

## ISGAN and GSGF Celebrate Global Excellence in Smart Grid Projects with special focus on 'Smart Microgrids'



On May 29, 2019, ISGAN, in partnership with the Global Smart Grid Federation (GSGF), announced the winners of the fifth annual ISGAN Award of Excellence, during a special ceremony during the ISGAN-Mission Innovation (MI) IC1 Forum at the tenth Clean Energy Ministerial (CEM10) in Vancouver, Canada. Ms. Amanda Wilson, the Director General of Natural Resources Canada and Mr. Youngjoon Joo, the Korean deputy Minister for Trade, Industry and Energy, presented the ISGAN Award to the winning projects.

The ISGAN Award of Excellence (AoE) international competition showcased leadership and innovation in smart grid projects around the world. The 2019 ISGAN Award of Excellence recognized exemplars in the field of smart grids with a special focus on "Local Integrated Energy Systems (Smart Grids)" that will advance smart grids by sustaining a reliable and resilient grid through integration of energy systems and allowing for customer participation in the electricity enterprise.

The Theme for 2019 was Excellence in Smart Grids for Local Integrated Energy Systems (Smart Microgrids) Competition at a Glance and the "Winner" of 2019 ISGAN Award of Excellence, was awarded to KEPCO's Open Microgrid Project, from Korea.

For the fifth Annual ISGAN Award of Excellence competition, a wide range of smart grid project nominations were received, representing projects from 10 different countries throughout the world. The winning projects were selected by an independent, international jury of smart grid experts, led by Reji Pillai Kumar, Chairman, Global Smart Grid Federation (GSGF). The jury selected the winning projects based on the following four criteria: potential impact, economic rationale, potential for replication and adaptation, innovation and other benefits.

Members of the Jury who contributed their time and expertise to the evaluation process were the following: Reji Kumar Pillai (India), Jury Chair, Chairman, Global Smart Grid Federation, President, India Smart Grid Forum; Steve Hauser (United States), CEO, GridWise Alliance; Oscar Miranda Miranda (Mexico), Co-founder and Chairman- Smart Grid Mexico; Michele de Nigris (Italy), Director, Ricerca sul Sistema Energetico, RSE SpA; Valerie-Anne Lencznar (France), Managing Director, Think Smart Grids; Robert George Stephen (South Africa), Technology Master Specialist, Eskom, President, CIGRE; Cheong Kam Hoong (Malaysia), Industry Advisor of University Tunku Abdul Rahman, GSGF Ambassador; Kentaro Akiyama (Japan), Vice President/Professor, Seijoh University; Ravi Seethapathy (Canada), Executive Chairman, Biosirus Inc., GSGF Ambassador.

### Table of Contents

Page	News topic
1	<b>Cover story:</b> ISGAN and GSGF Celebrate Global Excellence in Smart Grid Projects
2-3	<b>Stories across the globe on Smart Grids:</b> <b>Special:</b> European governments to form alliance for developing next generation EV batteries
4	<b>Member Updates</b> <b>Special:</b> Korea Smart Grid Association member KOSPO Secures Financing for Construction of Gyinaemi Photovoltaic Power Farm
5	<b>GSGF Update</b> <b>Special:</b> Malaysia's First Hydrogen Plant Set Up in Sarawak – Article by GSGF Ambassador Dr. Ir. Cheong Kam Hoong
6	<b>GSGF at a Glance</b>

# Global Stories on Smart Grid

## United Kingdom joins International Solar Alliance

The United Kingdom is the latest entrant to the International Solar Alliance (ISA), joining hands with India and 73 other member nations toward a common goal of sustainability. The proposed collaboration between the United Kingdom and ISA includes solar financing, developing next-generation solar technologies, and leveraging the United Kingdom's solar business' expertise to support the delivery of ISA objectives. The agreement between the United Kingdom and ISA was signed during the Foreign and Commonwealth Office (FCO) consultations held between Foreign Secretary of India and United Kingdom at the Foreign and Commonwealth Office, in New Delhi, India.

**Read More:** <https://bit.ly/2LNnjOJ>

## Thailand set to add 56GW of power capacity by 2037

Thailand has approved a National Energy Plan that will add 56GW of new capacity by 2037 to reach total capacity of 77GW. Currently the power generation capacity of Thailand is 40GW, with 20GW to go offline in the coming years. According to the energy plan, by 2037, the total generation capacity comprise of 53 percent natural gas, 20 percent renewable energy, 12 percent coal, and the rest from other sources including electricity import from neighboring countries.

**Read More:** <https://bit.ly/2WKerKI>

## New York allocates USD 280 million for energy storage projects

The New York State Energy Research and Development Authority (NYSERDA) will allocate USD 280 million for energy storage projects across the state to accelerate industry growth and drive deployment and The funding is part of a USD 400 million investment to achieve the state's goal of deploying 3 GW of energy storage by 2030. The NYSERDA funding will be available in two categories i.e. USD 150 million for bulk storage projects over 5 MW that primarily provide wholesale market energy and distribution services and USD 130 million for customer-sited retail storage projects below 5 MW that can be installed alone or paired with onsite generation.

**Read More:** <https://bit.ly/2IY8tlw>

## Ikea to begin the sale of Solar Modules in Sweden

By 2025, the furniture giant plans to offer solar panels worldwide at its stores. The company is in negotiation with potential partners and a supplier for the sale of PV panels in Sweden, which is planned to start in the autumn. Ikea, the world's largest furniture retailer, will begin the sale of its "Solstrale" PV modules in its domestic market after the summer. The Swedish multinational said it intends to benefit from the lessons learnt from its sales of solar panels in Germany – where it has encountered problems with a consumer watchdog – and from Italy, Belgium, Holland and Poland. The Swedish government has improved regulations for solar in the past two years and has increased the budget for rooftop PV rebates several times. Ikea said it is in negotiations with potential suppliers and partners for the Solstrale offer in Sweden. Finding the right partner may help the retailer avoid issues such as those encountered in Germany, where consumer association Verbraucherzentrale NRW said Ikea's advertising campaign to promote its solar offer was misleading as it did not sufficiently outline the different roles played by Ikea and its partner Solarcentury Microgen (Germany) GmbH.

**Read more:** <https://bit.ly/2LErWdY>

## Utilities need to get Smart or Lose Efficiency and Customers

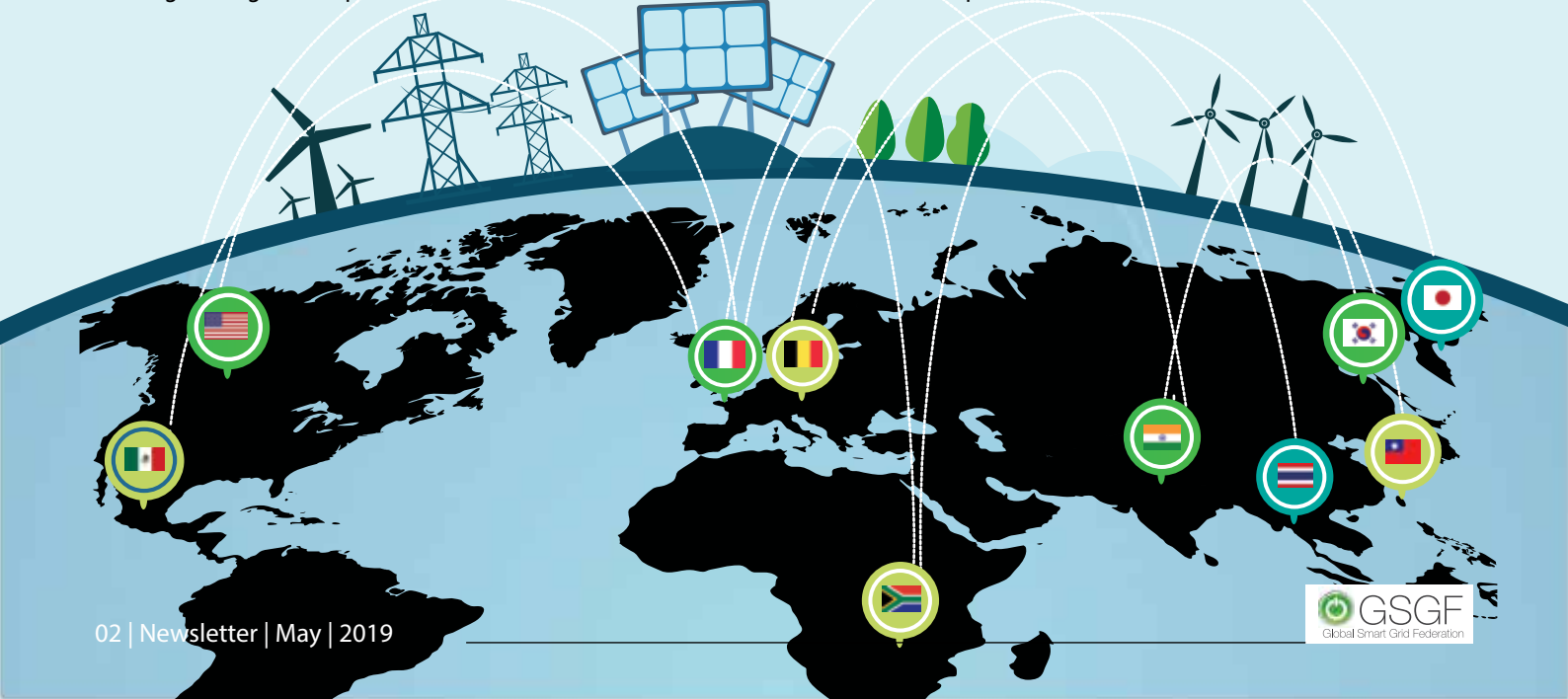
The smart grid could be a double-edged sword for utilities as it creates potential for efficiency gains but also opens the market to new entrants. Utilities need to stay on top of their customers' preferences for energy delivery or risk losing them to suppliers from other industries who tend to adapt to new technologies more quickly, speakers warned at the Digital Utilities Europe event in London in the first week of May, 2019. Some countries have encountered technical issues with smart meter roll-out and other barriers to full deployment remain. A more engaged consumer will emerge, who might be persuaded to use energy at an optimal time for the network, but may also be lured away from traditional suppliers if services can be packaged in an appealing way by other more nimble and customer-focused industries.

**Read more:** <https://bit.ly/2VV0Kvt>

## IEA warning against Stagnation of Renewables

After two decades of growth, the amount of newly installed renewable energy capacity is no longer rising and, despite a 7% growth in electricity generation from clean energy sources, global energy-related carbon emissions have risen 1.7%

Last year saw 180 GW of renewable energy generation capacity installed worldwide, according to the International Energy Agency (IEA). Although the figure is impressive, and matched the amount added in 2017, the IEA has pointed out it was the first time the volume of new



# Global Stories on Smart Grid

renewables had not risen year on year since 2001 and was not enough to keep the world on track to achieve the objectives defined in the Paris climate change agreement. In fact, the world saw a 1.7% rise in energy related CO<sub>2</sub> emissions last year, said the agency. According to the IEA's Sustainable Development Scenario, at least 300 GW of new renewable energy capacity is required per year up to 2030 to keep the Paris goals within reach. Adding 180 GW annually, said the agency, will provide barely 60% of the new clean energy capacity required. Among the competing clean energy technologies, solar power again dominated, with 97 GW of new generation capacity added, similar to the amount of PV installed in 2017.

**Read more:** <https://bit.ly/2vTfxbh>

## DHYBRID to supply control and energy storage solution for seven hybrid plants in Senegal

German hybrid specialist DHYBRID will supply seven PV-diesel hybrid systems in remote Senegalese locations with sophisticated hybrid control and energy storage systems. The total output capacity is 2 MW, the storage capacity 2 MWh. The plants will enable Senegal to supply power to very isolated sites and to diversify its energy mix. DHYBRID has been selected by French EPC Company and main contractor Omexom – the energy brand of the VINCI Energies Group – for seven prestigious projects because of its scalable technology platform as well as its global track record in hybrid installations. The total project will generate enough power to cover the annual needs of 140,000 people and will avoid atmospheric CO<sub>2</sub> emissions amounting to 19,000 tons per year, equivalent to the emissions of a car driven 135 million km. The scheme will be part of a €26.8 million investment financed by German development bank KfW and Senelec, the national electricity company of Senegal, and will consist of the hybrid sites plus an additional 15 MW solar installation. The project sites will be spread over four large regions: the Saloum Islands and the Thiès region, in the western part of the country, and the Tambakounda and Kolda regions in the east. DHYBRID will supply its proprietary Universal Power Platform – a modular and manufacturer-independent Energy Management System and SCADA solution that will manage, control and monitor the interaction between diesel generators, a PV inverter and energy storage system to minimize electricity costs and CO<sub>2</sub> emissions.

**Read more:** <https://bit.ly/2VyzmDV>

## European governments to form alliance for developing next generation EV batteries

European governments and companies, led by France and Germany, will form an alliance for developing next-generation batteries for electric vehicles, investing five to six billion euros (\$5.6 to \$6.7 billion) in the project. A maximum of 1.2 billion euros in public subsidies would be granted to the alliance, out of which at least four billion euros is expected to come from private companies.

**Read More:** <https://bit.ly/2Lz0vSW>

## Vermont Utility testing battery storage system for power metering

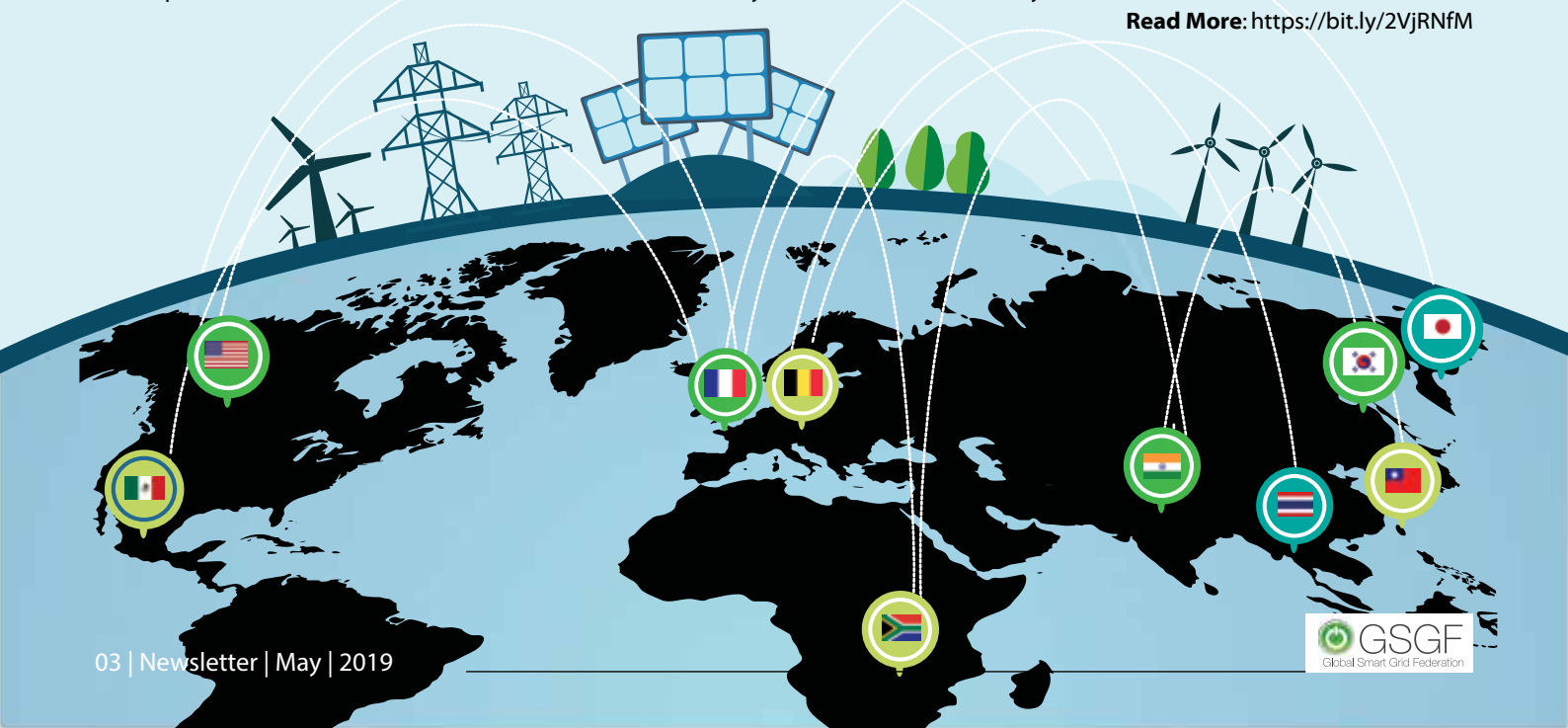
Green Mountain Power, an energy provider to 265,000 consumers in the US state of Vermont, is testing the usage of battery energy storage to measure energy delivery whilst reducing consumer energy costs. As part of the Resilient Home pilot programme, the utility is partnering with Tesla to replace traditional energy meters with a battery energy storage system. The pilot is open to 250 consumers. The project is expected to provide consumers with increased resiliency during outages at the same time reducing their carbon footprint. Customers participating in the pilot can buy two Tesla Powerwall batteries for \$30 a month or purchase the battery via the utility's Bring Your Own Device initiative at discounted price. The batteries provide whole-home backup power, switching on seamlessly during outages like a generator. The battery system will also provide energy metering capabilities. The service will include customers choosing a convenient, flat monthly price for power, and lock it in for a year. Consumers can also generate excess revenue by selling their stored energy to the utility during times when demand on the main grid is high. The pilot falls under efforts by the utility to prepare its customers for future business models and to adopt new technologies such as solar and smart devices.

**Read More:** <https://bit.ly/2Wrc9eN>

## Canadian Energy Regulator allocates 300 MW Energy Quota for Crypto Mining

The Régie de l'énergie, the energy sector regulator of Quebec, Canada, has announced new rules that will support blockchain innovation in the region. The regulator's decision envisages the classification of blockchain companies as a separate category of consumers. A 300 MW block will be dedicated to the industry, of which at least 50 MW will be reserved for small projects of 5 MW or less. This 300 MW will be in addition to the 158 MW already granted to existing customers approved by Hydro-Québec, the public utility that manages the generation, transmission and distribution of electricity in Quebec, and to the 210 MW granted to existing customers approved by municipal distributors. The result is a total of 668 MW of electricity for the blockchain industry.

**Read More:** <https://bit.ly/2VjRNfM>







*President*

Shin Jeong-shik of Korea Southern Power Co. (KOSPO)

## Korea Smart Grid Association member KOSPO Secures Financing for Construction of Gyinaemi Photovoltaic Power Farm

Korea Southern Power Co. (KOSPO) successfully secured financing for the planned Gyinaemi Photovoltaic Power Farm in Taebaek City, Gangwon-do, South Korea. The fundraising will ultimately spur KOSPO's plan to build 100 homegrown photovoltaic power units.

This project is designed to help Korean photovoltaic power farm contractors secure a competitive edge by building photovoltaic power units with localized equipment's and components. KOSPO successfully raised the 33.52 billion won necessary for the construction of the Gyinaemi Photovoltaic Power Farm from Kyobo Axa Investment Managers.

The Gyinaemi Photovoltaic Power Farm is KOSPO's fifth homegrown photovoltaic power farm project in an area near Hasami-dong, Taebaek City. The project calls for the building of 12 19.8MW photovoltaic power units with a combined capacity of 1.65MW. The private sector will channel 47.2 billion won in the construction of the farm, scheduled to be dedicated around this year-end.

When the farm is inaugurated, it will be capable of generating 37,600 MWh of electricity, equivalent to the annual electricity consumption of 8,000 households. It is expected to have an effect of reducing 16,900 tons of greenhouse gas emissions per annum. The farm's power generation will have an effect of substituting for 670,000 pine trees aged 20 years planted in an areas 11.5 times more than the size of Yeouido, Seoul, or purchasing 4.61 billion won worth of Dubai crude oil on the annual average for the recent three years.

KOSPO plans to do its best to ensure the safety of the construction site thorough joint inspection and safety diagnosis and drone-oriented surveillance flying in cooperation with Gyinaemi Photovoltaic Power Farm and cooperative players.

The power company also plans to contribute to the reinvigorating of the regional economy by developing the Gyinaemi Photovoltaic Power Plant into a regional landmark in cooperation of the regional and local governments.

The Gyinaemi Photovoltaic Power Plant, to be built at a place more than 1,000 meters above the sea level, is expected to be faced with environment issues related to the implementation of the project, but the project is making a smooth sailing for the successful construction of developing the photovoltaic power farm into an eco-friendly one through aggressive cooperation with project participants, local governments and neighborhood residents, by agreeing to create a forested area substituting for the trees being logged at the construction site.

KOSPO has so far built the 18MW Taebaek, 16MW Changjuk, 30MW PyeongChang, and 32MW Jeongam photovoltaic power farms. On top of the Gyinaemi Photovoltaic Power, to be dedicated late this year, the power company plans to have the 60MW Anin Photovoltaic Power Farm in 2020, the 40MW Cheongsu Off-shore Photovoltaic Power Farm in 2021, the 30MW Mt. Yukbaek Photovoltaic Power Farm in 2022, and 100MW Daejeong Photovoltaic Power Farm in 2023, contributing to creating the homegrown photovoltaic power ecosystem.

## Events Supported by GSGF



For participation in the above events  
please write to [info@globalsmartgridfederation.org](mailto:info@globalsmartgridfederation.org)

## Malaysia's First Hydrogen Plant Set Up in Sarawak

By

Dr. Ir. Cheong Kam Hoong

"Ambassador for the Asia Pacific Region", Global Smart Grid Federation, USA

The first hydrogen plant of Malaysia in Sarawak has been completed, with testing and commissioning in progress until later this month.

Sarawak Energy Bhd (SEB) is investing RM15mil in this pilot hydrogen production plant and refuelling station project to evaluate the viability of hydrogen and fuel cells to power Sarawak's transportation sector.

The plant will be able to produce 130 kg of hydrogen per day, which can power five buses and 10 cars per day.

The hydrogen refuelling station will be the first dedicated for transportation in South-East Asia. More hydrogen plants will be built if the pilot project proved successful.

Sarawak had purchased three hydrogen-powered buses from China that served as part of the pilot project and research into a green public transport system.

Sarawak could produce hydrogen as an alternative green energy as the state had abundant water resources that could be converted into hydrogen for public transport or even for export.

Countries like the United States, Europe, South Korea and Japan are now producing vehicles that run on hydrogen fuel cells due to environmental consideration and depleting fossil fuel resources. From 2013 to 2017, there were 6,500 hydrogen fuel cell cars sold globally. However, the cost of hydrogen production in these countries is much higher due to higher energy cost and less water resources. Production of hydrogen from natural gas is not competitive as compared to the production of hydrogen from water through electrolysis.

Sarawak has all the advantages in producing hydrogen from water at the cheapest cost and using hydro-power, a green energy.

With the advancement of technology, Sarawak envisions to realize the export of hydrogen to countries that produce hydrogen fuel cell cars in the future and will become its next source of revenue for the state.

Sarawak is collaborating with the Linde Group – the world's leading company in water electrolysis-based hydrogen generation – on the production of hydrogen project.

More details at <https://www.klscreener.com/v2/news/view/527798>

## Waste to Energy - Slips, Trips and Falls

By

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Recently, I have been inundated with questions on the efficacy of Waste-to-Energy (WTE) technologies. With the maturity of the solar and wind markets, perhaps it is time for us to turn to the next important "fuel" i.e. "waste". So, the question is indeed timely.

WTE technologies are not new and have been around for over two decades. The initial challenges were around (a) commercializing various conversion processes developed within the academia; (b) scaling up from a lab pilot; (c) waste preparation chemistries; (d) choice of materials for equipment longevity; and finally (e) the desired output conversion (heat, biofuel, biogas, electricity, etc.).

Based on the above, differing conversion processes were adopted by many companies as market differentiators based on (a) feedstock (biomass, municipal waste, medical waste, plastics) and (b) choice of thermal processes (pyrolysis, high temperature, steaming, microwave). A second big thrust focused on producing products, that were met industrial needs (power, heat, synthetic fuel, biogas)

This past two decades has yielded interesting observations from the many global installations. While a few good ones are still operating today, there have been many “slip, trips and falls” along the way. Most had frequent mechanical breakdowns, many operated at sub-par performance levels (poor ROI) while others were quietly shutdown due to ill-suited designs. The good news is that there are survivors and this good few have been in operation for nearly a decade. However, the investment returns to the owners of such plants have not been much to cheer about. Commercial lessons are secrets and they will likely remain so.

Today many more companies have entered this market with even finer array of conversion processes built on the market lessons of the past decade. A few have gained field operational experience while others are still trying it out. Nevertheless, the market pull is strong and the timing may be just right.

So where are the Achilles heels in WTE? The following is the gist of my thoughts:

#### 1. Waste Stream Itself:

- a. There is an attempt to mimic WTE designs with traditional fuels technology (gas, coal, lignite). These traditional fuels (albeit produced by nature) are very generically batch consistent in calorific values when specified and sourced. Waste stream’s calorific value (even biomass) is not batch consistent.
- b. Municipal Solid Waste (MSW) is most difficult to sort. It has many components including ferrous/non-ferrous metals, stones, wood, paper, plastic, food waste, etc. So, a sizable investment is needed to separate the good combustible waste from the rest. This front-end needs to be reliable.
- c. MSW’s calorific value is very variable from batch to batch. Only in the case of pure biomass does mixing batches (to a stable consistency), makes sense. For MSW, each batch will require process tuning based on a sample test or even during firing. Also, the waste stream availability (tons/day) is not consistent in practice. A good inventory is needed at the plant site to keep the WTE going.

#### 2. Moisture Reduction:

- a. All waste streams have moisture and they vary from batch to batch. Moisture reduction is very key to good combustibility but is often not adhered in practice in tropical countries (open/outdoor storage). Even biomass needs to have its moisture reduced. Unlike coal/lignite, it is not possible to pulverize MSW very finely for good combustion.
- b. Sheltered storage is needed in tropical climates, but is rarely adopted due to public health and rodent related issues. In such cases, a preheating stage may be needed to de-moisturize the feed stock.

#### 3. Combustion Process:

The combustion process matters immensely. Some combust at higher temperatures while others utilize lower pyrolysis temperatures. Certain technologies also ionize/atomize/oxygenate/hydrogenate the air infeed for a better and complete combustion. An effective process produces little residues and a cleaner burn (or gas production) and reduces large unburnt bottom ash issues. Also, pollution deviation at the stack-level is better controlled, requiring less expensive scrubbers.

#### 4. Thermal Cycling:

Thermal cycling is to be expected. Hence, all materials that make up the core combustion processes and enclosures need to appropriately selected. This is often ignored as cheaper equipment is often built for lowering upfront costs. Thermal cycling reduces useful life of all plants, but better materials last longer and do not breakdown frequently.

In closing, the failure of the WTE technology, is not just the equipment itself, but poor specifications, poor feedstock conditioning and rampant operational abuse. WTE plants are not standard coal/gas fired plants and need to be customized based on a batch use.

Emerging economies that are yet to take up WTE, need to wade into this carefully. Spending municipal tax-payers money on half-baked selections is disastrous. A good experienced design/consulting team will help. Settling for a lower ROI with a good robust plant is better than a false sales pitch, a hope and a prayer. An alternative approach would be to have an IPP build and run this with the offtake power being purchased.

One can avoid these “slips, trips and falls”, if one de-risks the above elements thoughtfully.





# 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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