

**Clean Energy States Alliance**  
**State Leadership in Clean Energy Webinar Series**

**Accelerating Resilient Power in  
Connecticut and New York**

Hosted by  
Todd Olinsky-Paul, Project Director, CESA  
Tuesday, December 16, 2014

# About CESA

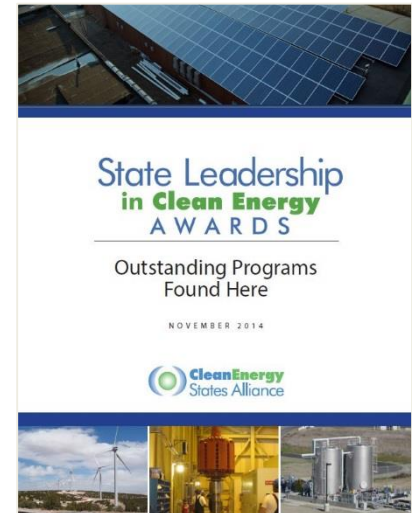
Clean Energy States Alliance (CESA) is a national nonprofit organization working to implement smart clean energy policies, programs, technology innovation, and financing tools, primarily at the state level. At its core, CESA is a national network of public agencies that are individually and collectively working to advance clean energy.

# About the State Leadership in Clean Energy Awards

CESA's State Leadership in Clean Energy Awards recognize state and municipal programs and projects that demonstrate leadership, effectiveness and innovation in advancing renewable energy and other clean energy technologies.

An independent panel of distinguished judges selected eight recipients for the 2014 Awards. More information, including case studies and links to upcoming webinars featuring the winning programs, is available on our website:

[www.cesa.org/projects/state-leadership-in-clean-energy/2014](http://www.cesa.org/projects/state-leadership-in-clean-energy/2014)



# Today's Guest Speakers

**Dana Levy**, Program Manager for Technology Development and On-site Power Applications, New York State Energy Research and Development Authority (NYSERDA)

**Veronica Szczerkowski**, Microgrid Program Coordinator, Bureau of Energy and Technology Policy, Connecticut Department of Energy and Environmental Protection (CTDEEP)

**Tracy Babbidge**, Bureau Chief, Bureau of Energy and Technology Policy, Connecticut Department of Energy and Environmental Protection (CTDEEP)



# CESA SLICE Award Webinar: NYSERDA's CHP Program Logic and Format



**Dr. Dana Levy of NYSERDA:**

NYSERDA CHP thought-leader since 1999.

Recipient of the USCHPA CHP Champion Award in 2007.

Recipient of the NECHPI CHP Champion Award in 2014.

[Dana.Levy@nyserda.ny.gov](mailto:Dana.Levy@nyserda.ny.gov)

[www.nyserda.ny.gov/CHP](http://www.nyserda.ny.gov/CHP)

December 16, 2014

# Agenda

1. CHP is Good
2. Sequence of Program Evolution
3. The Current Program -- The “Catalog” Approach
4. Other Features of The Current Program

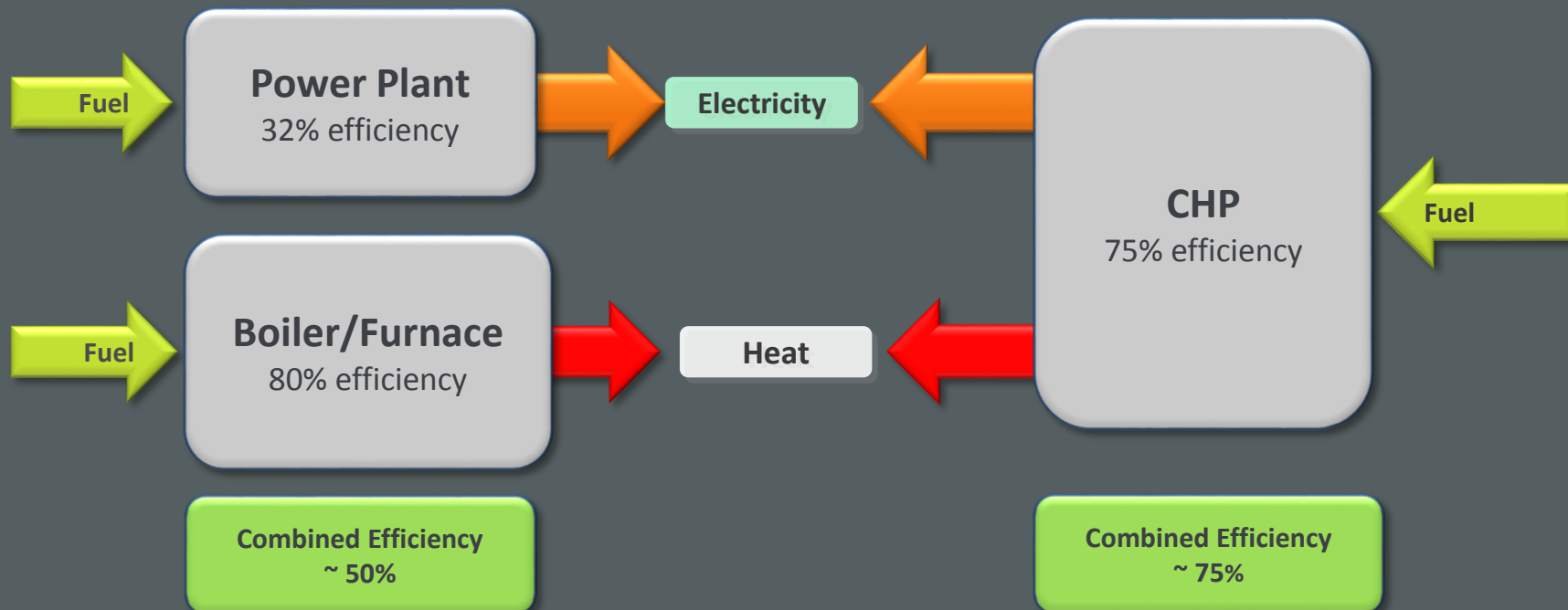
# What is Combined Heat and Power (CHP)?

Combined Heat & Power (CHP or cogeneration) is the simultaneous generation of heat and electricity from a single fuel source



# Why is CHP a Good Thing?

Comparison of “status quo” scenario versus “CHP” scenario



Fuel savings = Everyday Financial savings

Fuel savings = Everyday Emission reduction



# What are Common Uses of CHP?

- Produce onsite some of your everyday electrical power, while
- Recycling the electric generator's byproduct heat for use in heating and/or cooling (Combined Cooling Heating & Power = CCHP), and
- Keep power on to some circuits during grid outages

# Who Should Consider CHP?



Manufacturing



Hospitality



Commercial Real Estate



Data Centers



Healthcare



Municipalities



Multifamily



Other energy-intensive facilities

# Agenda

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2. Sequence of Program Evolution
3. The Current Program -- The “Catalog” Approach
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# Sequence of CHP Program Evolution

Explore  
Modularity

Ice Breaker



## CHP Demonstration Program

Goal: Diversity -- Broad Portfolio for Learning via Trailblazing Examples

## CHP Performance Program

Goal: Resource Acquisition of Good Projects that don't otherwise contribute new Demo-type Learning

## CHP Catalog Program

Goal: Market Transformation via Standardization & Maturity

Ferry



2000

2006

2012

# NYSERDA's Decade of CHP Experience

- Strategy: Portfolio of diverse examples
  - **Size:** 1.2 kW to 40 MW
  - **Sectors:** 56 at Apartment Buildings, 26 at Healthcare, 26 at Farms, 17 at Schools, 6 at Office Buildings
  - **Fuels:** Natural Gas, Biogas, Wood
  - **Machinery:** Engines, Microturbines, Fuel Cells, ORC, Combustion Gas Turbines, Steam Turbines
- Impacts
  - **181 projects to yield 200 MW**
  - Of these, 140 projects are operational = 170 MW installed
  - Funding: NYSERDA ... \$125 Million
    - + Others ..... \$675 Million
    - = Total ..... \$800 Million**

<http://chp.nyserda.ny.gov>

# CHP Viewed as an Appliance

Packaged  
Modular  
Standardized

All-in-One  
Within-the-Box  
Plug-and-Play

DRESSER-RAND.

## CHP 2

250kW Combined Heat and Power (CHP) systems reduce on-site energy costs and carbon dioxide emissions through the highly efficient delivery of power and heating. Combined cooling, heating and power (CCHP or Trigeneration) systems, provide the high efficiency of CHP with the added benefit of chilled water output.

## INTELLIGEN POWER SYSTEMS LLC

Intelligent Cogeneration

Saving Money Through Efficiency  
Is an Efficient way to Save

- Why Choose Intelligen Power?
- The Intelligen Platform
- Intelligen Product Benefits
- Intelligen Product Line and Specifications
- Custom Equipment Packages
- Operation and Maintenance Services
- Consulting



### The Intelligen Platform

**Standardized Approach**  
Intelligen Power Systems has developed a standardized cogeneration system for a particular site. The standardized platform greatly reduces the cost of installation and improves reliability and the maintenance function.

**Pre-Packaged**  
In order to simplify the installation, Intelligen Power Systems has developed a factory tested package that is a quick and cost effective installation product.

**Fully Automated Control System**  
The Intelligen Power Systems control system has been specifically designed for cogeneration systems as well as integration with the host facility's control system functions to allow for reliable unattended operation.

**Remote Monitoring**  
The Intelligen Power Systems control package provides full remote monitoring and maintenance program that is designed for maximum run-time performance 24 hours per day and 7 days per week and response time.

**Highest Quality Components**  
Intelligen Power Systems obtains its high levels of availability and reliability through the use of the highest quality components available. The prime mover is a heavy duty industrial reciprocating engine.

**Simplified Utility Connection**  
Intelligen provides standardized utility interface packages that are designed to interconnect with your electrical utility. Intelligen has extensive experience in utility interconnection.

Energy consumers demand high efficiency and reliability in order to minimize operating costs and maximize uptime. Our CHP systems are supplied as a comprehensive factory tested package that can be easily integrated into existing site operations. Items such as synchronizing switchgear, heat recovery equipment, emissions treatment, attenuation, and lube oil systems are included "within the box" dramatically reducing the risk of cost overruns and performance issues associated with

**26 CENERGY**  
Advanced Clean Energy Technologies

### NATURAL GAS CHP COGENERATION MODULES

#### PRODUCT LINE DATA SHEET

**Natural Gas Cogeneration CHP Modules**  
34kVA / 27ekW up to 3750kVA / 3000ekW - 60Hz - U.S.

- Especially designed for NG CHP
- More than 1500 Units in Operation
- Professionally Engineered
- Production Line Manufactured
- Factory Tested
- Reliable & Fuel Efficient
- Lean Burn with optimum AFR
- Economical Rich Burn Options
- Compact Standardized Design
- Low Service & Maintenance Cost
- Extended Life Cycle
- Fully Automated User Friendly
- Higher Reliability
- Connection Ready
- All-In-One (Plug & Play)
- Best In Class Technology
- Decreased Operating Expenses
- Increased ROI

**No other CHP Systems are manufactured more thoroughly. 26<sup>th</sup> delivers the ultimate solution in High Efficiency, Performance and Design. Unmatched Quality Reliability like nothing else.**

**C1000 Megawatt Power Package**  
High-pressure Natural Gas

1MW of reliable electrical power in one small, ultra-low emission, and highly efficient package.

- High electrical efficiency over a very wide operating range
- Low-maintenance air bearings require no lube oil or coolant
- Ultra-low emissions
- High availability - part load redundancy
- Proven technology with tens of millions of operating hours
- Integrated utility synchronization and protection with a modular design
- 5 and 9 year Factory Protection Plans available
- Remote monitoring and diagnostic capabilities

C1000 Power Package

**Tecogen-10**  
Advanced Modular CHP Systems

## InVerdē Ultra 100

Ultra-Low Emissions Inverter-Based Cogeneration

**Key Features & Benefits**

- 100 kW Continuous/125 kW Peaking
- Delivers ultra-low emissions levels compliant with strict "CARB 2007" Standards
- Standardized Interconnection
- Black-Start Grid-Independent Operation
- Microgrid compatible with licensed CERTS' power balancing control software
- Premium Quality Wave Form, Voltage and Power Factor for Special Applications
- Power Boost for Demand-Side Response
- Enhanced Efficiency from Variable Speed Operation
- Simplified Inter-Unit Controls for either Mode of Operation (parallel or standby)
- ETL Listed - Labeled for compliance with UL 1741 - Utility Interactive, Inverters, Converters, Controllers and Interconnection System Equipment for Use with Distributed Energy Resources
- Renewable Energy Compatible, a Clean Energy Solution for Today and Tomorrow

CERTS - Consortium for Electric Reliability Technology Solutions

UL 1741 Compliant NYSIR Certified

Tecogen-10 Advanced Modular CHP System

- Over 25 years experience in packaged cogeneration, chillers and refrigeration systems
- More than 1,400 operating units in the field
- Extensive service network with factory-trained technicians exclusively servicing Tecogen products

Tecogen Inc. • 45 First Avenue, Waltham, MA 02451 • 781-466-9400 • 781-466-9400 (fax) • www.tecogen.com

**ELITE ENERGY**

## Combined Heat and Power

Cut energy expenses and reduce emissions with a packaged combined heat and power (CHP) EnviroGen® Energy Module powered by a Caterpillar natural gas or diesel engine.

- Standard Natural Gas CHP Modules:

**KRAFT ENERGY SYSTEMS**  
COMBINED HEAT AND POWER

Specialists in Combined HEAT & POWER

Kraft Energy Systems LLC is dedicated to providing reliable onsite combined heat & power (CHP) systems. We have over 40 years experience in the power generation field, combining a sales force that possesses outstanding engineering knowledge and a service team that is expertly trained in the power generation field. We are responsive to your needs, providing customers with highly dependable power systems suitable to a wide variety of industry needs.

Our products supply power ranging from 50kW - 3 Mw. We offer prepackaged plug-and-play modular systems and customizable power components, meeting the needs of your unique power requirements.

Kraft Energy System stands apart from the rest in terms of providing clean efficient energy for good reason:

- The performance of our high quality products
- The value of purchasing environmentally sound CHP systems
- The expertise our service technicians bring, keeping your equipment running for decades to come

With CHP you can rest assured that you are getting the most cost-efficient power system, achieving several industry needs from one well engineered system that either meets or exceeds environmental standards.

Call one of our expert sales people today to learn how Kraft Energy Systems can provide you with a power producing system geared towards peak performance. TEL: 800-969-6121

**Aegen PowerVerter PV75**  
Daily energy savings AND standby power... with just one machine.

When the grid goes down, keep your building up and running with black-start capable Aegen PowerVerter.

**Never lose power again!**

The PowerVerter provides your building with everyday energy savings while remaining available for emergency power in the event of a grid power failure.

Designed by Aegis Energy Services the leader in small modular Combined Heat & Power Systems, the PowerVerter is engineered to interface with utility area or spot networks, such as those found in parts of New York City, or other cities in the Northeast.

Unlike standby generators, which are only activated in the event of a power outage, PowerVerter operates continuously in parallel with the grid, delivering 24/7 energy savings from its synchronous, inverter-based CHP technology.

Combined Heat and Power (CHP), also known as cogeneration, is the simultaneous production of heat and electricity from a single fuel source. This high efficiency system produces significant reductions in energy costs as well as reduced emissions, as recognized by the EPA.

When a central power grid failure occurs, PowerVerter continues to operate, automatically switching its electrical output to the load priorities pre-selected by the building management. **Your building continues to operate!**

With continuous operation of PowerVerter and remote monitoring of the system by the manufacturer, there is never any question as to whether or not vital standby electricity will be available in the event of an outage.

Simple standby generators produce no energy savings and their reliability is unknown until the time when they are actually needed. In the meantime, these generators sit idle, requiring capital, floor space, and maintenance. Why tie up vital resources when Aegen PowerVerter modular CHP systems could be delivering energy savings every day AND providing peace-of-mind security in the event of an outage?

Contact Aegis Energy Services today for a free energy analysis!

**AEGIS ENERGY SERVICES, INC.**  
55 Jackson Street, Holyoke, MA 01040 • (413) 536-1156 • (413) 536-1104 (fax)  
Website: www.AegisEnergyServices.com • Email: Aegis@AegisEnergyServices.com

**myserda**  
Energy. Innovation. Solutions.

# Observation of Purchasing Habits

- **Habit #1: Simplicity is most important**

- Small-to-medium (50 kW – 1.3 MW)
- Identify replicable designs/opportunities
- Promote standardization for streamlining
- Many mass-market “appliance-like” sales (how an individual person buys a car)



Like “Modular” Housing



Like “Shopping Off The Rack”



- **Habit #2: Customization is most important**

- Medium-to-large (greater than 1.3 MW)
- Promote custom design to maximize efficiency
- Few custom-oriented sales (how the US Navy buys an aircraft carrier)



Like “Custom Tailored”



# Program Administration Formats

- **Competitions**

- **Standard Offers:**

1. List of pre-qualified measures and their associated specific rebates
2. Pseudo-performance (financial award is computed based on analysis and forecast of site-specific performance)
3. Performance payments based on measured & verified performance

Increasing Complexity of Project



Increasing Magnitude of Incentive

See Program Logic Model at:

<http://www.nyserda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2014ContractorReports/2014-PLM-CHP-Acceleration.pdf>



# Agenda

1. CHP is Good
2. Sequence of Program Evolution
3. The Current Program -- The “Catalog” Approach
4. Other Features of The Current Program

# CHP Acceleration “Catalog” Program

## Program Mechanism:

- Create a catalog of “pre-qualified” systems
  - reputable components that appear to be properly size-matched
  - coordinated with Utilities for generic review
- Assign specific “rebate” to each system
- Invite customers to shop from catalog
  - Streamlined approach to system sizing
  - Customized approach to system sizing



# CHP Acceleration “Catalog” Program

## CHP System Sizing Guidelines

NYSERDA has developed a set of conservative CHP system sizing guidelines for common building types based on combinations of site characteristics and CHP system sizes that have been shown to perform well. Applications that fall within the sizing guidelines will receive a streamlined review by NYSERDA.

Building Type	Maximum Microturbine Size	Maximum Reciprocating Engine (RICE) Size	Other Restrictions
Multi-Family Housing	0.25kW/Apartment	0.35kW/Apartment	Building must be master metered
Assisted Living / Nursing Home	0.15kW/Bed	0.25kW/Bed	
Hospital	1.4kW/Bed	2.0kW/Bed	
Hotel	0.14kW/Room	0.20kW/Room	

### “Safe Harbor” Sizing:

- a hotel with 300 guest rooms should buy not-to-exceed 60 kW system
- a nursing home with 300 beds should buy not-to-exceed 75 kW system
- an apartment building with 300 housing units should buy not-to-exceed 100 kW system
- a hospital with 300 beds should buy not-to-exceed 600 kW system

# Right-size is Key to Success

Example: Two Seemingly Similar Hotels

## 300 Guest Rooms

- No Grand Ballroom
- No Health Club
- No Linens Laundry

Rule-of Thumb sets cap at 60 kW, probably right size

## 300 Guest Rooms

- Yes Grand Ballroom
- Yes Health Club
- Yes Linens Laundry

Rule-of Thumb sets cap at 60 kW, but probably could go bigger

# CHP Acceleration “Catalog” Program

## Catalog Items:

- Clean and Efficient CHP and CCHP
- Integrated Controls Package
- Built-in Data Monitoring Features
- Bumper-to-Bumper Warrantee / single-point
- 5-year Service Plan
- “Stand-alone” Operability is Mandatory for All

**Attention CHP Vendors (system “packagers”):**  
Instructions at RFI 2568 for how to get  
your products added to the Catalog

# CHP Acceleration “Catalog” Program

## CHP System Catalog

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*CHP Acceleration Program*

*(PON 2568 Attachment C)*

*Updated August 2013*  
*Updated Sept 2014*

CHP Acceleration Program  
Program Opportunity Notice (PON) 2568

~~\$20M Available~~

**\$60 million Available**

Applications accepted  
through 5:00 PM Eastern Time\* on December 30, 2016

# The CHP “Catalog” -- 50 kW to 1.3 MW

Eligible Vendor	kW Range of Approved Systems												
	50-100	101-200	201-300	301-400	401-500	501-600	601-700	701-800	801-900	901-1000	1001-1100	1101-1200	1201-1300
2G Cenergy													
Aegis Energy Services													
Cogen Power Technologies													
Ener-G Rudox Inc													
GEM Energy													
Intelligen Power Systems													
Kraft Power Corporation													
LC Associates													
RSP Systems													
Tecogen, Inc													
Unison Energy													

v1: 8 Vendors & 36 systems  
 v2: 10 Vendors & 64 systems  
 v3: 13 Vendors & 141 systems  
 v4: due to be issued soon

All of these systems are capable of running during a grid outage.

### Incentives:



- Upstate/Downstate differential
- Extra for Absorption Chillers
- Bonus for Critical Infrastructure
- Bonus for ConEd Target Zone

### Downstate “Base” Incentives:

100 kW = \$1,800/kW  
 200 kW = \$1,750/kW  
 300 kW = \$1,700/kW  
 400 kW = \$1,650/kW

...

# Example of a Catalog Cut Sheet

**Ener-G Rudox Inc**

**ER265F HW**

**265 kW**

**Description**

Type of prime mover	Number of prime mover units	Synchronous or Inverter	Type	Eligible for N+1 installation	Qualification Status
RICE	1	Inverter	CHP	No	Conditionally qualified

**NYSDERDA Incentives**

Downstate	Upstate
\$455,138	\$375,838

**Performance at Full Load**

Ambient	Fuel in MBtu/hr (HHV)	Net kW	Hot Water to Building @ 120°F		Hot Water to Building @ 180°F		NOx lbs/MW/hr
			MBtu/hr	Return °F	MBtu/hr	Return °F	
0°F	2,538	282	1,403	102	1,403	178	0.3
50°F	2,538	282	1,403	102	1,403	178	0.3
95°F	2,538	282	1,403	102	1,403	178	0.3

**Footprint**

	Width ft	Length ft	Height ft	Weight lbs
Core system based on minimum area*		12.0	20.3	8.1
Core system based on minimum width*		12.0	20.3	8.1
Heat Rejection subsystem*		12.0	12.5	3.0
Largest part for delivery	5.2	13.7	7.2	9,240
Heaviest part for delivery	5.2	13.7	7.2	9,240

\*Includes maintenance clearances.

**Vendor Statement**

ENER-G Rudox Inc, as part of the ENER-G group offers a range of efficient cogeneration and tri-generation systems from 4kwe to 5Mwe. Ener-G offers turnkey solutions, with in-house capabilities from Project Development, Financing, Design, Assembly, Delivery, Installation, Commissioning and on-going 24/7 maintenance with dedicated remote monitoring facilities based at our US Head office. We stock a full inventory of spare parts for all of our equipment.

The demand for energy is ever growing whilst it is becoming increasingly expensive. Businesses and individuals are seeking to reduce their costs and carbon footprint. Ener-G Cogeneration can help.



Ener-G offer flexible finance models, offering access to our energy solutions without the upfront capital expenditure normally required. ENER-G is 100% dedicated to the development of its products and markets and over the years has seen rapid growth, both organically and through acquisition, to achieve a strong global presence within the energy industry. Currently ENER-G operates in the UK, the USA, the Netherlands, Norway, Poland, Hungary, Lithuania, Spain, Italy, Romania, Mexico and South Africa, with partners across the globe.

**Vendor Information**

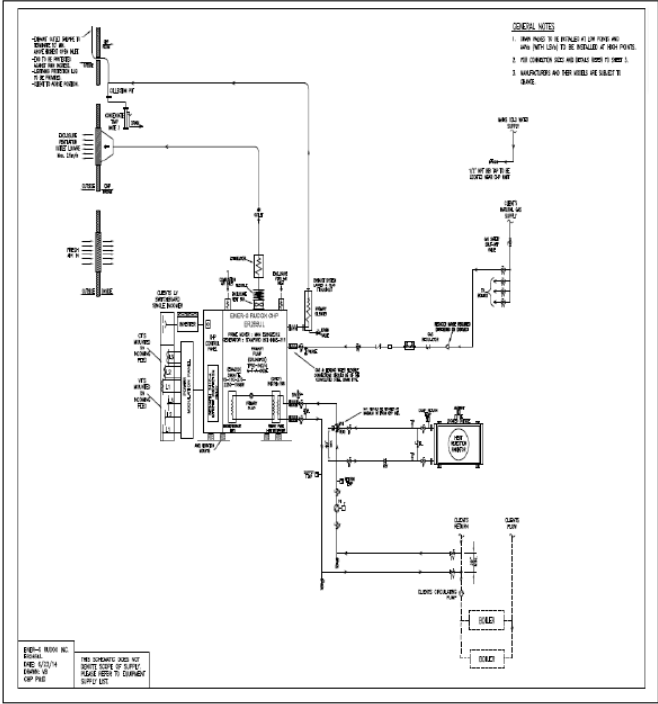
Ener-G Rudox Inc  
 1201 Broadway, Suite 608  
 New York, NY 10001  
 (718) 561-7170  
 Contact Person: Vishnu Barran  
 vishnu.barran@energ-rudox.com  
 www.energ-rudox.com

NYSDERDA CHP Acceleration Program PON 2568  
 Version 3 Revised September 2014  
 For the most recent version go to  
<http://www.nyserda.ny.gov/Funding-Opportunities/Current-Funding-Opportunities/PON-2568-CHP-Acceleration-Program.aspx>

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**Ener-G Rudox Inc**
**ER265F HW**
**265 kW**



NYSDERDA CHP Acceleration Program PON 2568  
 Version 3 Revised September 2014  
 For the most recent version go to  
<http://www.nyserda.ny.gov/Funding-Opportunities/Current-Funding-Opportunities/PON-2568-CHP-Acceleration-Program.aspx>

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# Examples of Incentives

System Size	Typical Customer (these are real examples)	Total Cost	NYSERDA Incentive	Out-of-pocket Expense
100 kW	Multifamily 100 units	\$370,000	\$198,000	\$172,000
200 kW	Multifamily 500 units	\$625,000	\$350,000	\$275,000
	Multifamily 450 units	\$850,000	\$350,000	\$500,000
300 kW	Multifamily 700 units	\$1,800,000	\$561,000	\$1,239,000
600 kW	Hotel 400 rooms	\$1,800,000	\$930,000	\$870,000
800 kW	7-story @ 200,000 sq.ft. mixed-use commercial	\$3,400,000	\$1,276,000	\$2,124,000
1,200 kW	48-story @ 1,800,000 sq.ft. mixed-use commercial	\$5,000,000	\$1,500,000	\$3,500,000

In this size range, NYSERDA incentives are, on average, about 40% of the overall cost of the project.

39 applicants to-date (19 of which have major equipment on-site already), zero attrition!

# Agenda

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4. Other Features of The Current Program

# Transformational Aspects of Program

Replacing arms-length transactions with long-term relationships.

Furnishing “Helper Agent” as coach to customer (e.g., help to establish a rationale for choosing between prospectuses).

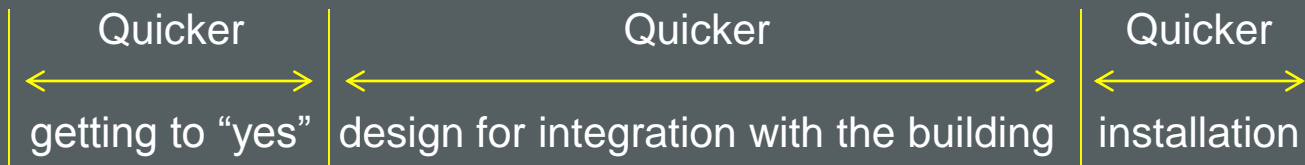
Annual technical conferences for vendors and consultants. Periodic Expos for potential customers to facilitate comparison-shopping.

NYSERDA funding is paid to the Vendor.

To receive an incentive, the system must be installed and commissioned showing it runs during a grid outage, and must be sited “high and dry” at buildings located in flood prone areas.

Promotes a preferred configuration for enhanced resiliency.

## Compresses timelines:



# NYSERDA CHP Expo

New York State Energy Research and Development Authority (NYSERDA)

NYSERDA

**CHP**  
EXPO

**Friday, October 17, 2014**

DoubleTree by Hilton Hotel  
455 South Broadway, Tarrytown, NY  
Expo Hours – 10:00 a.m. to 3:00 p.m.

Register today: [chpExpoWestchester.eventbrite.com](http://chpExpoWestchester.eventbrite.com)

*There is no cost to attend this event.*

Westchester

NYSERDA's Combined Heat and Power Expo is designed to help commercial, industrial, and multifamily building owners and managers connect with pre-approved Combined Heat and Power (CHP) equipment vendors and other organizations offering financial incentives and technical support for the installation of CHP systems. NYSERDA's CHP programs offer incentives for systems 50 kW and larger.

Building owners, managers, and other representatives are invited to stop by and speak with CHP system vendors, NYSERDA staff, and U.S. Department of Energy's CHP Technical Assistance Partnership representatives about the various products and services available to capture significant energy savings and improve the resiliency of their buildings.

## The Expo will feature:

- Information from vendors of pre-approved CHP systems featured in NYSERDA's CHP Catalog
- Information on the incentives available for CHP through NYSERDA's complementary pair of CHP programs:
  - CHP Acceleration Program (PON 2568)
  - CHP Performance Program (PON 2701)
- Information on FREE technical assistance and project screening offered through the U.S. Department of Energy's Northeast CHP Technical Assistance Partnership
- Q&A time with representatives from Con Edison

Register today: [chpExpoWestchester.eventbrite.com](http://chpExpoWestchester.eventbrite.com)

Questions? [chpAcceleration@nyserda.ny.gov](mailto:chpAcceleration@nyserda.ny.gov)

Please note: This event is intended to address medium-to-large buildings (those with a monthly electric bill of \$5,000 or more).

The World Alliance for Decentralized Energy (WADE) will hold their Annual Meeting and DistribuGen Conference at the same location on October 14-16. Visit [www.localpower.org](http://www.localpower.org) for more information and to register!



**nyserda**  
Energy. Innovation. Solutions.

FD-ELM-CHP-westchester101714-8.1-v1 9/14

**November 22, 2013**

The TimesCenter – 242 West 41st Street  
Expo Hours – 10:00 a.m. to 3:00 p.m.

*There is no cost to attend this event.*

Manhattan

**Wednesday, February 26, 2014**

Sheraton LaGuardia East Hotel  
135-20 39th Avenue, Flushing, NY  
Expo Hours – 10:00 a.m. to 3:00 p.m.

*There is no cost to attend this event.*

Queens

**Wednesday, May 14, 2014**

Holiday Inn Albany  
205 Wolf Road, Albany, NY  
Expo Hours – 10:00 a.m. to 3:00 p.m.

*There is no cost to attend this event.*

Albany

**Tuesday, May 20, 2014**

Sheraton Brooklyn New York Hotel  
228 Duffield Street, Brooklyn, NY  
Expo Hours – 10:00 a.m. to 3:00 p.m.

*There is no cost to attend this event.*

Brooklyn

**Wednesday, September 17, 2014**

The TimesCenter  
242 West 41st Street, Manhattan, NY  
Expo Hours – 2:00 p.m. to 7:00 p.m.

Register today: [chpExpoManhattan.eventbrite.com](http://chpExpoManhattan.eventbrite.com)

*There is no cost to attend this event.*

Manhattan



**nyserda**  
Energy. Innovation. Solutions.

# Enhanced Resiliency via N+1 Config

NYSERDA encourages meritorious “N+1” configurations

Example: A hospital suitable for a 600 kW system should consider 3 generators at 300 kW each = 900 kW

Operating schedule on regular days:

**Week #1 use generators A + B = 600 kW**

**Week #2 use generators A + C = 600 kW**

**Week #3 use generators B + C = 600 kW**

<u>Size kW</u>	<u>Downstate Incentive</u>
600	\$930,000
900	\$1,260,000
delta	\$330,000

Operating schedule on “Demand Response” days and during grid outages: use generators A + B + C = 900 kW

# CHP Acceleration “Catalog” Program

System “re-commissioning analysis” in sophomore year

## Win-Win-Win-Win-Win-Win Outcomes:

- **Customer:** confidence, “vetted” system
- **Developer/Financier:** transparency of program
- **Equipment Vendor:** marketing edge
- **Consulting Engineer:** role of “personal shopper”
- **Authority-having-Jurisdiction:** familiarity & comfort
- **NYSERDA:** acceleration of uptake



# Connecticut Microgrid Program CESA Webinar – December 16, 2014

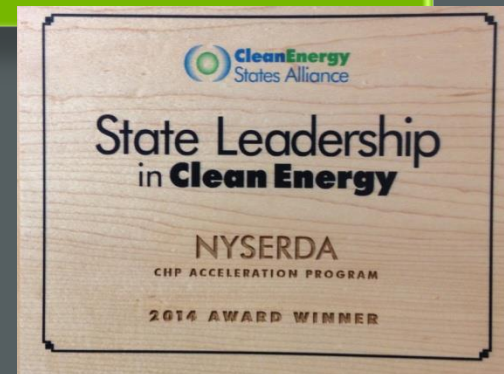


Connecticut Department of  
**ENERGY &  
ENVIRONMENTAL  
PROTECTION**

# Program Accomplishments

We've proven that this program format:

- Gets good projects.
- Accelerates timelines.
- Drives-down “soft costs” such as customer acquisition.



Transformed the way “deals” occur in marketplace:

- Expanded the tendency toward “healthy” comparison shopping.
- Market embraces a new objective of “partnerships” instead of “sales”.



# Thank You!



[www.nyserda.ny.gov](http://www.nyserda.ny.gov)

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*NYSEERDA, a public benefit corporation, offers objective information and analysis, innovative programs, technical expertise, and funding to help New Yorkers increase energy efficiency, save money, use renewable energy, and reduce their reliance on fossil fuels. NYSEERDA professionals work to protect our environment and create clean-energy jobs. NYSEERDA has been developing partnerships to advance innovative energy solutions in New York since 1975.*

- The entire marketplace will benefit if other states adopted a similar “Catalog” approach (enables Vendors to claim multi-state approval).
- **NYSEERDA is eager to work with other states to evolve this into a common/regionalized “Catalog” to be maintained by a neutral party** (for example: Unified List of Small Wind Turbines maintained by ITAC <http://www.cesa.org/projects/ITAC/itac-unified-list-of-wind-turbines/>).



# Connecticut Microgrid Program CESA Webinar – December 16, 2014



Connecticut Department of  
**ENERGY &  
ENVIRONMENTAL  
PROTECTION**

# Connecticut Microgrid Program

## Presenters:

### Tracy Babbidge

- Bureau Chief
- Bureau of Energy and Technology Policy

### Veronica Szczerkowski

- Microgrid Program Coordinator
- Bureau of Energy and Technology Policy



# Connecticut Microgrid Program

## Overview

- Where We Are Coming From
- Vision for Microgrids in Connecticut
- Program Purpose
- Energy Policy
- Round 1 Award Winners
- Round 2
- Round 2 Award Winners
- Round 2 Survey
- Future Rounds
- Municipal Assistance
- Additional Program Information



# Connecticut Microgrid Program

## Where are We Coming From

- Connecticut has been hard hit with severe weather in recent years
  - 2010 snowstorms
  - Tropical Storm Irene
  - Freak October snowstorm
  - Superstorm Sandy
  - Blizzard of 2013
- Storms have left hundreds of thousands without power for long periods of time, in some cases in excess of 10 days



# Connecticut Microgrid Program

## Vision for Microgrids in Connecticut

- Microgrids will provide critical services to residents
  - Generating electricity with cleaner, 24/7 operational power sources
    - Natural gas turbines with combined heat and power, fuel cells, solar panels, etc.
  - Engineered to “island” from the grid when the larger grid is de-energized
  - Built in a cost-effective manner
  - Contribute to public good by islanding critical facilities
  - Connects more than one critical facility to reliable distributed generation resources



# Connecticut Microgrid Program

## Program Purpose

The purpose of the program is to solicit proposals to build microgrids in order to support critical facilities during times of electricity grid outages.



# Connecticut Microgrid Program

## Energy Policy

- Connecticut's first-in-the-nation statewide microgrid program is critical piece of larger resiliency strategy
- Power outages are inevitable, but program provides enhanced safety and quality of life for residents in an outage situation
- Program fits in with Governor's larger vision for cheaper, cleaner, and more reliable energy future for Connecticut
- In line with "portfolio approach" that encourages deployment of distributed generation





# Connecticut Microgrid Program Results

## Round 1 Award Winners

Project	Critical Facilities	Generation	Grant \$ awarded
UConn Depot Campus	Campus Buildings	400 kW fuel cell, 6.6 kW PV	\$2,144,234
City of Bridgeport	City hall, Police Station, Senior Center	(3) 600 kW natural gas microturbines	\$2,975,000
Wesleyan University	Campus, Athletic Center (Public Shelter)	(1) 2.4 MW and (1) 676 kW Natural Gas Combined Heat and Power Reciprocating Engine	\$693,819
University of Hartford	Dorms, Campus Center, Operation Building	(2) 1.9 MW diesel (existing), 250 kW diesel, 150 kW diesel	\$2,270,333
SUBASE	Various Buildings and Piers	5 MW cogen turbine, 1.5 MW diesel	\$3,000,000
Town of Windham	2 Schools (Various Public Purposes)	(2) 130 kW natural gas, 250 kW solar, 200 kWh battery; (2) kW diesel,	\$709,350
Town of Woodbridge	Police Stations, Fire Station, Department of Public Works, Town Hall, High School, Library	1.6 MW natural gas, 400 kW fuel cell	\$3,000,000
City of Hartford	School, Senior Center, Library, Supermarket, Gas station	600 kW natural gas	\$2,063,000
Town of Fairfield	Police Station, Emergency Operations Center, Cell Tower, Fire Headquarters, Shelter	50 kw natural gas recip engine, 250 kW natural gas recip engine, 27 kW PV, 20 kW PV	\$1,167,659



# Connecticut Microgrid Program

## Round 2

- \$15 million in funding
- Revised program procedures and criteria
- Financing program in conjunction with the Connecticut Green Bank
- Emphasized participant education
  - Four part microgrid educational webinar series:
    - Financing for clean generation and entire microgrids
    - Technical aspects of microgrids
    - Other microgrid assistance (legal, process, etc.)
    - Clean generation, renewable generation, storage



# Connecticut Microgrid Program

## Round 2 Stage One Threshold Review Criteria



- Complete proposal
- Documentation
- Serve two or more physically separated critical facilities
- Generation requirements
- Withstand Category 1 hurricane
- 2-4 week fuel supply
- Not located in a flood plane



# Connecticut Microgrid Program

## Round 2 Stage Two Threshold Review Criteria

Review Criteria	Percentage
Technical	25%
Financial, Managerial and Operational Capability	45%
Social Benefits	20%
Environmental	10%
<b>Total</b>	<b>100%</b>



# Connecticut Microgrid Program

## Round 2 Award Winners

Project	Critical Facilities	Generation	Grant \$ Awarded
City of Milford	Parsons Complex, middle school, senior center, senior apartments, city hall	(2) 148kW natural gas CHP units, 120KW PV, 100kW battery storage	\$ 2,909,341
University of Bridgeport	campus buildings - dining hall, recreation center, student center, 2 residential buildings as shelter, police station	1.4 MW fuel cell	\$ 2,180,899
TOTAL GRANTS AWARDED			\$ 5,090,240



# Connecticut Microgrid Program

## Round 2 Survey

Survey Respondents - By Type	
State Government	1
Municipal Government	10
Private Company	13
Other/Unknown	27
Total	51

\* Survey conducted from November 4 – 20, 2014



# Connecticut Microgrid Program

## Future Rounds – What is DEEP Thinking?

- Survey
  - Analyze responses
  - Integrate suggestions into future program design
- Rolling applications
- Work with DAS to develop an approved vendor list
- Possible redesign to individual grant amounts



# Connecticut Microgrid Program

## Future Rounds cont.

- Continue funding under the \$30 million authorized in 2013 legislative session
- Next round of microgrids program will be launched in early 2015
  - Refined procedure
  - Rolling applications
  - More technical support for municipalities





# Connecticut Microgrid Program

## Municipal Assistance

### Meeting With Municipalities

- Municipal Officials
- Municipal Staff
- DEEP
- EDC
- CT Green Bank

### Meeting Topics

- General Program Questions
- Town Energy Needs
- Identify Critical Facilities
- Project Financing



# Connecticut Microgrid Program

- Email [DEEP.EnergyBureau@ct.gov](mailto:DEEP.EnergyBureau@ct.gov)
- Link to Microgrid Program Pilot Round and Round 2 information:
  - [http://www.dpuc.state.ct.us/DEEPEnergy.nsf/\\$EnergyView?OpenForm&Start=1&Count=30&Expand=7&Seq=2](http://www.dpuc.state.ct.us/DEEPEnergy.nsf/$EnergyView?OpenForm&Start=1&Count=30&Expand=7&Seq=2)
  - Request for Proposals
  - Frequently Asked Questions
  - Proposals
  - Presentations



# Thank you for attending our webinar

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