

Space-Based Services for Distributed Energy Networks (SMART-GRIDS)

Opportunity

European Space Agency (ESA) Business Applications is launching a new Invitation to Tender, to assess the technical feasibility and commercial viability of satellite-based services in support of smart grids and electricity grid maintenance. Any resulting studies are also intended to establish the roadmap for service implementation through one or more potential follow-on demonstration projects.

For the purpose of this study, ESA Business Applications has established cooperation with the following stakeholders, who will provide feedback to the study results and contribute with inputs towards potential follow-on demonstration projects.

- European Network of Transmission System Operators for Electricity (ENTSO-E)
- European Distribution System Operators for Smart Grids (EDSO)
- Enel Global Infrastructure and Networks
- Global Smart Grid Federation (GSGF)
- Friends of the Supergrid (Supergrid)

Key Focus Areas

Smart Grid: Demand Response management, energy load and demand forecasting, automatic load balancing/self-healing of the electricity grid; Integration of electric vehicles into the electricity grid; Smart factories and smart buildings; Advanced metering infrastructure and smart meter enabled services, Home automation, Predictive maintenance; and Virtual power plants and commercial/industrial microgrids management.

Electricity grid maintenance: Conductivity and hot spot measurements; Vegetation and infrastructure monitoring; Impact of weather events on energy infrastructure and supply; Assessment of buildings' electrical consumption; and Satellite communication as back-up for terrestrial communication systems.

Technology enablers and space technology: Data analytics and big data; Internet of (nano-) things; Artificial intelligence; Cyber security; and Satellite for Smart Grids.

For more details visit : <https://business.esa.int/funding/invitation-to-tender/space-based-services-for-distributed-energy-networks-smart-grids>

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Global Stories on Smart Grid

ISO New England Lays Out Its Energy Storage Market Integration Plans

The Federal Energy Regulatory Commission has given every grid operator in the country a deadline till December for submitting plans for integrating energy storage into capacity, energy and ancillary services markets. ISO New England's recently filed proposal for integrating batteries and other fast-acting storage assets into its energy markets fits the requirement stated by Order 841 of FERC and is well ahead of the scheduled mentioned in the Order 841.

Read More: <https://bit.ly/2FI1q2Q>

NYPA to come up with new high speed charging corridor

New York Public Authority has identified 2 new public charging locations along major traffic routes and has reached an agreement with the New York State Thruway to site fast chargers at 15 service areas along the corridor. Chargers will be conveniently located at service areas no more than 75 miles apart in order to support long-distance travel. NYPA will also build out a 10-station high-speed charging hub at John F. Kennedy airport, which will serve both the general public and rideshare drivers.

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

Regional Cooperation in East Africa Set to Tackle Energy Insecurity

The Energy Security Policy Framework was launched in Kigali by the East African Community in partnership with the UN Economic Commission for Africa, ECA to help East African countries to tackle the increasing energy insecurity affecting the region by focusing on implementation of the continental free trade area. The EAC policy framework aims at improving security and affordability of energy supply, and advancing the achievement of the Sustainable Development Goal 7 on universal access on clean, affordable, sustainable and reliable energy.

Read More: <https://bit.ly/2Bx8xVc>

AfDB Launches Africa Energy Portal

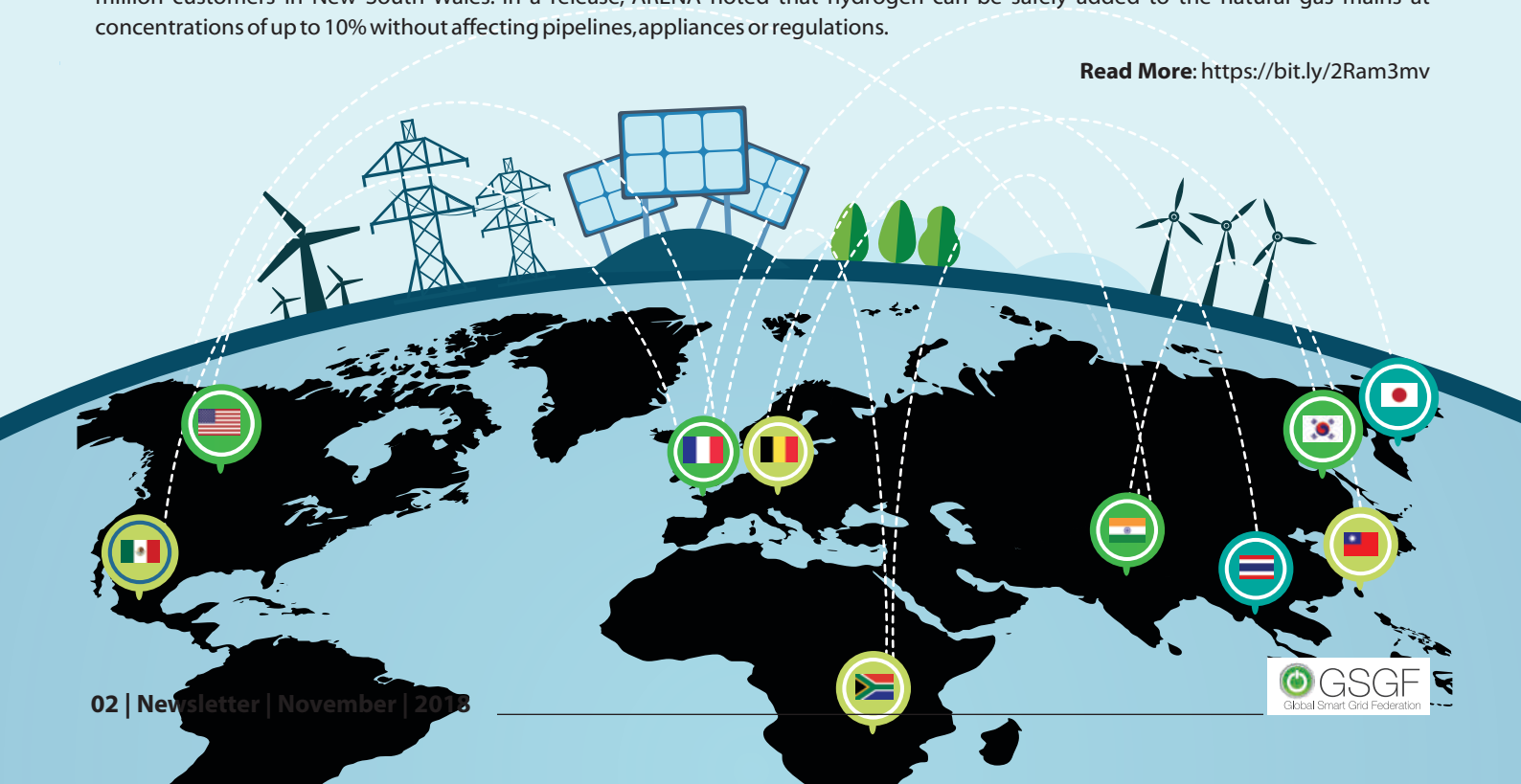
African Development Bank (AfDB) has launched the Africa Energy Portal, which is designed to address lack of information in the sector, by providing a one-stop-shop for accurate, reliable, relevant, and up-to-date information on energy in Africa. This will include statistics on investment flows and deals, as well as the socio-economic outcomes of power projects. The portal will consolidate, validate, and disseminate energy data and insights across Africa's energy value chain, covering generation, transmission, distribution, regulation and policy.

Read More: <https://bit.ly/2QiyDn3>

Australia pilots using renewables to produce hydrogen for energy storage

Australia will trial pilots using solar and wind power to produce hydrogen via electrolysis, with the hydrogen then being used for long-term energy storage in the Sydney gas network. The Australian Renewable Energy Agency (ARENA) has committed AU\$7.5 million (US\$5.3 million) in funding for Australian energy firm Jemena to build a demonstration scale 500kW electrolyser, known as Project H2GO, at its facility in western Sydney. The AU\$15 million, two-year trial project will connect to Jemena's existing gas network, which delivers gas to 1.3 million customers in New South Wales. In a release, ARENA noted that hydrogen can be safely added to the natural gas mains at concentrations of up to 10% without affecting pipelines, appliances or regulations.

Read More: <https://bit.ly/2Ram3mv>



Global Stories on Smart Grid

AGL launches Solar Energy Trading Platform pilot project in Victoria, Australia

AGL Energy Ltd. has developed an online platform which allows users to trade solar energy, with the aim of giving its customers more control over their energy use and reduce the cost of their power bills. Currently 220 AGL customers in Victoria are participating in the AGL Solar Exchange trial, which started in August, by trading solar tokens that represent solar energy through an online trading account. AGL's marketplace means household generating solar power can participate in trading energy beyond receiving compensation for returning excess solar to the grid known as a feed-in tariff (FiT).

Read More: <https://bit.ly/2TK6B2F>

KEPCO to develop Advanced Solar Micro Grid using Blockchain Technology

KEPCO's new Open Micro Grid will utilise blockchain tech to expand the energy industry in South Korea, primarily focusing on the hydrogen industry. The University of Tokyo and the Mitsubishi UFJ Bank has partnered up with the power giant to help develop the Blockchain technology to be applied in the electricity supply grid, setting a precedent for the industry in new power distribution techniques.

Read More: <https://bit.ly/2BxM9ep>

Chicago superconductor project to link substations with high-capacity wires

Chicago's largest utility, ComEd, announced a deal with American Superconductor Corporation (AMSC) to connect some of its substations with wires made from a material known as Amperium. The wires conduct far more power than traditional aluminium or copper lines without losing any energy from resistance or heat loss. That extreme efficiency is expected to boost resiliency on the grid, which can also make it easier to integrate renewables.

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

Enel's Emotorwerks and EO Charging launch Smart EV Charger with Vehicle-to-Grid Technology

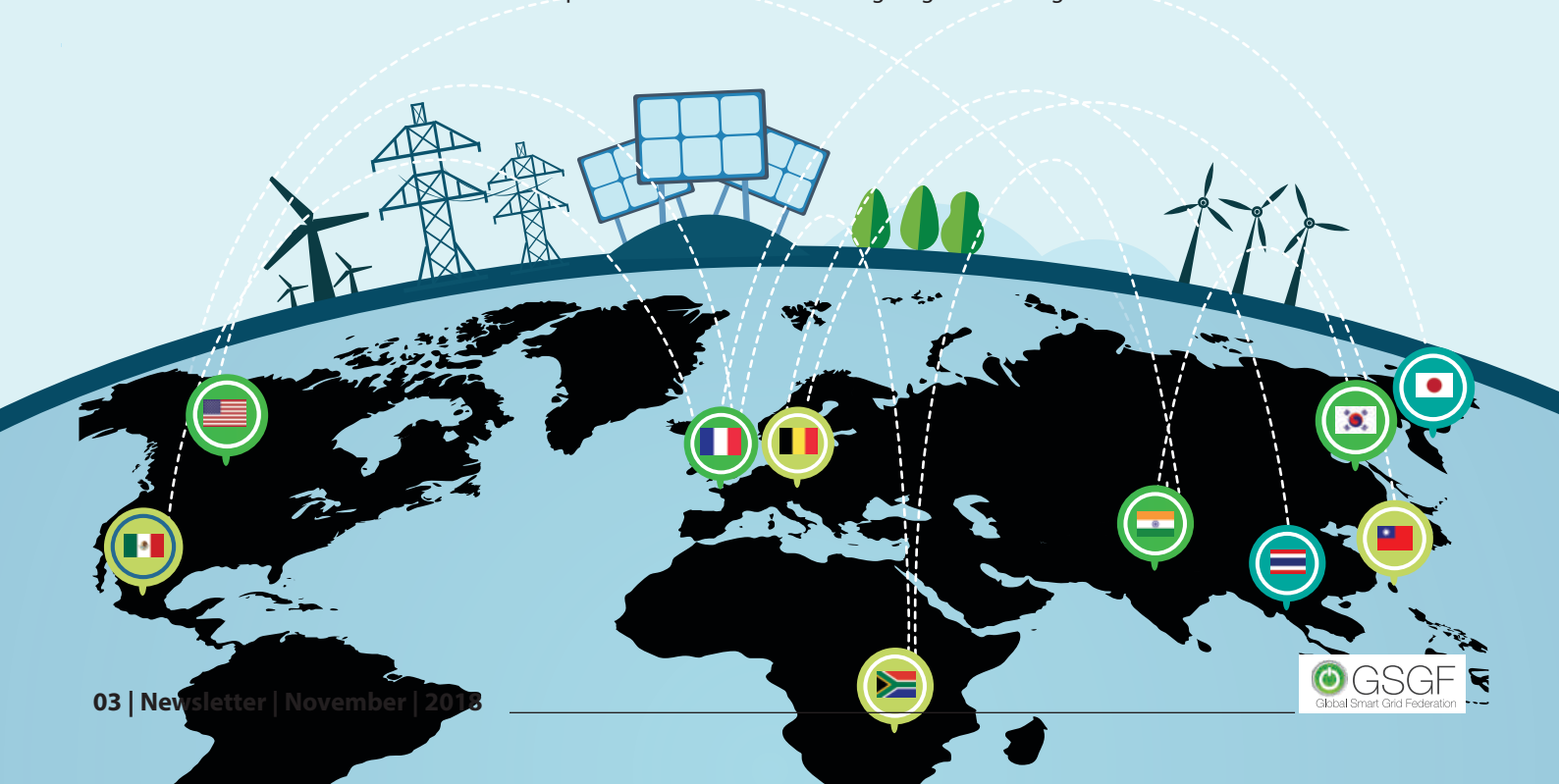
Emotorwerks, owned by Italian utility Enel, has partnered with UK-based manufacturer EO Charging to launch a smart electric vehicle charger that enables vehicle-to-grid services. Initially the domestic market will be targeted with a small fast charger that enables scheduling of charge times and response to dynamic tariffs where available from energy suppliers and in later phases, more feature will be added to support fleet managers and drivers that will enable the real-time trading of home- and depot-based charging.

Read More: <https://bit.ly/2FG0xVM>

Global Microgrids Market Set to Reach US\$30 Billion in 2022

The global microgrids market is estimated to be valued at US\$30 billion in 2022, growing at a compound annual growth rate (CAGR) of 15% between 2018 and 2022, according to GlobalData. The company's latest report Microgrids, Update 2018 Global Market Size, Competitive Landscape, and Key Country Analysis to 2022 reveals that despite the slowdown in the market, compared to the 23% growth during the 2013–2017 period, it is expected to showcase a healthy growth, mainly attributed to trends in the Asia-Pacific region. Americas will continue to be the largest market, reaching \$18 billion in 2022, underpinned by movements in the U.S. market. The Asia-Pacific market is expected to grow with a CAGR of 18%, making it the fastest growing market during the forecast period.

Read more: <https://www.tdworl.com/smart-grid/global-microgrids-market-set-reach-us30-billion-2022>



Member Updates



Florence School of Regulations (FSR) hosted the 6th EU-India Smart Grids Workshop from 19th to 22nd November 2018 in Florence, Italy

The Florence School of Regulations (FSR) hosted the 6th EU-India Smart Grids Workshop from 19th to 22nd November 2018 at Florence School of Regulation in Florence, Italy.

Opening address was made by H.E. Vincenzo Grassi, Secretary-General European University Institute and Former Ambassador of Italy to the EU.

Welcome addresses were made by Mr Reji Kumar Pillai, President, India Smart Grid Forum, Professor Jean-Michel Glachant, Director Florence School of Regulations and Mr P.K. Pujari, Chairman, Central Electricity Regulatory Commission, India.

Along with this the workshop welcomed high-level dignitaries from Indian central and state regulators and utilities, European Policy Makers, Network Operators, Regulators and Technology Providers to interact on themes such as i) Regulatory Frameworks enabling RE Integration, ii) European and Indian demonstration projects on Energy Storage to promote the integration of Renewable Energy and Electric Vehicle, iii) Evolving role of Distribution System Operators in the context of Smart Grids and vi) Upscaling and transferring promising Smart Grid demonstrations in Indian and European contexts.

The workshop was followed by site visit to ENEL Smart Grid Lab in Rome.

Events Supported by GSGF



India Smart Utility Week 2019
March 12 - 16/ 2019
Manekshaw Center, New Delhi, India



ICSG Istanbul 2019
April 25-26, 2019, Turkey



For participation in the above events please write to info@globalsmartgridfederation.org

Green Business Certification Institute (GBCI) and Tata Power-DDL sign MoU to promote smart grid technologies and sustainable power systems in India, Asia, Africa and Middle East

The collaboration seeks to identify the opportunities for applications of performance excellence in electricity renewal (PEER)

Tata Power Delhi Distribution (Tata Power-DDL), India's leading power distribution company serving a populace of 7 million in the national capital, and Green Business Certification Institute (GBCI), a US- based global accreditation and certification body working in the domain of green, sustainable and energy efficiency initiatives have signed a memorandum of understanding (MoU) today in New Delhi to establish a strategic partnership to promote, implement and accelerate the uptake of smart grid technologies and sustainable power systems in India, Asia, Africa and Middle East. The MoU aims to bring together relevant technical competencies and share resources, tools and information more efficiently. The MoU was signed by Sanjay Kumar Banga, CEO, Tata Power-DDL, and Mili Majumdar, MD, GBCI, and senior vice president, USGBC.

The main thrust of the MoU is to work jointly for the achievement of common goals and utility objectives related to identification of opportunities for applications of PEER — a comprehensive, consumer-centric, data-driven system for evaluating power system performance and to promote sustainable power. It also emphasises on promotion of energy efficiency and smart grids.

On signing the MoU, Mr Banga said, "The collaboration with an institution like Green Business Certification Institute will provide momentum towards making a robust sustainable power system. We are confident that the association with GBCI will empower utilities with key performance outcomes, capabilities, design considerations, metrics and examples of best practices that will enable customer satisfaction and improve power system efficiency."

Ms Majumdar said, "We are privileged to partner with Tata Power Delhi Distribution to steer certification of sustainable power systems in India. As the world's first certification, PEER measures and helps to improve power system performance and energy infrastructure. We work with multiple stakeholders across the world to help them transform the power sector and now we will be jointly working with Tata Power-DDL towards a common goal of providing sustainable power for all."

ESKOM : R&S RT&D launch A ground breaking Solar Smart Rural Microgrid System in the Free State!

On Friday 2 November 2018, Risk and Sustainability Division's Research, Testing, and Development (RT&D) Business Unit launched a ground breaking pilot solar-powered smart rural microgrid at Wilhelmina Farm, Ficksburg, in the Free State. This is an innovative project from one of RT&D's centres of excellence. The launch was honoured by the presence of, among others, local government officials and Cllr Nthateng Maoke (Executive Mayor of Ficksburg, Setsoto Municipality), Eskom leadership from head office, Mr Leo Dlamini (Acting GE R&S Division) and Mr Chose Choeru, Corporate Affairs (CAD) DE. The smart rural microgrid project saw its inception in 2013, initiated by RT&D's Smart Grid Centre of Excellence. From this melding of minds, key concepts and strategies were realised by the Smart Grid team that would form the basis for what is now known as Eskom's first smart rural microgrid. Wilhelmina Farm was chosen for its remoteness, its need for social upliftment, and its being un-electrified.

Construction of the smart rural microgrid demonstration plant began in April 2017, and it was commissioned in August 2017. The brand-new solar-powered small power system provides electricity to the Wilhelmina community of 14 households with 81 family members. The plant harnesses solar energy and converts it to a peak of 32 kW electrical energy via solar photovoltaic panels and power inverters. The remaining energy from the solar panels is stored in three sets of lithium-ion batteries, totalling 90 kWh of storage.

This storage facility provides electricity when there is low or no sunlight available to the solar photovoltaic panels. The differentiating factor of this pilot lies in the fact that both supply and demand are managed in real time. The project symbolises innovation and development and is consistent with Eskom's future strategic objectives of incorporating renewable and smart energy technologies in the company's integrated electricity systems. A smart rural microgrid can be a cost-effective system, mostly suitable for the electrification of rural areas with no access to the national grid.

This pilot will not only provide Eskom with a business model around smart rural microgrids as a new revenue stream, but will also provide the community with clean sustainable power for the next 25 years. The testimony of the community members at the launch spoke directly to poverty eradication and universal access. Eskom executives commended the success of the project and were in full support of the initiative. The breath taking project was pioneered by the RT&D Smart Rural Microgrid team, led by Nick Singh. Key players included Renier de Lange (Project Leader/Senior Engineer), Carl van den Berg (C&I Expert), and Ruan Olwagen (Software Engineer), supported by other team members: Renier van Rooyen, Johnny Rudolph, Mpho Manoto, Philadelphia Monkoe, Nirvaan Singh, Oswald van Ginkel, S Dywili, W Lazarus, T Mbaso, M Shunqukel, R Chetty, and Dr Vic Lawrence.

A word of appreciation to the R&S CAD team led by Lindi Nxumalo, together with Free State CAD team led by Roshan Pillay, for making the launch possible. Without the support of Leo Dlamini (Acting GE R&D Division), Sumaya Nassiep (Acting RT&D GM), Mandy Rambharos (Snr Manager Climate Change), Nick Singh and his project team including RT&D communications support staff, Mpho Makhetha, the launch would not have bear the fruits.

GSGF Updates

Energy Policy-Regulation Nexus - Need for a Different Approach

Article By

Ravi Seethapathy P.Eng., MBA, FCAE

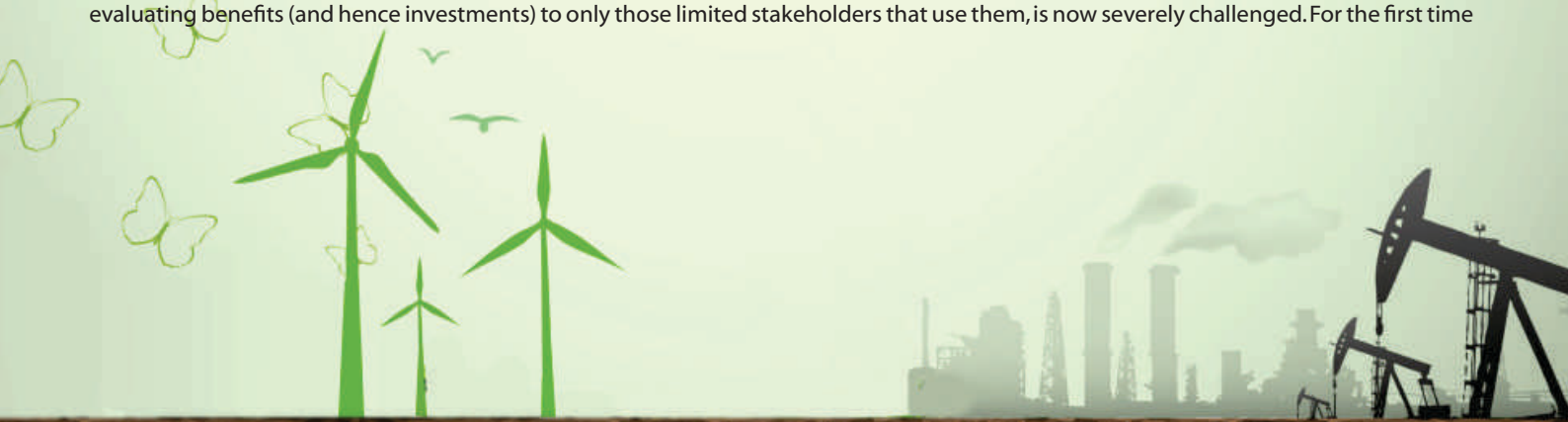
“Ambassador for the Americas”, Global Smart Grid Federation, USA



In May 2015, I was invited to the World Forum of Energy Regulators (WFER 2015) in Istanbul, Turkey to share my thoughts on the regulatory impact of small RE, small microgrids and energy access. As one of the handful non-regulator invitee amongst the 1,500 regulatory commissioners and experts from around the world, I was surprised at the positive feedback I received after my talk (which I thought was very controversial to current framework of regulation). My pitch was essentially that, (1) smaller “networks and micro-generation” (less than 50KW, 500 customers) should not be subjected to current regulation/framework, but be allowed to develop as a free market under some stipulated guidance; (2) selling small-scale electricity is unprofitable (relative to investments) and will require development support; (3) each small network infrastructure must be planned as a hub for micro-economic activity (beyond a few residential light bulbs); (4) the network blocks must be scalable for expansion (say 1KW – 10KW each); (5) miniaturized traditional distribution network design architectures/topologies will not work; and (6) enable network architectures that promote selling of products and services (from this electricity). My talk was obviously inter-twinning both policy and regulation as “pre-aligned partners” (a big no-no in today’s policy-regulation nexus).

The arm’s length “galvanic isolation” between institutions of policy-making (legislatures) and regulatory functions (tribunal of experts protecting consumer interests), has worked well with large infrastructure builds. With the rate-base being only second to the tax-base, energy occupies a keen interest in all governments for multiple reasons (economic progress, affordability, vote bank, etc.) and hence to assume a perfect “galvanic isolation” between the two, would be utopian. Over time, this boundary-line has tactically shifted with sometimes policy over-reaching and meddling with regulation and at other times, regulation not moving in tandem with policy (or rather political interests). As long as the agenda and time-lines of both the institutions moved at a slow pace, the energy industry has chugged along reasonably well, duly content with outcomes.

Beginning this past two decades, cracks have appeared in both organization’s effective functioning (and their capabilities), particularly as it relates to defining energy security, resiliency, renewable energy, fuel choices, and delivery mechanisms. The traditional methods of evaluating benefits (and hence investments) to only those limited stakeholders that use them, is now severely challenged. For the first time



now, large 500 MW solar/wind farms can be installed in 2-3 years, whilst transmission still takes 7+ years and on the distribution sector, the grid integration of renewables (requiring additions to the wires), is often much longer (thanks to the regulatory cycles) leading to power quality issues. The emergence of energy storage technologies will exacerbate this even more.

Social and technology changes is creating raised expectations from regulatory and policy processes and distrusting of politicians and regulatory agencies to think better and faster. Traditional regulatory roles that simply arbitrated (financial view) is being questioned, due to lack of well-established business case frameworks that include new technology. At the policy level national priorities are emerging with no touch-points with local entities (e.g. climate change). The industry no longer sees any stability in the guidance of the triple constraint of economy, environment and security, as it relates to energy policy and regulation.

A much different approach is needed now perhaps with even a "tighter collusion" in the Policy – Regulatory nexus i.e. policies that guide the actions of regulation and regulation that advises the policy side. This new approach, of course needs to be managed craftily (so as to not break the "galvanic isolation"), but better align the two sides, whilst maintaining procedural integrity and adjudication that is fundamental to regulatory independence. This also means that countries that do not have a strong national regulatory body, will now need one to be linked with national policy and be able to guide the state-level regulatory agencies and utilities. Here is why:

First, if one accepts that technology innovation (as evidenced today) will always outpace policy and regulatory time-horizons, the question is, should we accommodate a "beta mode" (much like entertainment electronics and PC software) in our policy and regulatory frameworks and what will this look like. Should rate-payers alone be funding this beta mode or should the nation/industry at large shoulder part of this as development burden? How will utilities be allowed to risk their bottom-lines for such beta-mode efforts (on a suspense account basis), but be allowed to (auto) recover substantial returns on an established performance-based regulation (PBR) framework.

Second, the last-mile delivery investments by utilities (end-of-life replacements, expansions, DT upgrades, etc.) must be forced to consider new (less or non-wires) technology alternatives (as comparators) within a revised/prescribed regulatory CBA framework (based on the twinning principle with policy). This is critical, since once the new investment is made (as same-old), the window of innovative opportunity is lost for the next 40 years.

Third, the consumer segment (knowing their understanding of most regulatory processes is poor) needs to be encouraged to become safe prosumers. The technology choices at their disposal (as prosumers) is now at an all time high. If we do not manage this right now, they will go ahead and do it anyway as many of these building blocks (PV panels, batteries, inverters, load management tools, etc.) are now available at nearby stores (my talk last month at the Distribution Utility Meet 2018, in Mumbai, India). I think prosumer right is here to stay. We need to guide them to safe methods of installation and sizing.

All this is important now, as PV, inverters, microgrid and storage technologies allow the larger network to be broken up into smaller pieces and reconnect again, each for their own benefits. These smaller pieces could be as small as a residence (3-5KW) or a school or even a community. The larger wires network may indeed play the role of the insurance provider (backup).

In closing, we energy professionals (experts in policy, regulation, industry, utilities) have lots to think and act upon collectively to head-off these challenges and be proactive, when these technology and/or prosumer waves does take hold in larger numbers. Questions about distrust in the existing policy/processes will also play a big part in this reform. Other questions would include (1) whether an additional third-party oversight body would be required to bridge the policy-regulation "galvanic isolation"; (2) should regulations guide efficiency/economic progress as its core principles; (3) will the current financial arbitration style regulatory processes, satisfy national priorities such as fuel security, resilience from natural disasters, climate change impacts and customer choices and (4) can regulatory processes continue to remain technology/systems agnostic.

In most countries, the green energy revolution was promoted without too much thought to sound power systems and engineering inputs which has resulted in rate shocks (much higher tariffs), policy back-tracking (retroactive incentive withdrawals) and political downfalls (electoral defeats). This is hurting investments in cleantech manufacturing and RE project development. The jerkiness of the RE project pipeline is evident globally.

Developing countries have an advantage of getting this right (as they start afresh), perhaps better than developed countries that have to manage their legacy issues. There is a huge need for sound engineering inputs in both policy and regulation, if we are to achieve this collectively.

GSGF at a glance

Charter Members



Think Smart Grids



India Smart Grid Forum



Japan Smart Community Alliance



Korea Smart Grid Association



Smart Grid Mexico



Prakarsa Jaringan Cerdas Indonesia (PJCI)



GridWise Alliance

Utility Members



Electricity Generating Authority of Thailand (EGAT)



Electricity Supply Commission of South Africa (ESKOM)



EDM Mozambique



Tenaga Nasional Berhad Malaysia

Associate Members



Green Business Certification Inc.



Florence School of Regulation (FSR)



Energy Block Chain Consortium

Current Working Groups

- Smart Grid Roadmaps:
Chair – Smart Grid Mexico
- Smart Grids for EVs:
Chair – Think Smartgrids, France

Working Groups in Pipeline

- Blockchain for Utilities
- AI and Advanced Analytics for Utilities
- Robotic Process Automation for Utilities

Contact us for more information.

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