

The Economics of Micro Grids

SPIDERS Industry Day August 27, 2015

Go Electric

**Energy
Security**



**Energy
Resiliency**

Go Electric: Who We Are



Lisa Laughner
Founder, President & CEO



Tony Soverns
Engineering Director



Alex Creviston
Chief Engineer Mechanical Systems



Anderson, Indiana

Go Electric: What We Do



Micro Grid in a Box

- Provides Uninterruptible Power
- Delivers energy services
- Integrates Renewables



Our Role in SPIDERS Phase III:

Delivered:

- 500kW LYNC™ UPS
- 1500kW Diesel Generators
- Micro Grid Control & Integration

Capabilities **Statement**

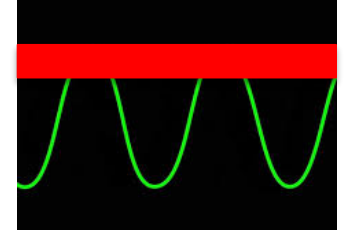
FACILITIES



Blink-less UPS



Energy Optimization



Peak shaving

UTILITIES



Demand Response & Aggregation



\$\$ Buy?
\$\$ Sell?

Energy Arbitrage

Micro Grid Economics: **2 Examples**

Brown Field Site

Improving Generator Efficiency

385,805 liters diesel saved pa

52% ROI

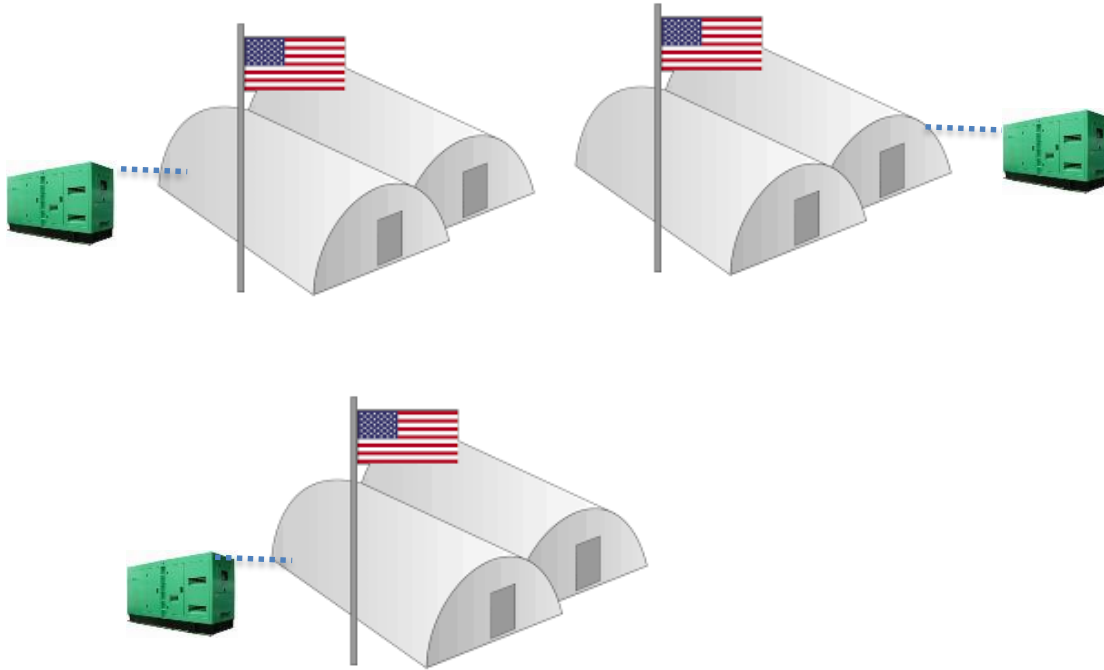
Green Field Site

Collaborating with the Local Utility

**\$2,900,000 Construction
Contribution**

\$277,076 annual payments.

Brown Field Site: 1 MW Remote/Islanded Site

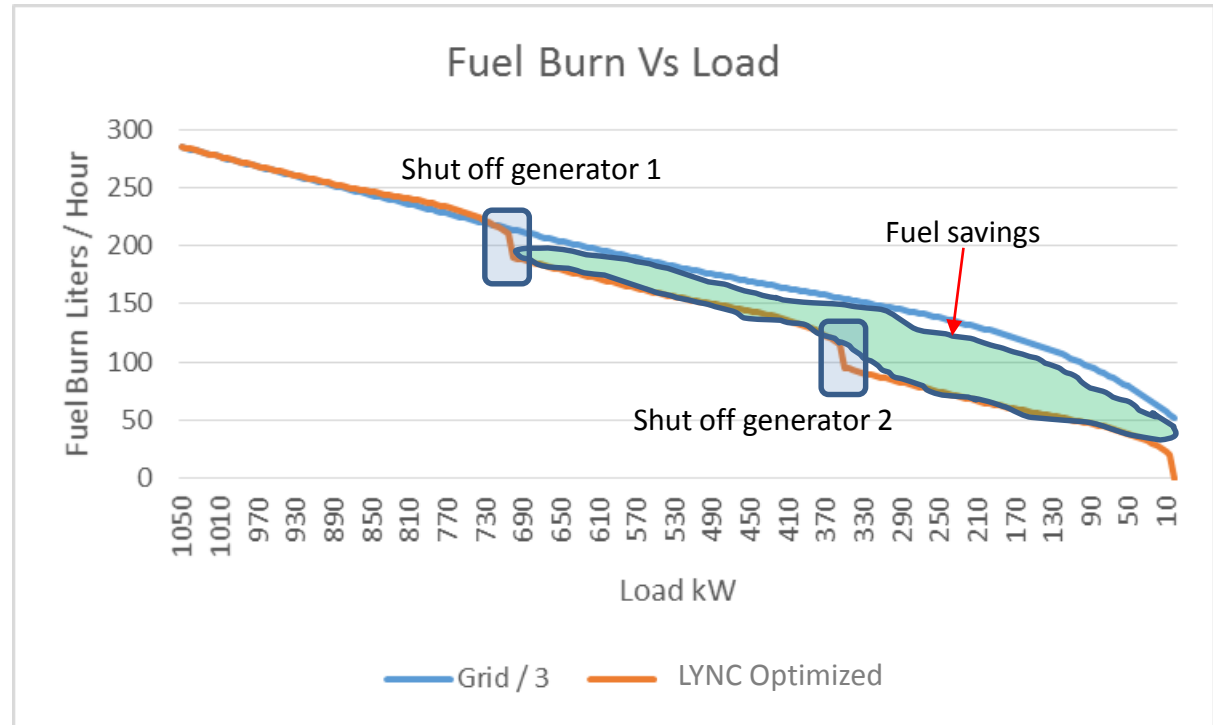


- Qty 3: 350kW Diesel Gens
- Individually connected
- Mid-day peak load; evening min load.
- 3955 liters diesel DAILY

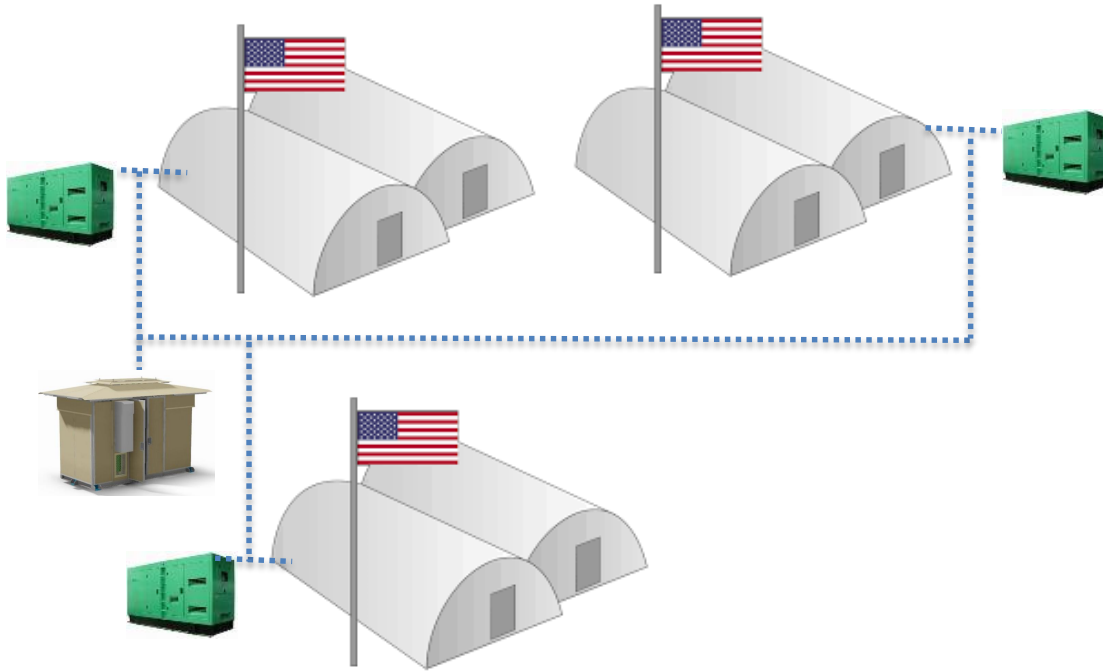
1 MW Remote/Islanded Brown Field Site: **Fuel Savings**

Efficiency Optimization with **LYNC™**

- Lightly loaded generators shut down
- Remaining generators run at higher efficiency rate
- LYNC™ manages load fluctuations



1 MW Remote/Islanded Brown Field Site: **Add 250kW LYNC™**



- Optimize generator & site efficiency
- Manage load spikes & site load sharing
- Adds “No Fuel” spinning reserve

**Fuel Savings:
1,057 liters per day**

1 MW Remote/Islanded Brown Field Site: **Economics**

LYNC™ equipment **\$365,000**

Installation & NRE @ \$2,000/kW **\$500,000**

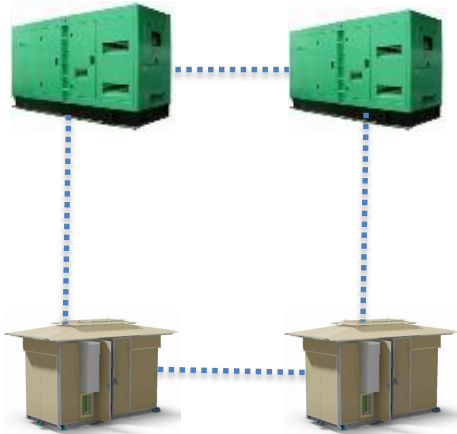
Annual Fuel savings @ \$4.51/gal **\$459,654**

ROI **52%⁺**

Payback **<1.8 years**

Other benefits: **730 hrs reduction on generator pa**

Green Field Site: **New 1 MW Generation Plant**



- Qty 2: 500kW Cat NG Generators
- Qty 2: 500kW/1MW KWH LYNC

Operating Performance: 1MW continuous
2MW peaking

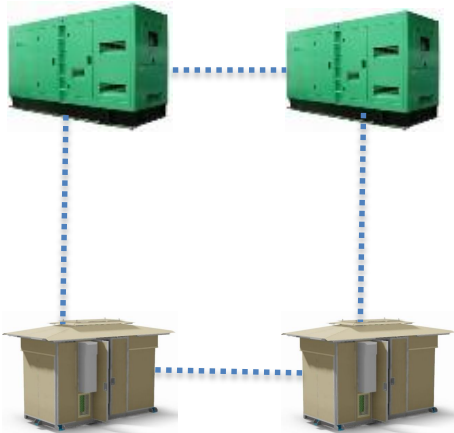
Enroll assets in a utility Demand Response program

**Uses Customer energy assets
to support Grid stability**

**Pays \$\$ Incentives for
equipment installations**

**Pays \$\$ monthly fees for participation
in Demand Response events**

Green Field Site: **Utility Incentives**



New York /ConEd Utility

- \$2,100/kW battery energy storage
 - \$800/kW generators
- = \$2,900,000 contribution**

CA / San Diego Gas & Electric Utility

- \$1,460/kW battery energy storage
 - \$300/kW generators
- = \$1,760,000 contribution**

Green Field Site: Construction **Economics**

LYNC™ & Generators	\$3,177,880
Installation & NRE @ \$2,000/kW	\$2,000,000
Total	<u>\$5,177,880</u>

ConEd Contribution	\$2,900,000
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Project Cost Reduction	56%
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Green Field Site: Operating **Economics**

Demand Response Income	\$237,000
Peak Shaving benefit	\$59,569
Fuel (Cost) during DR events	(\$19,493)
Total Annual Net Benefit	\$277,076

ROI

12%

(& avoids costs of inefficient generation)

Micro Grid Economics **Summary**

Micro Grids improve energy efficiency by optimizing generator operation **>53%**

Collaborating on a Utility DR program substantially reduces new construction costs **50%+**

Utility DR program provides on-going revenue stream to the facility **12%+**

Go Electric LYNC™: the UPS that pays you back

Go Electric



Lisa Laughner

Pinktoe Tarantula

Lisa@goelectricinc.com

Tony Soverns

Barn Spider

Tony@goelectricinc.com

Alex Creviston

Assassin Spider

Alex@goelectricinc.com