

2018 GRID MODERNIZATION INDEX- Report Overview

The GridWise Alliance's Grid Modernization Index (GMI), produced in collaboration with E9 Insight, assesses and evaluates all 50 states and the District of Columbia in USA based upon their progress in modernizing their state's electric grid. Using data inputs from key industry stakeholders and publicly available information, the GMI benchmarks each state on a wide range of factors that influence grid modernization policies, investments, and accomplishments.

The first GMI Report was released in 2013, with updated editions appearing in 2014, 2016, and 2017. Now in its fifth iteration, GMI-2018, following the structure of the previous versions, assesses the states on factors in three broad categories:

- STATE SUPPORT, which is based on plans and policies that support grid modernization
- CUSTOMER ENGAGEMENT, which ranks states on their rate structures, customer outreach, and data collection practices
- GRID OPERATIONS, which benchmarks the deployment of grid modernization technologies such as sensors and smart meters

More than 75 metrics are examined across these three categories. Scores are assigned to each metric and totaled to create a score for each state in the each of the three categories. The possible point totals are 32 for State Support, 31 for Customer Engagement and 37 for Grid Operations.

SUMMARY GMI-2018 provides an overview of the changes taking place across USA by evaluating progress in each state, focusing the analysis on developing an "index," rather than a "ranking." It is less focused on comparing one state against another, but rather on comparing each state to what its fullest potential might be - expressed in coordinated activities that span across legislation, state policy, customer engagement, and technology deployment. Increasingly, grid modernization is less about specific devices or equipment and more about how the pieces fit together to create a system capable of transforming the traditional grid and the way that customers interact with it.

The GMI-2018 Final Report is available for download at www.gridwise.org.



1	California	82	LEADERS
2	Illinois	77	
3	Maryland	62	
4	Arizona	60	
5	Oregon	58	
6	Texas	57	MOVERS
7	New York	54	
8	Nevada	51	
8	District of Columbia	51	
10	Minnesota	50	

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Global Stories on Smart Grid

Google signs its first renewable energy power purchase agreement in Asia

Google has launched its first clean energy project in Asia and signed a long-term power purchase agreement to buy the output of a 10-megawatt solar array in Tainan City, Taiwan, about 100 km south of its data center in the country. The agreement is a collaboration between Google, several Taiwanese energy companies, and the country's government, which recently revised Taiwan's Electricity Act to enable non-utility companies to purchase renewable energy directly. The revisions are part of Taiwan's new energy policy, aimed at phasing out nuclear energy by 2025 and increasing the share of electricity generated from renewable sources to 20 percent

Read More: <https://bit.ly/2RCAm2Y>

DOE announces USD 40 million for grid modernization initiative

Department of Energy (DOE) announced USD 40 million in FY 2018-19 for funding Grid Modernization Initiative (GMI) which is a crosscutting initiative involving all the applied energy offices, and focusing on working with public and private partners to develop new tools and technologies that measure, analyze, predict, protect, and control the grid of the future. Through this funding, and with the support of our National Labs and private sector partners, DOE envisages to establish a grid that will withstand the tests and challenges of the future, while ensuring availability and reliability of supply to the citizens.

Read More: <https://bit.ly/2MMgZ6U>

10 million euro for energy efficiency in Italy

SUSI Partners have signed an agreement with Free Energia to finance LED street lighting, rooftop solar PV, and combined heat and power plants projects. The funding is expected to reduce carbon emissions of up to 5,000 tonnes per year. The capital has so far funded the development of three on-site energy generation projects with corporates and two street lighting projects with municipalities. SUSI has to date invested capital of more than 230 million euro and launched a follow-up vehicle for energy efficiency investments with a volume of at least 300 million euro.

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

Madagascar plans to double power capacity

Madagascar plans to double its electricity over the next five years and has considered five major for achieving the objective. The first is the introduction of new sources of energy like solar, wind, hydroelectric, thermal in cities that are already connected to the power grid. This will improve the quality of electricity supply and gradually reduce load shedding. In addition, in rural areas and localities that are too far off the grid, solar electric kits will be massively distributed at an affordable cost and with payment facilities for the beneficiary localities.

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

Australia's largest EV fleet to be managed by Australia Post

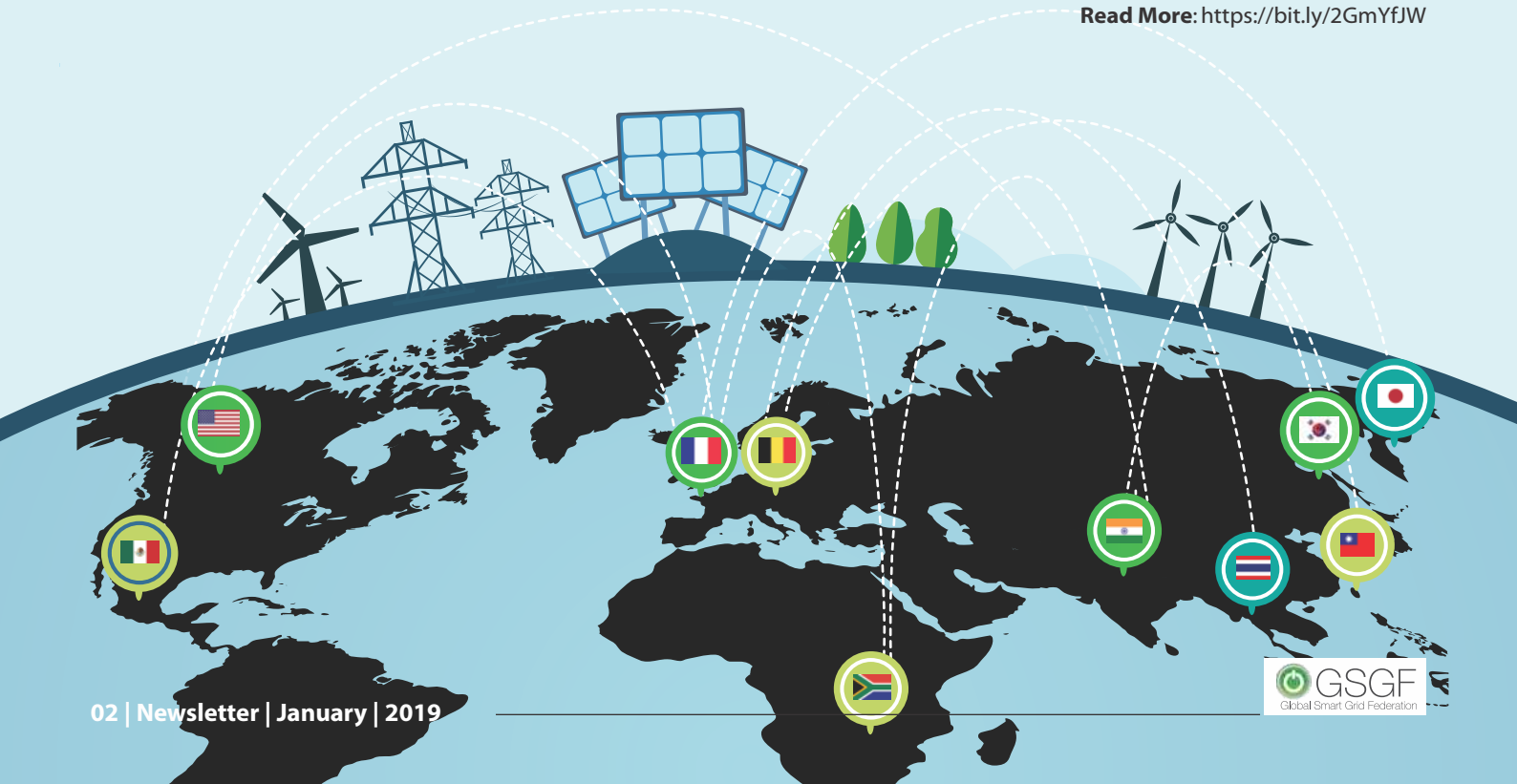
Australia Post will become the nation's largest electric vehicle fleet operator with the addition of 1,000 three-wheeled electric delivery vehicles (eDVs). These vehicles will offer additional carrying capacity, allowing postmen to deliver more parcels directly to the customer's door. The eDVs can also perform additional functions, such as collecting mail from street posting boxes. Along with delivery benefits the eDVs will also offer added safety and environmental protections. Deployment of the additional 1,000 vehicles is expected to start from June across all states. Along with the additional 1,000 eDVs Australia Post will also roll out an additional 4,000 electric pushbikes, bringing its total to 5,980 over the next three years.

Read More: <https://bit.ly/2MM2v73>

31 companies set to join the Global EV100 Initiative

According to the Climate Group's annual report on the Global EV100 Initiative, 31 companies with a combined revenue of over \$500bn have now made EV commitments as part of the campaign, including high profile names such as BT, IKEA, Unilever, EDF, and Heathrow Airport. The EV100 initiative has set a target of electrifying two million vehicles by 2030 through its membership.

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



Global Stories on Smart Grid

Siemens Canada, NB Power and Nova Scotia Power to develop Smart Grid Atlantic project

Siemens, New Brunswick Power (NB Power) and Nova Scotia Power (NSP) have been awarded \$35.66 M CAD in federal funding for a joint pilot project aimed at analysing challenges and opportunities posed by Canada's energy transition. The partners will research and test in real-time how the grid of the future can optimize integration of renewables, ensure stability of the grid and manage decentralized distribution in order to better manage the provinces' electricity, potentially reduce future electricity costs for consumers and reduce greenhouse gas emissions. The pilot, officially called the Smart Grid Atlantic project, is being funded in part by the Government of Canada's Strategic Innovation Fund.

Read More: <https://sie.ag/2DSMwkQ>

ABB develops e-drivetrain technology for heavy vehicles

ABB has launched an optimized e-drivetrain platform to help manufacturers of heavy duty special and commercial vehicles make a smooth, fast-track transition from diesel to zero-emission electric operations. The complete e-drivetrain solution includes the key elements – motor, drive and vehicle control unit - harmonized for maximum performance, reliability and energy efficiency. ABB can work alongside vehicle OEMs to design a drive train that suits their specific application needs. Manufacturer of underground mining and infrastructure equipment, Epiroc, has already adopted the new concept for its second-generation battery-powered vehicles.

Read More: <https://bit.ly/2RzH2iw>

SynchroniCity develops a smart city IoT data marketplace

SynchroniCity, a large, international internet of things (IoT) pilot for smart cities, and its technology partner Digital Catapult, a UK government innovation agency, are using TM Forum Open APIs to create a marketplace enabling the exchange and trade of a broad array of city-generated IoT data among a diverse group of stakeholders for deployment across multiple cities. The first project is currently live in the Spanish city of Santander, with launches planned for 2019 in Manchester, Helsinki, Carouge, Porto and other cities.

Read More: <https://bit.ly/2CX1qVw>

Ottawa announces plan to spend \$35.6 million on East Coast Power Grid technology

A new \$92.7-million project aims to improve the sustainability and efficiency of grid technology on the East Coast. Ottawa is contributing \$35.66 million towards the pilot project. Siemens says the partners will research and test in real-time how the grid can optimize the integration of renewables, ensure stability and manage decentralized distribution. A federal news release says the project will create 241 highly skilled jobs in Atlantic Canada. It says the project will help improve power delivery to underserved communities and reduce future electricity costs for consumers.

Read more: <https://bit.ly/2Tmchz7>

EVs Create New Value in the Energy Cloud, but Utilities Are Not Guaranteed a Cent

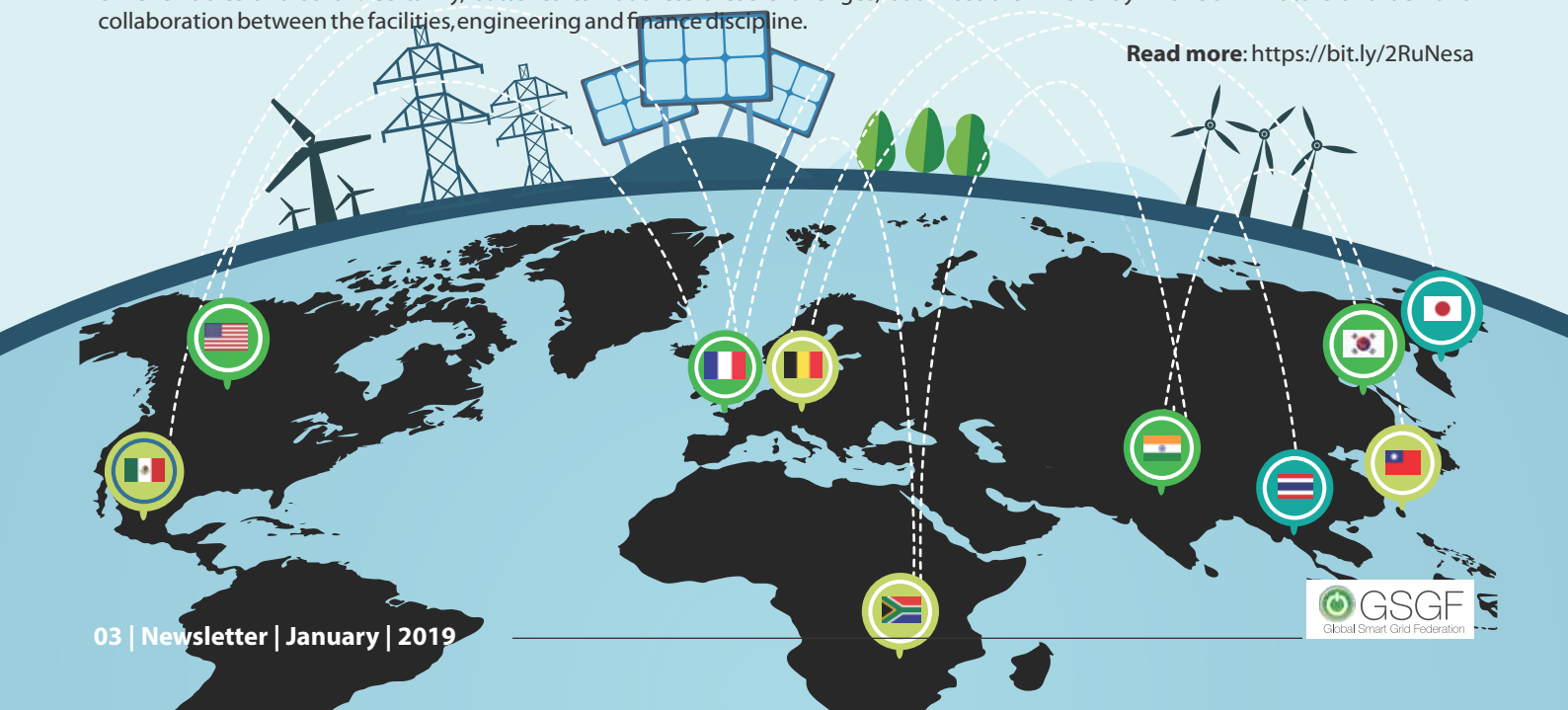
Traditional energy suppliers should be afraid, as tiles-to-tyres solar PV, stationary storage, and vehicle-to-home services lie outside a monopoly market. Suppliers have little opportunity to influence the development of these services or control who competes in the market. With automakers moving into EV-related energy services, imagine the pitch that will occur in the EV showroom, where a salesperson can offer a tiles-to-tyres system for less than the cost of charging the EV. Remember, potential customers will be sitting face-to-face with the sales rep, who will be armed with glossy brochures detailing the benefit of their system, a healthy commission, and will be backed by a finance company with 70 billion (\$79.9 billion) in assets. In competitive markets, EVs will try to become the customers' energy supplier. Utilities will only discover a customer has bought an EV once the sale has been completed. If the customer buys solar and storage from the car dealership, it is too late. Rather than grow revenues, they will be lost for at least 20 years.

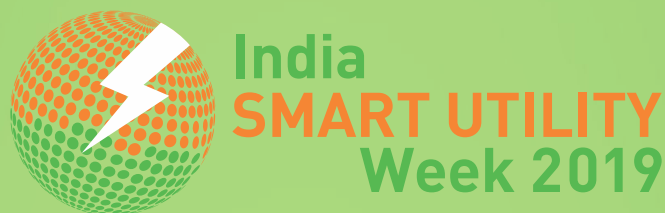
Read more: <https://bit.ly/2TqZH1E>

The Smarts inside the Storage: Software and Analytics Can Drive Economic Value

Energy storage has held the promise of solutions for companies that generate, transmit and distribute energy; this is especially true for anyone in the business of solar. Even end-users have come to see storage as a solution to issues such as balancing generation and consumption, reducing line losses, reviving grid assets after a blackout, avoiding expensive infrastructure upgrades, reducing curtailment of renewables and so on. Certainly, batteries can address these challenges, but most are inherently financial in nature and demand collaboration between the facilities, engineering and finance discipline.

Read more: <https://bit.ly/2RuNesa>





India Smart Utility Week 2019

Smart Utilities for Smart Cities
12 -16 March 2019, New Delhi, India

India Smart Grid Forum (ISGF) has been conducting India Smart Grid Week (ISGW) since 2015 which is today considered to be one of the top 5 events on Smart Grids and Smart Cities in the world. With launching of 100 smart city projects by the Government of India, water and city gas distribution utilities will also need to equip themselves with latest technologies for improved operational efficiency and successful integration into the smart city systems. However, lack of effective policy and regulations both at the central and state level along with inadequate safety guidelines, standards, business models act as barriers for its growth. In order to address all the challenges and to discuss future technologies and opportunities, **ISGF will be organizing India Smart Utility Week (ISUW) 2019. It will be an International Conference and Exhibition focused on Smart Energy, Gas and Water for Smarter Cities and will take place in Delhi from 12 – 16 March 2019 and will include plenaries, interactive workshops, keynotes, and technical sessions.**

ISUW 2019 will bring together India's leading Electricity, Gas and Water Utilities, Policy Makers, Regulators, Investors and world's top-notch Smart Energy Experts and Researchers to discuss trends, share best practices and showcase next generation technologies and products in smart energy and smart cities domains.

Experts from more than 75 countries and 200 utilities are expected to converge at the event to discuss on the latest developments, trends and technologies related to Grid Modernization, Clean Transportation, Smart and Sustainable Cities, Energy Storage, Smart Water, Smart Microgrids and Renewable Energy, Smart City Gas Distribution, Artificial Intelligence, Advance Analytics and Blockchain and will share their experiences and best practices followed globally in these emerging areas.

The conference will also witness bilateral workshops with representatives from European Union, USA and France. The event will also have Smart Grid Pilot Projects: Presentation of Results of Successful Projects - in collaboration with NEDO, Japan; Workshop on Blockchain for Utilities - in collaboration with Energy Blockchain Consortium, USA and Energy Web Foundation; Future Skills 2030 - Skilling for the Jobs in 2030 - in collaboration with Indian School of Business & Skill Council for Green Jobs; Workshop on Power Markets Design - in collaboration with European Commission, Florence School of Regulations and Central Electricity Regulatory Commission; Roundtable on Interconnection of Regional Grids in Asia: ASEAN Grid – SAARC Grid – GCC Grid; Roundtable on Women in Energy - in collaboration with C3E Initiative.

To register for India Smart Utility Week 2019, kindly visit <http://isuw.in/>. Email us at isuw@isuw.in



GSGF Updates

Connecting Europe Facility (CEF) projects Update by Mr. Marc Boillot : GSGF Ambassador –Europe & Africa

The EU Member States approved an EC proposal to invest almost 800 million in key European energy infrastructure projects with major cross-border benefits through the Connecting Europe Facility (CEF).

Out of the total amount, electricity and smart grids account for 504 million. The call for proposals (2018-2) was launched in June and closed on October 11, 2018.

The funding will support studies and works for fourteen projects – seven in electricity, two in smart grids, two in CO2 cross-border transportation and three in gas infrastructure.

When it comes to electricity, the biggest part of the funding, namely 323 million will go to the Baltic electricity synchronisation project. The project “aims to increase the security of supply and reliability of the power systems in the region through their synchronous connection to the Continental European Network (CEN)”.

The two smart grid projects that will receive funding are SINCRO.GRID and ACON SG. The latter will receive 91 million for the modernisation and improvement of the power grid between the Czech Republic and the Slovak Republic.

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

Utility Led – Ratepayer Funded Innovation



Update by

Ravi Seethapathy: GSGF Ambassador –Americas

The last two decades of my involvement in Smart Grid innovation and R&D areas (both within a large Canadian utility for 30+ years and now outside in global consulting for the past 5 years), turns many innovation framework and support parameters on its head, particularly in T&D¹.

This article builds on an earlier Report, “Should Ratepayers Fund Innovation”, published² in the Canadian Energy Regulation Quarterly, Volume 6, Issue 3, 2018, authored by James N. Coyne, Robert C. Yardley & Jessica Pryciak (all from Concentric Energy Advisors Inc.) and duly commented/concluded by Prof. Adnois Yatchew of the University of Toronto. This referenced article highlights the following:

- Utility-led, rate payer-funded innovation has strengthened over the past decade driven by the need to integrate significant quantities of customer-sited DERs.
- Recognition by the Policy side (governments) that utilities can play a central role in advancing this agenda and that Government (tax payer) funding is most appropriate in the high-risk early R&D stages and Customer (ratepayer) funding is most appropriate where the benefits belong to the customers. Such programs de-risk the investment for both customers and shareholders.
- A sample of such ratepayer funding (Australia, USA, UK and Canada) range from USD \$0.72 to USD \$14.12 per customer annually or an average of USD \$6.55 per year. The RD&D cost recovery in a few jurisdictions were capped at 0.5% of total utility revenue or USD \$ 10 million (to protect against runaway RD&D investments by utilities)
- Regulators have implicitly added another important objective to spur the transformation of utility cultures to becoming learning and innovative organization. This may see a growth in “Incentive Regulation for Innovation”.
- Energy innovation provides customers and society with benefit-to-cost ratios in the range of 2 to 5:1.

In my view, innovation (or managing innovation) does not naturally come to the utility sector despite its excellent technical and operational knowledge about the generation/wires business that it runs. The monopolistic business model together with its local regulatory oversight, makes it compulsive to avoid any and all risks. There are five factors that allowed the utilities (in the above cited article) to make innovation a success. These are (1) they were all large utilities; (2) facing a high level of requests for R.E (wind/solar PV) generation connections; (3) the policy push towards renewables was backed by an impatient public (at least then); (4) they had a Smart Grid roadmap identified; and (5) the industry innovation was churning out products that needed a “large integrated real-life test bed” to prove successful deployment.

During my tenure in the utility RD&D/innovation area, there were several additional internal frameworks instituted within our group to ensure that the utility's “residual risk” (or shareholder's risk) was not only minimized, but also ratepayers' funding had an improved chance of success i.e. a prudent RD&D risk framework that worked internally and externally. The basic tenets were as follows:

¹In an earlier Dec 2018 article in this GSGF forum, I wrote about the need for a new healthy Policy-Regulation Nexus.

²Based on a longer research report supported by the Canadian Gas Association and Canadian Electricity Association

1. Have a long-term Smart Grid Roadmap prepared and approved by senior management. It is very important to understand the new business drivers, technology gaps, HR gaps, organizational impacts and the collective vision to shape this new tomorrow (alignment). Not having this done, leads to endless debates on requirements and R&D direction/investments.
2. Start the theoretical validation groundwork for new systems innovation studies, early in the cycle based on the anticipated policy push and industry innovation progress (have multiple pots going – power systems, telecom, DERs, Energy Storage, etc.) using academia, research houses, and individual experts. This is a very low cost in the overall RD&D triage process. Its “better to know early, what you do not know”.
3. Build on the theoretical validation with a small-scale laboratory demonstration (initial proof). Identify gaps in tools and process that do not exist inhouse. For example:
 - a. Planning tools for RE/DER integration, system studies to be performed, limits on plug-and-play sized connections, system upgrades to wires (where/what), etc.
 - b. Internal capacity building (identifying internal champions) to lead this area.
4. Should the innovation move up in the stage-gate to a field trial, the following risk measures need be activated depending on the size and impact of the investments (say 1M\$ plus):
 - a. Provide a heads-up to the Regulator and Policy makers on this effort
 - b. Institute external partners (both funding and knowledge experts) in guiding this field trial effort. This provides assurance that the best efforts were made. No one partner should be dominant in investments (shared liability in finance, interests, direction and process)
 - c. Carry a few small utilities/industry/academia/expert partners that are interested in the partnership (even if their financial contribution is minimal). A discerning view is important
 - d. Do not allow residual financial risk to be more than 10% of net income of each contributing partner per project. Cap all the projects risk at 15% of net income
5. Pull the plug on projects quickly (even midway) that fail to show promised objectives (reset and start the formal queue again).

The above framework provided for a more transparent view to all stakeholders (internal and external). The usual 50-50 “coin toss” chance of new technology success was not only significantly improved but understood well by all (including policy makers, regulators, public) that best use of everybody's contribution was made and risks were mitigated for better success. Despite this, you do get failures, but a success-chance rate of 70-80% is really good.

In my frequent travels to Asia and Middle East, I see a need for many aspects of the above being adopted by utilities. The utility best understands the supply-demand interplay and should lead T&D innovation. The high capex nature of the utility business is in itself a big risk!



GSGF at a glance

Charter Members



Think Smart Grids



India Smart Grid Forum



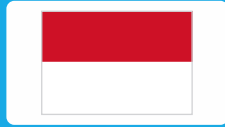
Japan Smart Community Alliance



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

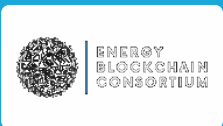
Associate Members



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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