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
- Energy Arbitrage

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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.

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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

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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**

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LYNC™ equipment</td>
<td>$365,000</td>
</tr>
<tr>
<td>Installation &amp; NRE @ $2,000/kW</td>
<td>$500,000</td>
</tr>
<tr>
<td>Annual Fuel savings @ $4.51/gal</td>
<td>$459,654</td>
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**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
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
  \[= \$2,900,000 \text{ contribution}\]

CA / San Diego Gas & Electric Utility
- $1,460/kW battery energy storage
- $300/kW generators
  \[= \$1,760,000 \text{ contribution}\]
Green Field Site: Construction Economics

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

ConEd Contribution $2,900,000

Project Cost Reduction 56%
Green Field Site: Operating **Economics**

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
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<tbody>
<tr>
<td>Demand Response Income</td>
<td>$237,000</td>
</tr>
<tr>
<td>Peak Shaving benefit</td>
<td>$59,569</td>
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<tr>
<td>Fuel (Cost) during DR events</td>
<td>($19,493)</td>
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<tr>
<td>Total Annual Net Benefit</td>
<td>$277,076</td>
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**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