New Jersey Energy Resilience Bank

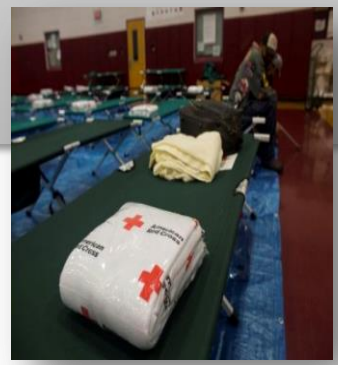
Sustainable Business Initiative

October 31, 2014

Contents

New Jersey Energy Resilience Bank (ERB) Overview

- The extensive damage and outages caused by Superstorm Sandy prompted the state to prioritize its efforts to minimize the potential impacts of future major power outages and increase energy resiliency
- BPU and EDA have partnered to commit $200 million in funding for the ERB to assist critical facilities with securing resilient energy technologies that will make them – and, by extension, the communities they serve – less vulnerable to future severe weather events and other emergencies



Mission

"Realizing energy resilience for New Jersey's critical facilities through financing and technical assistance"

Contents

The ERB will fund resilient energy systems for critical facilities

Resilient energy technology is …

… distributed generation or other technologies …

CHP plants can use a reciprocating natural gas engine

Gas Turbine CHP Plant

… that is islandable, capable of blackstart and can operate at critical load

Inverter system

Black Start Controls

Fuel cells

Resilient energy technology is not…

…emergency backup generators

Generator

SOURCE: DOE, NREL

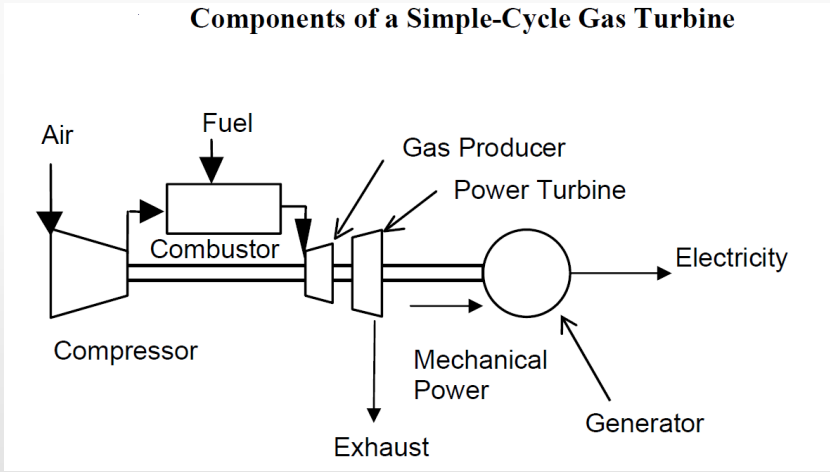
Technology Overview: Combined Heat & Power (CHP)

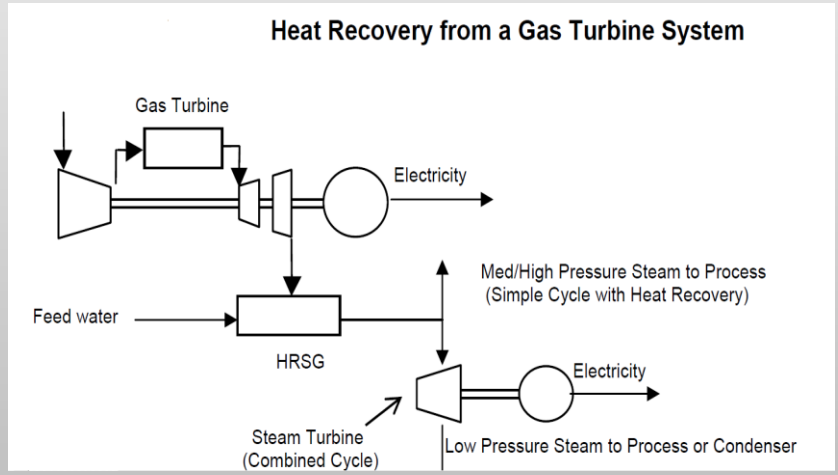
What is CHP?

- Combined Heat & Power or Cogeneration
- ASHRAE Handbook: "Combined heat and power (CHP) is the simultaneous production of electrical or mechanical energy and useful thermal energy from a single energy stream."
- CHP uses 32% less primary energy versus grid power and fossil fueled boilers. (source US EPA)

What is CHP?

- CHP is a component of Distributed Generation (DG) and is not necessarily applicable to all facilities.
- CHP works best in applications that:
  - Have a high concurrence of electric and thermal loads
  - Have a high cost of electric energy (>8 to 10¢/KWh)
  - Have high operating hours (4,000 hours per year)
  - Can offset cost of providing new power capacity
  - Can integrate CHP with central plant renovation
  - Benefit from continuous duty backup power
  - Value reduced emissions footprint





ERB support for critical facilities will support distributed generation at the customer site

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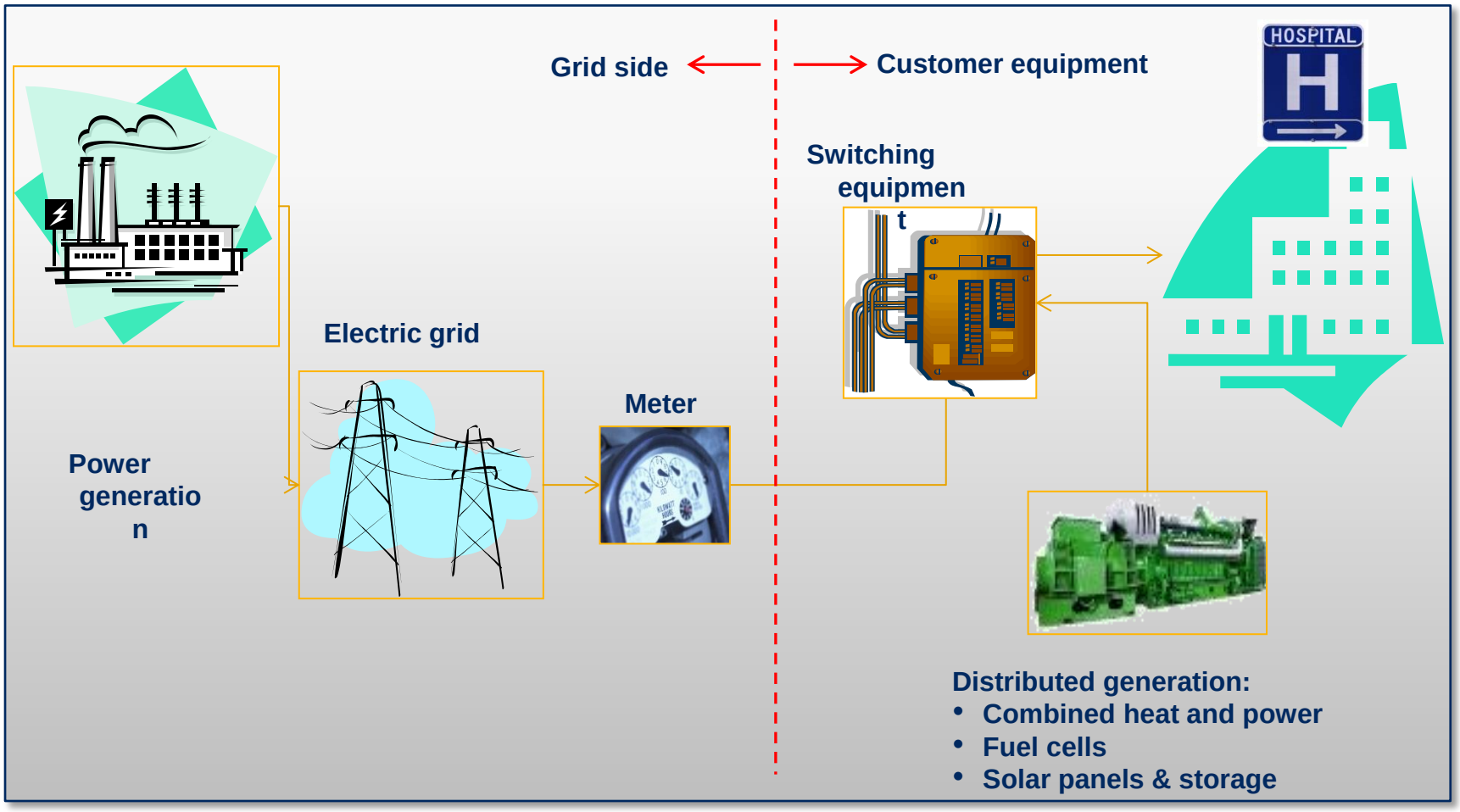

The ERB can cover a range of costs for both new and retrofit systems

Eligible costs

New resilient systems

- Core equipment
- Piping & wiring
- Islanding equipment
- Interconnection
- Fuel pre-treatment (e.g., biogas treatment, or gas compression)
- Installation
- Site work
- Engineering and project management
- Hardening of resilient energy system (e.g., elevation)

Resilient retrofits

- Additional core equipment (e.g., battery storage for existing solar system, biogas storage equipment)
- Islanding equipment
- Interconnection
- Installation
- Engineering and project management
- Hardening of resilient energy system (e.g., elevation)

Non-eligible costs

Backup Generators

- Emergency backup generators
- Onsite fossil fuel storage for emergency generators
- Transfer switches to support backup emergency generators

Other non-energy hardening

- Flood walls
- Elevation

Other

- Used, refurbished equipment
- Solar PV panels

Contents

Product terms will consider resiliency benefits in addition to economic benefits

Economically Positive Investment

- Energy Savings
- \+ ERB Incentives
- \- Incremental Cost of Islanding
- \- Sizing for Resiliency

\+

Resiliency benefits

- Avoided Revenue Loss
- \+ Avoided Litigation/Liability Cost
- \+ Lives Saved
- \+ Environmental Benefits

=

Economically healthy and resilient healthcare facility with functionality during a storm or disaster

ILLUSTRATIVE

Illustrative Pro Forma CHP Economics

Our assumptions

Engine / system size (kW)	2050
Average electric load (kW)	2000
Our best understanding of your critical load (kW)	2000
Estimated capex for system ($/kw)	$3,200
Estimated islanding costs ($/kwh)	$400
Operating and maintenance ($); yearly cost for 15 years	$200K

Summary of Project Costs

Generation cost ($)	$6.5M
Islanding cost ($)	$0.9M
Total system cost	$7.4M

Summary of Project Benefits

Annual electrical savings	$1.8M
Annual resiliency benefits	$100K

Benefit cost ratio	1.14

The ERB will be providing financing for unmet need

FOR DISCUSSION

Calculation of duplication of benefits worksheet

Sources	Uses	Unmet Need ($M)
▪ Insurance	▪	
▪ FEMA	▪	
▪ SBC Funding	▪	
▪ Other State Funding	▪	
▪ Other Federal Funding	▪	
	Total	

- **100% provided by ERB**
  - **% incentive**
  - **% loan**

The ERB will support you with comprehensive financing for your resilience project

Overview of Proposed Total ERB Funding for New Builds		
Eligible facilities	▪ **Hospitals** ▪ **Long term care facilities**	
100% unmet funding	**Incentive:**	▪ **Grant:** Percentage of unmet funding need provided as a grant ▪ **Loan Forgiveness:** Percentage of unmet funding need available as a loan that may be forgiven based on performance-based standards
	Loan:	▪ **Larger percentage of unmet funding need provided as a loan**
Terms	▪ **Interest rate:** Based on risk rating ▪ **Collateral:** No collateral required ▪ **Term:** Up to 20-year term, based on useful life of majority of assets ▪ **Principal Moratorium:** Up to 2 years' principal moratorium	

The ERB will support you with comprehensive financing to retrofit your distributed generations system

Overview of Proposed Total ERB Funding for Retrofits		
Eligible facilities	▪ All eligible critical facilities with existing distributed generation systems ▪ Systems should be sized to the "critical load" of the facility	
Eligible costs	▪ ERB will fund equipment that lets you operate independent of grid: – Additional core equipment (e.g., battery storage for existing solar system, biogas storage equipment) – Islanding equipment – Interconnection – Installation – Engineering and project management – Hardening of resilient energy system (e.g., elevation)	
100% unmet funding	**Incentive:**	▪ Percentage of unmet funding need provided as a grant
	Loan:	▪ Percentage of unmet funding need provided as a loan
Terms	▪ **Interest rate:** Based on risk rating ▪ **Collateral:** No collateral required ▪ **Term:** Up to 20-year term, based on useful life of majority of assets ▪ **Principal Moratorium:** Up to 2 years' principal moratorium	

Projects that do not qualify for ERB funding may be eligible for other programs offered by the state, or could seek private funding

	NJ Energy Resilience Bank	NJ Economic Development Authority	NJ Clean Energy Program	NJ Environmental Infrastructure Trust	NJ Healthcare Facilities Financing Authority
Mission	▪ Increase resiliency of critical facilities to extreme events	▪ Finance small and mid-sized businesses, administer tax incentives, redevelopment initiative	▪ Promote energy efficiency and use of clean energy	▪ Provide financing for environmental infrastructure projects to protect water sources and safety	▪ Provide healthcare providers with low cost capital
Target sectors	▪ Critical facilities e.g. hospital, WWTP, education	▪ NJ-based businesses and communities	▪ NJ residents, businesses and local governments	▪ Drinking water, wastewater, equipment purchase, storm water, landfill etc.	▪ Hospitals, nursing homes, assisted living etc.
Products offered	▪ Partial grants, loan forgiveness and discounted loan	▪ Low interest lending, training, mentoring	▪ Partial rebates for installation of energy efficient equipment[1]	▪ Loans with some principal forgiveness	▪ Municipal bond issuance ▪ Direct lending
Eligibility requirements	▪ Public facilities ▪ Damage from specific storms ▪ Other	▪ Size of business ▪ Number of employees ▪ Business location ▪ Other	▪ Varies – based on location, building type, fuel source	▪ Various – projects must fall in list of eligible sectors	▪ Health care related service in NJ
Funds disbursed to date	▪ $200M available	▪ ~$23B in assistance; ~$52B in public/private investment	▪ TBD	▪ >$4.3B to local and county government and some private facilities	▪ >$16B in bonds to ~150 organizations in NJ

1 CHP program includes up to a 30% rebate subject to a cap on dollars per kW basis

Contents

Eligibility Criteria

Eligibility Overview

- Eligible ERB Applicants
  - Public facilities – municipal and county authorities
  - Non-profits
  - For-profit businesses that meet the SBA definition of “small business”

All other entities, and all privately owned utilities, are currently ineligible

BPU/NJEDA are working with HUD toward regulatory flexibility for the ERB that would expand the list of eligible entities

Eligible Disasters

- To be eligible for funding under the Energy Resilience Bank, according to the Robert T. Stafford Disaster Relief and Emergency Assistance Act (P.L. 93-288), as amended by the Disaster Relief Act of 1974 (P.L. 93-288), projects must:
  - Demonstrate a tie Superstorm Sandy or
  - Have incurred physical damage from one of the six additional nationally-declared disasters dating from December 2010

HUD Requirements

- Direct impact by Sandy or other qualifying disaster
  - Physical damage to facility caused by the eligible disaster
- Indirect impact by Sandy - must demonstrate that the project is supporting revitalization of the community in which it is located and one of the following
  - Area flooding and/or loss of power that prevented facility from treating waste water, causing a release of sewage/storm water into the surrounding waterway
  - Area flooding and/or loss of power from a qualifying disaster prevented the facility from operating and being able to treat drinking water
- With limited exceptions, per federal regulation, CDBG-DR funding may not be used within a Coastal Barrier Resource Area (CBRA)
- Project equipment must be installed at a facility and be operational within two years of the closing of the ERB grant and loan

The ERB evaluates all projects on the following criteria

- Tech. Efficiency / Economic Cost Effectiveness
- LMI National Objective
- Most Impacted Communities
- Readiness to Proceed
- Criticality
- Microgrid
- Facility Energy Efficiency

Additional detail on these criteria available

Application Overview

Some steps in the application process will take place concurrently

Contents

How the ERB team can help you

- Provide technical support on feasibility and possible options
- Assist with financial analysis
- Connect you to other sources of funding
- Support you in enhancing the community and improving energy resilience
- Help you communicate with your stakeholders to explain the benefits of energy resilience
- Provide you with a single point of contact at ERB

Any questions or concerns?

ERB Contacts

Mitch Carpen

36 West State Street,
Trenton NJ
mcarpen@njeda.com

Thomas Walker

44 South Clinton Avenue
Trenton NJ
Thomas.Walker@bpu.state.nj.us

Call toll-free: 1-866-534-7789
E-mail Address: erb@njeda.com
Website: www.njerb.com