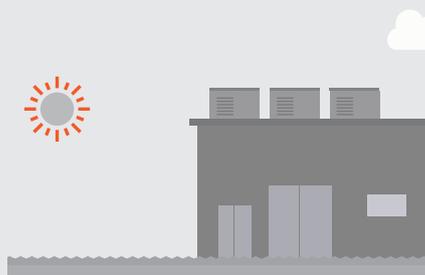
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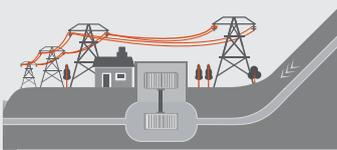
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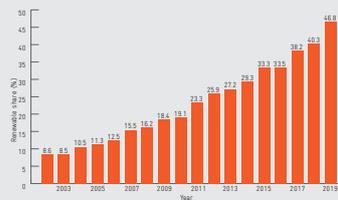
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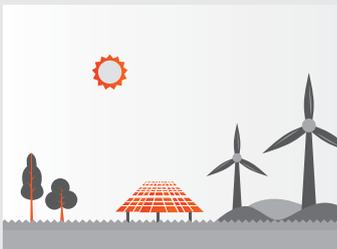
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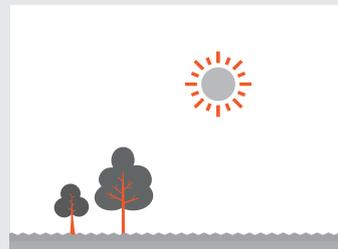
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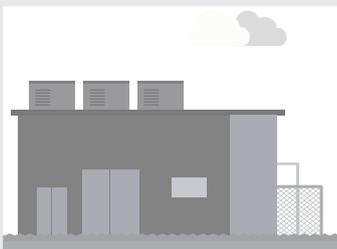
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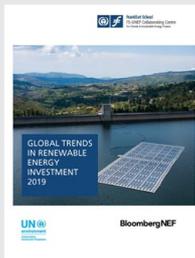


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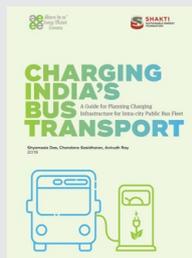
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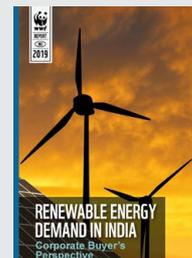
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Introduction

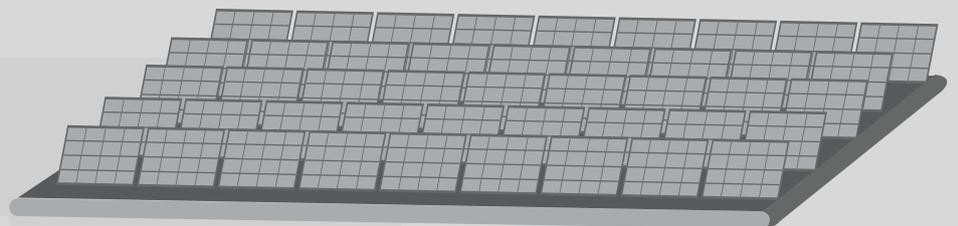


Philipp Knill

Philipp Knill

Head of India and South Asia Department, Ministry for Economic Cooperation and Development, Government of Germany

“It is a tremendous opportunity for Germany and India to cooperate more closely on defining challenges of our time, the achievement of the SDGs and climate goals. Let us translate it into global and bilateral action of our cooperation” says Mr. Philipp Knill from the German Federal Ministry for Economic Cooperation and Development. Heading the India and South Asia Department, he also recently assumed the position as Co-Chair of IGEF Subgroup 4 on Green Energy Corridors. Mr. Knill holds a degree in economics and received his academic training in Augsburg, Rennes and Detroit. Since the year 2000, he held different positions in the Federal Ministry for Economic Cooperation and Development (BMZ) advising on cooperation with West Africa, development effectiveness and in particular on environment related topics. In Latin America, he was in charge of the Department of Economic Cooperation and Development at the German Embassy in La Paz, Bolivia. In 2015 he became Head of Division for Climate Policy in the ministry. In July 2019 he was appointed to lead the Division for Cooperation with India and South Asia overlooking the entire ongoing portfolio with India. On occasions such as G20, climate talks or in the Global Environmental Facility (GEF), Mr. Knill already worked intensively with colleagues from India. Repeatedly he stressed the importance of the Indo-German collaboration on climate change and the Agenda 2030 Sustainable Development Goals (SDGs). Green urban mobility, sustainable agriculture and clean energy were mentioned as key issues for future collaboration on climate change. Sector dialogues and skill development have been identified as key for fruitful bilateral cooperation.



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Events and Activities

Technical study tour to India's first grid-scale 10 MWhr battery energy storage project

27 - 28 June, New Delhi

On the occasion of the International Conference on Energy Storage organized by the Central Board of Irrigation and Power, the Indo-German Energy Forum (IGEF) Support Office organised several technical study tours to India's first grid-scale lithium-ion battery energy storage system, housed in a substation of the Delhi DISCOM Tata DDL with a capacity of 10 MW/10 MWh on 27 and 28 June in Rohini New Delhi, India.

More than 85 participants comprising various stakeholders, power utilities, PSUs, State Governments, State nodal agencies and research

institutions formed part of the guided tours on both the days through the battery-based energy storage, which is regarded as a milestone for India's entire energy sector. Owned and operated by AES, the power station helps to provide flexibility to the local grid mainly through frequency control. The entire system is based on state-of-the-art technology from Fluence Energy, a market-leading supplier of energy storage technology, which is jointly owned by Siemens and AES.



Visit to India's first grid-scale 10 MWh battery energy storage project.

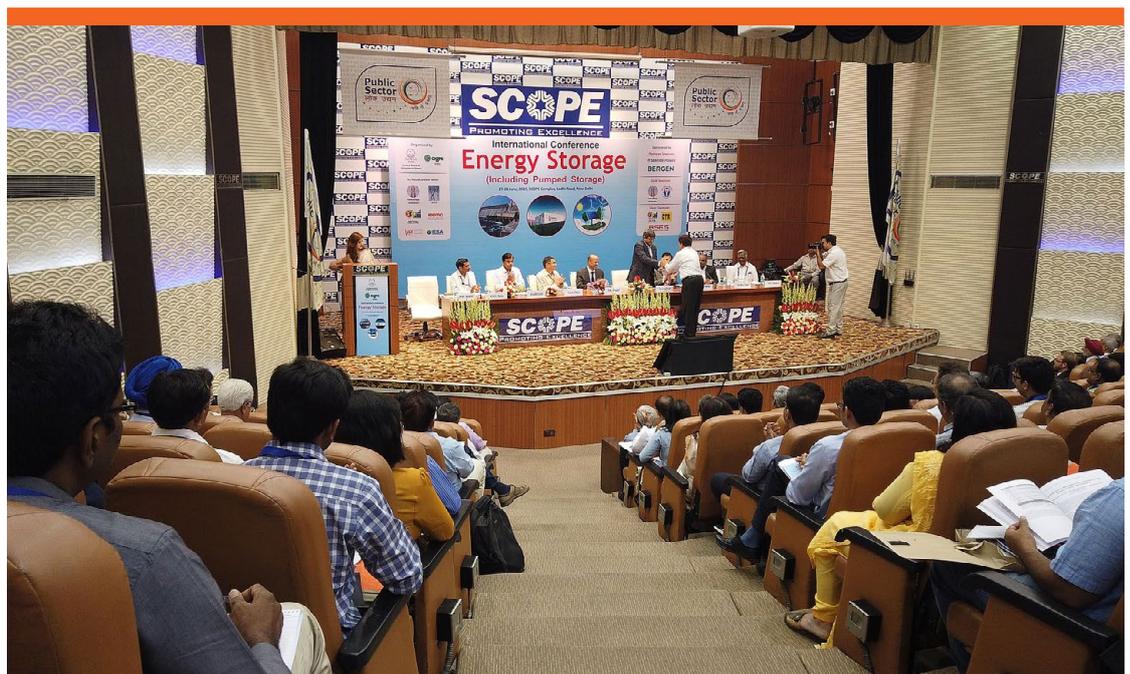


International Conference on Battery and Pumped Hydro Energy Storage

27 - 28 June, New Delhi

In association with Powergrid, GETCO, Solar Energy Corporation of India (SECI), Energy Storage Alliance, IEEMA and the Indo-German Energy Forum (IGEF) Support Office, the Central Board of Irrigation and Power (CBIP) and CIGRE-India jointly organised the International Conference on Energy Storage at SCOPE Convention Centre in New Delhi, which was attended by more than 250 participants. The main purpose of holding this conference was to provide a forum for open discussions and exchange of information on the latest state of the art technology in storage and relevance for India, and to come out with recommendations on the subject. The inaugural event was addressed among others by the Chairman of Central Electricity Regulatory Commission (CERC),

Chairman of Central Electricity Authority (CEA) and Joint Secretary (Hydro) of Ministry of Power, Government of India. Joint Secretary (Hydro), Shri A. Kumar referred to the importance of the MOP-CEA draft report on optimal generation capacity mix for 2029-30 available on the website of CEA for comments from stakeholders. Speaking of the Energy Transition in the Indian context, Shri A. Kumar complimented IGEF for successfully facilitating the flexibility pilot in NTPC Dadri power unit and further acknowledged the joint efforts taken by the Government of India and the Government of Germany. To read more on PSP Hydro "Modelling investment potential for pumped storage hydropower (PSP) projects for optimization and grid balancing" click [here](#).



The International Conference on Energy Storage at SCOPE Convention Centre in New Delhi provided a platform for knowledge exchange and discussion.

Expert Dialogue on “Accelerating Solar Rooftop Growth in India”

27 August, New Delhi

Solar energy from rooftops is a key driver for the expansion of India’s solar market. Despite the various advantages of this energy source, such as low maintenance costs and greenhouse gas reduction – the growth potential of solar panels especially on roofs of Small and Medium Enterprises (SMEs) and private households remains huge. To discuss the acceleration of solar rooftop in India, sector experts gathered for a correspondent one-day seminar. It was hosted by the National Solar Energy Federation of India (NSEFI) in cooperation with IGEF and TERI. The seminar took place in, the India Habitat Centre, New Delhi and was attended by representatives of the industry and the Indian government. In his welcoming remarks, Mr. Pranav R Mehta, Chairman NSEFI, stressed on the employment potential that lies in this sector and mentioned the growth of solar rooftop to 61% in India. The rising demand for this energy source was also addressed by Mr. Vinay Rustagi, Managing Director, Bridge to India, who named consumer support and awareness campaigns as a means to increase the number of solar

rooftop installations in India. While participants shared first-hand experiences from bottom-up approaches to solar rooftop expansion in the residential area, Mr. Deepak Gupta, Hon. Director General of NSEFI underlined the importance of a policy support for a successful energy transition. Project financing, the importance of storing energy and challenges that come with open access projects were further key points on the agenda. One of the event’s highlights was the launch of the “Affordable Solar Rooftop Financing for MSMEs” report that was conducted by IGEF with support of NSEFI and TERI. It presents detailed case-study analysis on rooftop solar projects at Micro, Small & Medium Enterprises (MSMEs) and documents best practices’ examples in this area. The seminar closed with a presentation of innovative technologies and business models for rooftops, where GIZ India demonstrated the PV Port and Store concept that allows a direct flow of energy from private roofs to household consumers.

Please click [here](#) to download the full report.



(L to R) Dr. Ashvini Kumar, TERI; Mr. Deepak Gupta, former Sec. MNRE; Mr. Pranav Mehta, Chairman Global Solar Council; Mr. Vinay Rustagi, Bridge to India.



(L to R) Mr. Tobias Winter, IGEF; Dr. Ashvini Kumar, TERI; Mr. Deepak Gupta, former Sec. MNRE; Mr. Pranav Mehta, Chairman Global Solar Council; Mr. Vinay Rustagi, Bridge to India.

German Pavilion at REI Expo 2019

18 - 20 September, Greater Noida

Renewable Energy India (REI) Expo 2019, the mega event on renewable energy saw the participation from +36.900 visitors and +240 speakers, leading international stakeholders and experts from across the globe. More than 700 exhibitors from +45 countries showcased their innovations and solutions for the Indian market. From Germany, more than 30 companies demonstrated their commitment to the Indian market as exhibitors.

One highlight was the 5th Renewable Energy India Awards on 19 September 2019. The REI awards recognize innovation and excellence demonstrated in India and promote talent in the industry. Congratulations to the German company Juwi India Renewable Energies Pvt. Ltd. for being India's leading company in Operations and Maintenance of large scale photovoltaic power plants! Congratulations to Centrotherm India Pvt. Ltd. for being the leading Renewable Energy Technology Innovator in 2019. The REI Awards had an august audience of industry stalwarts

competing under various categories from both manufacturing & implementing communities.

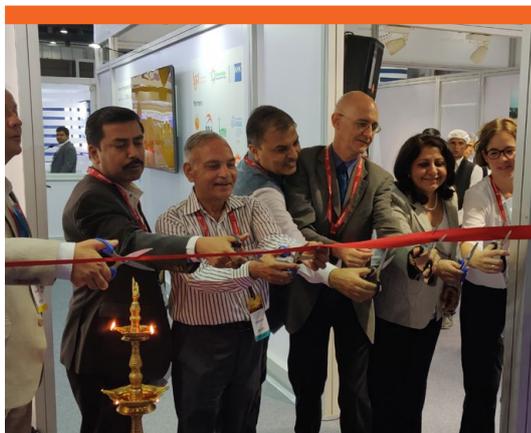
A power-packed three-day conference themed "Giving the Business of Power –The Power to Do Business" encompassed knowledge-rich sessions by Indo-German Energy Forum on Residential Solar and AgroPhotovoltaics with more than 160 participants in total.

The German Pavilion, which was organized by the Indo German Chamber of Commerce and supported by IGEF, offered German companies the opportunity to increase their visibility and explore further access to the Indian market. Several presentations by sector experts were hosted at the speakers' corner of the German Pavilion. Across 3 days, 28 Indian and International energy experts took part in the discussions and presentations enhancing knowledge of the participants and visitors alike. Highlights were the presentations, from Deutsche Windguard, Enerparc, NSEFI, MJB Solutions GmbH, Semikron, Siemens, TUV Rheinland.

The 13th edition of REI 2019 took place from the 18 to 20 September at India Expo Centre in Greater Noida. Indo German Energy Forum, German Biogas Association, Indo German Chamber of Commerce, and GIZ, among others supported REI 2019 to accelerate discussions around best practices in the domain, distribution and role of start-ups in renewable energy.

For access to presentations made at the German Pavilion speakers' corner please click [here](#).

(L to R): Mr. Joerg Gaebler, GIZ India; Mr. Rijoy Sengupta, VDMA; Dr. Aatma Ram Shukla, Indian Biogas Association; Dr. Ashvini Kumar, TERI; Dr. Joerg Polster, German Embassy; Ms. Sonia Prashar, Indo-German Chamber of Commerce; Ms. Antje Kramer, German Biogas Association.





German Local Business Council

18 September, Greater Noida

In the scope of the 13th edition of the Renewable Energy India Expo, 23 German companies and several representatives from industry and politics gathered on the 18 September, 2019 for the 2nd German Local Business Council. Dr. Jörg Polster, Head of Economic Affairs and Globalization, Embassy of the Federal Republic of Germany in India inaugurated the Business Council meeting and welcomed all participants, representing German companies and institutions of the energy sector in India. Mr. Alexander Stedtfeld, Economic Counsellor, Embassy of the Federal Republic of Germany in India and Mr. Boris Alex, Director, Germany Trade and Invest (GTAI) addressed the participants with a short

welcome speech. Encompassing the next hour, company representatives had the opportunity to directly approach the Embassy, GTAI and the Indo-German Chamber of Commerce, to further discuss opportunities but also difficulties and challenges they are facing in the Indian market. In this regard, Dr. Polster especially focused on issues which are perceived to require concrete actions by the Indian government. He aimed at identifying which areas must be tackled in order to improve conditions for businesses. In addition, the companies were asked to elaborate on their current situation compared to the previous year, the development of their business as well as the impact of the present market conditions.



23 German CEO's of German companies discussing with Dr. Polster and Mr. Alexander Stedtfeld, both representatives of the German Embassy in New Delhi, as well as Mr. Boris Alex, Director at GTAI and representatives from Indo-German Chamber of Commerce.

AgroPhotovoltaic Session at REI Expo 2019

18 September, Greater Noida

Harvesting crops and solar energy on shared land offers a promising solution for India's land and water scarcity. Combining solar power generation with farming is known as AgroPhotovoltaic. Among its various benefits is the ability to save resources as demonstrated by the Central Arid Zone Research Institute (CAZRI). Here the water used for cleaning the solar panels is being captured and reused for cleaning, or, for watering the crops growing below the solar panel area. As the first AgroPhotovoltaic pilot plants are being equipped with water harvesting systems, some project developers will further consider to even integrate drycleaning systems.

By now, many farmers around the globe already cultivate their land successfully under solar panels. The estimated total capacity of 2 GW AgroPhotovoltaic is installed in Japan, Korea, USA, France and Germany. India currently counts around 5 MW of AgroPhotovoltaic capacity. The topic of AgroPhotovoltaic increasingly attracts the interest of researchers both in and outside India. Pioneer studies by institutions

such as CAZRI, Anand Agricultural University, Navsari Agricultural University, Amity University and Jain Irrigation Labs generated valuable insights for further practical implementation. Fraunhofer Germany finalized another important study on the potential of agricultural activity below solar panels in India. Latest results and expert insights were presented at India's 2nd AgroPhotovoltaic Workshop Session at Renewable Energy India Expo 2019 on 18 September. International participation could also be realized via Video Conference with presentations by Mr. Frisson and Mr. Krause-Tünker from France and Germany, respectively. Participants were able to explore future business opportunities of combining farming and solar energy generation. Sector experts from CAZRI, AMITY, Next2Sun, Astron Solar Power and Innovation AgroPhotovoltaic Consultants gave detailed presentations of ongoing research as well as commercial projects under implementation in India.

This workshop session was hosted by Indo-German Energy Forum (IGEF) on the 18

September during the Renewable Energy India Expo, 2019. Prof. Dr. Eicke Weber, Vice President ISES Germany inaugurated the workshop with a special address. The session was chaired by the Head of the Energy Cell, German Development Bank KfW, Ms. Sandra Soares da Silva.

More information, pictures and all presentations can be downloaded [here](#).



(L to R) Ms. Sandra Soares da Silva, KfW Development Bank; Mr. Karan Verma, Astron Star; Dr. V. K. Jain, Amity University; Prof. Dr. Eicke Weber, International Solar Energy Society; Dr. Priyabrata Santra, CAZRI; Mr. Munjal Rangwala, Harsha Abakus; Mr. Tobias Winter, IGEF-SO.

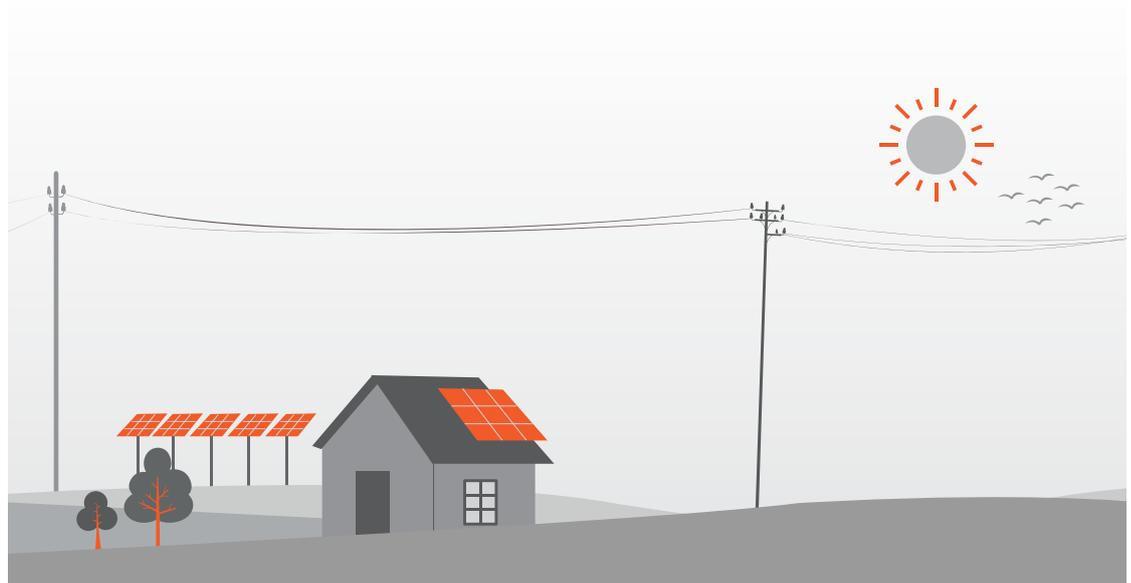
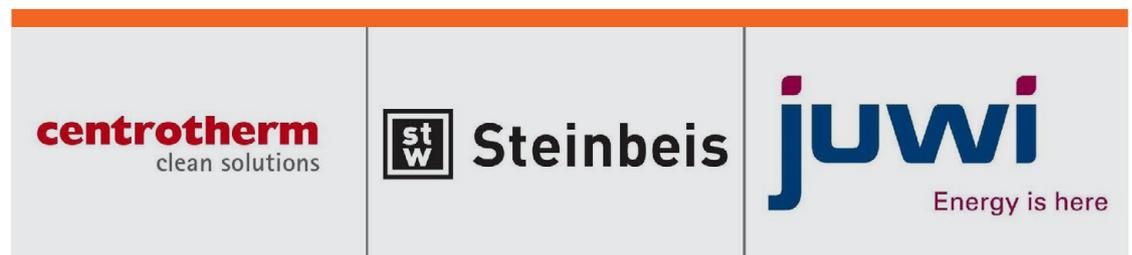
REI Awards 2019

19 September, New Delhi

On 19 September, 2019 the annual Renewable Energy India Awards were presented for the 5th time in a row. The REI Awards aim to make innovations related to Renewable Energy more visible. The German Foundation Steinbeis - Centre for Technology Transfer India received the award in the category "Excellence in RE Skilling" for its innovative last-mile skilling concept, "Skills on Wheels", in which a fully equipped transporter brings training for the installation of solar systems into small towns

and villages. Other German companies also succeeded in the categories "O&M Excellence - Solar Ground Based" (Juwi India Renewable Energies Pvt. Ltd.) and "Leading Technology Innovation" (Centrotherm India Pvt. Ltd.). Along with representatives of the, Indo-German Energy Forum, Bloomberg New Energy Finance, Ernst & Young, ICF and other, jury members oversaw the selection of the winning companies.

Three German companies won the REI Awards 2019.



TERI Campus in Gurgaon

15 July, New Delhi

India's growing power consumption calls for extensive action in the country's residential building sector. On 15 July, representatives from the GIZ and KfW visited the Mahindra TERI Centre of Excellence for Sustainable Habitats, that dedicates research in the area of sustainable construction. The Mahindra TERI Centre of Excellence (CoE) for Sustainable Habitats is a joint initiative of the company Mahindra Lifespaces and the research institute, TERI. It is based on the institute's campus in Gurgaon. TERI Senior Director Mr. Sanjay Seth introduced the delegation to three major research pillars of the initiative's innovative laboratory: material testing, thermal comfort

studies and visual comfort studies. Being the first of its kind in India, the laboratory allows third party testing of energy-efficient building materials. To raise awareness for energy efficiency among the Indian population, a certification system identifies companies using these materials. The TERI campus itself hosts many examples of sustainable infrastructures, such as daylight integration, efficient water use and electricity generation from solar energy. After a presentation and a tour around the facilities, the visit ended with a business lunch in the hotel on the campus itself.



Dr. Winfried Damm, Director of IGEN and Mr. Sanjay Seth, Senior Director TERI, (L - R in the centre) together with representatives from GIZ, KfW, BEE and TERI.

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Developments in Indo-German Energy Cooperation

Study Tour to Germany & France on Energy Storage Systems and Floating Solar

21 - 29 September, Germany and France

GIZ in association with Solar Energy Corporation of India (SECI) organized a study tour to Germany and France on the topic of energy storage systems and floating solar plant from 21 to 29 September. The delegation consisted of 14 members from different state agencies namely Andhra Pradesh Electricity Regulatory Commission (APERC), Andhra Pradesh Solar Power Corporation Private Limited (APSPCL), Uttar Pradesh Jal Vidyut Nigam Limited (UPJVNL), Uttar Pradesh Electricity Regulatory Commission (UPERC), Uttarakhand Renewable Energy Development Agency (UREDA), Uttarakhand Power Corporation Limited (UPCL), Uttarakhand Electricity Regulatory Commission (UERC), Chhattisgarh State Power Distribution Company Ltd (CSPDCL), Chhattisgarh State Electricity Regulatory Commission (CSERC) and officials from SECI & MNRE.

In Germany, the delegation visited the Lithium Iron Phosphate battery storage technology at Pfenning Electrical Systems in Ochsenfurt. The delegation also visited large battery storage facilities of STEAG GmbH as well as battery

storage system operated by Westnetz GmbH at Wettringen. The delegation had an interactive session at Fraunhofer UMSICHT at Oberhausen where they got an insight into various novel ideas about energy storage and renewable technologies.

At Essen, a workshop was organised by VGB PowerTech in which the experts from the power technology sector of Germany presented on topics of the battery storage and flexibility in power generation. The representatives from VGB PowerTech, Steag Energy Services GmbH and Energynautics shared their experiences in battery system operations and discussed various business case studies related to energy storage. Furthermore, challenges, opportunities and new energy storage technologies were discussed with the Indian delegation.

In France, the delegation visited Akuo Energy's O'MEGA1 floating solar power plant with installed capacity of 17 MW in Piolenc. Given the promising future of floating solar plants in India, the visit was perceived as extremely insightful by the participants.



Members of the Indian delegation at a Iron Phosphate Battery storage unit in Ochsenfurt, Germany.



Indian delegation visiting the O'MEGA1 floating solar plant at Piolenc, France.



2nd International Conference on Large-Scale Grid Integration of Renewable Energy

4 – 6 September, New Delhi

More than 450 representatives and energy experts from 16 countries attended the three-day conference, jointly convened by Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), the US Agency for International Development (USAID) and the UK's Department for International Development (DFID) from September 4th to 6th, to share information on large-scale grid integration and its benefits to a country like India, which has embarked on one of the most ambitious clean energy programs in the world.

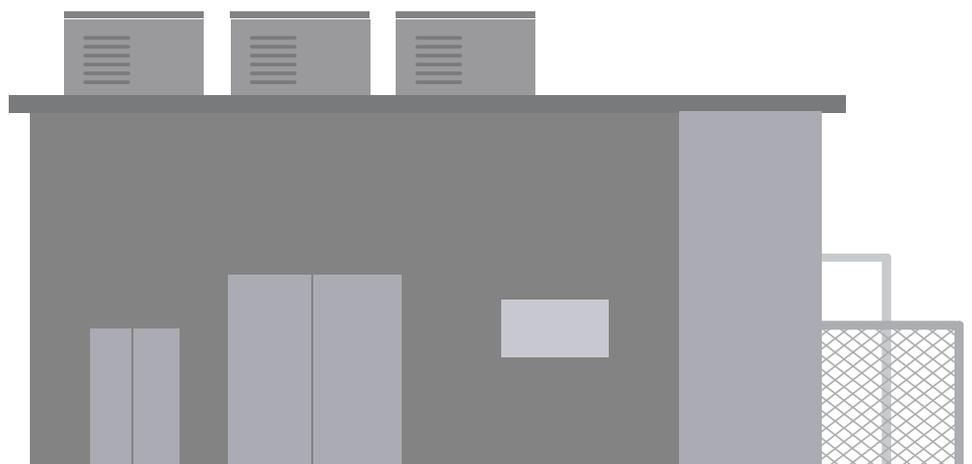
The three-day conference covered deliberations between representatives from the Ministry of Power (MOP), Ministry of New and Renewable Energy (MNRE), Central Electricity Authority (CEA), Central Electricity Regulatory Commission (CERC), and Power System Operation Corporation Limited (POSOCO) on technical and economic issues. Some of the international representations included Ofgem (UK), CAISO (USA), Eurelectric (Germany), NREL (USA), International Energy Agency (IEA), Southern California Edison (USA), DNV GL (Germany), AMSC (USA), Next Kraftwerke (Germany), Electric Power Research Institute (USA), Uniper Kraftwerke (Germany), Fraunhofer IEE (Germany), Recognis (Finland), and the Victoria University of Wellington (New Zealand).

The conference focused on renewable energy grid integration aspects ranging from forecasting, reliable system operation, and transmission and market operation for reliable grid operations under high-variability that accompanies clean energy.

The 2nd edition of the Conference provided an International Forum to:

- Discuss technical and economic issues of the large-scale integration of solar and wind power, including the recent advances in transmission technologies
- Discuss worldwide project experiences
- Discuss innovative ideas and present results from ongoing research
- Stimulate interdisciplinary thinking between renewable energy and power transmission and distribution industries, as well as universities
- Identify subjects requiring more research efforts

The conference was endorsed by the Ministry of Power (MOP) and Ministry of New and Renewable Energy (MNRE). More information and presentations to be found [here](#).



Low carbon buildings: KfW and EESL promote solar rooftop in Maharashtra

17 June, Mumbai

In a bid to enhance the deployment of decentralized solar energy in India, reduce carbon emissions from government and public buildings and bring in long term energy security, German Development Bank KfW and the energy service company Energy Efficiency Services Limited (EESL) jointly organised a Stakeholder Consultation Workshop in Mumbai on 17 June 2019. The workshop's aim was to support EESL in their discussions with key stakeholders like the Public Works Department (PWD) and other state government departments in Maharashtra on the deployment of solar rooftop on their buildings under the Building Energy Efficiency Program (BEEP). According to Managing Director Mr. Saurabh Kumar, EESL already achieved to make 1,800 buildings more energy efficient under the BEEP.

A total of 48 participants, comprising of representatives from the PWD, the Maharashtra Electricity Regulatory Commission, TATA Memorial Hospital and State Bank of India (SBI), joined the discussion on benefits, business opportunities and the status quo of government policies in the area of solar rooftop in India. Maharashtra's State Revenue Minister Mr. Chandrakant Dada Patil took the workshop as an occasion to name the use of solar rooftop on PWD and other government buildings a win-win for the state and the environment. Based on the input given, EESL formulated a clear target for future actions to be taken under the BEEP. Accordingly, a total capacity of 100 MW solar rooftop systems will be developed in Maharashtra to the 1,800 buildings covered by the programme.

(L to R) Mr. Ajit Pandit (Idam Infrastructure Advisory), Shri Deepak Kokate (EESL), Mr. Ronnie Khanna (KfW), Shri Chandrakant Dada Patil (Honourable Minister Revenue, Relief & Rehabilitation, Agricultural and PWD); Shri Ajit Sange (PWD, Government of Maharashtra); Shri Saurabh Kumar (EESL); Shri Sandeep Patil (PWD, Government of Maharashtra).



Impact assessment of Electric Vehicle charging on the Indian electricity distribution system

8 August, New Delhi

On 8 August 2019, the GIZ India released a study on "Impact assessment of high penetration of Electric Vehicles along with rooftop PV systems", which deals with implications of large scale Electric Vehicle (EV) charging infrastructure expansion on the power grids. It identifies and evaluates the major technical challenges and opportunity for the grid operator while integrating high shares of EV & distributed rooftop PV generation. The event was attended by +90 stakeholders. Ranging from the government, policy makers, consultants, regulators to manufacturers of EV chain, battery Original Equipment Manufacturers (OEMs), startups and DISCOMs.

Following key findings were presented on the occasion of the event:

- The EV charging will not impose a significant toll on the energy consumption & peak

demand, and DISCOM's shall be able to manage the load from EV.

- Power quality issues like harmonic injection from EVs chargers & rooftop PV generation would have an impact at few points. However, it can be mitigated/compensated with harmonic filters installation.
- Developing the Time of Use (ToU) tariff (Controlled Charging) for EVs would have a beneficial proposition for DISCOM and market penetration of E-mobility.

The study demonstrates the impact of EV infrastructure on the distribution network (LT network, HT network, distribution transformers) under various technical parameters. The study also provides the framework guidelines for policy and regulatory authorities.

The expected rise in EVs will add complexity to the grid management, thus balancing power

Shri Abhay Bakre,
Director General,
Bureau of Energy
Efficiency (BEE)
addressing the
audience.



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Developments in Indo-German Energy Cooperation

supply and demand and quality of power will become more important in decades to come. Moving forward with the EV targets set by government and market forces, the electricity distribution licensees will have to be well prepared. They will have to estimate the impacts of integrating charging infrastructure along with increasing embedded generation from rooftop

Solar PV in advance and prepare their network for safe and reliable operation.

For more information please contact Mr. Sudhanshu Mishra via email to [sudhanshu.mishra\(at\)giz.de](mailto:sudhanshu.mishra(at)giz.de).



Trading energy among neighbours: a bottom-up revolution for network stabilization in rural India

August, Assam

GIZ replicated the concept of swarm electrification in the state of Assam. Swarm electrification is a form of network stabilization that works through energy trading across neighbours. The basis of swarm electrification is households and businesses that generate and store their own solar energy. They are connected to each other in a peer-to-peer DC grid. Abundant energy from one household can flow to another household where there is a shortage of electricity supply. GIZ has established two such peer-to-peer DC grids each including 15 households in Assam this summer. The project was implemented with the technical assistance of Cygni and SOLshare.

The Saubhagya – Sahaj Bijli Har Ghar Yojana scheme based on the swarm electrification concept was launched by the Government of

India in September 2017. It aims to provide last mile connectivity and electricity connections to all households in rural and urban areas through grid extension. The Assam swarm electrification project facilitates in achieving the government's goals of offering a bottom-up approach for stable and clean energy supply, especially for the marginalized communities, for whom the generation and trade of solar energy hold great promise of empowerment, economic boost and livelihood improvement. As calculated by the impact enterprise IIX Asia, each USD 1 the Assam project invested into building the peer-to-peer DC grids generates an estimated social impact of USD 4.85.

For more information please contact Mr. Sudhanshu Mishra via email to [sudhanshu.mishra\(at\)giz.de](mailto:sudhanshu.mishra(at)giz.de).



Customer Training in
Kaminirvita.

Solar irrigation pumps and its impact on water, energy and food security in rural India

7 August, New Delhi

In cooperation with the International Institute of Sustainable Development (IISD) and The Energy and Resources Institute (TERI), the Indo-German Energy Programme (IGEN) of GIZ India held a workshop on the promotion of solar irrigation pumps. Solar water pumps help farmers to improve their agricultural activities and depict the strong linkage between energy, water and food security, known as “water, energy and food security (WEF) nexus”. The workshop took place on 7 August, 2019 in the Habitat Centre, New Delhi and was joined by government representatives, leading experts from national policy think tanks and non-governmental organizations. In his welcome speech, IGEN-head Dr. Winfried Damm addressed the issue of overexploitation of groundwater that resulted from the industrialization of Indian agriculture. IISD and TERI presented their recent joint study

titled “Mapping Policy for Solar Irrigation Across the Water-Energy-Food (WEF) Nexus in India”.

After describing pressing issues of Indian agriculture – inter alia there are 600 million Indians who suffer from high water stress and 14% of Indians are undernourished – Dr. Mini Govindan (TERI) and Mr. Christopher Beaton (IISD) presented several policy recommendations from their study. The recommendations were formulated with reference to the recently adopted Pradhan Mantri Kisan Urja Suraksha evem Utthan Mahabhiyan (PM-KUSUM) Scheme, drafted by the Indian government to scale up the use of solar energy for irrigation pumps. Particularly better information on the practical implications on regulations such as KUSUM scheme as well as a policy on sustainable groundwater extraction (including solar water pumps) was requested by the experts. On the



IGEN Director Dr. Winfried Damm (middle) addressed the linkage between water, energy and food security in rural India.

state level, the study assessed the influence of respective state-level policies on the W-E-F nexus for Bihar and Rajasthan.

The second part of the event was a panel discussion. It dealt with the practical and operational issues on deployment of the solar irrigation pump. The session started with an overview presentation by Mr. J.K. Jethani, Director at the MNRE and responsible for the KUSUM scheme. Afterwards, Mr. Amit Kumar (Senior Director of TERI) chaired a discussion on improving water efficiency. A major focus

was set on micro and community irrigation as well as on the storage of harvested crops and the evolution of state-level schemes. At the end of the panel discussion, Mr. Abhishek Jain presented an on-line decision support tool “Solar Pump Tool” developed by CEEW in collaboration with GIZ, which helps to identify the most conducive geographical regions for sustainable deployment of solar pumps.

For further information kindly contact Mr. Nilanjan via email to [nilanjan.ghose\(at\)giz.de](mailto:nilanjan.ghose(at)giz.de).



Solar farms on water: KfW and TERI host expert session on Floating Solar Photovoltaic

21 June, New Delhi

How can India benefit from Floating Solar Photovoltaic (FSPV)? Around 50 experts from the solar sector gathered for the sixth edition of the Saurya Samvad, based on the theme 'Floating Solar Photovoltaic (FSPV) Plants: Opportunities, Challenges, and Way Ahead', to discuss opportunities and challenges connected to the installation of solar systems on floating water bodies. The Saurya Samvad is a recurring event organized by the German Development Bank- KfW to connect stakeholders from the solar sector. This edition was hosted on 21 June in New Delhi in cooperation with TERI and attracted representatives from academia, banks, insurance companies, distribution utilities and institutions such as World Bank, ADB, SECI, NTPC, NHPC, Green Job Council (Skill India).

The half-day workshop was divided into two sessions. The first session started with a general overview of the status quo, potential, opportunities and challenges regarding FSPV. TERI presented a study on the state-wise potential of Floating Solar Photovoltaic in India. NTPC, NHPC, Yellow Tropus and Renew India shared valuable insights from practical

implementation in that area. They stressed the need for detailed site assessments to analyse the surface area of the water body. In addition, future projects need to consider soil and ground specifics and change in water levels during the year and over the years. Ownership and control of water levels in dams; remuneration of reduced evaporation losses; quality standards for floats and guidelines on the design of FSPV plants were further mentioned as crucial for successful project implementation.

The second session revolved around the environmental and social impact of FSPV, such as effects on plants and marine-life, changes in the properties of water, and the question of the long-term sustainability of the projects. The participants expressed the need to collect more data and carry out zone-wise studies in India to gain a better understanding of the common effects of FSPV projects on local conditions. KfW from their side affirmed Germany's consistent support for solar projects in India, including FSPV, through funding preparatory studies and final investments.

Head of Energy Cell at KfW Development Bank India, Ms. Sandra Soares da Silva and Dr. Christoph Kessler, Director KfW India as well as Shri Shirish Garud, TERI addressing participating experts from the solar sector on benefits from Floating Solar Photovoltaic.



Residential Solar – Business Opportunities in India

18 September, Greater Noida

The “Indo-German Energy Conference” held on 18 September at Renewable Energy India Expo in New Delhi was organised by the Indo-German Energy Forum (IGEF). The conference was inaugurated by Mr. Alexander Stedtfeld, Economic Counsellor, Embassy of the Federal Republic of Germany in India and Mr. Pranav Mehta, Chairman NSEFI & Chairman of Global Solar Council. The first session of the conference focused on Residential Solar opportunities in India. Mr. Joerg Gaebler, Principal Advisor at GIZ India moderated the session. He welcomed the audience by outlining opportunities in the residential solar PV. He emphasised that Solar PV behind the meter system along with Battery storage will open more market opportunities for solarising the diverse rooftops in India.

Mr. Abhinav Jain (GIZ India) shared insights on the new SRISTI scheme as well as business opportunities available for 700 GW solar market in India by 2047. Dr. Christoph Mueller, CEO

at Simply Solar, discussed the 2kWp plug-n-play rooftop PV system (PV-Port) developed by GIZ for residential, micro/off-grid applications. CEO of Expectus GmbH, Mr. Schaefer shared logistic related issues and solutions for meeting the demand of PV Port solutions. Dr. André Nobre, Head of Operations & Maintenance at Cleantech Solar, elaborated on his experiences of challenges managing Operations and Maintenance of hundreds of rooftop PV systems across India and his perspective on residential Solar rooftop as an expert on large-scale projects.

The conference session was attended by +80 interested parties from around the globe, including representatives from industry and international associations. The Solar Rooftop session was followed by a second workshop on AgroPhotovoltaics (AgroPV) and its potential for the Indian market.

(From L to R) Mr. Stefan Schaefer, Expectus GmbH; Mr. Abhinav Jain, GIZ India; Dr. André Nobre, Cleantech Solar; Ms. Theresa Jocham, IGEF-SO; Mr. Joerg Gaebler, GIZ India; Dr. Christoph Mueller, Simply Solar.



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Quote of the month from India and Germany

Quote of the month from India



© PIB



"In India we are going to increase the share of non-fossil fuels to 175 GW by 2022, and to further increase it to 450GW."

Shri Narendra Modi, Hon'ble Prime Minister of India

Source: [Press Information Bureau](#)

Quote of the month from Germany



© Reuters



"[...] it was only the youth that jolted us back into action. That's good. That is not only the right of young people, but it does us all good." says Chancellor Merkel in regard to @FridaysForFuture climate protests.

Dr. Angela Merkel, Hon'ble Chancellor of Germany

Source: [Clean Energy Wire CLEW](#)

5

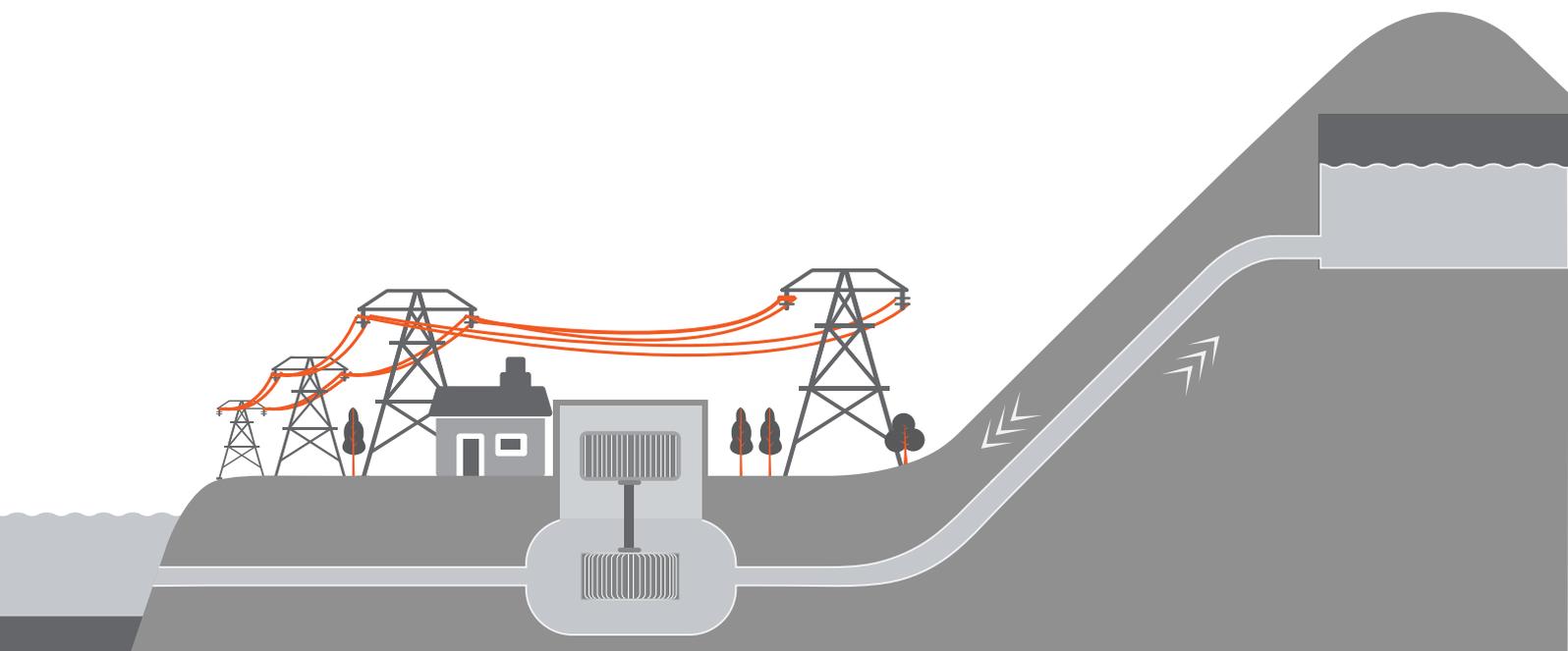
Energy Transition News

Keeping track of the progress of the energy transition



As shown by the latest report on the progress of the German energy transition, many steps on the way to a successful energy transition have already been taken. The challenges that remain to be mastered in order to make this major climate policy project a success, have been identified, and ways to address them described. The report contains almost 300 pages of information and figures on the current state of the energy transition and provides an outlook for the years up until 2030. It is part of an

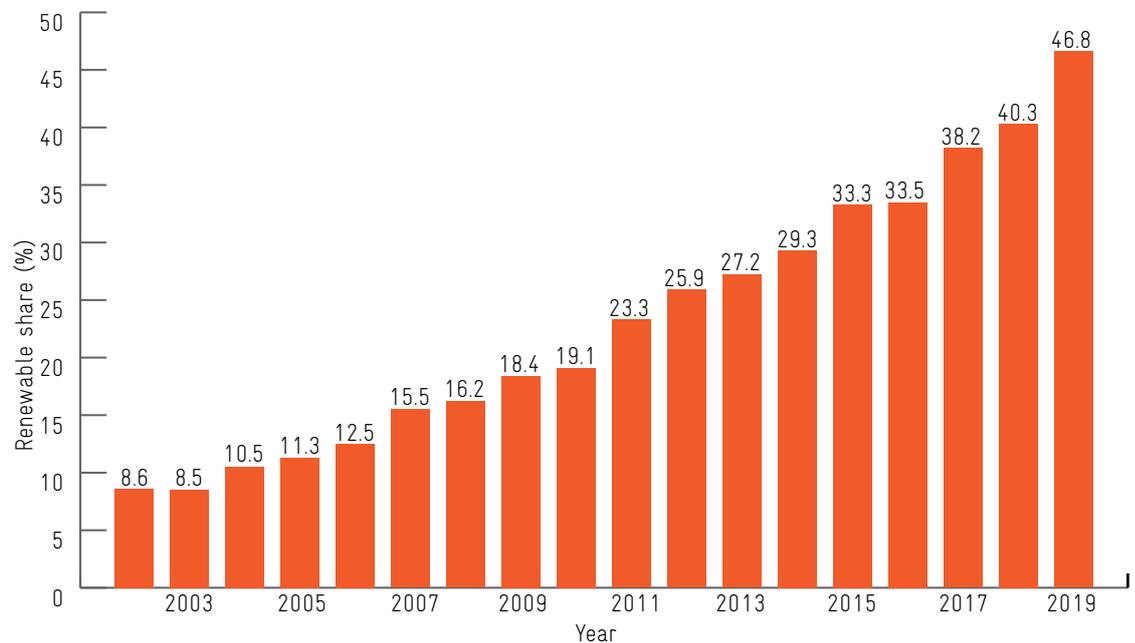
extensive process to monitor the progress of the energy transition. The report was conducted by the Federal Government, with the Federal Ministry for Economic Affairs and Energy serving as the lead ministry and was adopted by the Federal Cabinet on 6 June. A commission made up of four renowned and independent experts proof-reads the report and provides a scientific opinion of the results of the monitoring activities achieved.



Energy transition makes headway

The report shows that the energy transition is coming along. Germany is on track in its use of renewable energy power. The share of renewables in gross electricity consumption reached 37.8 % in 2018, which means that the target that had been set for 2020 was reached two years earlier than planned (see graph below on annual renewable energy shares in Germany). In addition to this, the costs of expanding wind and photovoltaic installations continue to fall. So, the energy sector is making a key contribution to reducing greenhouse gas emissions. According to estimated figures, the use of renewable energy in the electricity

sector helped Germany cut its greenhouse gas emissions by around 140 million tonnes of CO₂ equivalents in 2018. This is almost equal to the total amount emitted in the transport sector (162 million tonnes in 2018). And the good news does not end there: Germany's electricity supply continues to be secure, even as the share of renewables in electricity generation grows. The country is able to cover its demand for energy at all times and ranks among the best countries worldwide in terms of the reliability and quality of its energy supply.



Annual renewable shares of electricity production in Germany

Net generation of power plants for public power supply.

Datasource: 50 Hertz, Amprion, Tennet, TransnetBW, Destatis, EEX

Last update: 9 Oct 2019

Source: <https://www.energy-charts.de>

The macroeconomic costs for electricity – in terms of GDP – once again went down in 2017, reaching the lowest level since 2010. Electricity prices for private customers remained almost the same between 2017 and 2018, whilst remaining at a relatively high level compared with other European countries. When it comes to electricity prices for companies that are particularly energy-intensive, Germany ranks

somewhere in the middle of all European countries. This is because Germany has adopted legislation to help these companies cope. However, customers in the industrial sector who are not covered by these rules had to pay around 4.9 per cent more for electricity in 2017, and according to the information provided by the report, these costs continued to climb in 2018.

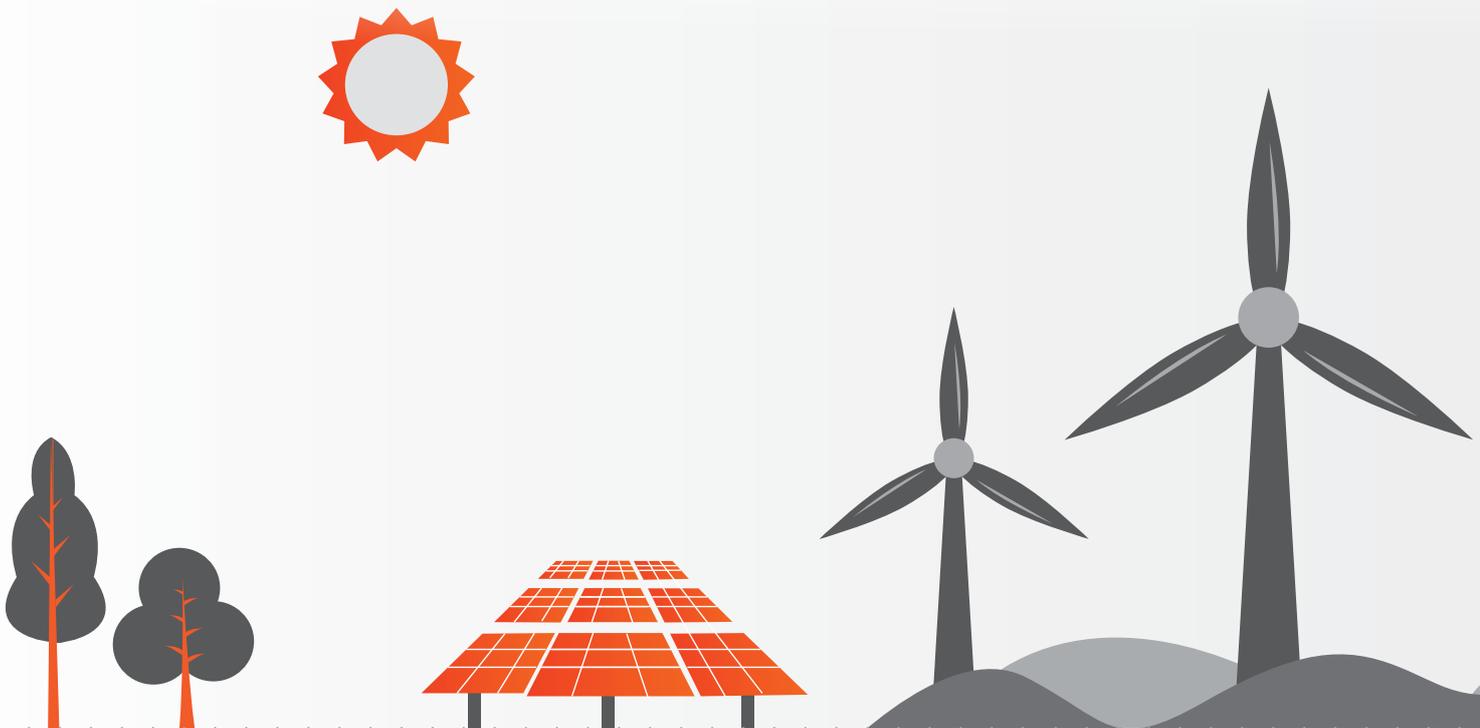


The Energy Transition – an Engine for Innovation



The report clearly shows that the energy transition is triggering investment and innovation in the German economy and industry. It benefits companies which are selling new, innovative energy technologies. In 2017 alone, German companies exported equipment and components required for using renewables technology worth more than eight billion euros. Federal

Minister for Economic Affairs and Energy Peter Altmaier commented on the report by saying that business models will only be successful in the future if they take energy and climate concerns into account. “At the same time, this is also a great opportunity for us to create new opportunities for business and industry in Germany,” he said.



Federal Government takes action to further reduce Carbon Emissions



Even though greenhouse gas emissions have recently been decreasing, falling by a mere 0.5 per cent in 2017 and a whopping 4.5 per cent in 2018, Germany is likely to fall short of its target to reduce GHG emissions by 4 per cent by 2020 compared with 1990 levels. Not all sectors are seeing the same development, though. In the energy sector, for example, carbon emissions have continued to fall, decreasing by 14 million tonnes between 2017 and 2018 alone according to initial estimates. Once the recommendations developed by the Commission on Coal with regard to Germany's planned phase-out of coal-fired power have been put into practice, however, there is a good chance that the energy sector will meet its targets for 2030. The Federal Government has set up a cabinet

committee on climate protection (the "climate cabinet"), which seeks to ensure compliance with the climate targets for 2030 which it is required to meet by law.

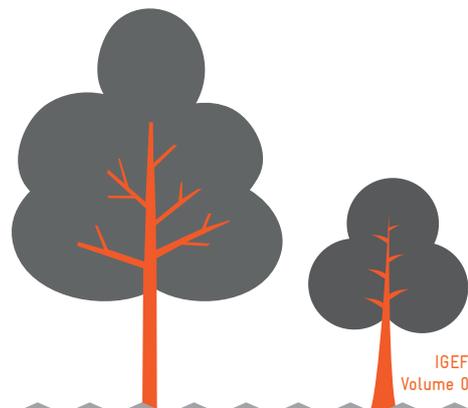
Away from emission reductions, energy efficiency is also improving. In 2018, primary energy consumption is estimated to have fallen by 4.6 per cent, lowering Germany's energy consumption to a level last seen in 1972. However, further considerable efforts are required to meet the national and European targets on energy efficiency. Therefore, the Federal Government plans to adopt a cross-sectoral strategy on energy efficiency.

German and European energy strategies on the way



The Energy Concept adopted by the Federal Government sets out clear and ambitious targets for the medium and long term. These targets can be regularly and closely scrutinised under the “Energy of the Future” monitoring progress that was launched in 2011 and by the commission of energy experts. The EU’s “Clean Energy for all Europeans” legislative package provides the basis for bringing about the energy transition at the European level. It also contains clear targets for 2030 and the post-2030 period. The idea behind the extensive monitoring process is

to have an instrument that allows adjustments to be made to the process as it goes along. By providing for a continuous reporting mechanism and publishing important data on the energy transition, the complex process is to be made easier to understand and more transparent. At regular intervals, the more in-depth progress report on the energy transition is published instead of the annual monitoring report. The first progress report was published in December 2014.



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Publications

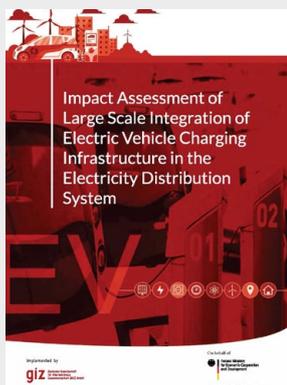
Global Trends in Renewable Energy Investment 2019



Global Trends show that in 2018, investors again put hundreds of billions of dollars behind renewable energy and the energy transition we need. The latest issue of this report, which has tracked trends and opportunities in the sector since 2004, shows that global investment in renewable energy capacity hit USD 272.9 billion in 2018. Several unexpected findings emerge from the decade perspective taken in the Focus Chapter of this report. One is the meteoric rise of solar PV to become not just the biggest renewable power technology in terms of investment – onshore wind was the number one back in 2009 – but also the most added generation source of any kind during the period. Another has been the precipitous price fall in both solar PV and wind, and a third has been the steady improvements in efficiency of those technologies. The years 2010 – 2019 will have seen USD 2.6 trillion invested in renewable energy capacity (excluding large hydro), more than treble the amount invested in the previous decade. Solar is set to have attracted the most in 2010–2019, at USD 1.3 trillion, with wind securing USD 1 trillion and biomass and waste-to-energy USD 115 billion.

The report is supported by Govt. of Germany based on data from Bloomberg New Energy Finance and can be accessed free of cost [here](#).

Impact Assessment of Large-Scale Integration of Electric Vehicle (EV) Charging Infrastructure in the Electricity Distribution System

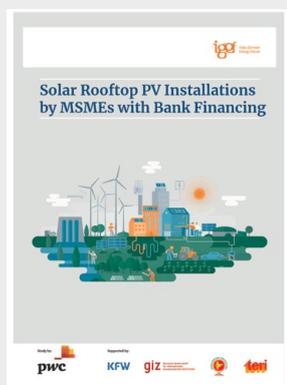


India moves towards green mobility. By 2030, the Government of India (GoI) aims to electrify large parts of its public transport. However, the nationwide expansion of EVs will hardly challenge India's capacities to balance power demand and power supply: large-scale increases in battery charging stations will increase power consumption very moderate - the impacts from additional (NDC) conditioners being installed in the country will be far higher. Solar rooftops offer a clean solution to feed the power grids with the additional electricity required. The full impact of large-scale EV extension however still needs to be explored, so power distribution systems can adjust accordingly. India's ambitions regarding its mobility sector form part of the Nationally Determined Contribution (INDC) that India has submitted to demonstrate its commitment to the Paris Climate Agreements. Accordingly, India plans to reduce its emissions by 35 % of its GDP.

The study identifies and evaluates the major technical challenges and opportunities for the grid operator while integrating high shares of EVs and distributed generation.

For more information please contact Mr. Sudhanshu Mishra via email to [sudhanshu.mishra\(at\)giz.de](mailto:sudhanshu.mishra(at)giz.de).

Solar Rooftop PV installations by MSMEs with bank financing



Micro, Small & Medium Enterprises (MSMEs) are significant players when it comes to the growth of solar rooftop in India. To explore and promote the opportunities of solar rooftop projects for entrepreneurs, IGEF with support from National Solar Energy Federation of India (NSEFI) and The Energy and Resources Institute (TERI) conducted the study "Solar Rooftop PV Installations by MSMEs with Bank Financing". It presents a deep cluster-level analysis and documents best practice examples of existing MSME projects in the solar PV power sector. The study was launched on 27 August during the one-day seminar on "Accelerating Solar Rooftop Growth in India" hosted by NSEFI in the India Habitat Centre, New Delhi.

Please click [here](#) to download the full report.

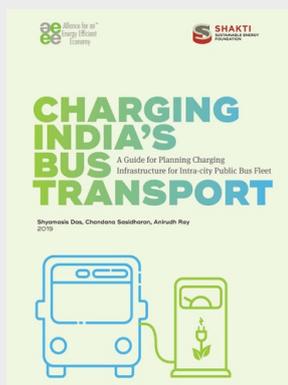
Mainstreaming super-efficient appliances in India



Ready to cart in some cool appliances this festive season. Why not buy smart and save energy? This August, Alliance for an Economy and American Council for an Energy-Efficient Economy released a deep-dive report on Mainstreaming Super-Efficient Appliances in India. The report spotlights policies and programs to drive adoption of the most Energy Efficient Appliances.

The report can be downloaded free of cost [here](#).

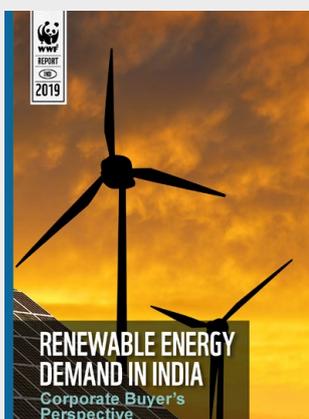
Charging India's Bus Transport



To accelerate the transition of the public bus mobility in India to electric, here is a pioneering new report released by Alliance for an Efficient Economy and Shakti Sustainable Energy Foundation that spotlights Charging India's Bus Transport. The study provides insights into the e-bus and charging technology market, providing guidance to plan charging infrastructure for intra-city e-bus fleets. The findings of this research are helping in the decision-making of the State Road Transport Undertakings (SRTUs) and private bus operators, state nodal agencies, OEMs, charging service providers and policymakers.

The report can be downloaded free of cost [here](#).

Renewable Energy Demand in India - Corporate Buyer's Perspective



This report examines the role of the corporate sector, constituting commercial and industrial (C&I) consumers of power, in driving greater uptake of renewable energy in India. RE buyers include corporates that procure RE through captive generation, power purchase agreements, or purchase of Renewable Energy Certificates (RECs), voluntarily or for compliance reasons. The report focuses more on solar and wind power due to overall rising installed capacity and greater interest shown by corporates when compared to other RE technologies.

The primary purpose of the report is to provide a RE-Buyers' perspective by highlighting the rapidly increasing corporate RE procurement trends, the rationale for and mechanisms involved in this procurement. The report focuses on the challenges that these corporates are facing while procuring RE. The report also provides recommendations for corporates and policy makers to address some of these challenges.

Download the report [here](#) for free.

Clean Energy Investment Trends 2019



The 2019 Clean Energy Investment Trends report maps out the evolution in the renewable power industry and investment landscape through tracking the risk perceptions of debt financiers towards solar photovoltaic (PV) and wind projects over the period from 2014 to 2018 and recent developments impacting the pace of capacity addition. To assess the relative standing of renewables and thermal assets, this report includes an analysis of thermal projects along with the same metrics. The report also takes stock of the impact of a recent policy measure – the imposition of safeguard duties on solar PV cell and module imports – on the pace of project awards.

Download the report [here](#) for free.

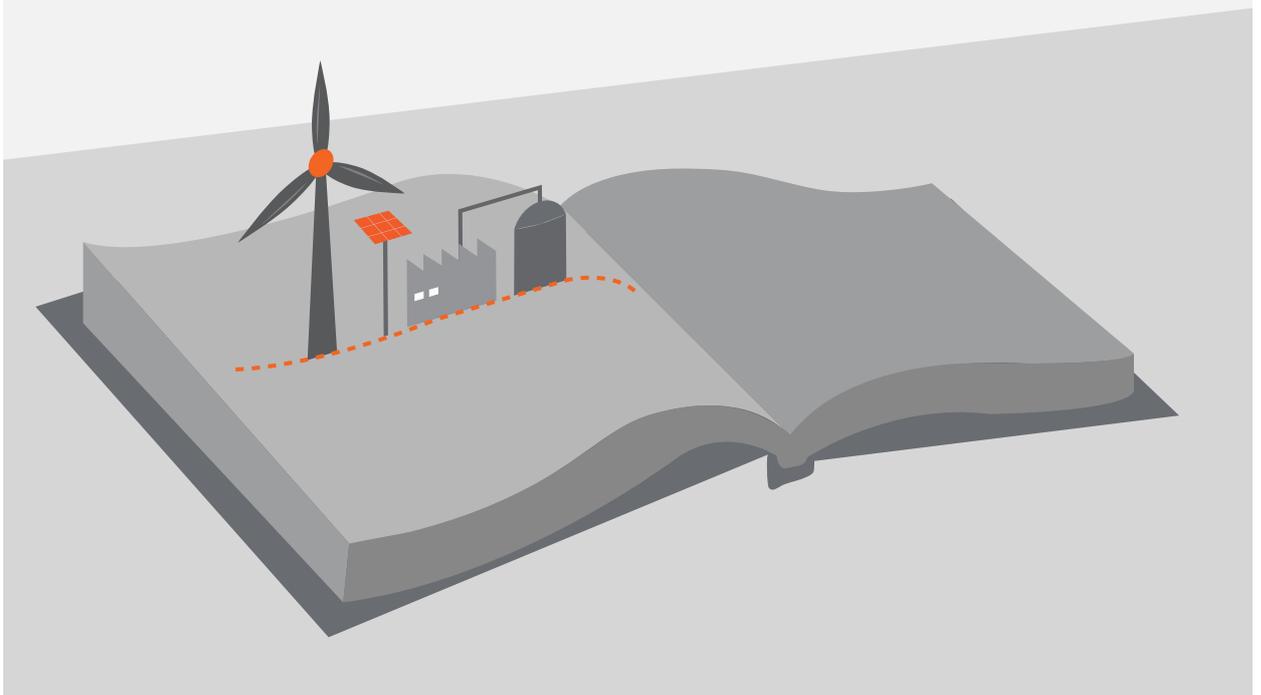
The German Coal Commission – A Roadmap for a Just Transition from Coal to Renewables



To prevent economic disruption and associated social hardship for workers, coal-dependent countries would be well-advised to initiate a political process on how to transition from coal to clean energy. In the summer of 2018, Germany launched such a process by establishing a Commission on Growth, Structural Change and Employment otherwise known as the Coal Commission. Following in-depth deliberations between key stakeholders, in January of 2019 the Commission presented a comprehensive roadmap for the phase out of coal-fired power generation in Germany by 2038. The federal government has declared its intention to implement the recommendations.

In this report, the Agora Energiewende analysis the recommendations with regard to their anticipated impact on the German electricity sector, carbon emissions, and economic development in coal-mining regions.

Download the report [here](#).



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Upcoming Events

Climate Opportunity 2019

15 - 16 October | Berlin, Germany

The Climate Opportunity 2019 conference dedicated to “Co-Benefits for Just Energy Futures” on 15 and 16 October 2019 in Berlin. The conference comes between the Climate Week NYC and COP25 in Santiago and will explore the socio-economic potentials of ambitious climate protection that are gaining political and social relevance.

More information [here](#).



MI Innovation Meetings

4 - 6 November | New Delhi, India

Mission Innovation (MI), launched in 2015, is a global initiative of 23 countries (Member Countries) and the European Union to accelerate the pace of innovation and make clean energy widely affordable. Led by the public sector, it aims to mobilize both public and private sector efforts. MI also provides a platform to support collaborations among members and facilitate engagement with business, industry and investors, so as to attract more private funding into innovative clean energy research. India has taken a leading role in all mission innovation activities. The next meeting is happening in New Delhi, India (invitation only).

More information [here](#).



Best Practice Study Tour cum Training and Capacity Building Program

13 - 15 November | Pondicherry, India

The Indo-German Energy Forum (IGEF) and the Central Board of Irrigation and Power (CBIP) are jointly organizing a Special Study Tour cum Training and Capacity Building Program on Grid Management from the 13 November 2019 until the 15 November 2019. The program is aimed at participants drawn from the relevant energy stakeholders in India and other neighbouring countries.



Global Energy XPO 2019

20 - 22 November | New Delhi, India

The Confederation of Indian Industry is organizing the Global Energy XPO, India's first integrated & Comprehensive Exhibition & Conference on Energy focusing on the entire value chain of the energy sector. The Global Energy XPO gives a global overview of the Indian Energy sector and brings key stakeholders on one platform to exchange insights on all areas relevant to renewable energies in India. It includes technology collaborations and forging partnerships, one-to-one business meetings (B2B and B2Gs), an exclusive Startup Pavilion, a series of focused CEO roundtables with policymakers, international conferences and country sessions, cross-border learning and sharing as well as the participation of Indian States showcasing their policies and projects.



More information [here](#).

The Smarter E India 2019 – Intersolar India, EES India and Power2Drive

27 - 29 November | Bangalore, India

The smarter E India with three parallel energy exhibitions will take place from 27 - 29 November 2019 in Bangalore, India. This trade fair and conference is India's largest event fully dedicated to solar energy as well as eMobility and storage. The smarter E India unites three energy exhibitions: Firstly, Intersolar India – India's most pioneering exhibition and conference for the solar industry, secondly, EES India – the country's leading electrical energy storage exhibition and finally, Power2Drive India – India's premier exhibition for electric mobility and charging solutions.



More information on all exhibitions you can find [here](#).

World Utility Summit 2020

20 - 21 January | New Delhi, India

World Utility Summit is a pioneering thought leadership forum, which attempts to set the agenda for the future, actively playing the role of a key enabler for the ecosystem and to develop optimal solutions, technology & products. The theme of the World Utility Summit 2020 is "Utility Next". This summit would bring in thought leaders across the globe to deliberate the preparedness of utilities to deal with the transformational changes. Regulators, technology providers, consultants, government bodies and utility leaders are expected to share their views on various challenging and exciting scenarios, and this will help to shape the roadmap of future utilities.



20-21 January 2020
Delhi NCR, India

www.worldutilitysummit.org

More information on the summit you can find [here](#).

German Chancellor Fellowship for tomorrow's leaders at German Solar Association BSW in Berlin

The Alexander von Humboldt Foundation is searching for the leaders of tomorrow from India. The German Chancellor Fellowship offers you an opportunity to take the next career step 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 Mr. Knaack ([knaack\(at\)bsw-solar.de](mailto:knaack(at)bsw-solar.de)).



Alexander von Humboldt
Stiftung/Foundation

Retired German energy experts offering their support to Indian institutions

You are a fresh 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 free of cost to the world.

You are an Indian based company or institution and 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 fields of potential support and is also able to finance such expert visits. SES is the worldwide leading organization for voluntary assignments carried out by retired specialists and executives.

For further information please contact Mrs. Sharon Mogose: sharon.mogose@indo-german.com or visit the website <https://www.ses-bonn.de/en/startseite.html>.



All upcoming events in the next six months – Save the date!

German Business Delegation with focus on Power Self Consumption in Industries

14-17 October | New Delhi, India
<https://bit.ly/2VoJnAi>

Event Climate Opportunity 2019

15-16 October | Berlin, Germany
<https://www.cobenefits.info>

National Seminar on Flexible Operation of Coal Fired Plants and Environment Challenges

1 November 2019 | New Delhi, India
<http://www.eecpowerindia.com/>

Indo-German Energy Forum (on invitation only)

1 November 2019 | New Delhi, India
<https://www.energyforum.in>

G2G Meeting MI Innovation (on invitation only)

4-6 November 2019 | New Delhi, India
<http://mission-innovation.net>

Renewable Energy Growth Forum

8 November 2019 | Hubballi, India
<https://bit.ly/2ntvNPB>

German Business Delegation with focus on Emission Reduction

11-15 November 2019 | Delhi & Kolkata, India
<https://bit.ly/31XPjCQ>

Best Practice Study Tour cum Training and Capacity Building Program

13-15 November 2019 | Puducherry, India
<https://www.energyforum.in/home/>

Trade Fair Global Energy XPO

20-22 November | New Delhi, India
<http://www.gexpo.in/>

Event dena Energiewende-Kongress 2019

25-26 November | Berlin, Germany
<https://www.dena-kongress.de/startseite/>

Trade Fair The Smarter E India 2019-Intersolar India, EES India and Power2Drive

27-29 November | Bangalore, India
<https://www.thesmartere.in/en/intersolar-india>

Event World Utility Summit at Trade Fair ELECRAMA

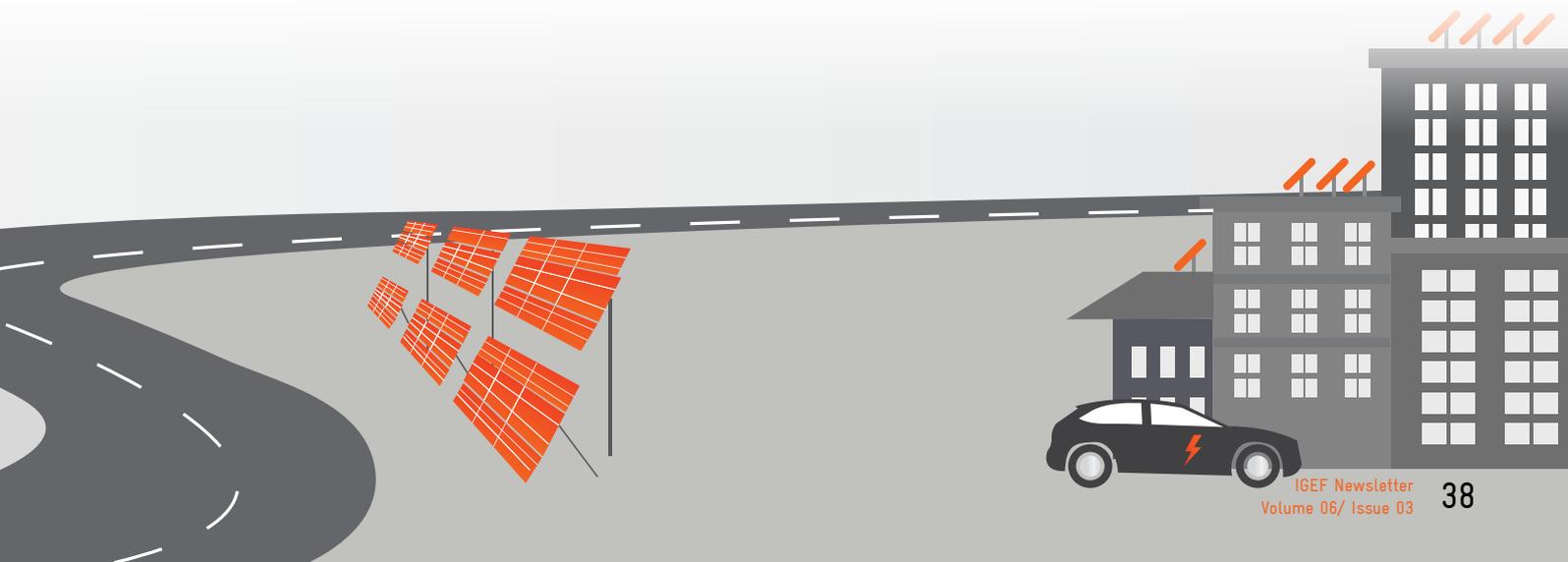
20-21 January 2020 | New Delhi, India
<https://www.worldutilitysummit.org/>

6th Berlin Energy Transition Dialogue (on invitation only)

24-25 March 2020 | Berlin, Germany
<https://2019.energydialogue.berlin/>

14th Renewable Energy India Expo 2020

23-25 September 2020 | New Delhi, India
<https://www.renewableenergyindiaexpo.com/>



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Disclaimer

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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.

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New Delhi >>

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