Energy Storage for Resilient Power: State-Based Programs and Policy

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Clean Energy States Alliance / Clean Energy Group

National Summit on Smart Grid and Climate Change
October 14, 2015

Clean Energy States Alliance (CESA)

Clean Energy States Alliance (CESA) is a non-profit organization providing a forum for states to work together to implement effective clean energy policies & programs:

- Information Exchange
- Partnership Development
- Joint Projects (National RPS Collaborative, Interstate Turbine Advisory Council)
- Clean Energy Program Design & Evaluations
- Analysis and Reports

CESA is supported by a coalition of states and public utilities, by federal contracts, and by foundation grants.

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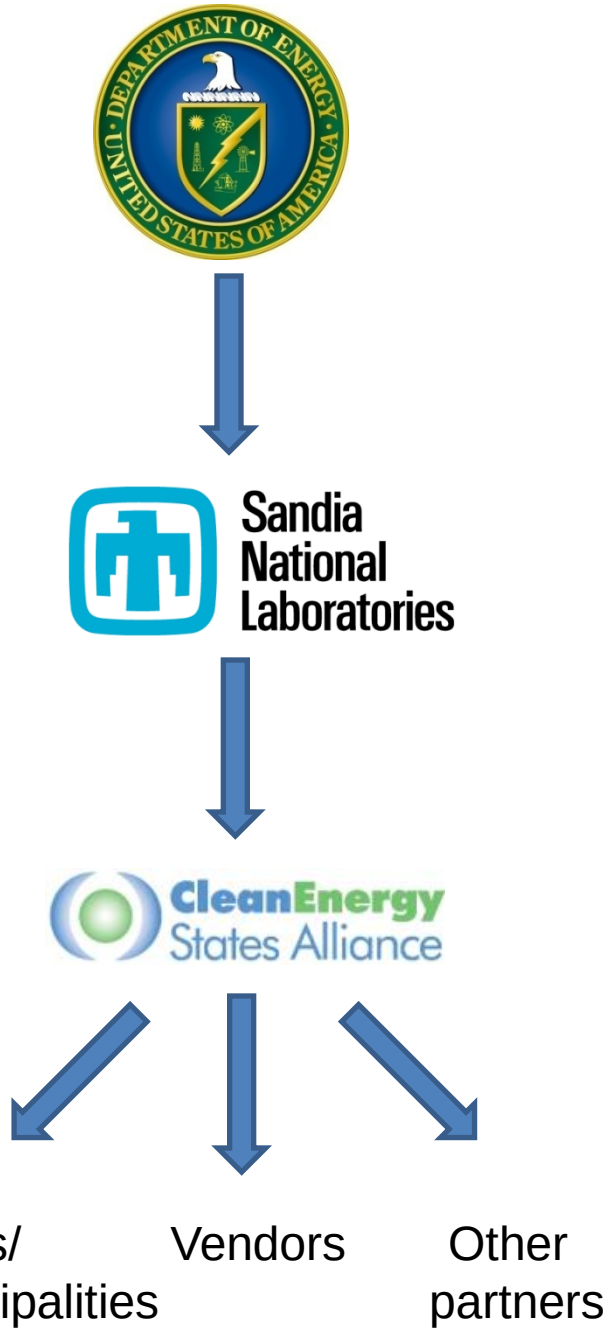
Energy Storage Technology Advancement Partnership (ESTAP)

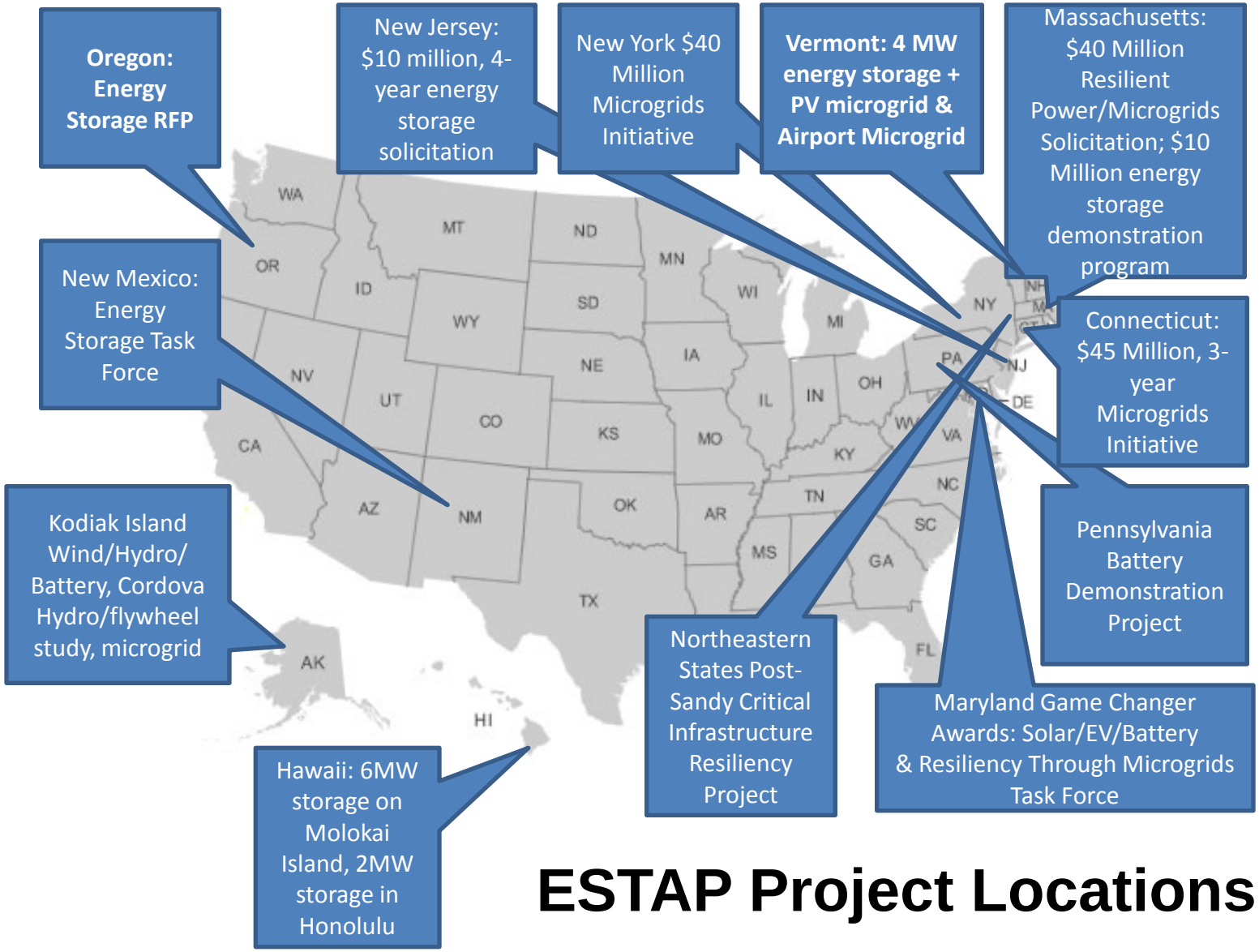
ESTAP is a project of CESA

Purpose: Create new DOE-state energy storage partnerships and advance energy storage, with technical assistance from Sandia National Laboratories and funding from DOE-OE

Key Activities:

1. Disseminate information to stakeholders
2. Facilitate federal/state partnerships to support energy storage **program development** and **project deployment**





ESTAP Project Locations

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DOE Peer Review, September, 2012:

Why work with states?

Surveys Indicate Strong State Interest in Storage

- 75% of states responding "very interested" in collaborating on energy storage technology projects with DOE, especially commercial & demonstration projects.

States Have Resources

- From 1998-2009, state clean energy funds incentivized 70,000 projects – 3 GW of installed capacity – with $2.7b
- With Renewable Energy Public Benefit Funds alone (18 states & DC), states will spend $7.8b by 2017

States Are Important Partners

- Many state partners also have jurisdiction over utilities, resource planning, transmission and project siting, etc.
- State-stakeholder partnerships can ignite project ideas and creative funding arrangements

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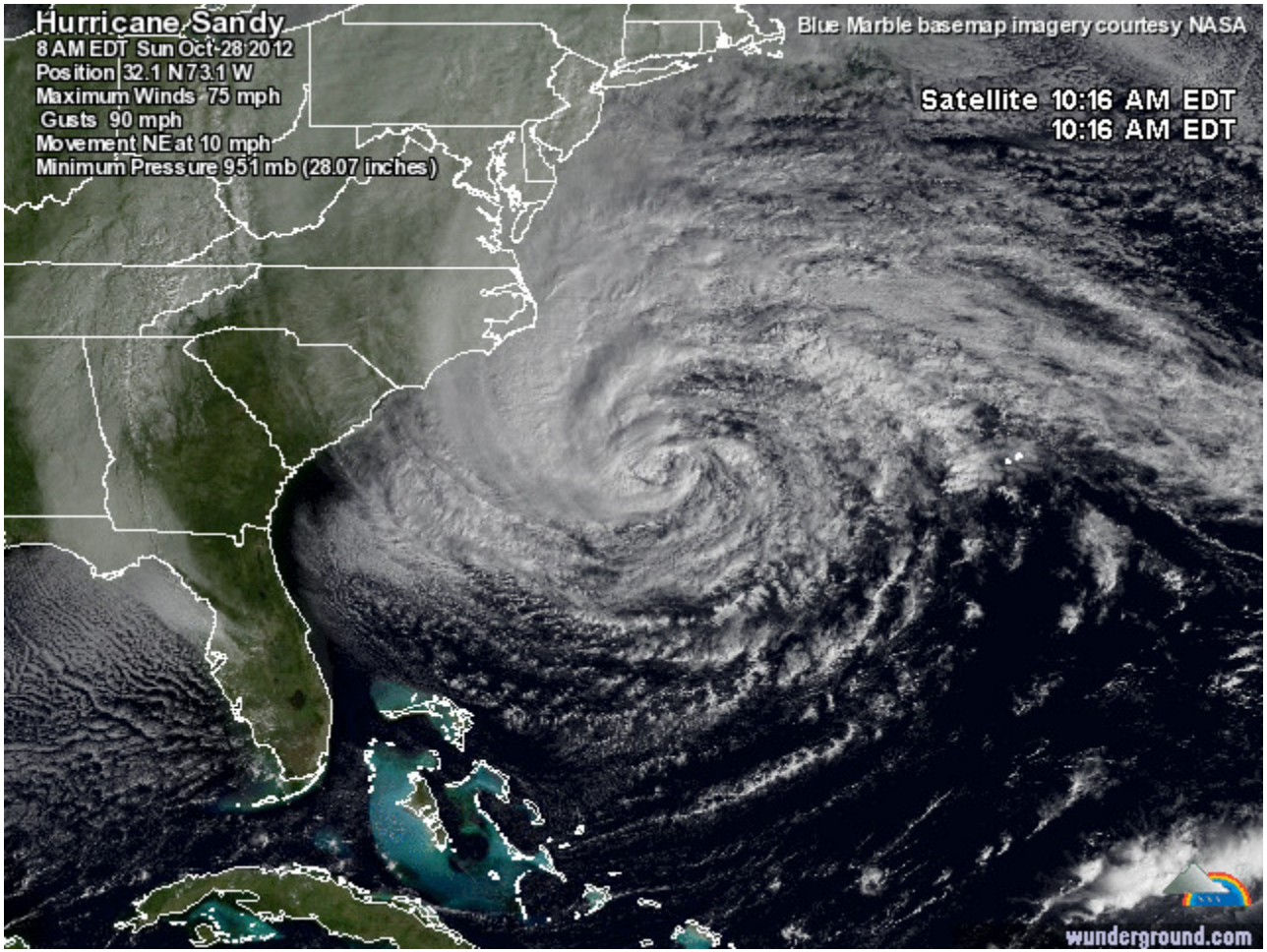
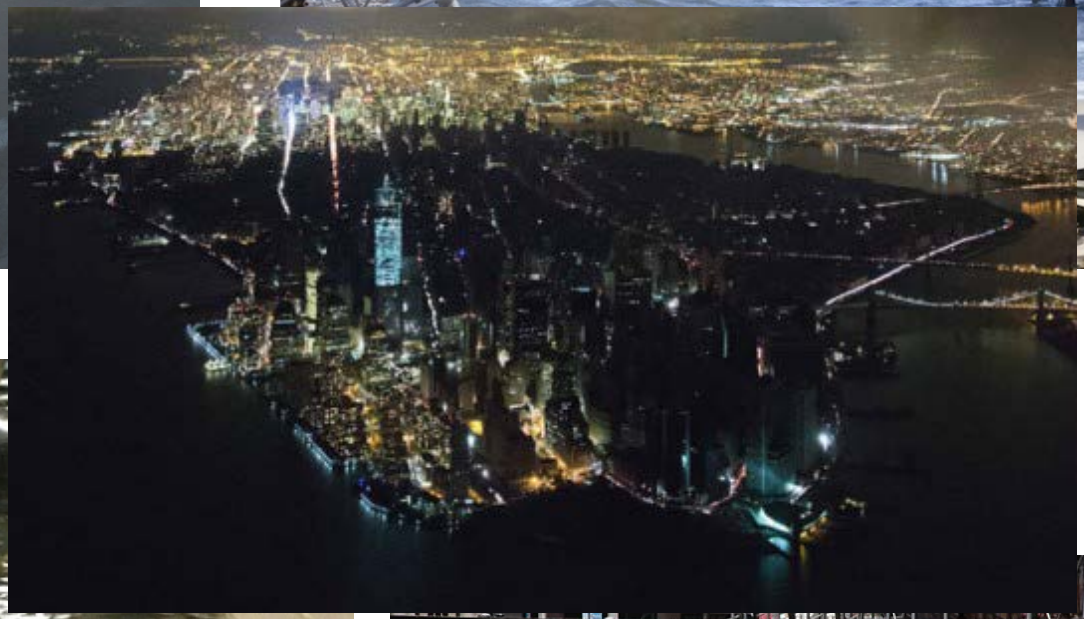
Hurricane Sandy

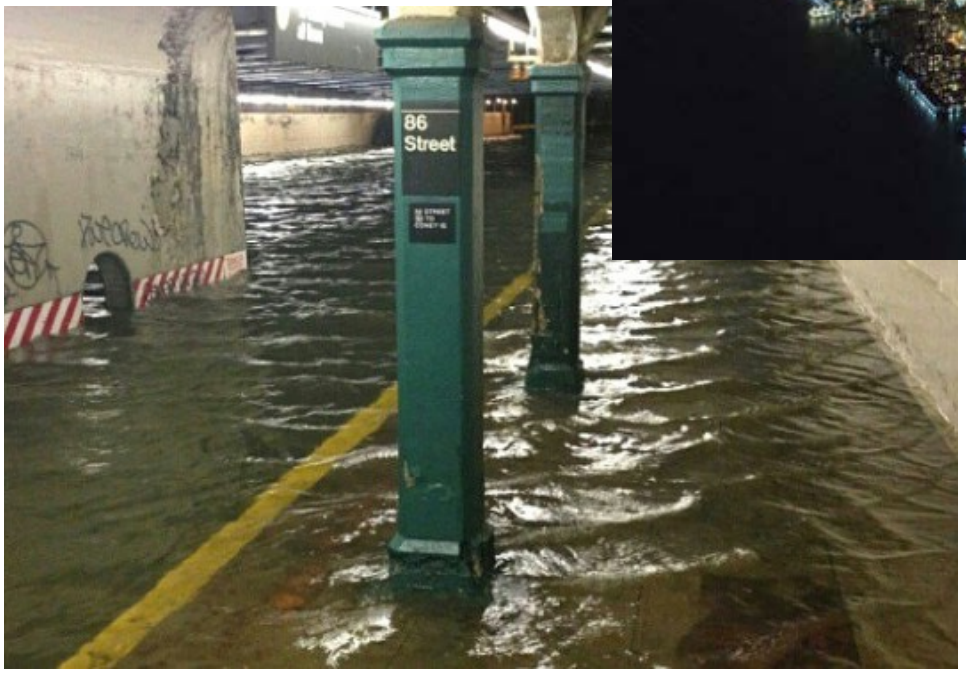
October 29, 2012

$37 Billion in damages

8 million without power across 17 states






86
Street


DO NOT ENTER
12' CLEARANCE

CEG Resilient Power Project

Following Superstorm Sandy, the Northeastern states asked CESA/CEG to help them develop resilient power solutions

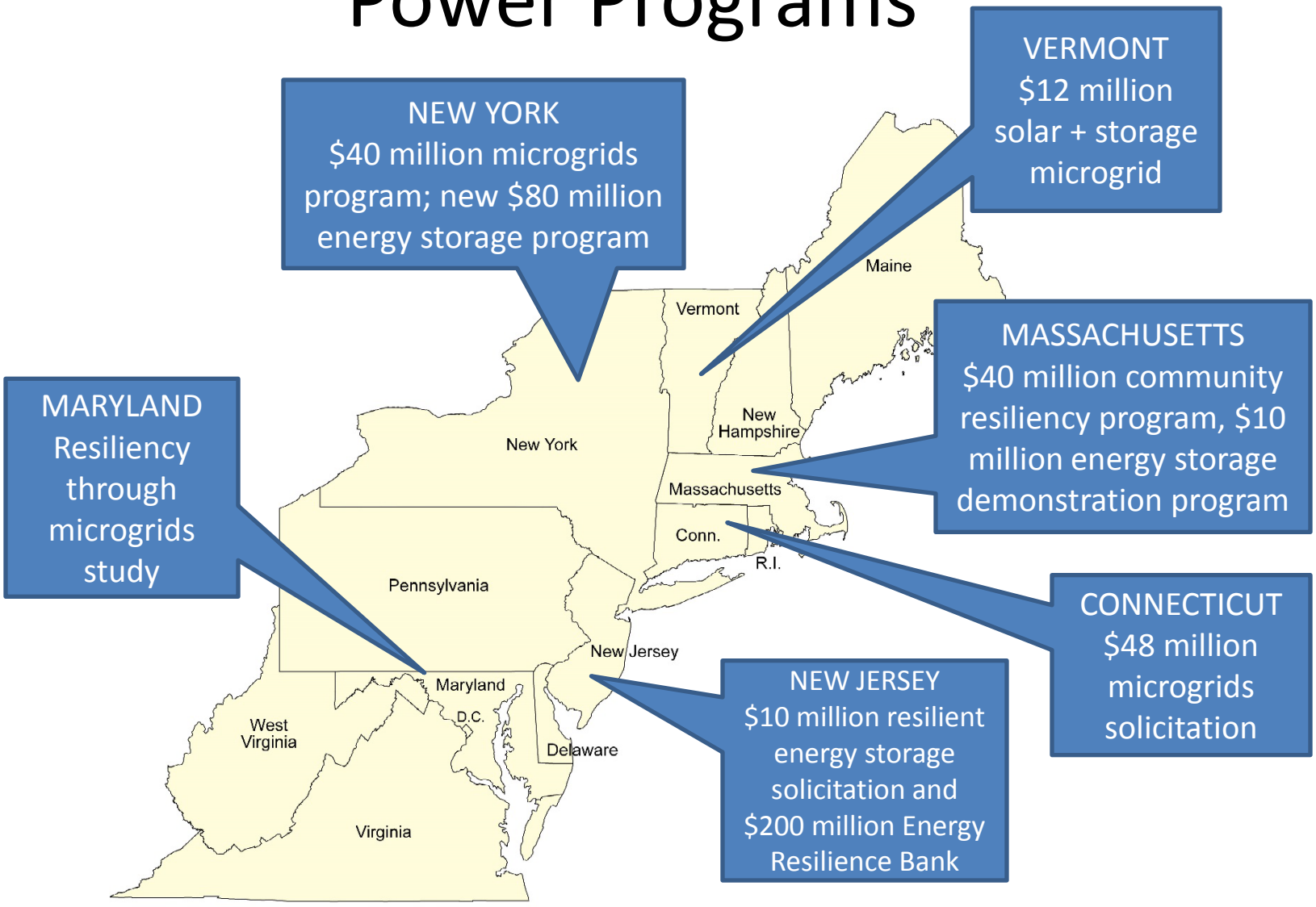
In response, CEG initiated the foundation-funded Resilient Power Project

RESILIENT POWER
A Project of Clean Energy Group

Our role:

- Convening/knowledge sharing
  - Research on technologies, financing, markets, industry
  - Webinars, conferences, reports, newsletters
- Assist in state program development and marketing
- Provide program documentation
- Provide technical assistance to municipalities and developers
- Monitor and evaluate progress

Northeast Post-Sandy State Resilient Power Programs



Total: >$400 Million in new state funds in the Northeast alone

Connecticut DEEP
Microgrid Grant and Loan Pilot Program

- $48 million total state allocation
- Three year program
- Focus on municipal critical infrastructure projects

Round one: 9 project grants

Round two: 2 project grants

Round three pending

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New Jersey BPU

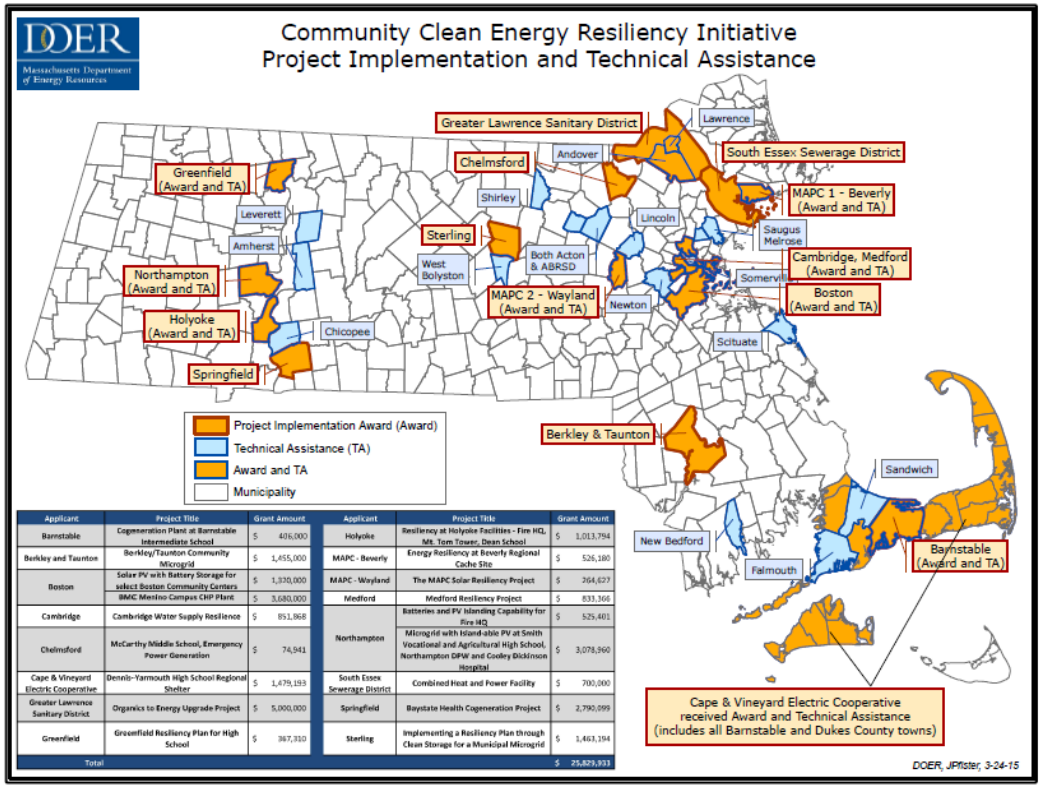
Energy Resilience Bank

- $200 Million in federal disaster relief funds
- Co-managed by NJ Board of Public Utilities and New Jersey Economic Development Authority
- 100% of unmet needs met through combination of grants and loans
- Energy storage with PV is an eligible technology
- First funding round = $65 Million for water and wastewater treatment plants

Energy Storage Incentive Program

- $10 Million, 4-year grant program focused on critical infrastructure
- Energy storage devices must be paired with renewable generation
- Round one: $3 million, 13 projects funded
- Round two: $6 million

Massachusetts DOER Post-Sandy Resilient Power Program



Applicant	Project Title	Grant Amount
Barnstable	Cogeneration Plant at Barnstable Intermediate School	$ 406,000
Berkley and Taunton	Berkley/Taunton Community Microgrid	$ 1,455,000
Boston	Solar PV with Battery Storage for select Boston Community Centers	$ 1,330,000
	BMC Menino Campus CHP Plant	$ 3,680,000
Cambridge	Cambridge Water Supply Resilience	$ 851,868
Chelmsford	McCarthy Middle School, Emergency Power Generation	$ 74,941
Cape & Vineyard Electric Cooperative	Dennis-Yarmouth High School Regional Shelter	$ 1,479,193
Greater Lawrence Sanitary District	Organics to Energy Upgrade Project	$ 5,000,000
Greenfield	Greenfield Resiliency Plan for High School	$ 367,310
Holyoke	Resiliency at Holyoke Facilities - Fire HQ, Mt. Tom Tower, Dean School	$ 1,013,794
MAPC - Beverly	Energy Resiliency at Beverly Regional Cache Site	$ 526,180
MAPC - Wayland	The MAPC Solar Resiliency Project	$ 264,627
Medford	Medford Resiliency Project	$ 833,366
Northampton	Batteries and PV Islanding Capability for Fire HQ	$ 525,401
	Microgrid with Islandable PV at Smith Vocational and Agricultural High School, Northampton DPW and Cooley Dickinson Hospital	$ 3,078,960
South Essex Sewerage District	Combined Heat and Power Facility	$ 700,000
Springfield	Baystate Health Cogeneration Project	$ 2,790,099
Sterling	Implementing a Resiliency Plan through Clean Storage for a Municipal Microgrid	$ 1,463,194
Total		$ 25,823,933

- $40 million state solicitation
- Pre-proposal feasibility studies
- 18 municipal projects funded
- 11 projects include energy storage
- CESA developing no-cost contract with DOER
  - SNL technical assistance to storage projects
- MA DOER has $12 million remaining for resilient power projects
- MA DOER has $10 million committed to energy storage demonstration projects
- MA DOER, MA CEC and MA DPU currently funding state energy storage roadmap
- DOE-OE/SNL/CESA partnership with MA DOER for future joint federal/state energy storage demonstration project

New York NYSERDA

NY Prize Microgrid Challenge

- $40 million competition
- “Community-based microgrids”
- 83 feasibility studies funded
- Program expects to fund 5-7 microgrid deployments
- Emphasis on knowledge building and industry development

New $80 million, 10-year energy storage program

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Vermont: 4 MW Energy Storage + PV Microgrid

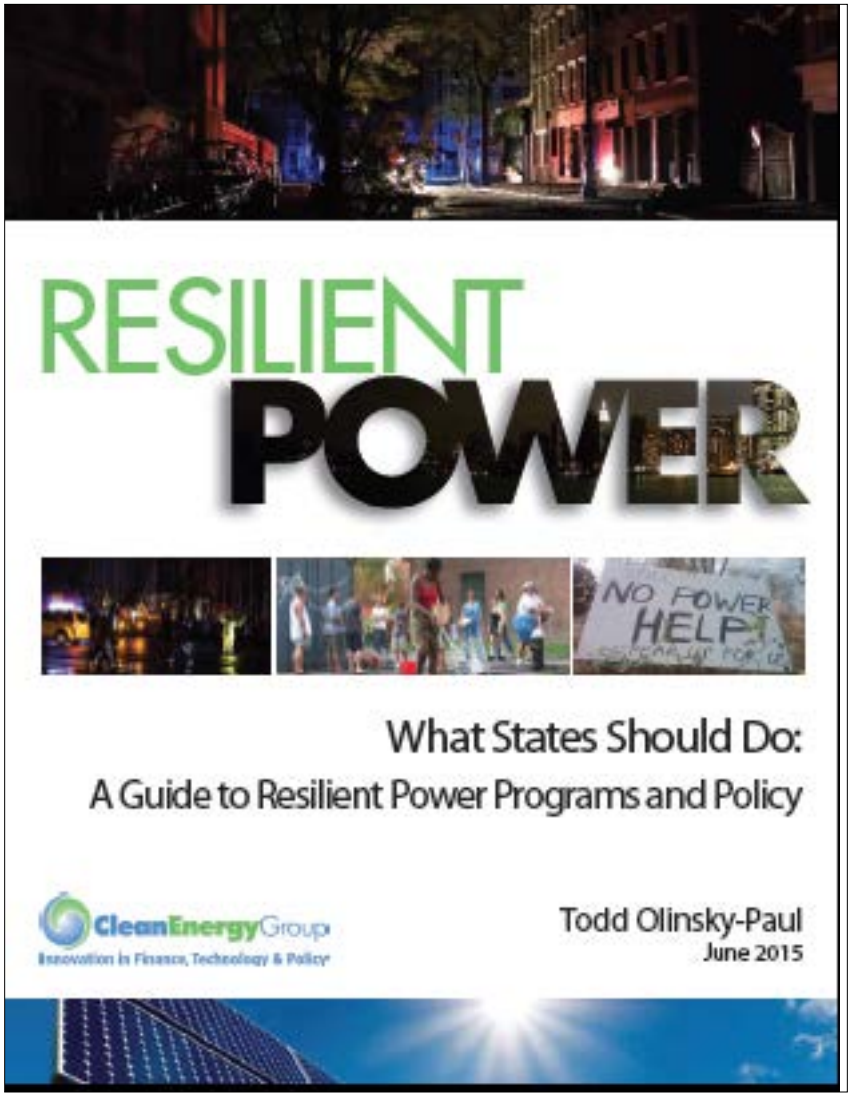
- 4 MW electricity storage
  - 2 MW lithium ion
  - 2 MW lead acid
- 2 MW solar PV
- 2 MW inverter capacity
- Future expansion planned

- Brownfield redevelopment (sited on closed landfill)
- Resilient power for school serving as public shelter
- State contribution: $50,000
- DOE contribution: $250,000
- Total investment: $12 million

CEG State Resilient Power Handbook

The first comprehensive look at the emerging resilient power movement in the Northeast

- Information on state resilient power programs
- Focus on solar+storage
- Lessons learned
- Best practices and policy recommendations



Key Take-Aways

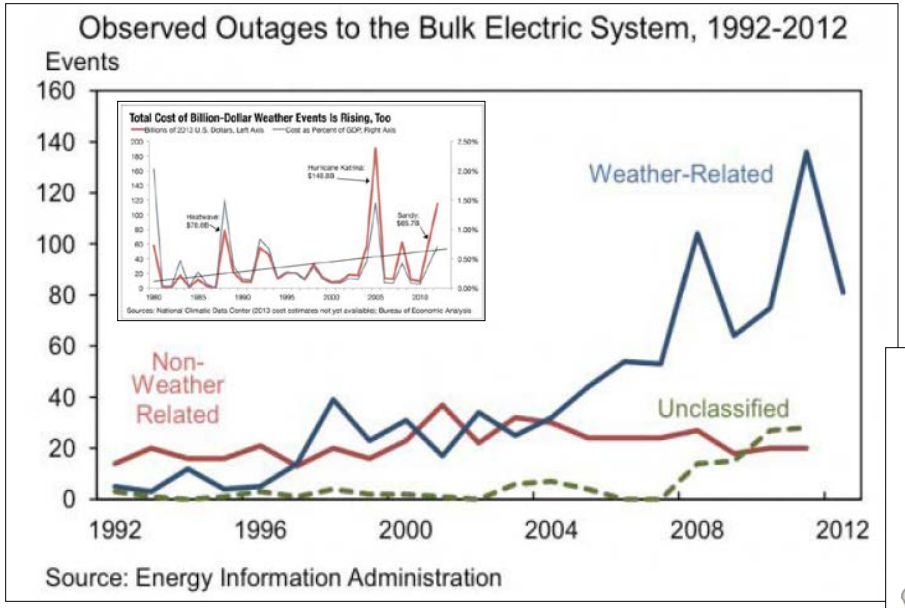
- In the first 2 ½ years, some **$400 million** in new state-managed funds have been committed in the Northeast alone
- Millions of people will have resilient services in communities
  - Schools as shelters
  - Wastewater treatment plants
  - Firehouses and other first responder facilities
- States are evolving from heavily subsidized demonstration projects to more sustainable financing and incentive programs that leverage markets
- Solar+Storage has proved it can provide resilient power during grid outages AND reduce provide year-round benefits
- Resilient power is spreading beyond the Northeast

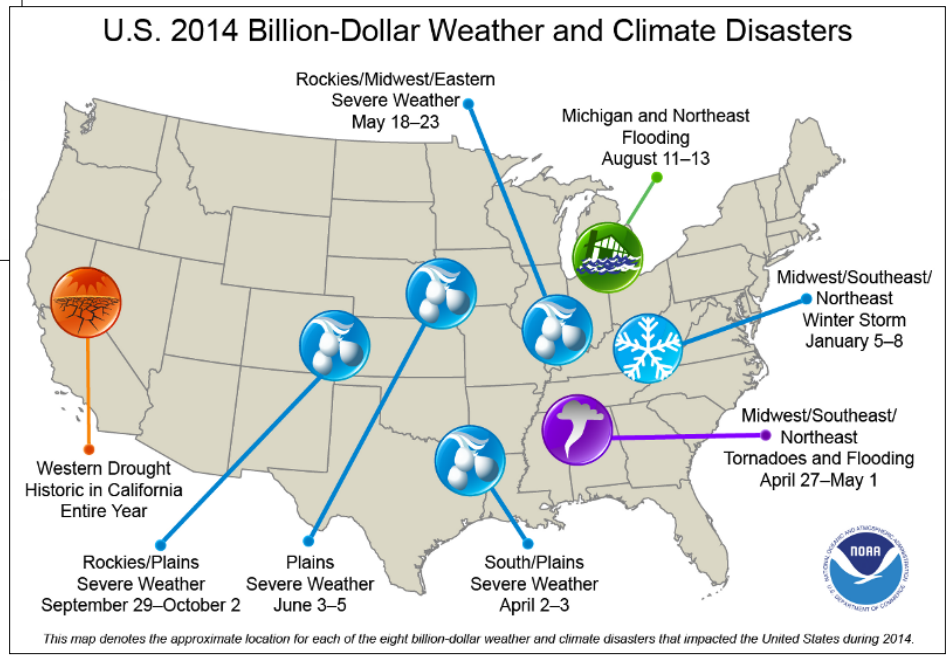
State policy tools

- **Solicitations/RFPs:** MA, CT, NY, NJ, VT, OR
- **Renewable portfolio standards/stand-alone mandates:** CA, OR, PR
- **Adders, multipliers and carve-outs:** NY
- **Prescriptive rebates:** NJ?
- **Financing institutions (green banks, resilience banks):** NJ, CT, NY
- **Studies, roadmaps:** NY, MA, MD, RI, MN
- **Integrating solar+storage into longer-term state policy (energy plans, disaster preparedness):** CA, FL
- **Grid modernization efforts:** NY, MA, HI

Drivers are expanding

Extreme weather, power outages not limited to the Northeast



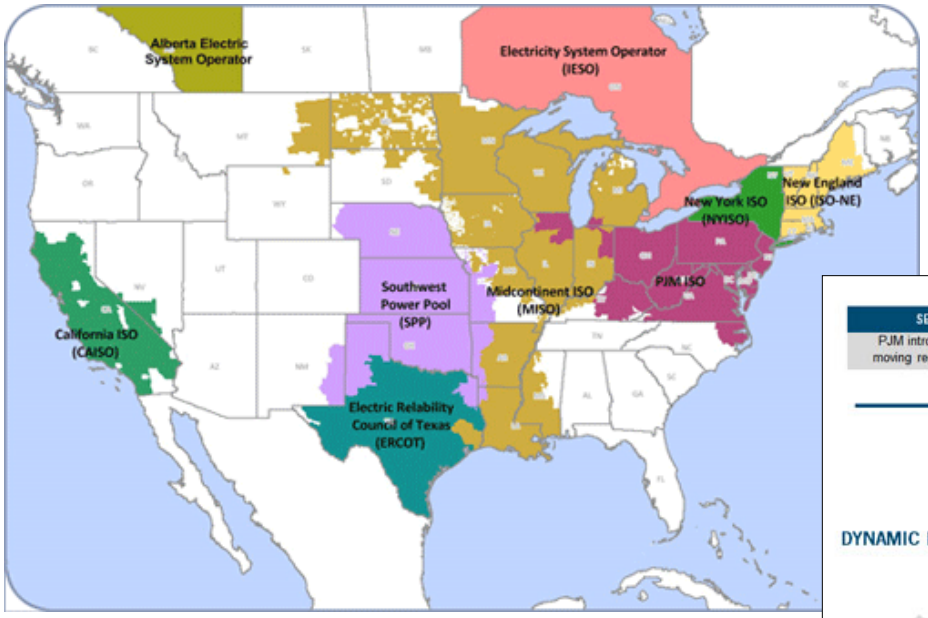


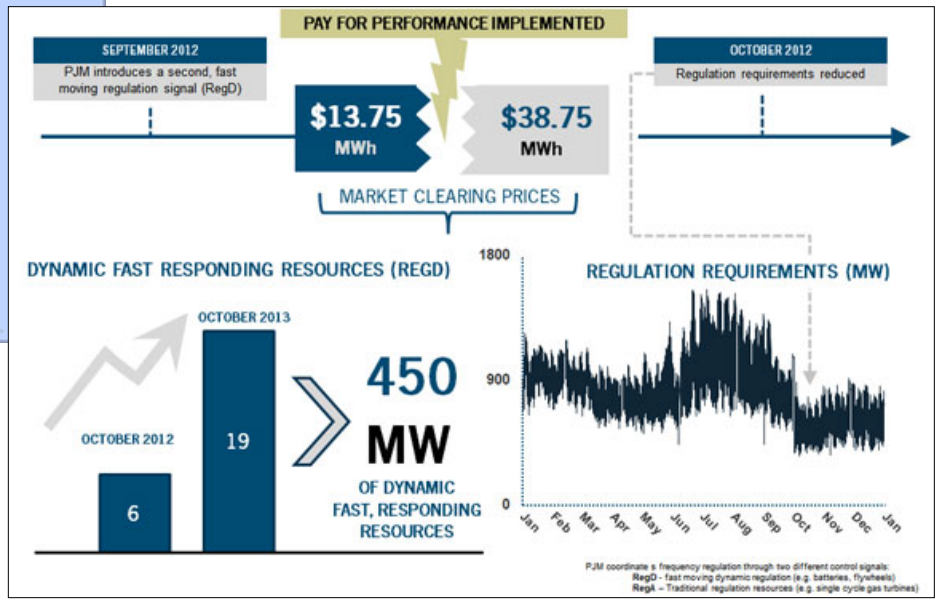
Pacific Northwest

- Earthquakes
- Wildfires
- Drought

Electric services markets are emerging

- Frequency regulation market – PJM
- Demand response and demand charge management – NY, CA
- Capacity shaving by utilities



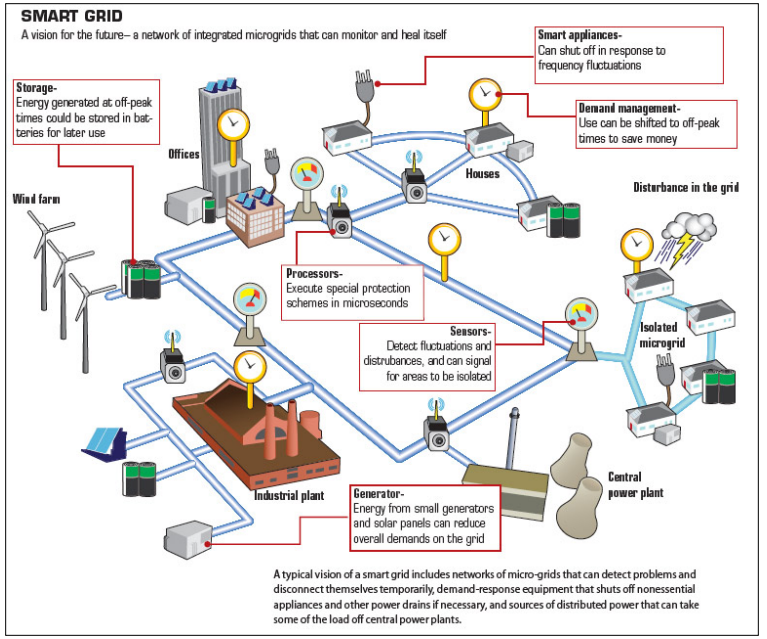


Grid Modernization

Some states have begun a process of modernizing the electric grid (NY, MA, HI)

Grid modernization initiatives are focusing on:

- More distributed clean generation
- Greater role for distribution utilities
- Smartgrid and microgrid development
- Peak shifting, reduction of overcapacity
- Reduced outages, greater resiliency
- Optimized demand
- Improved asset management



Opportunities for energy storage

www.cleanenergystates.org/projects/energy-storage-technology-advancement-partnership/

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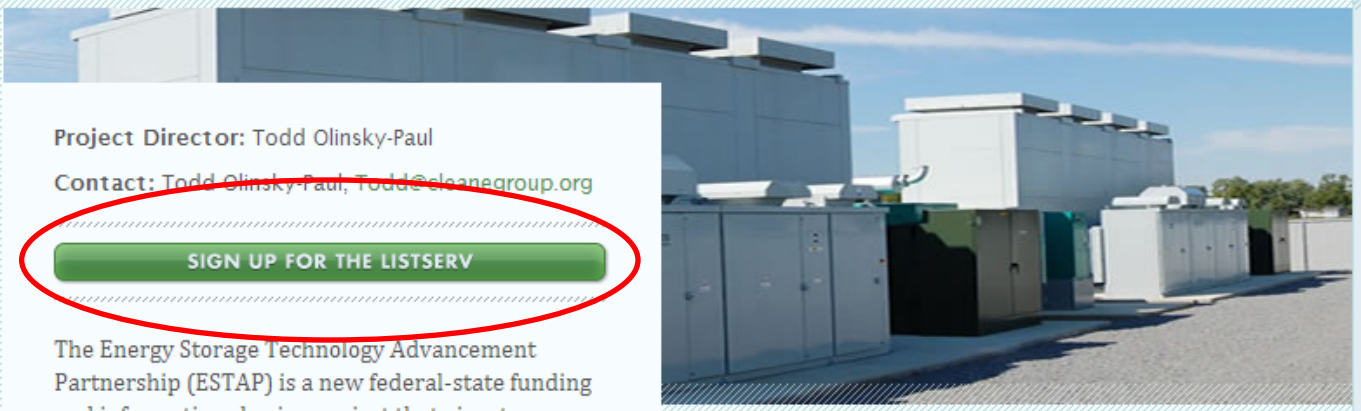

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The Energy Storage Technology Advancement Partnership (ESTAP) is a new federal-state funding and information sharing project that aims to accelerate the deployment of electrical energy storage technologies in the U.S. The value proposition for participating states is to work closely with the U.S. Department of Energy's Office of Electricity Delivery and Energy Reliability (DOE-OW) on near-term joint funding and technology deployment, to join a network of leading states supporting energy storage technology, and to achieve faster progress in electrical energy storage commercialization and economic development.

Background

NEW RESOURCES

May 16, 2013

CESA Webinar Recording: Smart Grid, Grid Integration, Storage and Renewable Energy

By CESA

UPCOMING EVENTS

June 18, 2013

ESTAP Webinar: An Overview of the Electricity Storage Handbook,

More Events

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Thank You to:

Dr. Imre Gyuk, U.S. Department of Energy, Office of Electricity Delivery and Energy Reliability

Dan Borneo, Sandia National Laboratories

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