



Global Smart Energy Federation
Formerly known as Global Smart Grid Federation

NEWSLETTER

June 2021

ISGF Contributions at Asia Clean Energy Forum (ACEF) 2021

ISGF organised four deep dive online workshops as part of Asia Clean Energy Forum (ACEF) 2021, the annual event organized by Asian Development Bank - a) Blockchain Innovation and Adoption in Electric Utilities on 14th June 2021; b) Artificial Intelligence and Robotics for Electric Utilities on 15th June 2021; c) Sustainable Air Conditioning with District Cooling Systems on 16th June 2021; d) Electric Cooking - The Way Forward on 17th June 2021.

All four Online Workshops received overwhelming response and was attended by overall 1103 delegates from around the globe. Overall 38 speakers participated in the 4 workshops conducted by ISGF. The Blockchain Workshop appraised the participants on the potential of Blockchain Technology for Peer to Peer (P2P) Trading of Rooftop Solar Energy amongst prosumers and consumers, Tokenization, trade and management of Green Energy Certificates on Blockchain, Blockchain enabled charging and sharing of Electric Vehicles, Leveraging Blockchain for Flexible Marketplace for Future Energy Trading, Maturity and Usability of Blockchain based Applications in Utilities, Potential Regulatory Interventions for Upscaling Adoption of Blockchain Applications in Utilities and Use Cases of successful Implementation of Blockchain Projects in Energy Sector in Regulatory Sandbox Framework were presented during the workshop.

The AI and Robotics Workshop discussed the potential of AI, ML and Robotics in utilities and speakers presented the state-of-the-art technologies and tools relevant for utilities in AI, ML and Robotics, Business Drivers and Benefits of AI Applications for Utilities and Robotic Process Automation (RPA) for Utilities. Successful Case Studies of different AI, ML and Robotics Applications were presented during the workshop.

During the District Cooling System (DCS) Workshop, speakers discussed international experiences with DCS projects and the challenges with both green field and brown field DCS projects. Discussion also revolved around present innovative financing models for providing Cooling-As-A-Service against monthly payments. Policy and Regulatory support for implementation of sustainable DCS projects in developing countries was also discussed during the workshop.

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In the Electric Cooking Workshop, discussion revolved around need of policies to promote electric cooking amongst households having no access to clean cooking fuels that will improve the health of people particularly women and children, reduce emissions from millions of kitchens, reduce deforestation and improve the business case of electric utilities.

Panellists also mentioned about barriers in moving to electric cooking in rural and semi-urban areas – poor state of electric grid and unreliable electricity supply, availability of electric cooking appliances locally, maintenance support for appliances, cultural and mental barriers. Speakers mentioned about environmental benefits from electric cooking by reducing GHG emissions and avoiding deforestation, different strategies for promotion of electric cooking and campaigns for consumer awareness and adoption of electric cooking appliances and practices, leveraging renewable energy for electric cooking and integration of cooking appliances with the grid – smart cooking with green electricity bought from the cheapest resource on the grid and promotion of the technology by electric utilities. Overall, all the four workshops received lot of appreciation from the participants as well as speakers.

Besides these four deep dive workshops, ISGF President, Reji Kumar Pillai made presentations on “Prospects and Challenges on Digitalization of Electricity Utilities” at the ACEF regional session on Digitalization of Electricity Utilities in South Asia and presented on “Electric Cooking - The way forward” in the session on Deep dives at the city, national and regional level, in the track - tracing future paths with technology roadmaps for NDCs.

The full recording of the webinar can be accessed at:

Sustainable Air Conditioning with District Cooling Systems-

https://www.youtube.com/watch?v=eZllkm1Ruo4&list=PLgSiPGd4Nrcg3JNUpl3NNSJH43DiFFu_f&index=10

Electric Cooking - The Way Forward-

https://www.youtube.com/watch?v=RQy8piOWk5A&list=PLgSiPGd4Nrcg3JNUpl3NNSJH43DiFFu_f&index=8

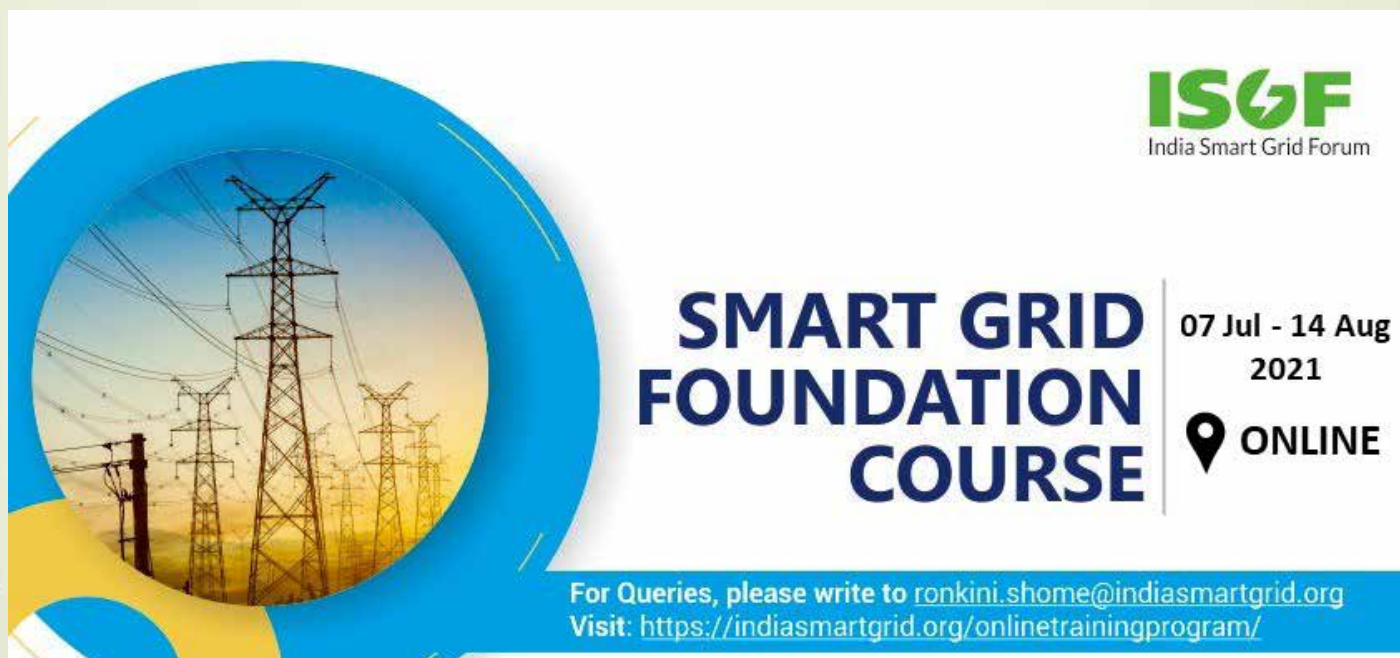
Artificial Intelligence and Robotics for Electric Utilities-

https://www.youtube.com/watch?v=DrTealVJlvU&list=PLgSiPGd4Nrcg3JNUpl3NNSJH43DiFFu_f&index=7

Blockchain Innovation and Adoption in Electric Utilities-

https://www.youtube.com/watch?v=nxB5bl7UARM&list=PLgSiPGd4Nrcg3JNUpl3NNSJH43DiFFu_f&index=6

Article contributed by India Smart Grid Forum (ISGF)



The banner features a large blue circular graphic on the left containing an image of high-voltage power lines against a sunset sky. To the right of the graphic, the ISGF logo is displayed in green. The main text 'SMART GRID FOUNDATION COURSE' is in large, bold, blue letters. Below this, the dates '07 Jul - 14 Aug 2021' and the location 'ONLINE' with a location pin icon are shown. At the bottom, contact information is provided: 'For Queries, please write to ronkini.shome@indiasmartgrid.org' and 'Visit: <https://indiasmartgrid.org/onlinetrainingprogram/>'.

Global Stories on Smart Grid

Hitachi ABB Power Grids to Supply Europe's Largest Battery to OLS

Hitachi ABB Power Grids and Teollisuuden Voima Oyj (TVO) have signed a contract to deliver one of Europe's largest battery energy storage systems to the Olkiluoto NPP in Finland. The 90 MW system will support the entire energy network at unit 3 of the Olkiluoto NPP, minimizing the effect of power fluctuations on the grid. The turnkey solution acts as a fast-start backup power source. The battery energy storage system will be commissioned in 2022. Battery energy storage of this scale and the growth in low-emission electricity production represent significant steps for the climate and contribute to Finland's goal of carbon neutrality in 2035. TVO's contribution to national electricity production is growing, and the soon-to-be completed Olkiluoto 3 plant unit is a critical part of this effort.

Read More: <https://bit.ly/3qxnPRO>

Fortescue Signs Land Deal for 250-MW Green Hydrogen Site at Tasmania Port

The renewables arm of Australia's Fortescue Metals Group Limited has secured land for the construction of a 250 MW green hydrogen production complex in Northern Tasmania. Fortescue Future Industries has signed an option agreement for land and operating access to a site at the Port of Bell Bay with TasPorts, the state-owned port authority. The planned facility, set to become one of the largest ones globally, could produce 250,000 tonnes of green ammonia per year, both for domestic use and exports. Fortescue teamed up with Japanese engineering firm IHI Corporation to jointly explore opportunities into exporting green ammonia to Japan from Tasmania.

Read More: <https://bit.ly/3cYAI0X>

ABB Supplies Southeast Asia's Largest Battery Energy Storage System

With the global energy storage system market expected to reach \$17.9 billion by 2027, battery energy storage systems (BESS) are emerging as the strongest solution to increase grid flexibility and reliability. To help improve grid performance in the country, SMC Global Power Holdings Corp. (SMC), one of the major suppliers of power to the national grid in the Philippines, has partnered with ABB to install BESS facilities as part of its nationwide BESS Project, the region's largest BESS project. As part of this project, ABB will support two 20 MW sites, which will be installed by June 2021 with a further 40MW site in July 2021. The remaining sites will be completed in 2022. This project will support the Philippines' ambitious plans to build a more sustainable future for its communities by decarbonizing energy generation and ensuring that 54 percent of its energy mix comes from renewables by 2040.

Red More: <https://bit.ly/3h84hz5>

UK's Data Communications Company Pilots EV Chargers on Smart Meter Network

A pilot project launched by a consortium of technology companies in partnership with the Data Communications Company (DCC) aims to connect electric vehicle (EV) charging infrastructure on a national network. The technology companies include cybersecurity and technology firm Toshiba, who are leading the consortium, IoT connectivity solutions firm Pelion, Vestel and firm has.to.be. The project aims to supplement or enhance the current approach to EV infrastructure rollout and management rather than replacing it.

Read More: <https://bit.ly/3rik1xr>

Outages Top Cybersecurity Concerns for DSOs, Netherland.

Half of DSOs in the OSGP Alliance's 2021 cybersecurity survey highlighted outages caused by cyber attacks as their top smart grid security concern. Next, cited by over a quarter is tampering of data or systems, followed by the theft of customer information and exposure to ransom. Energy infrastructure is a critical resource and denial of access to energy, even for a few hours, can have significant consequence, the OSGP Alliance notes in its survey report. It is not just about convenience but also about the health and safety and efficiency of businesses relying on the energy supply. This, in addition to the reputational damage suffered by a DSO due to outages, is cause for concern.

Read More: <https://bit.ly/3eBm9lg>

World: Artificial Intelligence Enables Smart Control and Fair Sharing of Resources in Energy Communities

Energy communities will play a key role in building the more decentralized, less carbon intensive, and fairer energy systems of the future. Such communities enable local prosumers (consumers with own generation and storage) to generate, store and trade energy with each other—using locally owned assets, such as wind turbines, rooftop solar panels and batteries. In turn, this enables the community to use more locally generated renewable generation, and shifts the market power from large utility companies to individual prosumers.

A paper recently published in Applied Energy by researchers from the Smart Systems Group (SSG) at Heriot-Watt University in Edinburgh, Scotland (UK), has shown that tools from distributed AI (specifically multi-agent systems) and cooperative game theory can be efficiently used to answer these questions.

Read More: <https://bit.ly/3gbY5Fw>

Global Stories on Smart Grid

Chile to Track Renewable Energy for Copper Mining on Blockchain

Chile's National Electricity Coordinator (CEN) is developing a blockchain platform that will be used to trace renewable energy usage in copper production. The Renova initiative is not limited to copper and aims to provide renewable energy traceability and a log of all the country's renewable energy resources.

There is a growing demand in the mining industry for more transparent and environmentally-friendly practices, and companies are looking at renewable energy as a solution to mitigate the environmental impacts of copper mining. The renewable energy sector is growing at a fast pace in Chile. Nevertheless, selling duplicate contracts or accounting for the same renewable energy certificate twice are still common occurrences.

Read More: <https://bit.ly/2Ro8vty>

Powerco and Actility to Partner on LoRaWAN-enabled Smart Grid Connectivity

New Zealand's second-largest electricity and gas distribution utility Powerco is partnering with IoT solutions firm Actility to enhance connectivity on its grid network.

Actility is providing the utility with its LORAWAN-enabled ThingPark Enterprise IoT platform for rollout across its grid network.

The rollout of the large-scale IoT network will start in June 2021 with the deployment of 200 gateways over a period of 24 months. Moreover, IoT sensors will be installed on electricity assets such as power poles, lines and transformers. Each gateway can monitor hundreds of sensors, creating a comprehensive picture of the network. The sensors will provide fault, performance and metering information, allowing to more easily detect and locate power outages, identify underperforming assets, and understand power demand. It also means sending field crews to remote locations for routine checks on equipment will no longer be necessary.

Read More: <https://bit.ly/2SajfMj>

Dancing Robot Set to Help Energy Sector

A robot made famous by dancing on YouTube is set to help save lives and cut carbon dioxide emissions by supporting hazardous environment research at the National Robotarium, Heriot-Watt University has announced. Experts at the National Robotarium will use the new hardware to carry out research into how robots can support humans in hazardous environments like offshore energy inspection and disaster recovery, Heriot-Watt noted. The robot will be fitted with 'telexistence' technology, which lets humans experience an environment without being there, using devices like microphones and cameras to relay sounds and videos, the university highlighted. The \$84,810 (GBP 60,000) robot is part of the 'Spot' range created by Boston Dynamics.

Read More: <https://bit.ly/34NsQvw>

Member Updates

PEER ENABLING THE SMART GRID DEVELOPMENT IN PENNSYLVANIA (PA) STATE



The PEER Rating System measures and improves power system performance and electricity infrastructure. It encourages the adoption of reliable, resilient, and sustainable practices and helps utilities, campuses and transit systems solve aging infrastructure, find cost savings, share best practices, build for resiliency, and enhance tracking to prevent failures.

GBCI (Green Business Certification Inc.) with support from PA State Energy Office was working with facilities that have committed to smart grid and clean energy adoption. GBCI through its PEER (Performance Excellence in Electricity Renewal) is currently assessing the identified facilities – Electrical infrastructure performance and improvement required. Through this assessment, PEER is enabling the much-required smart grid infrastructure for remote operation of power systems, faster power restoration, power system hardening measures and creating a clean energy roadmap further demonstrating the value for smart and microgrids during catastrophic events and manmade events.

PEER takes a multifaceted approach to accelerating carbon reductions and reducing the negative impacts of electricity production and delivery, including:

- Establishing performance parameters for benchmarking on reliability and reducing environmental impacts, including carbon emissions
- Incentivizing renewable energy and the purchase of carbon offsets and renewable energy certificates that are climate e-certified
- Encouraging the use of distributed energy generation, onsite renewable energy, energy storage, thermally activated technologies, and district energy cooling or heating systems, which significantly reduces the dependency on inefficient and higher emission grid power
- Embracing demand response strategies that provide flexibility in power loads that lead to energy savings and prevent so-called dirty power at peak usage.
- SCADA and Outage management system for remote monitoring and operations

Thus, demonstrating their efforts on decarbonization, digitalization and decentralization in power system and encouraging other Campuses, Transit systems, Power Utilities and Cities towards grid modernization efforts by achieving PEER certification.

Article contributed by Ishaq Sulthan, Associate Director, GBCI India

BEYOND SANDBOXES – INNOGRID DAY 2 FOCUSED ON INNOVATION IN ASSET MANAGEMENT & MARKETS

Introduced by Uros Salobir, Vice-Chair of ENTSO-E Research, Development and Innovation Committee, and Richard Vidlička, Chair of E.DSO Innovation & Research Committee, the second day of the 10th edition of InnoGrid gave the opportunity to participants to deep dive in some of the Horizon2020 Projects in the areas of asset management and markets.

In the opening session, Cristobal Irazoqui, Policy Officer, Innovation, Research, Digitalisation, Competitiveness in DG Energy, European Commission, stressed “The Importance of Innovation for providing evidence to support the development of European Policies on the Energy Transition.”

The electricity grid will remain cornerstone in reaching climate neutrality by 2050 as per the EU Green Deal objectives. The projects Flexitranstore, Farcross, Interconnect and Platone had the opportunity to present at InnoGrid how the innovative solutions in grid asset management they are working on can accelerate the green transition, be it through improved power generation forecast or grid optimization technologies.

With increased variability, the need to leverage the potential of new market participants and increase consumer choice, enabling new sources of flexibility to reach the market is essential for a secure and affordable transition. Projects Interrface, Coordinet, OneNet and EUniversal explained how their work is advancing on such key ingredients as interoperability, product & services standardization and seamless coordination among the different actors of the electricity value chain.

The full recording of the webinar can be accessed at https://www.youtube.com/watch?v=EDc9UWTh_Kk

Read More: <https://bit.ly/3kxqVEg>

Article contributed by Marc Boillot, Ambassador, Europe and Africa

CITY ISLAND GRIDS: CHALLENGES & POSSIBILITIES



In a recent roundtable, I was asked to share my thoughts on “City Island Grids” as a climate disaster mitigation strategy. A few international cities are exploring this. These considerations are neither cheap nor easy to architect. Yet, I think it is inevitable. While it applies to all infrastructure (gas, electricity, other) this article is on electricity grids.

Cities are premium these days. They are the centers of knowledge, economy, politics and house the rich, the famous and the powerful. A global projection estimates that up to 60% of a country's population will live in an urbanized environment by 2050. The World Factbook 2020 (on Wikipedia) notes that 129 out of 194 countries have 50% or more of their total population in urban areas, with 20 countries above 90% and 59 countries above the 75% mark. Others such as China (61%), South Africa (67%), Indonesia (57%), Nigeria (52%), Egypt (42%), Jamaica (56%) and India (35%) are rapidly adding more cities.

The densification of urban space (high-rise, walkability, public transport) allows for a better economic payback, which dovetails with rising urban demand as well. Covid may have dented/delayed this view, but the trend appears to be holding. Smart City concepts have made steady progress over the last decade, towards a greener and healthier urban environment with a lower carbon foot print. Electricity utilization for heat/cool and mobility is a key factor in improving conversion efficiencies and lowering the carbon foot print. This places a high importance on electrical power and its reliability.

Yet natural disasters in the last 15 years have seen many large cities experience partial or total blackouts for several days (some even weeks). Examples include New York, Toronto, Mumbai, New Delhi, Dallas, Los Angeles, and Cairo to name a few. The cost of such outages in socio-economic terms, has been estimated as high 20-30 times the price of electricity. This multiple will grow higher with urbanization.

Many cities have mooted the creation of self-sufficient “City Island Grids” during such natural disasters. Examples include New York, Mumbai and New Delhi to name a few. These efforts include duplicate ring feeds, distributed energy resources, energy storage, underground MV cables, gas/diesel power plants, etc. While microgrid architectures have been adopted for universities, industrial and communities, to scale this up to a large city (5,000-8,000 MW peak) with a population of several million, is not easy. Further, to be completely islanded with dynamic load-generation balance and stability, is even more daunting.

In my view, there are several key considerations (neither cheap nor easy) and these are highlighted below:

1. Resetting old climate Standards/Codes

Climate standards for infrastructure planning needs a reset and a remake based on today's reality and trendline (floods, temperature, wind, dust, storms, etc.). For example, in South Asia, the 50 deg C design ambient standard was adopted almost 70 years ago, when the maximum temperature was 35-40 deg C. Today, this would need to be raised to 55-60 deg C with the today's 45-48 deg C summers. This is equivalent to 15-20% derating of electrical equipment. The same goes for city flood/water-logging maps. With more concrete surfaces, such water levels will be higher and will warrant elevating pad-mounted electrical infrastructure. The key issue here is not new Standards/Codes for future additions, but rather re-adapting/re-assessing existing equipment.

2. Architecting Electrical “Fractures”

A large city island grid cannot be maintained all times (pockets of demand-supply imbalance). While architecting dynamic demand-supply balance mechanisms, it is prudent to establish where the grid should fracture/isolate during extreme imbalance conditions. Classical power system theory and methodology help in such estimations and this real-time contingency should be modelled in the DMS. The ability to create small fractures at a place of choice is vital for contingency management. These small fractures may or may not survive their own local blackout, but will save the larger city island.

3. Power and not just Energy Management

Power system (vector) management is not just about (scalar) energy balance alone, but rather about managing dynamic power flows with quality and stability. Surges and short-term demand are more critical to stability than the energy it serves. Utility grids are generally designed to meet such demand, but a review is needed given the push for electric utilization (HVAC, cooking), transportation (EV charging) and self-generation (PV, ESS). Load factor, nodal-voltage and power-factor management are critical to avoiding expensive investments. Extensive use of inverter-based systems (PV, ESS, EV charging) and synthetic inertia needs to be augmented with distributed rotating inertia for both power and ancillary services.

4. Generation and Utilization Fuel Switching Capability

Despite MV feeder redundancy, last-mile 24x7 electricity supply is vital during calamities (cool/heat/cook). Considerations should include careful placement of grid connected gas/diesel generation, energy storage, other DERs together with feeder load management at the substation level. Selected power generation and utilization equipment shall be capable of fuel switching (or have an alternate-fuel standby) to protect the island stability and enhance security. Examples would be gas/diesel generation in tall buildings with perhaps a 10-hour battery energy storage for supplying reduced critical loads. All residences will need to be retrofitted with a sub-panel to feed only critical loads with an 8-hour battery backup (not small generators as they are inefficient/more polluting).

5. Distributed Automation

Central DMS systems will need to be modified to a hybrid model, with each distribution transformer/ substation capable of limited autonomy under the "supervision" of the main DMS. Distributed generation, distributed energy storage, distributed rotating inertia and ancillary services, all need to be placed carefully under the management of such mini-DMS. Each area or zone must be capable of managing their load-supply balance with standalone operation including load shedding tools.

In closing, it is better and more prudent to not just climate-proof the infrastructure, but rather invest in effective control of distributed supply and load assets within city zones. An effective solution would be the fast balancing of both demand and supply and be able to isolate/fracture at predetermined locations. I recollect the many global discussions/visits over the last 20 years (Cigre, Microgrid Forum, etc.) with experts, when we were conceptualizing and formulating such architectures. It is time to bring it to fruition for a large city.

Article contributed by Ravi Seethapathy, GSEF Ambassador for Americas

Smart Grid Events

18 – 27 August 2021: CIGRE (Digital), Paris
<https://www.cigre-exhibition.com/>

22 - 25 September 2021:
Solar Istanbul
<https://www.solaristanbul.com.tr/>

06 -08 October 2021: EM Power Europe
<https://www.em-power.eu/home>

13 - 15 October 2021: EIF World Energy Congress and Expo, Antalya
<https://www.enerjikongresi.com/>

03 – 05 November 2021: 14th International Energy Congress and Expo
<https://www.worldenergy-congress.com/>

26 - 28 January 2022: DISTRIBUTECH International
<https://www.distributech.com/event-information>

20 – 23 September 2021: CIRED, Geneva
<https://www.cired2021.org/>

06 – 07 October 2021: Innovation for Cool Earth Forum (ICEF), Tokyo
<https://www.icef-forum.org/>

10 - 12 October 2021: Turkey Energy Summit
<http://turkeyenergysummit.com/en/>

25 – 29 October 2021: Singapore International Energy Week
<https://www.siew.gov.sg/>

30 Nov – 02 Dec 2021: Enlit Europe, Milan (formerly known as European Utility Week)
<https://www.enlit-europe.com/>

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GSEF at a glance

Charter Members



Think Smart Grids



India Smart Grid Forum



Korea Smart Grid Association (KSGA)



Prakarsa Jaringan Cerdas Indonesia (PJCI)



GridWise Alliance

Regular Members



Smart Grid Mexico



Japan Smart Community Alliance

Utility Members



Electricity Generating Authority of Thailand (EGAT)



Electricity Supply Commission of South Africa (ESKOM)



EDM Mozambique



Tenaga Nasional Berhad (TNB) Malaysia



European Distribution System Operators (E.D.S.O)



Botswana Power Corporation

Associate Members



Green Business Certification Inc.



Florence School of Regulation (FSR)



Energy BlockChain Consortium



Caribbean Electric Utility Services Corporation



Electric Power Research Institute

Current Working Groups

- Blockchain for Utilities
- Regulatory Changes or Regulatory Reforms for the post Covid Digital Utility
- AI and Analytics for Utilities

Working Groups in Pipeline

- Green Recovery Playbook for Utilities

Contact us for more information.

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