

The <u>18th Microgrid Global Innovation Forum – North America</u>, December 5-6, 2023 in Chicago brings together key industry executives for focused networking and information sharing concerning the design, implementation and operation of renewables-centric microgrids in North America and globally. The emphasis is on maximizing the effective use of sustainable distributed energy resources, refining the positive business model for a range of microgrid deployments, and sharing real-world case studies in both grid-tied and off-grid environments. The event will focus on:

- Business models for multi-stakeholder, multipartner microgrids
- Microgrids for C&I customers
- Microgrids in EV fleet charging and V2G scenarios
- Microgrids as a strategy for grid resilience and outage management
- Energy-as-a-Service, decentralization and digitization
- Leading North America case studies and lessons learned to date
- Grid-tied, utility distribution microgrids and integration with the larger grid
- Solar PV, CHP, and energy storage strategies for decarbonizing the energy mix

- Minimizing energy costs and integrating renewables on-site
- Regulatory and public policy trends and developments
- Optimizing hybrid, renewable energy systems for public, municipal, commercial, and military deployments
- Evolving the traditional utility business model
- Recent C&I deployments internationally and key lessons for the U.S.
- System architectures and alternatives
- Microgrid design, analysis, and feasibility planning tools
- Microgrid power control systems
- System modeling and analytical tools



The audience for the Forum includes microgrid project developers, owners, and entrepreneurs; utility and energy provider executives; renewable energy professionals; energy storage providers, technology researchers, investors and regulatory representatives, and more.

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Previous Microgrid Innovation Forum – North America Attendees Include

127 Energy 60Hertz Microgrids ABB Adaptive Microgrids Advanced Control Systems Ageto Energy Air Voltaics LLC Alaska Center for Energy and Power Alliance for Rural Electrification AlphaStruxure Ameresco American Public Power Association **ARDA Power** AutoGrid Blue Pillar **Blue Planet Energy Systems** Bluefin Energy Solutions Inc. **Bluewave Resources** Boice Dunham Group **Bowen Advisors** California Energy Commission **California Public Utilities** Commission **Calpine Energy Solutions Camden County Municipal Utilities Authority** Canadian Solar Castello di Amorosa Winery Cenfura Energy Center for Climate and **Energy Solutions** ChargePoint **Citizens Energy Corporation** ComAp Commonwealth Edison ComRent **Concentric Power Concord Engineering Group Concord Engineers Connect California Connected Energy** Covanta **CPS Energy CustomerFirst Renewables Customized Energy Solutions CWL ENergy Management** Daegunsoft DCfusion / EnSync Energy **District of Columbia Public** Service Commission DEIF

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Previous Attendee Job Titles Include

- Assistant Professor, Microgrids
- Associate
- Associate Professor
- Attorney Advisor
- Business Advisor
- Business Development Director
- Business Unit Development
 Manager, Grid Automation
- Business Unit Director -Renewables (GB & International)
- CEO
- CEO and Co-founder
- Chairman
- Chief Commercial Officer
- Chief Marketing Officer
- Chief of the Office of Energy and Sustainability (OES)
- Co-Founder
- Co-Founder and CEO
- Co-Founder and President
- Deputy Director
- Director
- Director of Industry and Innovation
- Director, Distributed Electricity and Storage
- Editor
- ElectriFi Manager
- Energy & IT Analyst
- Energy Solutions Manager
- Energy Storage
 Marketing/Strategy Manager
- Engineer
- Engineering Manager
- Executive Director
- Founder & Managing Director
- Founding Partner
- General Manager
- Global Sales Manager Microgrids
- Global Sector Co-ordinator, Innovative Finance
- Head of Direct Sales

- Head of Innovation Global Infrastructure & Networks
- Head of Microgrid & Digital Substation Solutions
- Head of Project
- Independent Consultant
- Industry Research Analyst
- Journalist and Economist
- Manager of Market Intelligence, Strategy and Innovation
- Manager, Business
 Development
- Manager, Optimization and Forecast
- Manager, Policy and Innovation
- Manager, Smart Grid & Technology
- Manager, Technology
 Development
- Manager, Utility of the Future
- Manager-Emerging Technologies Office
- Managing Director
- Managing Partner
- Market Design Specialist -Distributed Resource Integration
- Microgrid Advisor
- Microgrid Laboratory Responsible
- Microgrids CTO North America
- News Director
- Of Counsel
- Operations Manager
- Partner & Co-Founder
- Portfolio Analyst
- Power Systems Group Leader
- President
- President & CEO
- Principal
- Principal Engineer
- Principal Research Analyst
- IEEE Fellow

- Program Director, Sustainable Energy Transformation and Microgrid Project
- Project Engineer
- Project Manager
- Renewable Energy Segment
 Manager
- Renewable Energy Specialist
- Research Associate Renewable
 Energy
- Research Officer
- Researcher and Industrial Engineer, Grid Integration
- Sales Manager
- Senior Analyst
- Senior Consultant Hydropower
- Senior Director, Energy & Utilities Practice
- Senior Engineer
- Senior Manager, Smart Grid Integration, North America
- Senior Portfolio Analyst
- Senior Principal, Sustainability
- Senior Vice President, Policy and Business Strategy
- SETS Program Manager
- Sr. Climate Change Specialist and Program Manager
- Technical Consultant Power Supply & Protection
- Technical Expert Regulatory Instruments
- Technical Sales Manager
- Technical Support Manager
- Venture Developer
- Vice President
- Vice President Smart Grid, North America Operations
- Vice President Business Development
- Vice President, Product Management
- VP Commercialization & Product Development
- VP of Operations

Agenda

Tuesday, December 5, 2023

8:00 - 9:00 am Registration and Welcome Coffee

9:00 - 9:30 am

Electrification and Decarbonization Hand in Hand

The Brookville Smart Bus Depot microgrid started operating in October 2022 and the Equipment Maintenance and Transit Operations Center (EMTOC) microgrid is under construction. What is so important about these two projects? They are game changers. Both are powering zero emissions vehicles (transit buses) without increasing the power from the grid. With Brookville, Montgomery County and AlphaStruxure proved that the grid is NOT required to be upgraded for heavy duty EV charging. This is counter to the mainstream messaging about grid improvements to electrify transportation.

With each microgrid at these two transit hubs, not only are the sites electrifying they are also decarbonizing with the use of the microgrids. Each microgrid has a plan to move from ~60% decarbonization now to 100% decarbonization by 2030.

This session will discuss the keys to the direction taken to enable these two microgrids, the essential outcomes provided, and the applicability of these two sites to the broader transit and commercial delivery vehicle space.



Steve Pullins Senior Vice President and CTO AlphaStruxure Profile

9:30 - 10:00 am Providing Customers the Economic Benefits of their Microgrids: The Challenges and Solutions

Since microgrids have become more than standby power, providers have been able to easily show the environmental benefits but have struggled to provide customers with what their financial results will be. We all have heard very impressive microgrid presentations at many conferences. Yet, when questions arise about what their Levelized Cost of Energy (LCOE) was, or Return on Investments (ROI) are, answers commonly given have been; "that was not the microgrid's objective" or "it was really a demonstration project". Yet, microgrid growth won't truly take-off until providers can show favorable financial returns in addition to their environmental impact.

Over the years, Innovus Power has performed microgrid design and financial models on hundreds of applications. Through this experience, we can share key hurdles that commonly impede a provider's capability to financially evaluate what a customer is looking for. Some of these challenges are in the following areas:

- Project objectives
- Project roles and responsibility allocations
- Microgrid system design variation
- Performance characteristics of wide-ranging components
- Range and volatility of key system cost drivers
- Key unknown and hidden costs

Innovus Power will provide strategies it commonly deploys to overcome these hurdles and provide case examples for context in the solutions suggested.



Marc Hoffman CEO Innovus Power Profile

10:00 - 10:30 am Benefits of Microgrids in Municipal and Coop Power Suppliers

This session will discuss the benefits of building microgrids around a municipality or a member of a coop. After examining various forms of microgrids that can be built, we will quantify transmission and energy savings, and discuss reliability gains. The speaker will also argue that the economic gains are more than transmission and energy savings since there are short-term employment gains during the construction of the microgrid. There is also long-term employment due to O&M as well as property tax/lease income from the microgrid, all of which currently are being spent on a large power plant somewhere else in most cases.



Yashar Barut CEO and Founder Power Market Solutions Profile

11:00 - 12:15 pm Utility Microgrid Case Studies

Non-wires alternatives such as microgrids can play an effective role in utilities' toolbox for delivering power quality and reliability to high-value customers. They can also be an important strategy for serving remote areas where load growth is straining distribution network infrastructure. Additionally, microgrids can be a key resiliency and outage restoration option for areas affected adversely by disruptions related to extreme weather events. Furthermore, microgrids can help advance a decarbonized energy grid at the local level, where residents can become more involved in the community co-ownership and greening of their electricity service.

For these reasons and more, utilities are looking at how microgrids can play a role in their service offerings going forward. This session will look at case studies where electric utilities in the U.S. have implemented microgrids, with discussion of enabling technologies, business models, and key takeaways to date. The goal is to help provide insight and guidance as to how other utilities can utilize microgrids in their future network planning.



Paul DeCotis Senior Partner Energy & Utilities West Monroe Partners Profile



Sainab Ninalowo Senior Manager of Smart Grid -Grid Modernization ComEd Profile



Michael Graves Lead Engineer - Engineering Solutions Alliant Energy Profile



Jeremy Donnell Senior Manager/Principal, Corporate Strategy Pacific Gas and Electric Company Profile

12:15 - 1:15 pm Lunch Break

1:15 - 2:45 pm

Community and Multi-User Microgrids for Resilience: Implementation Challenges and Perspectives from Puerto Rico and Washington

Historically, the majority of microgrids have been developed as single-customer assets behind the meter (hospitals, Department of Defense installations, etc.) or by utilities driving the development process. Increasingly, communities are seeking to lead the development of multi-user or multi-property microgrids to meet their own goals for resilience, energy equity and independence, and decarbonization. Without utility partners, the complex business models, regulatory and technical challenges (e.g., interconnection agreements, operating agreements, and financing structures) may prevent these projects from moving forward. This panel will discuss the value proposition of multi-user microgrids, the challenges of developing them, and progress in addressing those challenges. Finally, two case studies from communities moving forward with multi-user microgrids will be presented.

Key Takeaways:

- Value proposition of multi-user microgrids for communities, utilities, and end-use customers
- Key business model, regulatory, and technical obstacles that stakeholders face when seeking to develop multi-user microgrids
- Considerations prior to developing a multi-user microgrid (e.g., who benefits, who pays, and who owns and operates)
- Examples of how these obstacles have been addressed in specific microgrid projects
- Recent developments to support communities in addressing those obstacles on future projects
- Type of change still needed to enable the widespread proliferation of multi-customer (Community) microgrids



Lee Shaver Senior Energy Manager Slipstream Profile



Carlos Alberto Velázquez Program Director IREC Profile



Jared Leader Senior Director, Resilience SEPA Profile



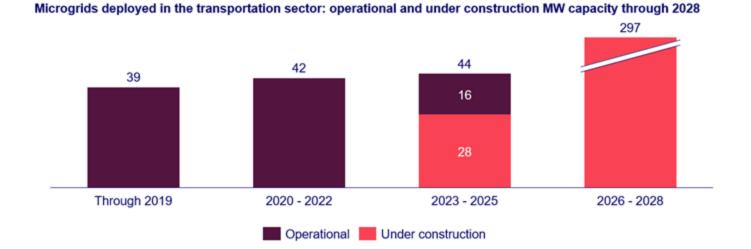
Ben Schwartz Policy Manager Clean Coalition Profile

2:45 - 3:15 pm Networking Coffee Break

3:15 - 4:00 pm

Electrifying Transportation: Microgrid Solutions and Emerging Trends in a Changing Energy Landscape

Grid insecurity is a mounting concern as the climate and energy crises intensify. Furthermore, It is expected that electricity demand will surge by more than 35% by 2050, primarily driven by the rapid adoption of electric vehicles (EVs) and transportation electrification. To alleviate the strain on distribution networks, utilities are exploring non-wire alternative solutions to avoid lengthy and costly infrastructure upgrades. Furthermore, companies are increasingly driven by their ESG goals to electrify their fleets. Nevertheless, this transition presents challenges, particularly regarding costs. Microgrids are a shortcut emerging as a promising solution to address these challenges while offering added resilience.



Key Takeaways:

- Interest in microgrid adoption has surged across transportation sectors since **2015:** Over 11 microgrids deployed and an additional 25 projects announced in the pipelines of utilities and solution providers through 2028, spanning e-fleets, e-bus transits, ports, and airports.
- Microgrid-as-a-Service (MaaS) offerings as a solution to mitigate upfront costs: The interest of various investors in MaaS for e-mobility gaining a market share exceeding 38%.
- Added business opportunities for fleet operators: resilience-added benefits ensuring fleet charging during grid disturbances, cost avoidance for grid upgrades, demand charge mitigation, and the modularity of advanced microgrids, allowing expansion as the fleet electrification expands over time. Modular solutions can reduce the project lifecycle by up to 40%.



Elham Akhavan Senior Microgrid Research Analyst Wood Mackenzie Profile



Rachel Marcus Principal Analyst, Grid Edge Wood Mackenzie Profile

4:00 - 4:30 pm Remote Grids: A Safe and Cost-Effective Alternative to Rural Distribution Lines

In the U.S., 5.5 million miles of distribution lines stretch across the nation, with a significant portion traversing forested regions. As the grid ages, these distribution lines increasingly pose a liability for utilities, becoming vulnerable to storms and powerful winds, causing millions of power outages annually. In the western part of the country, these lines have also been known to ignite devastating wildfires. In this session, BoxPower's Director of Applications Engineering Alexander Asante will be discussing three case studies, namely the Sagehen Field Station Remote Grid with Liberty Utilities, the Briceburg Remote Grid with PG&E, and the Pyramid Lake Remote Grid with Southern California Edison. These examples demonstrate how standalone solar-based power systems helped these IOUs reduce cost, mitigate wildfire risk, and improve energy resiliency for a variety of ratepayers.

Key Takeaways:

- How remote grids can reduce wildfire risk for energy providers while increasing the reliability of their grid
- How solar remote grids have cost, resiliency, and safety benefits for both wildfireprone and aging infrastructure locations
- How the increasing threat of natural disasters will test grid resilience, especially in rural and remote areas



Alexander Asante Director of Applications Engineering BoxPower Profile

4:30 - 5:00 pm A Case for Renewable Energy Microgrids

As EV adoption swells, critical charging infrastructure is subject to growing pressure on a number of fronts: 1) increased aggregate power and energy demands; 2) network coverage requiring deployments at the "grid-edge" with limited excess distribution capacity and; 3) decreased user tolerance for imperfect charging sessions. This session will present a case for renewable microgrids as a solution to ameliorate these challenges. We will describe how DERs can provide additional capacity during peak usage, and present a case for renewable-backed DCFC stations to manage DERs, EVSEs and fleets. A unique combination of IoT, AI and operations optimizations enable these microgrids and deliver affiliated benefits to utilities, site operators and end-users.



Austin Cappon Vice President of IoT Engineering and Co-Founder New Sun Road Profile

5:00 - 6:30 pm Drink Reception

Wednesday, December 6, 2023

8:00 - 9:00 am Welcome Coffee

9:00 - 9:30 am

A Novel DERMS + Transactive Energy Platform for Microgrid interoperability with the Bulk Power Grid

With increasing numbers of distributed energy resources (DERs), fast AC & DC EV chargers and net-zero homes/buildings within T&D power grids, aggregators can form virtual power plants (VPP) and Microgrids (MG) with numerous DER, EVSE (for V2G), smart flexible loads (e.g., smart thermostats, smart appliances and programable EV chargers) to interact with the bulk power systems' operators during peak-demand hours and contingency conditions. The cooperation between the power grid operators and VPP/MG owners/aggregators is mutually beneficial for both stake holders. The power grid operators could keep the lights on during peak-demand and contingency conditions for their customers, and the VPP/MG owners/aggregators could make money for their capital investments. In this presentation, we will demonstrate the simulations and optimal management of VPP and EVSE (for V2G and V1G) resources within two distribution feeders in north America, and the positive effects of DER and EVSE on the grids' voltage stability, transformers/cables congestion relief and the overall grid reliability.



Ashkan Rahimi-Kian Chief Technology Officer IEMS Solutions Profile

9:30 - 10:00 am The End Game: Tapping Buildings as a Virtual Power Plant

To bolster the grid, buildings could play a pivotal role when transformed into a Virtual Power Plant (VPP) or a "New Utility," by forming a collective network of hundreds or even thousands of sites that harness the untapped potential of their assets, such as thermostats, electric vehicles, appliances, batteries, and solar arrays. With intelligent management of these resources, buildings can potentially and collectively offer a wide range of energy services, including capacity, energy provision and ancillary services, akin to those provided by traditional power plants.

This session will highlight the current role and market potential of small and medium commercial buildings in the energy landscape; the key challenges and barriers that hinder the integration of smaller buildings into energy management solutions; and the kinds of opportunities and changes necessary for making buildings as VPPs a reality.

- The role and market potential of small and medium commercial buildings in the energy landscape
- The key challenges and barriers that hinder the integration of smaller buildings into energy management solutions
- The kinds of technology, business and regulatory changes that are necessary to harness the potential of small and medium commercial buildings in energy management
- A vision for how buildings and their assets can be leveraged as Virtual Power Plants (VPPs) to create an aggregated network of sites that supports the grid, and the kinds of VPP components that can contribute to grid stability and reliability



Greg Morehead Vice President, Hardware Engineering GridPoint Profile

10:00 - 10:30 am Revolutionizing the Grid with Fast-Track Microgrids and VPP Flexible Capacity

Microgrids are becoming an increasingly important tool for commercial and industrial enterprises. By generating and storing power on-site, organizations are becoming more efficient, resilient and self-reliant, making them better able to withstand the impacts of volatile?energy costs and grid outages. Until now, each microgrid has been largely customengineered and incorporated different?software, hardware, and interface systems to meet the unique specifications for each build. This session discusses a simple, standardized, validated and scalable strategy for designing and accelerating the deployment of microgrids. When simple and repeatable microgrids are combined with VPPs - harnessing either the distributed energy resources (DERs) within a single microgrid and/or aggregating multiple microgrids - the larger grid benefits from a multiplier effect. Capturing capacity and delivering grid services this way reduces strain, boosts reliability, cuts costs, and advances the clean energy transition by furthering sustainability.



Tad Piper Senior Vice President, Corporate Strategy & Development AutoGrid Profile



Claire Miller Microgrid Solutions Architect Schneider Electric Profile

10:30 - 11:00 am Networking Coffee Break

11:00 - 11:45 am

A Phased Approach to the EV Infrastructure Buildout Using Generators, Solar, Battery Storage and Fuel Cells to Serve the Electric Semi Truck Depots of the Future Many fleets and developers are installing EV Charging stations to support their future zero emissions trucks and buses. The larger vehicles are creating a big demand on the grid and its capacity to supply the megawatts of power needed for dozens of commercial vehicles. Often there is a significant delay in the grid's ability to provide the power necessary for these much larger loads. Often there is a significant delay in the grid's ability to provide the power necessary for these much larger loads. This session will discuss a phased approach to supporting these increasing loads utilizing best-in-class microgrid design and modeling tools. A case study of a typical freight depot based in Fontana, California will be examined.

Project Phase 1: Starting in 2024, we will use temporary generators to supplement the power for the initial 10 - 180 kW, Level 3 DC Fast Chargers to support 20 electric semi trucks hauling local loads of 30,000 pounds without any increase to the interconnection feed from the utility.

Project Phase 2: We will upgrade the site to 20 - 350 kW Level 3 DC Fast Chargers supporting 40 electric semi trucks doing regional hauling work starting in 2026.

Project Phase 3: We will add solar, battery and fuel cell backup generators to support those same chargers and trucks. This phase will also be duplicated into a similar depot operating in Chicago, IL.

With each phase Mr. Goldman will discuss the project phase results in terms of capital and operating Costs as modeled in Xendee.



Joshua Goldman Vice President, Mobility **Xendee** <u>Profile</u>

11:45 - 12:15 pm Mid Size Wind Turbines for Microgrids

Modern high tech wind turbines come in all sizes -- from small turbines to charge batteries on a sail boat to offshore giants in the ocean. Mid-sized wind turbines (80 to 100 ft tall) are an excellent fit to meet the needs for microgrids. These turbines have been designed for microgrids, do not harm wildlife, and offer a 30-year life span. One of the keys to their offering is the ability to secure permits without the need for excessive regulations such as FAA approval. They operate effectively at moderate wind speeds and are computer-controlled for optimum power production with electronic braking. These turbines are unobtrusive in size, qualify for all rebate programs and offer additional renewable energy credits for any project.



Frank Micone Owner/Manager Airvoltaics LLC Profile

12:15 - 1:15 pm Lunch Break

1:15 - 2:45 pm Financial Incentive for Microgrids

Our national electrical power system, for the past 15 years, has been seeing leaps and bounds in the deployment of the microgrid functionality. To match the physical benefits these systems provide to the larger macrogrid and individual customers, the industry as-a-whole can no longer wait to pass along the financial benefits to system microgrid owners. This was precisely the thinking 15 years earlier that led to our National Institute of Standards and Technology Laboratory (NIST) commissioning the Smart Grid Energy Interoperability Standards body. In 2011, NIST published a market standard known as Transactive Energy (TE), a sub-profile within EMIX1 that precisely identified the steps to standardize rate design that supports decentralized electrification assets and goals.

Ten years later, in the Summer of 2021, following the successful 3-year demonstration of a Transactive Energy proof-of- concept project sponsored by the California Energy Commission2 (CEC), the California Public Utility Commission (CPUC) held a workshop and a year later launched a first-of-its-kind rulemaking proceeding, known as CalFUSE3, to permanently deploy TE state-wide. Following the wake of this rulemaking effort, the CEC, later in 2022, issued its own first-of-its-kind mandate, which validated the CalFUSE premise in rate design, and instructed the State's primary energy agencies to construct, maintain, and upload hourly dynamic price to the newly created statewide rate access tool, MIDAS4.



Stephen MacDonald Founder Energy Profit LLC Profile



Ashkan Rahimi-Kian Chief Technology Officer IEMS Solutions Profile



Larisa Dobriansky Chief Business & Regulatory Innovations Officer General MicroGrids Profile



"Excellent. I have benefitted from hearing quite an array of perspectives and case studies. You have brought together a wealth of talent that generated great dialog and will stimulate cross-fertilization." --- Larisa Dobriansky, Chief Business & Policy Innovation Officer, General Microgrids

"One of the best, with highest quality presenters on timely topics." -- David E. Geary, PE, Co-Founder and Principal Engineer, DC Fusion



"Intra-disciplinary approach leads to this Forum as the premier program in microgrid innovations and thought leadership." -- Michael J. Zimmer, Washington Counsel, Microgrid Institute

"This was a great networking opportunity. Speakers were interesting in and of themselves, but the mix (tech, policy, regulatory,

markets) made for deeper conversations than most events provide." -- Paul Roege, Vice President - Strategic Initiatives, Typhoon HIL

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reduce their carbon footprint. With more than five years of experience in the industry, we are committed to making high-value solutions available to renewable energy projects. Visit www.airvoltaics.com

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Chicago Conference Center

205 W. Wacker Drive, Chicago, Illinois 60605

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About the Organizer

SGO Smart Grid Observer The Smart Grid Observer is an online information portal and weekly e-newsletter serving the global smart energy industry. SGO delivers the latest news and information on a daily basis concerning key technology developments, deployment updates, standards work, business issues, and market trends driving the smart grid industry worldwide. Visit <u>www.smartgridobserver.com</u> to sign up for a complimentary subscription.

Registration

Early Bird Standard Rate: Service providers, equipment and software vendors, consultants	\$895.00
C&I microgrid owners, project developers and utilities	\$795.00
Academic, Government and Non-Profit Organizations (.edu, .gov, or .org email address required)	\$695.00

Register securely online at <u>https://www.microgridinnovation.com/NA/register.htm</u>