POWER FORWARD

NYSERDA On-site Resilient Power Conference
June 27, 2019

Presented by: Shaun Hoskinson, VP Engineering & Operations
Regarding NYS Marketplace

What we bring to the effort for NYS marketplace:

<table>
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<tr>
<th>Pre-Analytics to determine Size-mix of Technologies</th>
<th>Solar Equipment &amp; Installation</th>
<th>Storage Equipment &amp; Installation</th>
<th>CHP Equipment &amp; Installation</th>
<th>Controls Equipment &amp; Installation</th>
<th>Dispatching Algorithm, Signaling, Monitoring</th>
<th>Systemwide Responsibility (Interface to Customer)</th>
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Audience-members we want to connect with to form a team in NYS:

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Summary Overview

Company Legacy
Unique Capabilities
Global Recognition
Industry-Leading Products
Microgrid Market Global Domination
World Class Customers
Storied Case Studies
Energy Tech Foundation

History
Founded 1992
New generation of distributed energy system-level control
Venture capital funded 1992-2006

Investment
$65M capital investment
~ $10M directly to product development

Ownership
Privately held
“Sister” companies: mission critical and energy focused
### Our Difference: Combining IT & Power

**Distributed Generation System Expertise** – Professional Engineering, Energy Savings Analysis & Reporting

**Control** – Real-Time / Remote, Single- and Multiple-Engine Generator Aggregation & Control

**Communication** – Full Two-Way Communication, Wireless / Web-based Capabilities

**Monitoring / Data Collection** – Remote Monitoring and Alarming, Secure Data Hosting

**System Experience** – 1000+ MW Controlled

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<th>Prime Mover Experience –</th>
<th>200 MW</th>
<th>160 MW</th>
<th>80 MW</th>
<th>65 MW</th>
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**Interconnection** – Coordination & Protective Relaying; Full Parallel with Utility, IEEE P1547 Compliant

**Device Interface / Integration** – Utility (electric/gas) and Generator Metering, SCADA, Emissions Monitors, PLCs, Protective Relaying

**Applications** – Prime Power, CHP, Methane Fuel / Biomass, Demand Response

**Markets** – Data Centers, Healthcare / Hospitals, Education, Military
Global Recognition

Microgrid Controller
Ranked 3rd Globally
Navigant Consulting, GreenTech Media, etc

Finalist, Most Innovative Commercial Technology
Microgrid Secure™, Platts/BusinessWeek global energy competition

Deloitte Fast 50 and Fast 500 Technology Rankings
Ranked 2nd Colorado Technology; 206th Fast 500 North America

Project of the Year: Chowchilla & Red Bluff 50MW Power Plants
Pennwell & Power Engineering Magazine, Power-Gen International

BusinessWeek, Chicago Tribune and industry articles
Encorp Evolution — Microgridding since before they were called microgrids...

- Founded in 1992 by Colorado State University grad
- $10M funding raised from friends and family and local domestic VCs
- Encorp trademarked the term “Virtual Power Plant”
- First distributed generation product offering
- Encorp acquired by Primary Integration, LLC
- Additional $40 million financing round leading energy tech VCs
- Encorp scaled to achieve profitability
- Encorp continued to complete industry-leading microgrid projects
- Management buyout July 2013
- Encorp shifted its strategic priority to focus on microgrid projects
- Began selective WW expansion
Leading the Global Microgrid Control Sector

Navigant Research Leaderboard: Microgrid Controls
Encorp: Industry-Proven Control Platforms

Distributed energy resources are integrated energy systems consisting of multiple electrical generation sources operating either independently of - or in parallel with - a utility grid to power buildings in campus-like environments: C&I and military.
Gold Box™: A World First

World’s first system-level distributed energy controller

Gold Box™ functionality

Controls generating assets
Combines synchronous & inverter-based resources
IEEE 1547 grid interconnection compliant
Open protocol communication interface
Grid-Interconnection Systems

Low & medium voltage switchgear

IEEE 1547-compliant Gold Box™ replaces electromechanical and multi-function solid state relays

Expanded functionality when combined with software application suite – monitor, control & aggregate renewable and traditional energy resources
Encorp Egility Control Platform Features

- Microgrid, CHP & Demand Response
- 2017 R&D effort leverages 30-years experience
- Advanced functionality
- Remote diagnostic, monitoring & programming
- Three interrelated computing hardware devices
- Modular hardware design for rapid deployment
- Updated physical aesthetic
- Economic optimization software
- Introduced at a Puerto Rico Pharma in 2018
Microgrid Encorp Market Approach

Feature-rich, Attractively-Price
Egility Product Offering
Leverage legacy and newly-developed IP

Participate in Additional Value
Chain Components
Limit the complexity of project development and related EPC activities

Concurrent Multiple
Channel Engagement
ESCOs, RE Distributors, Electrical & General Contractors, End-user Assoc.

Create New Microgrid Markets & Customers
Leverage Egility features with very select technical and commercial partner(s)

Egility Provides Rapid Rollout, Partner-assisted Commissioning
Leverage modular Egility hardware and modular software configuration
Representative Customers

- **Tesla**: 4 Projects; $200K
- **e.on**: 1 Project; $150K
- **Larson & Toubro**: 3 Projects; $500K
- **Fairbanks Morse & Enpro Industries Company**: 1 Project; $1.5M
- **Chevron**: Energy Solutions; 1 Project; $350K
- **Northrop Grumman**: 1 Project; $300K
- **ERNOC**: 9 Projects; $3M
- **Kraft**: 1 Project; $250K
- **U.S. Air Force**: 3 Projects; $1M
- **Level3 Communications**: 3 Projects; $500K
- **Siemens**: 5 Projects; $2M
- **Equity Office**: 8 Projects; $3M
- **Ameresco**: 3 Projects; $1.25M
- **AMERESCO**: 3 Projects; $500K
- **Washington Gas**: 3 Projects; $2.5M
- **Honeywell**: 1 Project; $350K
- **Verizon**: 3 Projects; $4M
- **Eaton**: Powering Business Worldwide; 20 Projects; $750K
- **Cupertino Electric**: 1 Project; $100K
- **Shaw**: 1 Project; $600K
- **County of Alameda California**: 1 Project; $400K
- **Qwest**: 4 Projects; $750K
- **DTE Energy**: 1 Project; $150K
- **Carolinas Healthcare System**: 3 Projects; $5M
Worldwide Projects with World Class Customers

IOLA & MOC Campus (Siemens Building Technologies)
Verizon Data Centers
Larson & Toubro: Chennai, India
City of Chicago
Miami International Airport
Bangor Navy Nuclear Sub Base
Fairbanks Morse: Puerto Rico
Carolina Medical Center
Fort Bragg Army Base
Washington Gas Utility
E.ON: Simris, Sweden
Microgrids Around the World

**Stewart Air National Guard – New York, US**
Extended renewable energy supply – completely inverter based islanding system

**E.ON Local Energy System – Simris, Sweden**
Platform for multiple use case evaluations

**Santa Rita Jail Microgrid – Alameda County, California**
Multiple renewable+fossil generation sources with BESS
Stewart Air National Guard
Microgrid in New York
Stewart Air National Guard Base
Orange County, New York (COD 2015)

FEATURES

160 kW rooftop solar PV system

120 kWh Li-ion BESS

AFRL Requirement: All-inverter based system – No synchronous sources allowed within the microgrid (mobile diesel gens connected manually)

Automatic, seamless islanding & reconnect capability

Overarching two-way communications backbone

Cyber security (NIST, NERC, FERC for CIP, etc.)

Physical attack protection

Self-healing capabilities

Weather protection – active and passive
E.ON Local Energy System
Simris, Sweden (COD 2017)

FEATURES
- 440 kW rooftop solar PV system
- 330 kWhr Li-Ion BESS
- 500 kW wind turbine generators
- Automatic, seamless islanding & reconnect capability
- Self-healing capabilities
- Weather protection – active and passive

Live link to site: https://les.eon.se/
Santa Rita Jail Microgrid in California

Power Surety
Multiple sources of power for secure electricity 24/7 for 1M sq.ft. facility

Seamless connection and disconnection from the utility supply with no impact on site loads or activities

Economics
Load shifting for economic benefit (power import during low rates, zero import or export during peak rates)

Environmental
Helping Alameda County meet its renewable energy goals

Diagram: Microgrid components including:
- Encorp Generator Control System
- Encorp Microgrid Remote Load Controllers (RLC)
- Encorp Battery Interface Control
- Microgrid SCADA & Control Network
- Dist. Energy Management System (DERMS)
- Utility Supply
- 12 kV Static Switch
- Gold Box™
- Enforc Point of Common Coupling (PCC) Interface
- Generator Controls
- 2MW Energy Storage
- (5) 2.3kW Wind Turbines
- 1.2 MW Rooftop Solar
- (2) 1.2 MW Generators
- 1MW Fuel Cell
- (18) Housing Units
- 12kV Grid
Santa Rita Jail Microgrid
Alameda County, California (COD 2011)

FEATURES

1.2 MW rooftop solar PV system
1 MW fuel cell power plant with heat recovery for facility hot water and space heating
Five 2.3 kW wind turbines
Two 1.2 MW emergency backup diesel generators
2 MW advanced energy storage system
12 kV sub-cycle static disconnect switch
Automatic, seamless islanding&reconnect capability
Electric power export and import capability
CERTS smart grid control logic