

Stakeholder Engagement for Success and PEER as a Tool for Microgrid Performance

► November 6th, 2017

ADVANCING THE POWER OF ENERGY

Why people are important in building a microgrid



"What Do Today's Microgrid Customers Want?"

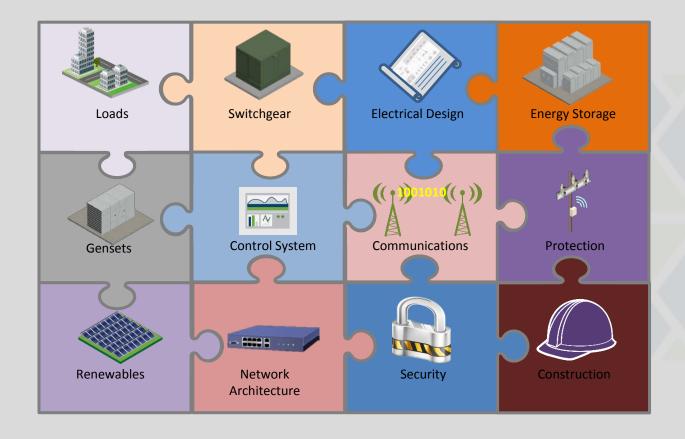
"Campus Microgrids Pushing New Generation of Development"

"DOE Invests up to \$50M for Microgrids, Grid Resilience & Cybersecurity"

"Lessons from Natural Disasters Spur New Microgrids in Japan"

"Utility Microgrids Make Progress in Arizona and Ohio"

Elements of a Microgrid





Microgrid Applications and Benefits



Islanded Operations

- ✓ Optimum solution for energy resilience and cybersecurity
- ✓ Preemptive storm mode
- ✓ Renewables-only modes
- ✓ Optimizes for time-of-day-use for prolonged islanding

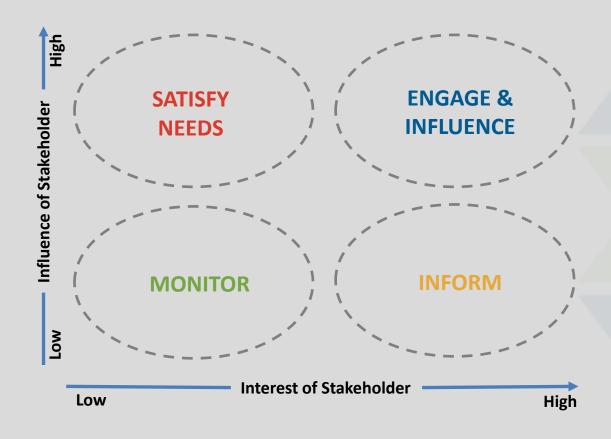
Grid-Connected Optimization

- ✓ Cost optimization across generation sources
- ✓ Economic Optimization and Forecasting capability
- Reduced fuel costs and carbon footprint
- ✓ Improved customer and end-user satisfaction

Remote Site Power

- ✓ Quickly integrates DERs and renewables
- ✓ Easily scalable

Evaluate and Identify the Roles of Stakeholders





Municipal Utility-Owned Microgrid

Minster, OH

Solar plus storage microgrid – Completed 2015



Megawatt s



Storage 7 MW



Solar 3 MW

SATISFY NEEDS

High

Influence of Stakeholder

Lo≪

Industrial Customers Third party financing company

MONITOR

Local / state policy officials

ENGAGE & INFLUENCE

City Leadership
Utility

NFORM

Equipment Providers

Low Interest of Stakeholder

High



Utility Driven, Consumer Focused Microgrid

City of Field Microgrid

Utility project highlighting effectiveness of battery storage – Completed 2013



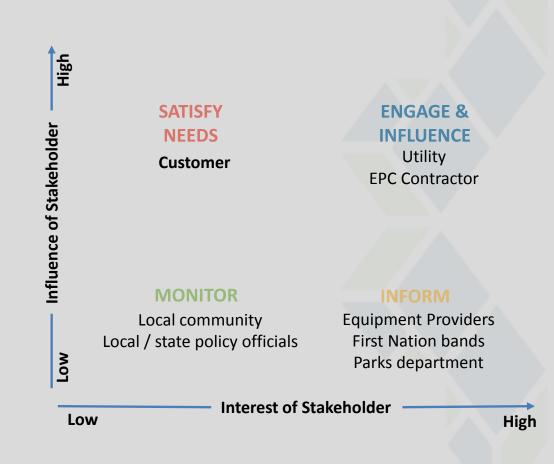


Loss of Grid Power Update, Battery State: ON since 7/17/2017 2:51:09 PM

Hours Remaining: 4hr(s), 37min(s)

Capacity: 20%

Average Load: 281kW



Pushing the Envelope with a Next Generation Utility Microgrid

Ameren Technical Application Center, IL

Utility prototype with 15 use cases - Completed 2017



Megawatt



Storage 250 kW



Generator s1.0 MW



Wind 100 kW



Solar 150 kW



Electric
Vehicle Only

High

Influence of Stakeholder

Lo≪

Low

Residential customers Local university

SATISFY

NEEDS

MONITOR

System operators Regulators Other utility providers

Interest of Stakeholder

ENGAGE & INFLUENCE

Utility leadership

INFORM

Equipment providers



High

The Complexity of a Military Microgrid

Fort Carson, CO

SPIDERS II – 4th ID HQ and data center – Completed 2015

4.3









Megawatt S

Generator s 3.15 MW

Solar 1.0 MW

Electric Vehicle 200 kW

ATO RMF

Camp Smith, HI

SPIDERS III - Entire PACOM HQ base - Completed 2015

5.8









Megawatt

Generator **s** 5 MW

Solar 300 kW

Storage 500 kW

ATO DIACAP

High

Influence of Stakeholder

Lo≪

Low

Government contracting **DoD Leadership IA Validators**

SATISFY

NEEDS

MONITOR

Local utility Non-local military base officials DoD policy officials

ENGAGE & INFLUENCE

Government project management Base energy manager System operators

Government tenant(s) National labs **Equipment providers**

Interest of Stakeholder





Practical Tips to Consider



Project Management



Make Time



Smarten Up



Who's Who



Hidden Helper



Start your Microgrid with PEER



RELIABILITY & RESILIENCY

Examines metering, communications, SCADA, emergency response plan, SAIDI, SAIFI, power quality, islanding capabilities, etc.



ENVIRONMENTAL

Examines renewable portfolio standard, local permit requirements, emissions, local renewable generation, environmental impacts.



OPERATIONAL EFFECTIVENESS

Examines system energy efficiency, cost savings, demand charge reduction savings, opportunity costs, etc.



CUSTOMER CONTRIBUTION

Examines data privacy, cybersecurity, consumer engagement programs, access to real-time data, access to dynamic pricing, incentive programs, etc.





THANK YOU

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