



**WELCOME TO OUR
Q2 2020 NEWSLETTER!**

Our Q2 newsletter looks back on some select industry highlights and shares some of our insights.

It certainly feels like this year should be over by now, but we're only just halfway through!

With the pandemic on-going, social change brewing around the world and the presidential campaign in the US, we've got a lot left on our plates for the second half of this history-making year.

Buckle-up and know that we are all in this together!
Dr. Mani Vadari, President

AT MODERN GRID SOLUTIONS, SMART GRIDS ARE BUSINESS AS USUAL
*Differentiated services to utilities and their vendors focusing on Smart Grid and System Operations.
Our team brings deep expertise in all aspects covering technology and management consulting.*



SPECIAL FEATURE

A Tale of Two Teachers

Dr. Krishna Kishore Nudurupati and Dr. Anil Jampala share their experiences using Mani Vadari's books as text in their university courses

Smart Grid Redefined: Transformation of the Electric Utility

I teach senior undergraduate students a course on electric power systems and co-teach with my American colleagues a course on smart grids. Over my career thus far, I've supervised nine PhD and three MS students and several BTech/MTech dissertations in the areas of PES and signal processing. This spring while on sabbatical from the Indian Institute of Technology, I taught a course on Smart Grids at UMass Amherst.

I and my colleagues have been teaching a course on smart grid for six years in India at IIT Kharagpur. While at UMass I adopted Mani's book in teaching my 19 students, both senior undergraduates in Electrical Engineering and graduate students from the Electrical and Computer Engineering Department.

I chose Mani's book as it is very informative and enabled me, and hence my students, to understand the state of the North American grid and all the facets involved in transforming into a smart grid. I found it to be a good textbook for giving the breadth of the smart grid topic and to motivate students to see how people from various disciplines can enable smart delivery of electricity, a critical commodity.

Dr. Krishna Kishore Nudurupati, EE Professor and Associate Faculty of Energy Science and Engineering at the Indian Institute of Technology, Kharagpur

Electric System Operations: Evolving to the Modern Grid

During the 2020 spring semester ten students took my senior level course on Electric System Operations at Seattle University. My motivation for teaching this course was to attract talent to our industry and I was ready because I was already familiar with Mani's book on this subject. (Disclaimer: Mani and I were in graduate school together and later were colleagues at ESCA/Cegelec ESCA.)

When I first read the book, I was very impressed with the breadth covered. My response to those who might say there is not enough depth, is that each chapter in the book can be a quarter or semester long course!

Be that as it may, I covered almost the entire book during this course, via online classes. The case studies were extremely useful. Thankfully, several of my industry colleagues also contributed as guest lecturers. For example, Mr. Ted Hailu of ERCOT covered how the ERCOT market system operates.

As the cliché goes, the proof is in the pudding. The pre-course survey indicated many students lacked knowledge about the power industry. By the time the course was done, the students took up projects they were unfamiliar with and yet successfully delivered projects demonstrating scraping power outages information from the web, using voice commands to search web for outages, applied machine learning for solar radiance forecast, and Renewables Resource Management.

Dr. Anil K. JAMPALA, FIEEE, P.E. PMP



MERGERS AND ACQUISITIONS

Berkshire buys Dominion's natural gas assets in \$10 billion deal

Dominion Energy [announced](#) that it has executed a definitive agreement to sell substantially all of its Gas Transmission & Storage segment assets to an affiliate of Berkshire Hathaway Inc. in a transaction valued at \$9.7 billion, including the assumption of \$5.7 billion of existing indebtedness. For Dominion, the move is part of its transition to a pure-play regulated utility company that focuses on clean energy production from wind, solar and natural gas. Following the sale, Dominion expects that 90% of its future operating earnings will come from its utility companies that provide energy to more than 7 million customers in states like Virginia, North and South Carolina, Ohio and Utah.

Partnership to develop wind turbines with 3D printed bases

A multi-year collaboration has been created between GE Renewable Energy, COBOD and LafargeHolcim to develop record-high 200-metre high wind turbines. At the initial stage, the partners will work together to produce a wind turbine prototype in addition to a production-ready printer and materials range in order to scale up production. The goal surrounding the partnership is to boost renewable energy production while lowering the Levelized Cost of Energy (LCOE) and optimizing construction costs at the same time. The partnership also aims to explore the most economical ways of capturing more wind energy by using the best designs and processes to produce taller wind turbines. For more information, read [GE's press release](#).



Ørsted and TSMC sign the 'world's largest renewables corporate power purchase agreement'

Danish energy firm Ørsted and TSMC, a Taiwan-headquartered semiconductor company, have signed a deal described in an Ørsted [press release](#) as "the world's largest renewables corporate power purchase agreement." The 20-year deal will see TSMC purchase all the energy produced by Ørsted's yet-to-be-built 920-megawatt offshore wind farm off Taiwan. The fixed price contract will come into force when commercial operations at the facility begin. This is expected to be in 2025/26, according to Ørsted, subject to a final investment decision and grid availability.

TVA approves the biggest acquisition ever by a power cooperative of a municipally owned utility

Middle Tennessee Electric Membership Coop – the second largest coop in the U.S. – took over Murfreesboro's municipal electric system creating one of the biggest distributors of power generated by the Tennessee Valley Authority. Under the agreement approved by TVA in June and already approved by the boards for both utilities, Middle Tennessee Electric will pay \$302 million over the next 15 years to the city of Murfreesboro to acquire the Murfreesboro Electric Department and its 67,000 customers. The deal closed on June 30, making July 1 the first official day of the newly combined utility which will serve more than 300,000 customers and collect nearly \$800 million a year in revenues. Read more about the merger [here](#). Find out more about America's electric cooperatives [here](#).

Portland General Electric and NextEra to develop nation's first major energy facility co-locating wind, solar and battery storage

Portland General Electric Company and NextEra Energy Resources, LLC, a subsidiary of NextEra Energy, Inc. [announced](#) plans to construct a new energy facility in Eastern Oregon combining 300 megawatts of wind generation with 50 megawatts of solar generation and 30 megawatts of battery storage. The new project, called the Wheatridge Renewable Energy Facility, will be the first of this scale in North America to co-locate and integrate these three technologies, creating an improved zero-emissions resource and accelerating Oregon's transition to clean energy. The new facility, combined with PGE's existing resources, will bring the company's wind generation portfolio to more than 1,000 megawatts (one gigawatt), available from five owned or contracted wind farms in the Northwest – enough power to serve the equivalent of 340,000 homes. The solar farm will be one of the largest in Oregon, while the battery storage facility will be the largest in Oregon and one of the largest in the United States.

Hydro One gets regulatory approval to buy two utilities

Hydro One Limited [announced](#) that the Ontario Energy Board has approved the applications for the acquisitions of Ontario-based utilities Orillia Power Distribution Corporation ("OPDC") from the City of Orillia, and the business and distribution assets of Peterborough Distribution Inc. ("PDI"), from the

City of Peterborough. "We look forward to welcoming our new customers and employees to the Hydro One family," said Mark Poweska, President and CEO, Hydro One Limited. "These strong partnerships will energize life in the City of Orillia and the City of Peterborough for years to come through our continued investment in exceptional customer service, safe and efficient operations, and community initiatives."

Rivian closes \$2.5 billion investment round to bring all-electric pickup truck to market in 2021

Electric vehicle startup [Rivian said](#) it closed a \$2.5 billion investment round led by funds and accounts advised by T. Rowe Price Associates as the company moves closer to production of an all-electric pickup and SUV. Other participants in the round included Soros Fund Management, Coatue, Fidelity Management and Research Company as well as Baron Capital Group. Existing shareholders Amazon and funds managed by BlackRock also participated. The funding comes as the company continues to renovate a former Mitsubishi plant in Normal, Illinois, to produce its vehicles as well as a line of EV vans. Amazon preordered 100,000 of the vans last year for its delivery fleet.

EDF and Canopy Power agree to develop microgrids in Asia

Singapore-based microgrid specialist [Canopy Power](#) and leading French energy company [EDF](#) announced a partnership that will initiate new business opportunities in renewable-energy microgrid projects. The partnership reinforces both Canopy Power and EDF's commitments to support Asia's transition to renewable energy, in turn enabling economic development in the region and improving the quality of life for communities.



KEY HIGHLIGHTS

World Bank approves \$750 million energy loan to Nigeria

The World Bank Board of Directors [announced](#) approval of the Power Sector Recovery Operation (PSRO) of \$750 million in International Development Association credit to improve the reliability of electricity supply, achieve financial and fiscal sustainability, and enhance accountability in the power sector in Nigeria. About 47% of Nigerians do not have access to grid electricity and those who do have access, face regular power cuts. In addition, the economic cost of power shortages in Nigeria is estimated at around \$28 billion - equivalent to 2% of its Gross Domestic Product (GDP). Getting access to electricity ranks as one of the major constraints for the private sector according to the 2020 Doing Business report. Hence, improving power sector performance, particularly in the non-oil sectors of manufacturing and services, will be central to unlocking economic growth post COVID-19.

Smart grid infrastructure investments in South America to hit \$18 billion

Led by Brazil, Colombia and Chile, countries in South America will invest \$18.1 billion in smart grid infrastructure over the next decade, according to the fifth edition of the [South America Smart Grid: Market Forecast](#) study published recently by Northeast Group, LLC. After several false starts, the South American smart grid infrastructure market may finally be an investment destination in the 2020s. Investment hinges on global recovery from the COVID-19 pandemic and its economic fallout – a recovery not yet in sight.

Australia think tank releases its 'Million Jobs Plan' to rebuild battered economy

Beyond Zero Emissions (BZE) [released](#) its framework to create over one million jobs and reinvigorate the national economy through a range of practical projects that help modernize industries, re-skill its workforce and reduce household energy bills. The analysis undertaken by BZE found that around three times as many jobs were created by investments in renewable energy and energy compared to the same level of investment in the fossil fuel industry and that the sector should be embraced by governments based on a plan that could see as many as one million Australians put to work. BZE's "Million Jobs Plan" proposes the creation of 1.8 million new jobs through renewables and low-emissions projects over the next five years. See infographic on right.

GE connects the most powerful hydro unit to the grid in China

GE Renewable Energy [announced](#) its first unit of the Wudongde (WDD) hydropower station has been successfully connected to the grid for power generation and has completed 72 hours of trial operation. This milestone marked a significant step towards the official commissioning and operations of the remaining units and the entire project.

GE Hydro Solutions is providing 6 x 850 MW Francis turbine-generator sets and related equipment for the WDD hydropower project. At 850 MW, these are the world's largest units ever used in a hydropower plant. They represent another large-scale national energy infrastructure project that GE Hydro Solutions has built with CTG following the Three Gorges Project and the Xiangjiaba Hydropower Station.

Four Colorado utilities to join the West's real-time energy market

Four Colorado utilities are joining the [Western Energy Imbalance Market \(WEIM\)](#), operated by the California Independent System Operator (CAISO). The four utilities that are joining are Xcel Energy, Black Hills Colorado Electric, Colorado Springs Utilities, and Platte River Power Authority. All share a commitment to clean energy and believe the WEIM will provide the most benefit to their Colorado customers.

The energy imbalance market allows energy from multiple power providers to be dispatched at the lowest possible cost to serve the combined customer demand of the region. It fosters the use of more wind and solar energy and will save customers money. The WEIM will serve over 80% of WECC's total load by 2022.

I-5 Electric truck charging sites mapped out by electric utilities

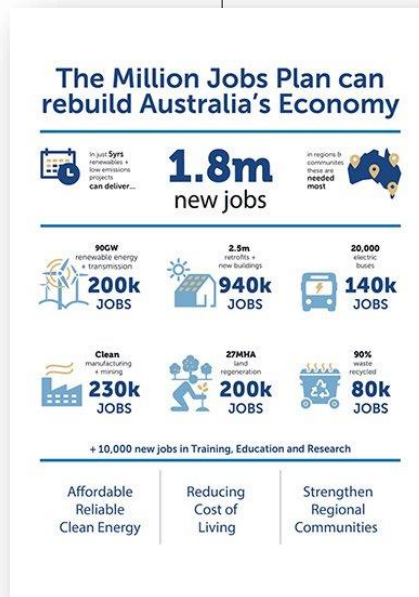
Electric utilities in three West Coast states have announced the results of a study that could lead to significant reductions of pollution from freight transportation up and down the Pacific Coast and create jobs in an economy hit hard by the novel coronavirus. [The West Coast Clean Transit Corridor Initiative](#), a study commissioned by an unprecedented collaboration among nine electric utilities and two agencies representing more than two dozen municipal utilities, recommends adding electric vehicle charging for freight haulers and delivery trucks at 50-mile intervals along Interstate 5 and adjoining highways. Of the 27 proposed sites, 16 are in California, five are in Oregon and six are in Washington.



[Corridor Initiative](#), a study commissioned by an unprecedented collaboration among nine electric utilities and two agencies representing more than two dozen municipal

World's first integrated hydrogen power-to-power demo launched

With the [HYFLEXPOWER project](#), a consortium made up of Engie Solutions, Siemens Gas and Power, Centrax, Arttic, German Aerospace Center (DLR) and four European universities are implementing a project funded by the European Commission under the Horizon 2020 Framework Program for Research and Innovation. The implementation of this project, the world's very first industrial-scale power-to-X-to-power1 demonstrator with an advanced hydrogen turbine, will be launched at Smurfit Kappa PRF's site - a company specialized in manufacturing recycled paper - in Saillat-sur-Vienne, France. The purpose of this project is to prove that hydrogen can be produced and stored from renewable electricity and then added with up to 100 percent to the natural gas currently used with combined heat and power plants. For this an existing Siemens SGT-400 industrial gas turbine will be upgraded to convert stored hydrogen into electricity and thermal energy.



SCE signs one of the US's largest energy storage procurements

Southern California Edison [announced](#) that it has signed seven contracts totaling 770 megawatts of battery-based energy storage resources to help enhance the region's electric system reliability needs. The recently conducted solicitation and the resulting contracts make up one of the country's largest energy storage procurements. The projects will enhance electric grid reliability and help address potential energy shortfalls identified in California. The projects will assist in integrating renewable clean energy into the grid from intermittent wind and solar resources and will also help the state transition its energy profile as several large coastal once-through cooling plants are scheduled to retire over the next three years. Most of the projects selected are co-located projects since the battery project will use an adjacent solar power plant to charge the battery over the term of the contract. These projects will be located at the same point of interconnection and will be the first of their kind on California's grid.

Southern Company joins 100% clean energy commitment

During its 2020 annual meeting, Southern Company [announced](#) a long-term greenhouse gas (GHG) emissions reduction goal of net-zero emissions by 2050. The company also reaffirmed its intermediate goal of a 50 percent reduction of GHG emissions from 2007 levels by 2030. These are enterprise-wide goals across all electric and gas operations. These actions replace the low- to no-carbon goal the company unveiled in April of 2018. Driven primarily by low natural gas prices, and through its regulators, Southern Company has seen a rapid transition of its system's generation fleet. The Southern Company system's carbon emissions have decreased by 44 percent through 2019, and the company now expects to achieve the 50 percent reduction goal well in advance of 2030, and possibly as early as 2025.

Report finds annual investment in DER will increase by 75% by 2030

A new [report](#) by Frost & Sullivan finds that investments into distributed energy resources (DER) technologies reached \$53.14 billion in 2019. Total capacity commissioned was 51.04 GW, meaning the total global installed capacity for DER increased by 10% in the year to 528.93 GW. Strong growth is expected for the global market across the decade as a whole. About \$846.12 billion is forecast to be invested in new DER capacity over the next decade (2020–2030). The investment will be driven by a combination of favorable regulations, declining project and technology costs, high electricity and demand charges, availability of funding, and new financing models that offset initial investment barriers.

Dominion Energy completes construction of first offshore wind project in federal waters

Dominion Energy [announced](#) the successful installation of the two turbine, 12-megawatt Coastal Virginia Offshore Wind (CVOW) pilot project 27 miles off Virginia Beach. The first offshore wind farm to be approved by the Bureau of Ocean Energy Management (BOEM) and installed in federal waters, and second constructed in the United States, was built safely and on schedule despite the worldwide impact from the coronavirus pandemic. The turbines will now undergo acceptance testing before

being energized later this summer and producing enough clean, renewable energy, at peak output, to power 3,000 Virginia homes.

GM and DTE Energy partner on Michigan's largest renewable energy investment

General Motors and DTE Energy [announced](#) they are working together to accelerate Michigan's transition to renewable energy with a deal to source 500,000 megawatt hours of solar energy as part of DTE's MIGreenPower program. This follows an initial investment of 300,000 MWh of wind energy purchased by GM in February 2019, bringing the total amount to more than 800,000 MWh. This investment will fund two new DTE solar parks that are currently in development and will be among the largest in the state. GM's initial MIGreenPower commitment was used to fund three wind parks scheduled to achieve commercial operation at the end of 2020. Based on similar projects, DTE expects this investment to support approximately 1,500 clean energy jobs in Michigan during project construction.

In related news, [DTE Gas announced](#) their 2050 net zero goal to address greenhouse gas emissions. Last September, the electric company announced its net zero carbon emissions by 2050 goal.



US wind project performance influenced by policy?

A recent study by the Department of Energy's Lawrence Berkeley National Laboratory finds that wind plant performance declines due to plant age can be partially managed and is influenced by policy. Compared to European wind fleet performance which declined linearly over time, Berkeley Lab found a more abrupt change in performance of US wind plants after 10 years of operation. This happens to coincide with when US wind plants lose eligibility for the production tax credit (PTC). The team of Berkeley Lab researchers analyzed the performance of 917 onshore wind projects in the United States. Read their [full findings](#) published in the journal Joule.

Business Customers Name Utilities as Their Most Trusted Provider

Local outreach and COVID-19 support have dramatically increased business customers' trust in utilities. In fact, according to this [press release](#), business customers now rank their utility as their most trusted provider overall, outranking their primary bank and all other vendors. The Cogent Brand Trust Index significantly increased this year (to 753 on a 1,000-point maximum scale) as more businesses use enhanced utility payment or rate options and recognize higher levels of utility support for their local economy. These and other findings are from the Cogent Syndicated Utility Trusted Brand & Customer Engagement™:

Business study. Utilities increased customer engagement during the pandemic, with one in five businesses changing to a different rate plan, one in seven changing how they pay their bill, and one in seven making a payment arrangement with their utility. In addition, almost two in three (61%) businesses are aware of the recent business community support efforts their utilities have made. This has reinforced business customers' loyalty to their utility, evidenced by the loyalty rating increasing to its highest level ever in the first half of 2020.



FEATURED ARTICLE



Electric Utility Distribution Planning at a Crossroads

By Robert Young and Mani Vadari

Adapted from MGS' "State of the Grid" Q4 2019 newsletter

In many US states electric utilities are transforming the distribution grid planning process. Drivers of this transformation are varied. In some states, the driver is the large and growing presence of distributed-energy resources (DER) such as residential and commercial rooftop solar, electric vehicles and batteries. These DERs result in intermittent, two-way power flows. This poses substantial stresses as the grids were originally designed for one-way power flows. Drivers in other states are renewable portfolio standards and other fuel-source specific acquisition targets. These drivers are set forth in state laws requiring increasing levels of renewable energy, by specific future dates. DER is also indirectly supported through the imposition of cap and trade or carbon taxes designed to reduce the states' carbon footprint. These drivers lead states to require utilities to analyze and build smart grids and post information regarding the capacity-bearing status of the utilities' substations and transmission facilities. All these state drivers will require a radical change in the way utility distribution grids are planned and operated.

With growing levels of DER and EV penetration, utility distribution grids will need to be transformed to handle significant and intermittent two-way power flows and incorporate a wide range of new distribution automation, communication and control technology. Utilities will also need to be able to monitor and manage varying loads and power flows down to the individual device level, such as EV charging and return of battery-stored energy.

Lisa Krueger, President of the US Strategic Business Unit ("SBU"), responsible for the AES' US generation units and its two US utilities, Indianapolis Power & Light and Dayton Power & Light Company, stated that grid modernization "... will transform the grid into a platform supporting customer choices, accelerating and enabling a low carbon future via easy integration of DERs and EVs, innovating in anticipation of customers' evolving needs due to rapid technological change, and enhancing reliability and resiliency for all connected customers."¹

Current utility distribution planning does not receive significant regulatory oversight from a planning perspective. Outcomes of the distribution system are reviewed and can affect the utility's financial performance such as through reliability performance standards. The lack of distribution planning oversight also precludes substantive

public involvement. Yet distribution planning greatly impacts generation and transmission planning, where there is typically substantive public involvement. New state grid planning efforts include significant regulatory oversight with many states merging distribution planning into the Integrated Resource Planning (IRP) process. States are also requiring utilities to afford opportunities for public involvement to allow broad input into distribution grid planning.

In assessing whether the electric grid is ready and primed for this new carbon-reducing energy structure sadly the answer is, "No." For most utilities, the electric grid has been in service for many years and needs replacement. A 2015 report from the U.S. Department of Energy concluded 70 percent of power transformers are 25 years of age or older, 60 percent of circuit breakers are 30 years or older and 70 percent of transmission lines are 25 years or older.² In the same report, the EIA stated, "Managing a grid with increasing amounts of customer-sited variable generation increases wear and tear on the distribution equipment required to maintain voltage and frequency within acceptable limits and to manage excessive heating of transformers during reverse power flow."³

Given that the grid needs major investment, the opportunity is created to redesign the grid to meet this new world of two-way power flows and DER. The redesign will require substantial utility investments. While utilities are ready and willing to make these substantial investments, a key question is how will these costs be timely and fully recovered? Between 2012 and 2017, distribution investment increased 5.9 percent annually, to \$26.5 billion.⁴

Grid modernization efforts will push utility distribution spending growth even higher putting pressure on utilities and state commissions to justify the increased costs of grid modernization. Substantial portions of these investments prepare for DER not

yet presently used and useful. This raises recovery issues in many states as facilities are built ahead of need to accommodate future DER and electric vehicle charging. For example, in 2018 the PUCs in Massachusetts and New Mexico rejected rate increases for AMI proposals because the costs were greater than the immediate customer benefits. However, New Mexico recently passed a law which allows a utility to file for cost recovery of a grid modernization plan.

Utilities and state commissions will need to expand the definition of benefits beyond the simple utility payback analysis traditionally used to justify utility investments. Because many distribution grid modernization efforts are an integral part of state laws and policies to address climate change, the economic analysis to justify grid modernization will need to include benefits including the economic impact of increased employment and investment, carbon reduction and other external benefits.

[Robert Young](#), Managing Director of Economists.com LLC

[Dr. Mani Vadari](#), President, Modern Grid Solutions



¹ Filed Testimony of Lisa A Krueger before the Public Utilities Commission of Ohio for Dayton Power and Light, Page 5. December 21, 2018. Docket 1875-EL-GRD.

² <https://www.eia.gov/todayinenergy/detail.php?id=36675>

³ Id.

⁴ https://www.scottmadden.com/wp-content/uploads/2018/10/ScottMadden_Energy_Industry_Update_V18_I2_2018_1024.pdf#page=5



FEATURED ARTICLE



From Debate to Co-Operate

By Susan Christiansen Wimer, Founder and CEO, The Masthead Group
Principal, Modern Grid Solutions

Energy delivery is changing with externally owned Distributed Energy Resources (DER) having a bigger presence in the marketplace. In states like California, Arizona and North Carolina upwards of 60% of existing or scheduled DER is third party-owned and operated. These statistics will only grow as increasingly more states, counties and cities introduce some form of clean energy policy. In addition, we are seeing C&I customers looking to enhance their sustainability targets (e.g., Amazon 2040 net carbon pledge, Volkswagen Group's 2050 carbon neutral goal), and utilities setting their own clean energy goals (e.g., Xcel Energy 100% Clean Energy by 2050, Dominion net-zero emissions by 2050). Lastly, technologies are also maturing which in turn is enabling greater efficiency and controllability of DER sources.

While power flow itself is still primarily the realm of the utility, the stakeholder ecosystem delivering that flow is growing, and relationships are becoming increasingly more complex. The one-way, traditional relationship of utility supplier to consumer is shifting. The first challengers to utility scale generators, typically transmission connected, came through PURPA, RTO markets, or PPA arrangements. The consumer as connected-anywhere-prosumer is next with an increased bring your own generation device ("BYOD") mindset. Lastly, emerging classes of externally owned DERs are on the horizon such as is the case with commercial fleets providing vehicle to grid (V2G) service. These stakeholders enter the market with their own interests. They have diverse perspectives, motivations, and expectations. As their voices get louder so does the potential impact to utility planning and operations.

However, while seemingly disruptive, each stakeholder brings opportunity if there is a relationship with common purpose and joint benefit. To realize this potential requires a shift in mindset and a deliberate move from articulating positions to understanding and overtime, building on each other's values. This is especially true as stakeholders' roles inch closer to the core utility responsibility of delivering safe, reliable power. Think of curtailment and dispatch during times of high generation and low load with multiple parties impacted. While sometimes uncomfortable, identifying the stakeholder ecosystem and developing an inclusive strategy and engagement framework can provide insights to support utility goals - ultimately moving from debate to co-operate.

[Susan Christiansen Wimer](#), The Masthead Group; Founder and CEO



WHAT'S on MANI'S MIND?

Over the last few months we've seen our communities participating in righteous protests in what started as a reaction to racial bias in our society reflected in policing. The associated social movement advocating for racial justice known as "Black Lives Matter" is demanding that all Americans – especially historically wronged Black Americans - are afforded the same dignity and opportunity as the rest of America. Others are supporting the police with a counter-movement called "Blue Lives Matter." Still others are saying "All Lives Matter," a common rebuttal to the "Black Lives Matter" slogan.

My intent is not to pick sides. That said, in this moment of self-realization in our nation's history, I believe we must ALL stand with our brothers and sisters of color and focus our attention on them.

We must demand reform of our justice system so the law is applied and enforced fairly. We must actively rally against racism and discrimination. We must condemn police brutality while expressing gratitude to the hardworking and caring police who believe in and serve to protect our communities.

I believe we must also support peaceful protests as practiced and promoted by Mahatma Gandhi and Martin Luther King, Jr. We should not condone violence, arson and looting. As the Mahatma himself said, we should be committed to universal values such as *Vasudhaiva Kutumbakam* (the entire world is one family) and *Ahimsa* (non-violence) as we strive for racial justice.



MEET THE EXPERTS

Dr. Spero Mensah brings over 30 years of hands-on experience on all aspects of transmission and distribution network management and energy market systems. Dr Mensah has broad North American and global experience having managed international teams that have deployed technologically challenging projects while at Alstom T&D and Areva T&D. He is a leading pioneer in the development of solutions for Energy Market reform in the United



Dr. Spero Mensah

States and Europe as well as Smart Grid and microgrid technologies and reliable integration of renewable energy sources. Dr. Mensah is also a past minister of energy, oil and mining for the country of Benin.



MORE ABOUT MODERN GRID SOLUTIONS

Modern Grid Solutions

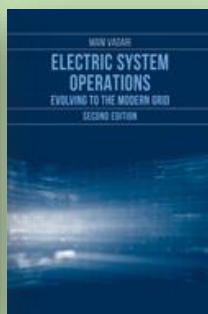
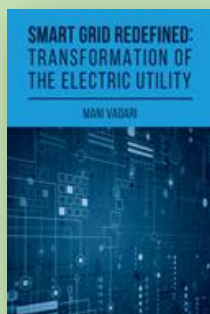
Modern Grid Solutions (MGS) is a cost-effective, global, supplier of deep expertise and board-experienced domestic resources. Our team members have been industry colleagues for over 25 years. Our approach focuses on delivering actionable guidance, direction and value, based on the depth of our team's expertise in North America, and around the world.

MGS has assembled a team of leading experts all having between 25 – 45 years of experience delivering complex, innovative technology, business, regulatory and finance solutions to electric utilities, corporate clients and policymakers. Our experts bring expansive breadth and tremendous depth in engineering, technology, economics, operations, and commercial areas directly applicable to utilities, suppliers, regulators and policymakers.

Ongoing Projects

- Assisting a major Northwest utility with transforming their planning capabilities to address the influx of Distributed Energy Renewables, Non-Wires Alternative solutions and to address the newly signed Washington State Clean Energy Act (SB 5116) to transition the state's electricity supply to 100 percent carbon-neutral by 2030, and 100 percent carbon-free by 2045.
 - Assisting the Pacific Northwest National Laboratory on a DOE project - development of an OpenADMS application development platform (GridAPPS-D).
 - Assisting with a major multi-OpCo distribution operations transformation – Control center consolidation, ADMS specification and procurement, and operations standardization.
- Assisting a major multi-Opco utility with identifying improvements to their Outage Customer Experience – People, Process and Technology.
- Assisting a major multi-Opco utility with defining a strategy for dispatching the DERs in their footprint by focusing on – People, Process and Technology aspects of the full implementation.
- Assisting multiple startup companies in the areas of IoT, Blockchain, and Voltage regulation devices.

BUSINESS EXPERTISE AREAS	TECHNICAL EXPERTISE AREAS
For Utilities and Policy Makers <ul style="list-style-type: none"> Strategy, tactics, and process redesign Business, technical and enterprise architecture Transmission and distribution roadmaps Grid modernization plans Project and program management Strategic change management RPS Support For Suppliers and Corporate Clients <ul style="list-style-type: none"> Business model design and analysis Electricity market entry and go-to-market Market analysis, volumes, and trends Competitive landscape analysis Alliances, divestitures, and acquisitions M&A, Project finance, structured products 	For Utilities and Policy Makers <ul style="list-style-type: none"> T&D system operations – EMS, DMS, OMS Generation operations Energy markets – design and deployment Energy and REC tracking system T&D Automation and smart grid solutions GIS and asset management solutions Generation planning and renewables integration Big data management and analytics Solution and vendor selection For Suppliers and Corporate Clients <ul style="list-style-type: none"> Solutions design and implementation Portfolio review and analysis Adjacency analysis and technology management Energy, REC and emissions trading



Smart Grid Redefined: Transformation of the Electric Utility

The book is available in all leading bookstores and [online](#).

The Chinese edition is out now and available in China.

Electric System Operations – Evolving to the Modern Grid, Second Edition

Dr. Vadari's book "[Electric System Operations – Evolving to the Modern Grid, Second Edition](#)" is available now. The key chapters covering EMS, OMS, ADMS, and DERMS now include industry case studies to move the discussion from theoretical to evidentiary with real-world, relatable content. Save 25 percent, plus FREE standard shipping with promo code: **VAD25**. *This discount cannot be combined with other discounts. Offer expires 1/31/21.*

Recent Articles

["COVID-19: Utility Operations Are Changing Forever"](#), T&D World, March 2020

["Changing the Distribution Planning Process"](#), T&D World, April, 2020

"Optimal Energy Dispatch of Distributed PVs for the Next Generation of Distribution Management Systems," in IEEE Open Access Journal of Power and Energy, vol. 7, pp. 287-295, 2020, doi: 10.1109/OAJPE.2020.3009684



ABOUT THIS NEWSLETTER

This quarterly newsletter is a production of Modern Grid Academy under the auspices of Modern Grid Solutions. Please send all comments and inquiries to info@moderngridsolutions.com.