

USEPA CHP Webinar NYSERDA CHP Acceleration Program A Manufacturer's Perspective

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Program Specifics: From the Tecogen Perspective

Benefits

- High grant value
 - Up to \$1800/kW
- Single point accountability for entire CHP project
 - Site engineering
 - Installation
 - Minimum 5 year warrantee and service agreement
- NYSERDA monitoring for 3 years
- CHP systems need to be pre-qualified and require a level of pre engineering
 - System includes CHP module and axillary equipment like cooling towers, absorption chillers, radiators, etc.
- There would be a catalogue of systems from NYSERDA available to the public

CHP System Requirements

- Only black-start capable CHP eligible
 - Technologically advanced systems
- Proven track record of system performance
 - Only veteran systems and vendors

Program Purpose

Program Perspective

- Resiliency
- Reliability
- Energy Efficiency
- Environmental Impact
- Energy Cost Savings

Manufacturer Perspective

- Creation of a credible baseline for CHP system comparisons
- Shorten discovery to implementation time by bridging trust and education gap
- Shorten project ROI by an average of 2 years

Tecogen's Answer to NYSERDA

- Ultra low emissions compliant with CARB 2007 standards
- Black-start grid independent operation
- Microgrid compatible with CERTS power balancing control software
- ETL listed, UL 1741 and UL 2200 certified for safe interconnection



Local Experience in NYC Area

- Considerable NYC population of InVerde microgrid enabled units
- Local support with 3 service centers



Pre-Qualification Process: Comprehensive but Necessary

- Bar should be set high
 - Fidelity of NYSERDA, CHP customers Important
 - Overall CHP industry perception at stake
- 3rd party verification essential
 - Important to have 3rd party verification of system components and overall system operation
 - Safety, reliability, stewardship at stake
 - Eg, UL 1741, UL 2200, emissions, other claims
- Black-start system performance history a must
 - PON is to encourage mass deployment of qualified CHP
 - Must encourage proven system technology over emerging technology
 - Other programs in place for emerging systems



Catalogue: Credible Baseline

-  seal of approval
- Publically trusted authority
- Streamlines CHP project implementation with sites
- Improves end user confidence
- Reduces discovery to implementation time by 6-12 months
- Standardizes CHP solutions

Catalogue: Impact of Shortening Discovery to Implementation time by 6 Months

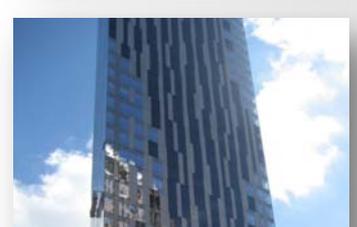
- Tecogen pipeline: 35-40 projects
 - Each site averaging 3.25 units
- 1 InVerde saves 510 tons of CO₂
- If each unit is installed 6 months earlier...
 - 28,800 tons CO₂ mitigation
 - ≈10,900 cars
 - ≈43,900 acres of trees

Catalogue: Impact of Shortening Discovery to Implementation time by 6 Months

- Economics:
 - At 3.25 units, each site would save an additional \$130,000
 - \$4,520,000 for all projects
- Reduction on Grid Strain
 - 14 GW peak strain reduction
 - InVerde can produce 125 kW for peak shaving purposes

Product Deployment:

Medical, Educational, Industrial, Commercial & Multi-Unit Dwelling



NYSERDA: Tecogen Case Study

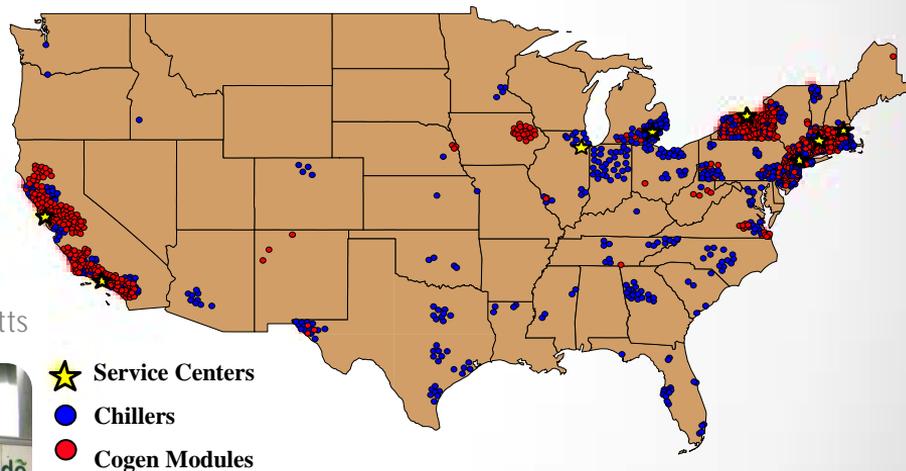
Madison-Oneida Board of Cooperative Educational Services (BOCES)

- Vocational tech school with 250,000 ft² of occupied buildings
- CHP System: 6 – 100 kW Tecogen InVerdes (600 kW total)
- Upgraded old 300 kW system
- Stand-alone capability required (Red Cross Refuge Facility)
- Thermal output serves DHW, hydronic space heating
- Chilled water air conditioning via absorption chiller



Tecogen Company Background

- Founded 1982 as division of Thermo Electron Corp.
- Headquarters in Waltham, MA
 - 66 employees
- 8 service centers across the US
- Thousands of systems shipped domestic/international
- Full Capabilities
- Application Assistance
- Engineering
- Turnkey Installation or Construction Management
- Long-term Service & Maintenance
- All Tecogen systems are manufactured In Massachusetts
- Website: www.tecogen.com





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