

Clean Energy Group
Resilient Power Project Webinar

New Jersey Energy Resilience Bank

Hosted by

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Housekeeping



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Submit your questions at any time by typing in the Question Box and hitting Send.

This webinar is being recorded.

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and at

vimeo.com/channels/resilientpower

About Clean Energy Group (CEG)

Clean Energy Group is a leading national, non-profit advocacy organization working in the US and internationally on innovative technology, finance and policy programs in the area of clean energy and climate change.



About the Resilient Power Project

CEG's Resilient Power Project helps states and municipalities to implement clean resilient power solutions. Through the project, CEG helps states develop new partnerships, supports new public financing tools, connects public officials with private industry, engages federal resources, and works with state and local officials to support greater investment in resilient power deployment.

www.resilient-power.org




Upcoming Webinar: Financing Resilient Power

- Thursday, November 20. Register here: <http://bit.ly/RPP-Finance-Webinar>
- How to access capital on terms that are economically feasible
- Describes broad range of financing approaches:
 - Bond financing
 - Clean energy financial institutions
 - Credit enhancement
 - Public & private ownership structures
- Explores appropriate financing strategies for specific market segments

Today's Guest Speakers

- **Mitch Carpen**, Executive Director, New Jersey Energy Resilience Bank
- **Thomas Walker**, Deputy Director, New Jersey Energy Resilience Bank



The background image shows a complex industrial facility, likely a power plant or refinery, with numerous pipes, walkways, and large cylindrical tanks. The lighting is a mix of blue and yellow. A semi-transparent map of New Jersey is overlaid on the right side of the image. A dark blue semi-transparent banner is positioned across the middle of the image, containing white text.

New Jersey Energy Resilience Bank

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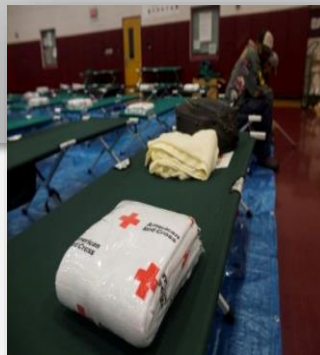
Contents

- 1** Introduction to the ERB
- 2 Potential resilience solutions
- 3 Financing support for resilience
- 4 Eligibility
- 5 Questions and next steps

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”

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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

High Potential Resiliency System Options

	Option	Description	Suitability for potential resiliency options
CHP		<ul style="list-style-type: none"> Combined heat and power (CHP) is the simultaneous production of electrical or mechanical energy and useful thermal energy from a single energy stream (e.g., reciprocating engines, microturbines) 	<ul style="list-style-type: none"> Offers potential energy savings (each year) Thermal and electrical load well balanced to make economics favorable, with a technology proven in WWTPs
Fuel Cell		<ul style="list-style-type: none"> Consists of an anode, a cathode and an electrolyte that allows charges to move between the two sides of the fuel cell Rapidly-evolving technology that produces electricity from natural gas with no moving parts 	<ul style="list-style-type: none"> Greater capital cost than CHP (e.g., batteries) Ideal for situations with a low thermal load
Solar PV		<ul style="list-style-type: none"> Generates power using a photovoltaic (PV) solar panel that can be fed into an electrical grid or local, off-grid electrical network Allows the use of ordinary AC-powered equipment Can only provide power during night/storm if coupled with storage (batteries) 	<ul style="list-style-type: none"> Greater capital cost than CHP (e.g., batteries) Near-zero ongoing operating costs
Retrofit		<ul style="list-style-type: none"> Addition of islanding and blackstart capabilities (e.g., ability to operate independently of the grid) to existing on-site generation system 	<ul style="list-style-type: none"> No current resilient-sized system
Microgrid		<ul style="list-style-type: none"> Network combining two or more facilities that share on-site electricity production (and possibly heating), with islanding and blackstart capabilities 	<ul style="list-style-type: none"> No nearby facilities to link to microgrid

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

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This investment has not only economic benefits but also resiliency benefits

Economically Positive Investment

Energy Savings



ERB Incentives



Incremental Cost of Islanding



Sizing for Resiliency



Resiliency benefits

Public Safety



Avoided Revenue Loss



Shelter for Emergency



Environmental Benefits



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

Illustrative Pro Forma CHP Economics

Our assumptions

Engine / system size (kW) **250**

Average electric load (kW) **350**

Our best understanding of your critical load (kW) **250**

Estimated capex for system (\$/kw) **\$9,000**

Estimated islanding costs (\$/kwh) **\$615**

Operating and maintenance (\$); yearly cost for 15 years **\$40K**

Summary of Project Costs

Generation cost (\$) **\$2.3M**

Islanding cost (\$) **\$0.2M**

Total system cost **\$2.5M**

Summary of Project Benefits

Electrical savings **\$240K**

Additional resiliency benefits (e.g., public safety, environmental, emergency shelter)

The ERB will be providing financing for unmet need

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
 - 40% incentive
 - 60% loan

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

Overview of Proposed Total ERB Funding:

100% unmet funding

Incentive:

40% of unmet funding need:

- **Grant:** 20% of unmet funding need provided as a grant
- **Loan Forgiveness:** 20% of unmet funding need may be available as a loan that may be forgiven based on performance-based standards

Loan:

60% of unmet funding need

Terms

- **Interest rate:**
 - 2%, fixed interest rate for bond rating of BBB- or higher at the time of approval
 - 3% fixed interest rate for applicants with bond rating lower than BBB- or which are not rated at time of approval
- **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	<ul style="list-style-type: none"> Increase resiliency of critical facilities to extreme events 	<ul style="list-style-type: none"> Finance small and mid-sized businesses, administer tax incentives, redevelopment initiative 	<ul style="list-style-type: none"> Promote energy efficiency and use of clean energy 	<ul style="list-style-type: none"> Provide financing for environmental infrastructure projects to protect water sources and safety 	<ul style="list-style-type: none"> Provide healthcare providers with low cost capital
Target sectors	<ul style="list-style-type: none"> Critical facilities e.g. hospital, WWTP, education 	<ul style="list-style-type: none"> NJ-based businesses and communities 	<ul style="list-style-type: none"> NJ residents, businesses and local governments 	<ul style="list-style-type: none"> Drinking water, wastewater, equipment purchase, storm water, landfill etc. 	<ul style="list-style-type: none"> Hospitals, nursing homes, assisted living etc.
Products offered	<ul style="list-style-type: none"> Partial grants, loan forgiveness and discounted loan 	<ul style="list-style-type: none"> Low interest lending, training, mentoring 	<ul style="list-style-type: none"> Partial rebates for installation of energy efficient equipment¹ 	<ul style="list-style-type: none"> Loans with some principal forgiveness 	<ul style="list-style-type: none"> Municipal bond issuance Direct lending
Eligibility requirements	<ul style="list-style-type: none"> Public facilities Damage from specific storms Other 	<ul style="list-style-type: none"> Size of business Number of employees Business location Other 	<ul style="list-style-type: none"> Varies – based on location, building type, fuel source 	<ul style="list-style-type: none"> Various – projects must fall in list of eligible sectors 	<ul style="list-style-type: none"> Health care related service in NJ
Funds disbursed to date	<ul style="list-style-type: none"> \$200M available 	<ul style="list-style-type: none"> ~\$23B in assistance; ~\$52B in public/private investment 	<ul style="list-style-type: none"> TBD 	<ul style="list-style-type: none"> >\$4.3B to local and county government and some private facilities 	<ul style="list-style-type: none"> >\$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

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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

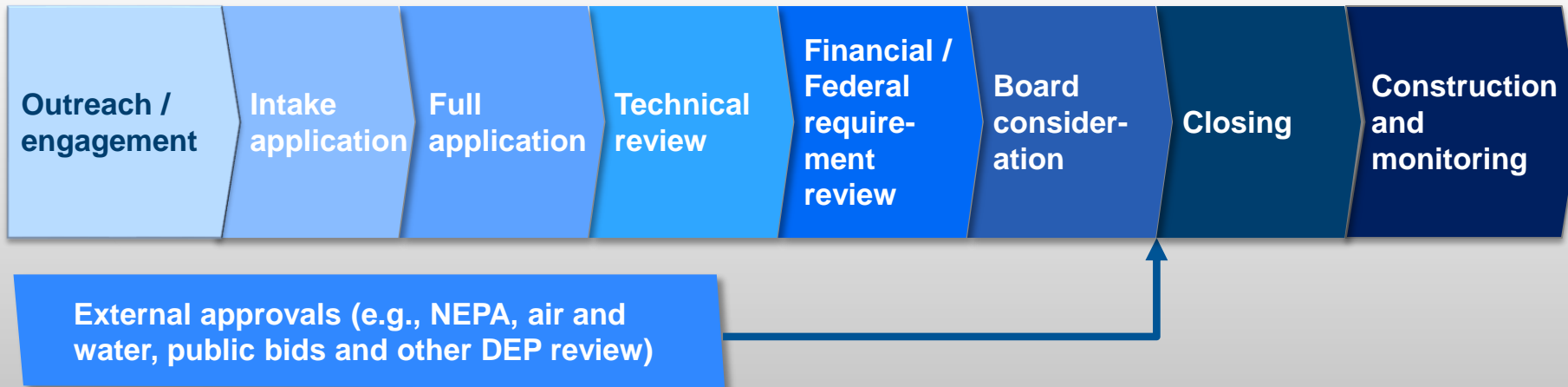
Criticality

Microgrid

Facility Energy Efficiency

Additional detail on these criteria available

Application Overview



Some steps in the application process will take place concurrently

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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



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Thank you for attending our webinar

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