State & Federal Energy Storage Technology Advancement Partnership (ESTAP) Webinar:

Connecticut and Massachusetts Present Upcoming Solicitations for Resilient Power & Microgrids

February 13, 2014

Clean Energy States Alliance

Sandia National Laboratories

U.S. DEPARTMENT OF ENERGY

Housekeeping

- All participants will be in listen-only mode throughout the broadcast.
- It is recommended that you connect to the audio portion of the webinar using VOIP and your computer's speakers or USB-type headset. You can also connect by telephone. If by phone, please expand the Audio section of the webinar console to select "Telephone" to find the PIN number shown and enter it onto your telephone keypad.
- You can enter questions for today's event by typing them into the "Question Box" on the webinar console. We will pose your questions, as time allows, following the presentation.
- This webinar is being recorded and will be made available after the event on the CESA website at

www.cleanenergystates.org/events/

State & Federal Energy Storage Technology Advancement Partnership (ESTAP)

Todd Olinsky-Paul

Project Director

Clean Energy States Alliance

Thank You:

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

Dan Borneo
Sandia National Laboratories

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ESTAP is a project of 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 representing the leading U.S. public clean energy programs.

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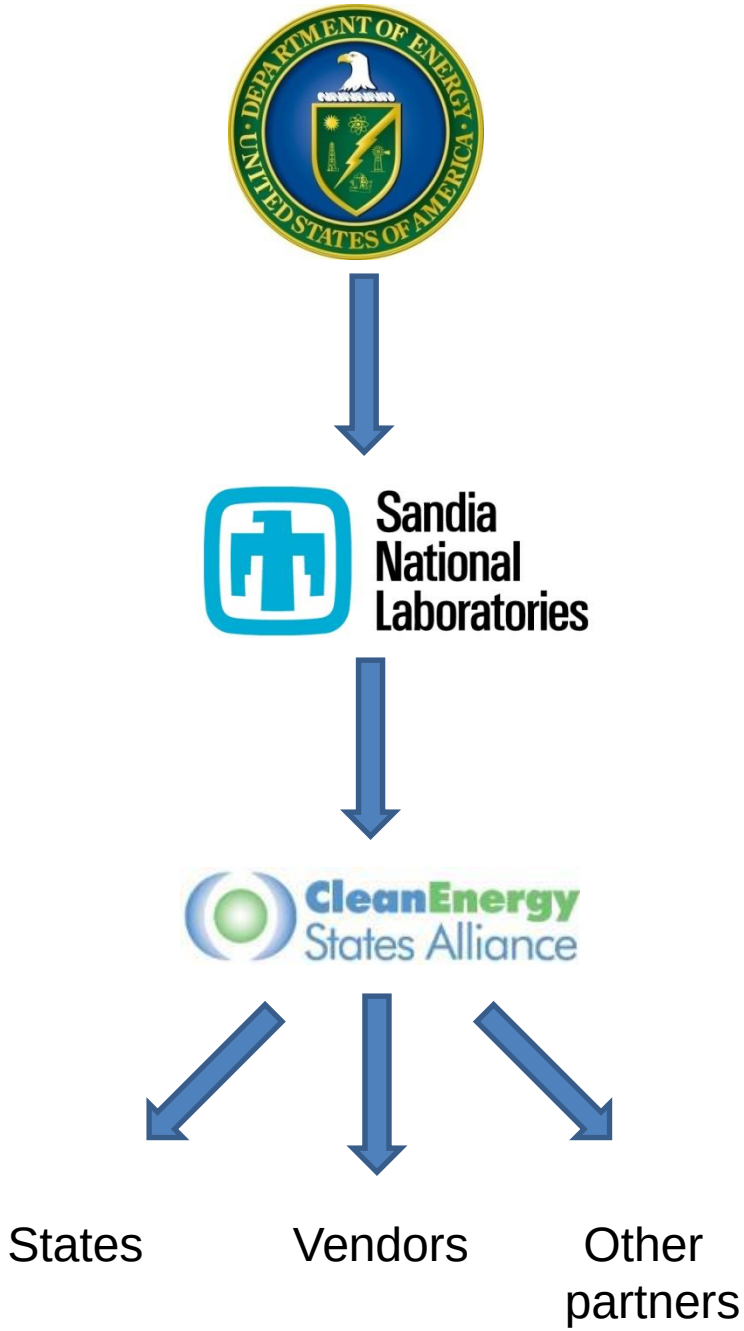
ESTAP* Overview

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

Focus: Distributed electrical energy storage technologies

Outcome: Near-term and ongoing project deployments across the U.S. with co-funding from states, project partners, and DOE



* (Energy Storage Technology Advancement Partnership)

ESTAP Key Activities

1. Disseminate information to stakeholders
   - ESTAP listserv >500 members
   - Webinars, conferences, information updates, surveys
2. Facilitate public/private partnerships at state level to support energy storage demonstration project development
   - Match bench-tested energy storage technologies with state hosts for demonstration project deployment
   - DOE/Sandia provide $ for generic engineering, monitoring and assessment
   - Cost share $ from states, utilities, foundations, other stakeholders

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ESTAP Webinars

Policy Webinars:

- Introduction to the Energy Storage Guidebook for State Utility Regulators
- Briefing on Sandia's Maui Energy Storage Study
- The Business Case for Fuel Cells 2012
- State Electricity Storage Policies
- Highlights of the DOE/EPRI 2013 Electricity Storage Handbook in Collaboration with NRECA

Technology Webinars:

- Smart Grid, Grid Integration, Storage and Renewable Energy
- East Penn and Ecoult Battery Installation Case Study
- Energy Storage Solutions for Microgrids
- Applications for Redox Flow Batteries
- Introduction to Fuel Cell Applications for Microgrids and Critical Facilities
- UCSD Microgrid

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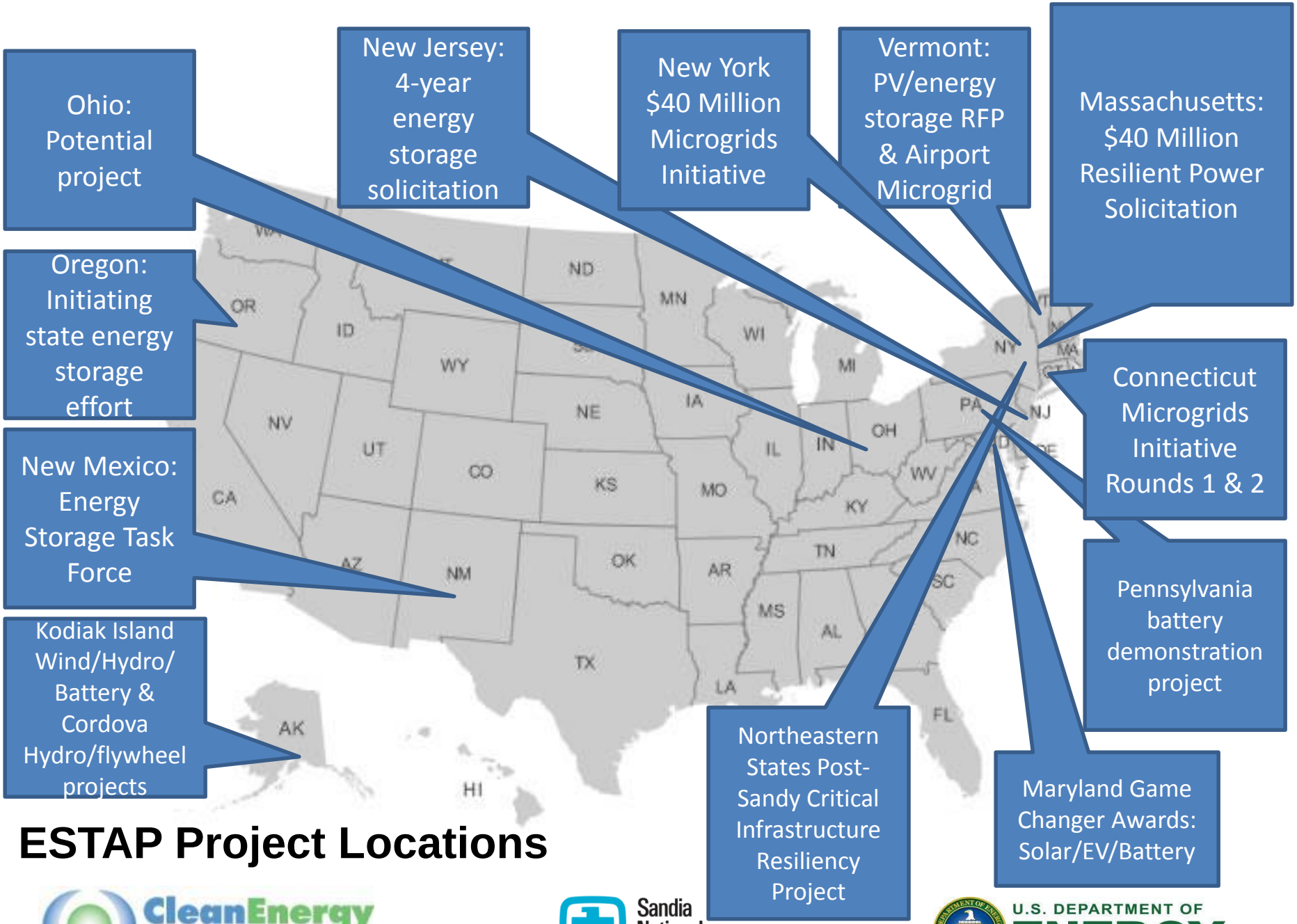

ESTAP Project Locations

Clean Energy States Alliance

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Today's Guest Speakers

Alex Kragie, Deputy Chief of Staff, Connecticut Department of Energy and Environmental Protection

Veronica Szczerkowski, Microgrid Program Coordinator, Connecticut Department of Energy and Environmental Protection

Amy McGuire, Project Coordinator, Massachusetts Department of Energy Resources

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ESTAP Contact Information

CESA Project Director:

Todd Olinsky-Paul
(Todd@cleanegroup.org)

Sandia Project Director:

Dan Borneo
(drborne@sandia.gov)

www.cleanenergystates.org/events

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

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Getting Ahead of the Curve:

Connecticut's First-in-the-Nation Statewide Microgrid Program

Connecticut Department of
ENERGY & ENVIRONMENTAL PROTECTION

Getting Ahead of the Curve: Connecticut's First-in-the-Nation Statewide Microgrid Program

February 13, 2014

Toward Cheaper, Cleaner, More Reliable Energy

Where we are coming from

Gov. Dannel Malloy

- Connecticut has been hard hit with severe weather in past three 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

Impacts from severe weather

- Storms have resulted in large-scale devastation
- Threat to safety and security of residents
- Disruptions to everyday rhythms of 21st century life

Predictable outcome

- Residents express frustration
- Policymakers scramble for ideas
- Somebody trots out a study on the cost of undergrounding power lines

> *"The most recent report in 2007 estimated the cost of placing the state's 1,330 miles of 345 kilovolt transmission line underground and maintaining it would be $27.8 million a mile compared to $6.8 million for the same length of overhead line."—CTPost.com*

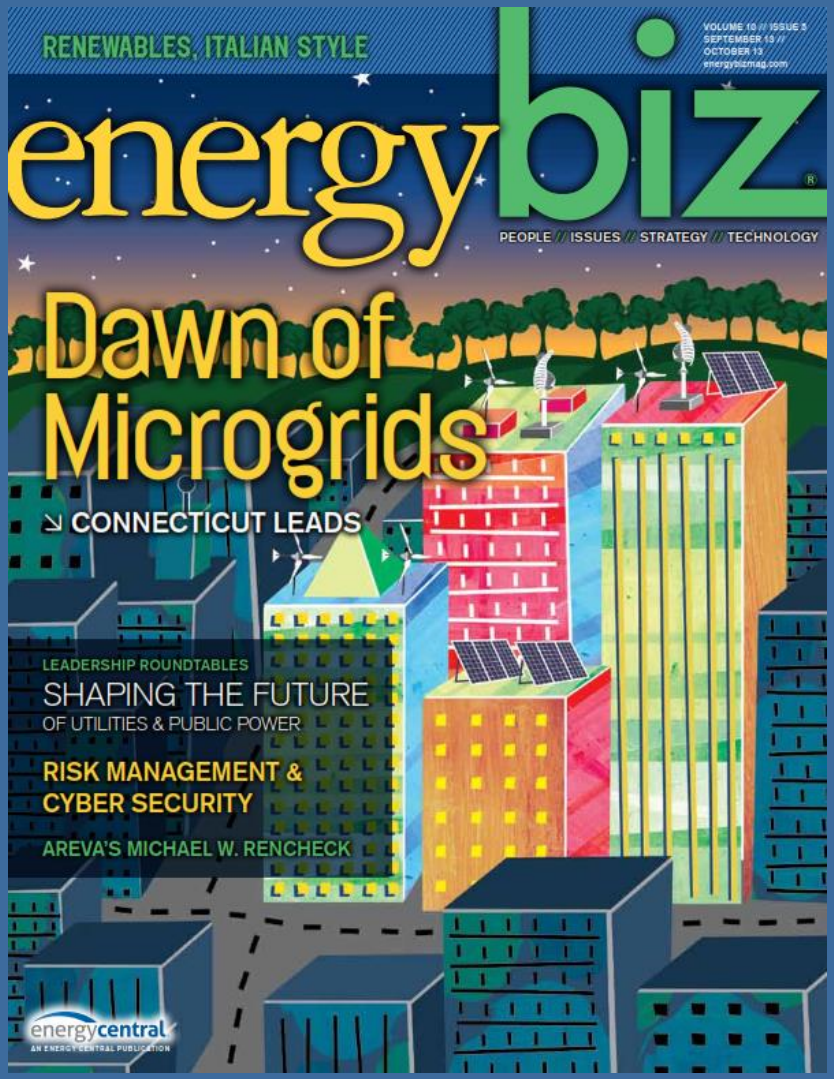
- Clamor dies down quickly

A fresh approach in Connecticut

- Governor Dannel Malloy wanted to do something different
- Worked with Connecticut legislature to design a “microgrid” program
- Program provides enhanced levels of safety and quality of life for Connecticut residents in large-scale outage situations

Creation of microgrids across the state

- Severe weather events becoming new normal
- Threats facing the state become more multi-dimensional (weather, terrorism, cyber-attacks, etc.)
- Microgrids are a way to allow critical facilities to function even when all else fails



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

What is a critical facility?

- Hospital
- Police station
- Fire station
- Water treatment plant
- Sewage treatment plant
- Public shelter
- Correctional facility
- Municipal center
- Telecommunications equipment
- Gas station
- Pharmacy
- Grocery Store
- Etc.

First round results

Project	Facilities	Generation	Grant Value
UConn Depot Campus/Storrs	Campus Buildings	400 kW fuel cell, 6.6 kW PV	$2,144,234
City of Bridgeport-City Hall/Bridgeport	City hall, Police Station, Senior Center	(3) 600 kW natural gas microturbines	$2,975,000
Wesleyan/Middletown	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-St. Francis/Hartford	Dorms, Campus Center, Operation Building	(2) 1.9 MW diesel (existing), 250 kW diesel, 150 kW diesel	$2,270,333
SUBASE/Groton	Various Buildings and Piers	5 MW cogen turbine, 1.5 MW diesel	$3,000,000
Town of Windham/Windham	2 Schools (Various Public Purposes)	(2) 130 kW natural gas, 250 kW solar, 200 kWh battery; (2) kW diesel,	$639,950
Town of Woodbridge/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-Parkville Cluster/Hartford	School, Senior Center, Library, Supermarket, Gas station	600 kW natural gas	$2,063,000
Town of Fairfield-Public Safety/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

Lessons from first round

STATE OF CONNECTICUT
GOVERNOR DANNEL P. MALLOY

- Perceived strengths
  - Strong executive champion (Governor Malloy)
  - Rigorous evaluation process
  - Full service support from CT Microgrids team
- Opportunities to improve
  - Need to make program more accessible for municipalities
  - Financing support for distributed generation resources

Microgrid Program – Round 2

- Governor has authorized an additional $30m for the program in his budget, which was passed by the legislature

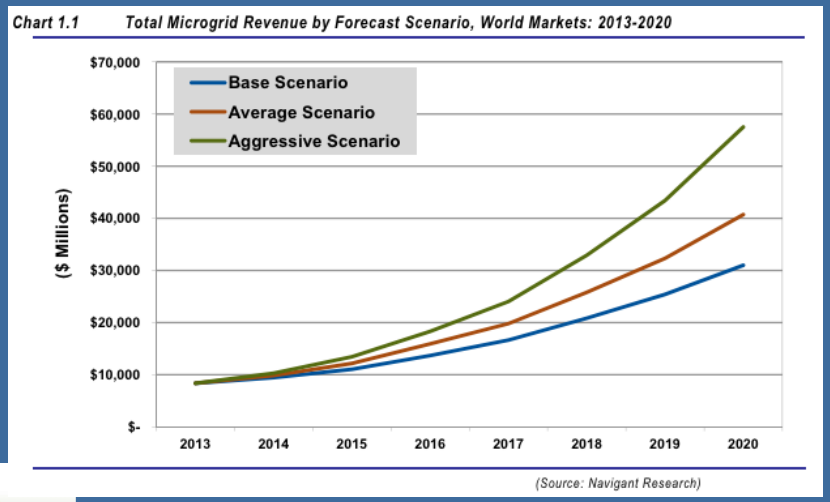
- Second round of microgrids program launched at the end of October 2013
  - Refined procedure
  - Financing program in conjunction with nation's first "Green Bank"
  - More technical support for municipalities

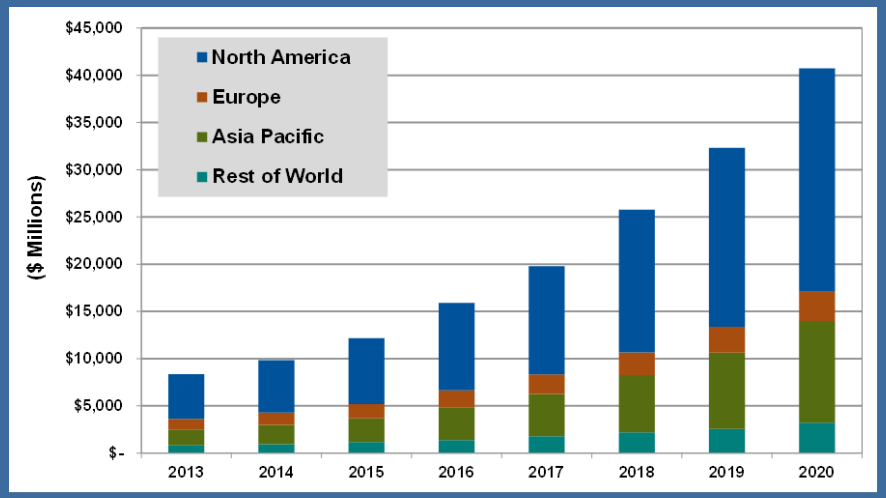
Microgrid Program – Round 2

- Frequently Asked Questions
- Meet and Greet – February 19, 2014
- Round 2 RFP target issue date – first week of March 2014
- Bidder's conference – March 20, 2014

Preparing for the future

- 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





Thanks for listening

Contact Information:

Alex Kragie

Deputy Chief of Staff

Connecticut Department of Energy and Environmental Protection

(860) 424-3000

Alex.kragie@ct.gov

Veronica Szczerkowski

Microgrid Program Coordinator

Connecticut Department of Energy and Environmental Protection

(860) 827-2890

Veronica.szczerkowski@ct.gov

Link to Microgrid Program information:
http://www.dpuc.state.ct.us/DEEPEnergy.nsf/$EnergyView?OpenForm&Start=1&Count=30&Expand=7&Seq=2

Creating A Cleaner Energy Future For the Commonwealth

Massachusetts Department of Energy Resources

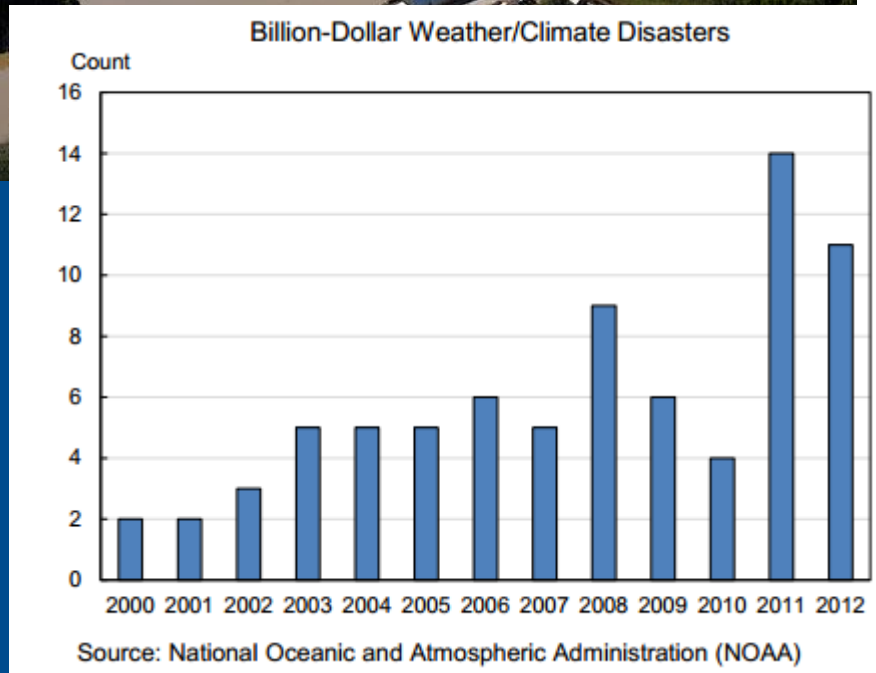
Helping Communities Prepare for Climate Change

Clean Energy States Alliance

Amy McGuire

February, 13, 2014

Time to Act



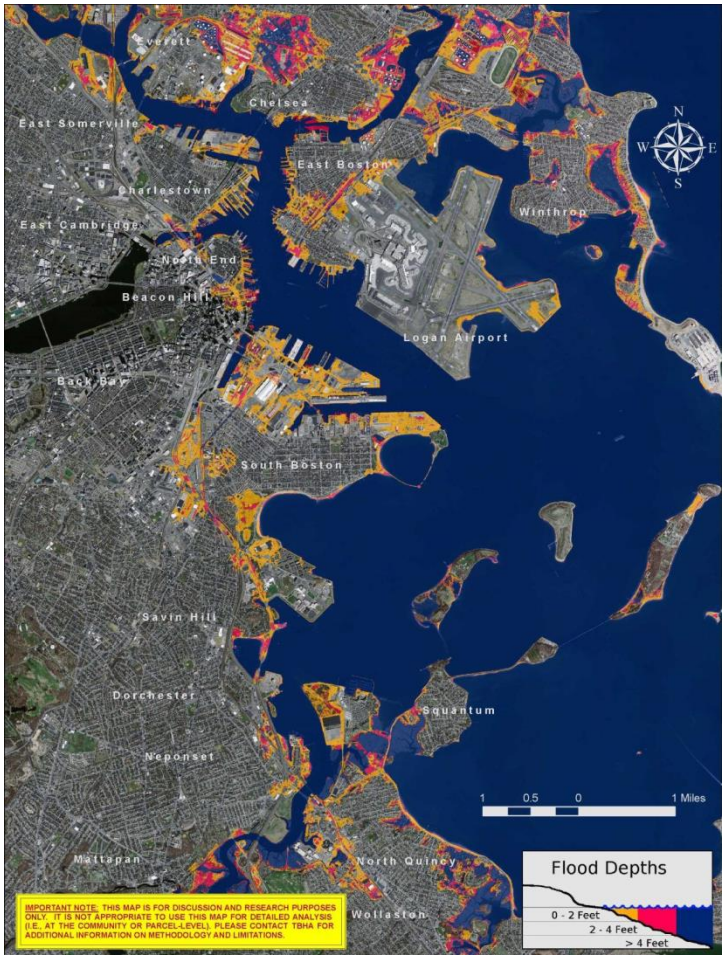
Severe weather is the leading cause of U.S. power outages

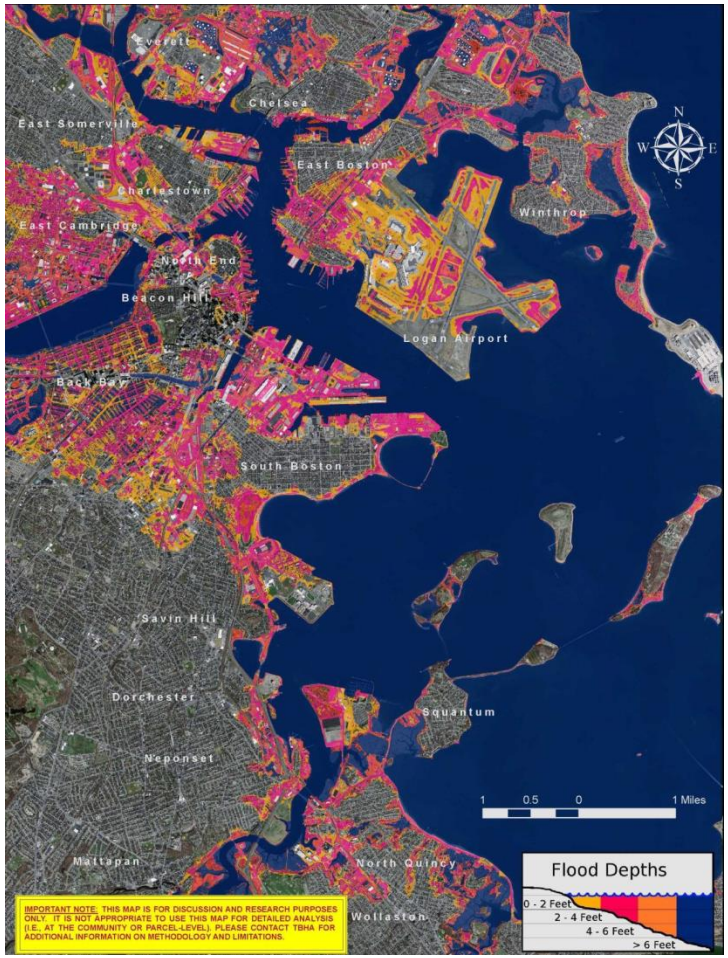
- $18-33 billion per year = est. economic costs (2003-12)
- 7 of 10 costliest storms in U.S. history between 2004-2012

Northeast

- $65 billion estimated for Superstorm Sandy (2012)
- 2.3 million people evacuated prior to Hurricane Irene (2011)
- >6.5 million lost power during Irene: 30% of RI, CT, MD

Boston Sea Rise Projections

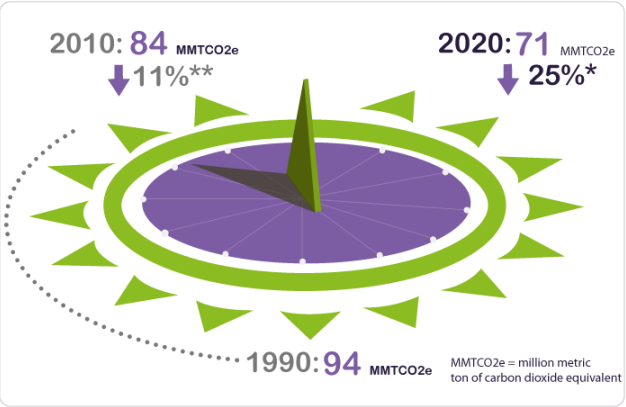




Preparing for the Rising Tide, TBHA

State Law and Policy Drivers

- Leading by Example
- Integration of Energy and Environment
- Global Warming Solutions Act
  - Mass. Climate Change Adaptation Report
  - Clean Energy and Climate Plan
  - GHG Dashboard
- Green Communities Act
  - Mass Save®
  - Green Communities Designation
  - RPS Class I Solar Carve-Out



Creating A Cleaner Energy Future For the Commonwealth

DOER
Massachusetts Department of Energy Resources

Climate Preparedness – Top EEA Priority

"We need to do more to address the extreme threats from climate change…We must properly assess the risks and vulnerabilities, plan for them and ensure our emergency services have the ability to keep our residents safe. And we must take action to protect our natural habitats to maintain healthy communities."

Governor Deval Patrick
July 24th, 2013

(Photo: Eric Haynes/Governor's Office)

Coordinated Climate Preparedness Initiatives

EEA is focused on investments that will have the most effective, immediate and long-lasting impact on our climate change preparedness.

- Identifying resiliency efforts at generation facilities and soliciting feedback through survey (EEA with NEPGA)
- Prioritizing climate preparedness through DPU's grid modernization process (DPU)
- Designing community clean energy resilience grant program (DOER)
  - $40M in Alternative Compliance Payment funds
  - Competitive solicitation, with consideration for municipal equity

Community Clean Energy Resiliency

- Grants will be available for communities to improve the resilience of critical energy services using clean energy technology at critical facilities.
  - Critical facilities:

1. Life safety resources – police, fire, hospitals, wastewater treatment plants, emergency communication resources and shelters
2. Lifeline resources – food supply and transportation
3. Community resources – city/town halls and senior centers, schools or multi-family housing developments capable of acting as alternative shelters

Eligible Clean Energy Technologies

- Incorporation of clean generation like:
  - Distributed renewable energy generation (electric and heating/cooling systems) and energy efficiency
  - CHP and district energy systems
  - High efficiency fuel cells
- Energy storage (flywheels, batteries, electric vehicles, hot/cold water storage)
- Energy management systems to enable critical load shedding during an event
- Islanding technology like:
  - Advanced controls, switches, and inverters
- Microgrids

Potential Project Outcomes

- Reducing critical energy use at critical facilities – energy efficiency, load shedding
- Co-locating renewable energy solutions at critical facilities to stretch emergency fuel supplies
- Leveraging shared assets – within a municipality, within a region
- Considering a full breadth of financing models to cover project costs – other incentives and resources, year-round project (not just emergency functionality)

Status

- Learning
  - Study of best practices, relevant clean energy technologies, potential financing solutions
  - Identification of stakeholders, need for local technical resources
  - Electric utilities, MEMA, MARPA, MassCEC, NECEC and CESA, communities
- Collaboration and leverage
  - Coordinate efforts and complement existing programs, incentives
- Timeframe
  - Establish program design: November 2013 - February 2014
  - Issue RFQQ for technical assistance expertise: February 2014
  - Solicit proposals from cities and towns: March - June 2014
  - Proposal evaluation, awards, and implementation are expected to span the remainder of 2014 and into 2015.

Approach

- Energy resiliency planning
  - Flexibility to allow direct application for project funding OR application for planning technical assistance and project funding
- Municipal equity
  - Via consideration of all vulnerability factors including high population density, high-need individuals, remote areas, flood risk
- Regional cooperation
  - Allowing multiple municipalities to jointly apply for funding and potential of mobile solutions
- Public-private partnerships
- Bulk purchasing

Why We Are Doing this

Creating A Cleaner Energy Future For the Commonwealth

DOER
Massachusetts Department of Energy Resources

Thank you!

Amy McGuire

Massachusetts Department of Energy Resources
100 Cambridge Street, Suite 1020, Boston, MA 02114
617.626.7380
Amy.McGuire@State.MA.US
www.mass.gov/doer

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