MICROGRID KNOWLEDGE

Virtual Conference

Staying the Course on Clean Energy in a Time of Societal Disruption

Agenda

Moderator: Elisa Wood (Microgrid Knowledge) Editor-in-Chief

Speakers:

1. Michael Bakas (Ameresco) Executive Vice President
2. Mark Martyak (PowerSecure) Chief Sales Officer
3. AJ Perkins (Instant On Energy) President

Resources:

- Speaker Bios
- Ask the Experts: Q&A at End
- Microgrid Resources Library

Renewable Natural Gas – A Piece of the Puzzle

Michael T. Bakas, Ameresco, Executive Vice President

Challenges:

1. Weather Related Outages

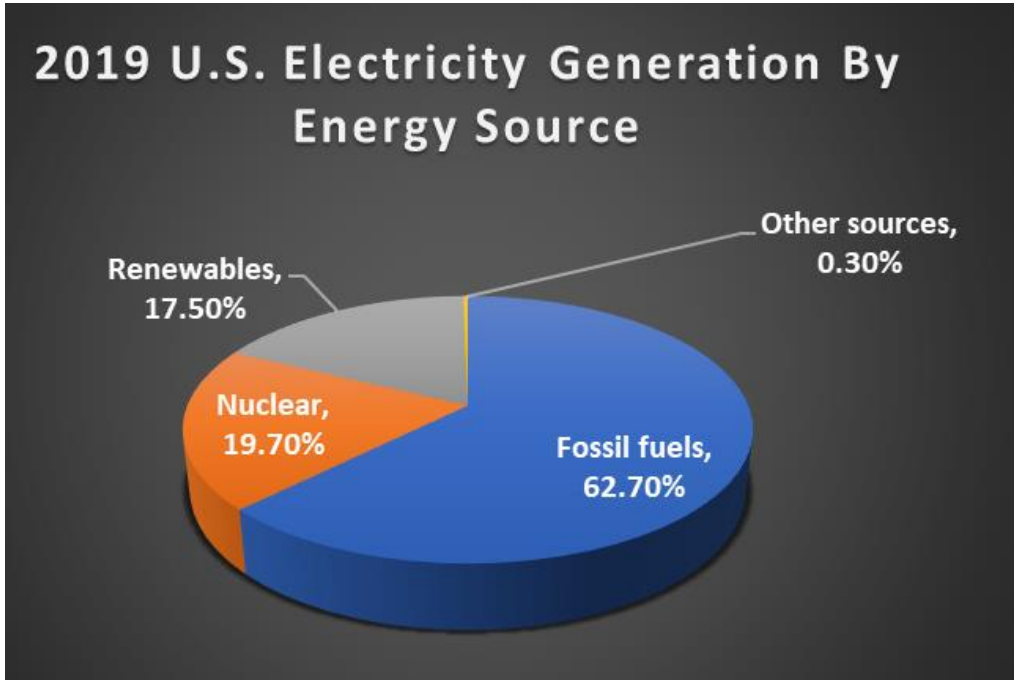
- ✓ Between 2003 and 2012, an estimated 679 widespread power outages occurred due to severe weather disrupting the lives of millions of Americans

2. Value of Resiliency

- ✓ Between 2003 - 2012, weather-related outages are estimated to have cost the U.S. economy an inflation-adjusted annual average of $18 billion to $33 billion

3. Baseload Fuel

- ✓ In most cases, fossil fuel is necessary to serve critical energy loads through dispatchable energy plants during a multi-day outage.



Solution – Renewable Natural Gas

- Available Today
  - ✓ Makes use of resources that are **already in our environment** – potential to **avert up to 54% of US methane emissions generated from human activities.**
  - ✓ Instead of voluntarily extracting natural gas that is already sequestered in the earth, we can capture biogas in its raw form and process it into a usable form of energy.
- Dispatchable
  - ✓ Unlike other renewable sources of energy that are based on intermittent resources (eg Solar, Wind, etc.) RNG is a base load dispatchable fuel source that is generated 24/7.
- Path to "Green" Hydrogen
  - ✓ Today, 95% of the hydrogen produced in the United States is made by natural gas reforming in large central plants (steam-methane reforming).
  - ✓ Using RNG as a renewable replacement for natural gas will produce "green" hydrogen, another piece of the "carbon neutral" puzzle.

Results/Recommendations

- Greens the Resiliency Portion of the Microgrid
  - ✓ Dispatchable RNG is the baseload solution to serve critical energy loads during a multi-day outage.
  - ✓ Existing natural gas pipelines deliver this renewable resource…**no additional investment required** in the Microgrid.
- Carbon Neutral Fuel
  - ✓ RNG produced **contributes no net increase in greenhouse gas emissions**.
  - ✓ RNG is considered carbon-neutral under best-practice carbon accounting methodologies, and organizations can use it to **achieve carbon neutrality** in their Scope 1 emissions.
- Cost Effective
  - ✓ 2019 ICF Study concluded cost of residential electrification would range between $572 to $806/ton of CO2 reduced vs $300/ton for RNG
  - ✓ A 2018 Navigant study concluded Replacing 16% of California's natural gas supply with RNG could achieve greenhouse gas reductions equivalent to electrifying 100% of building loads in California by 2020.

Staying the Course on Clean Energy in a Time of Societal Disruption

Mark S. Martyak-PE, PowerSecure, Chief Sales Officer

Challenges:

1. The Covid-19 "**True Resiliency**" Paradigm Shift
2. Customer Focus on Resiliency Versus Energy Efficiency/Sustainability
3. Internal Competition for Limited Financial Resources

…We are helping our customers to plan and implement Microgrids that provide Superior Levels of Long-Term Resiliency and Enhance Environmental Sustainability, often with an Attractive ROI or Energy-As-A-Service Zero CapEx Financial Terms

Solutions…*Extraordinary Value of "Hybrid" Microgrids Versus Traditional Approach to Energy Resiliency*

MICROGRID TOTAL VALUE PROPOSITION

CUSTOMER VALUE

- Business Continuity
- Loss Prevention
- Insurance Savings
- Capital Avoidance

+

UTILITY VALUE

- Non-Spinning Substitute for Spinning Reserves
- Demand Response
- Peak Load Management
- Frequency Control
- "Duck Curve" Mitigation
- T&D Capital Avoidance

=

TOTAL VALUE

THAT CAN BE DERIVED

FROM A WELL-PLANNED "HYBRID"

MICROGRID

"HYBRID " MICROGRID ENERGY SOURCE OPTIONS

-Super Clean EPA T4F Generation
-Natural Gas Generation
-Battery Energy Storage Systems (BESS)
-Bi-Directional BESS/UPS Systems
-Photovoltaic PV Systems
-BESS/PV with DC-DC Battery Charging
-Fuel Cells
-Plastic-to-Electricity Systems

Results ...*Current Examples of Value-Driven Microgrids*

Arizona

- 100% Standby Power with Clean EPA T4F Generation
- Autonomous Frequency Control on CAISO
- Provided at Zero CapEx to the Navy
- Phase 2 Underway: 25MWh BESS/5.6MW PV

Alabama

- Neighborhood of the Future
- 400kW NG Generation for 100% Standby Power
- 330KW of PV
- 360kW/825KWh of BESS

Pennsylvania

- 7.5MWs of 100% Clean EPA T4F Standby Power with N+4 Redundancy
- Saved Wellspan over $3M in CapEx compared to Traditional Design
- Generates over $600,000 in PJM Demand Response Value Annually

Connecticut

- 25MWh Bi-Directional BESS Charged by PV
- 35MWs of Clean Generation and an Electric Boiler System
- 100% Resiliency & Mitigates High NG Curtailment Risk
- Drives Cost per kWh down to below 5 Cents/kWh in the Northeast!

California

- 14MW of PV, 5.46MWh of BESS, 4MW of Fuel Cells and 6 MWs of Generation
- Long Term Off-Grid Operational Capability
- Generates ROI

“Home as a Service” Model Brings Affordable Microgrids to Military Veterans

February 21, 2020 By Lisa Cohn 5 Comments

A California community plans to provide microgrids to 37 US military veterans in Perris, California, under a home as a service model that the developer hopes to replicate nationally.

All American Homes is acting as builder with Instant On, a battery and fuel cell distribution company, providing batteries, solar and controls for the pilot project. The partnership also is planning a second undertaking of 200 homes that will add fuel cells to the energy mix.

Ultimately, All American Homes hopes to build about one million homes across the country using this model.

By flysnowfly/Shutterstock.com

Each home in the pilot project will have 5 kW of solar, 40 kWh of battery storage and an advanced home energy management system, said AJ Perkins, president of Instant On. The community center will be equipped with a 1 MW battery.

“What’s unique about this project is using a large battery storage system — 40 kWh for each home — to ensure homes don’t experience blackouts,” he said.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Ask the Experts: Q&A Session

Type your questions in to the Q&A box

#MicrogridVirtual

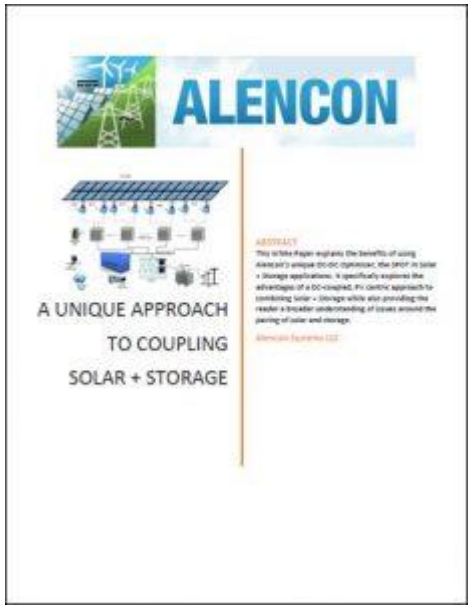
Microgrid Knowledge Virtual Conference Resource Library

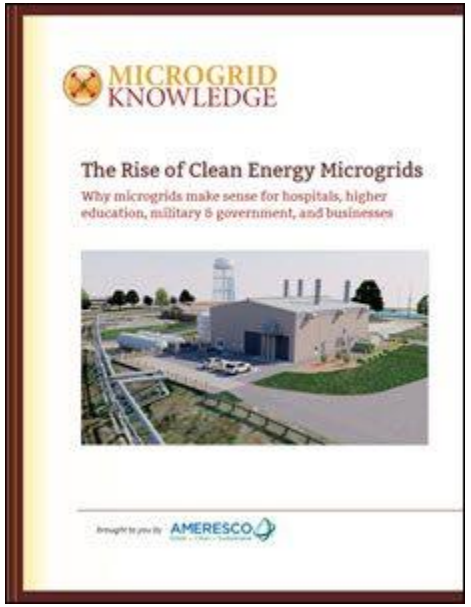
Recommended Resources

Microgrid Resource Library

- Visit ThinkMicrogrid.com

Network with the MGK Community on LinkedIn





Save the Date : Microgrid 2020 Conference Nov. 18-20 - Philadelphia, PA

Finance Session: *Resiliency vs Sustainability. Why They are in Conflict and How to Make Peace*

- Plus 90 speakers in 30+ sessions on best practices
- 35 exhibitors
- Networking opportunities

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Thank You!

Next Session: *Disaster Planning & Business: How Microgrids Help Commercial & Industrial Operations Improve Customer Service in a Crisis @ 11 AM Eastern*

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