



Energy Storage Technology Advancement
Partnership (ESTAP) Webinar:

A Solar Storage Microgrid for the Energy City of the Future

Friday, August 22, 2014

Hosted by Todd Olinsky-Paul
ESTAP Project Director, CESA



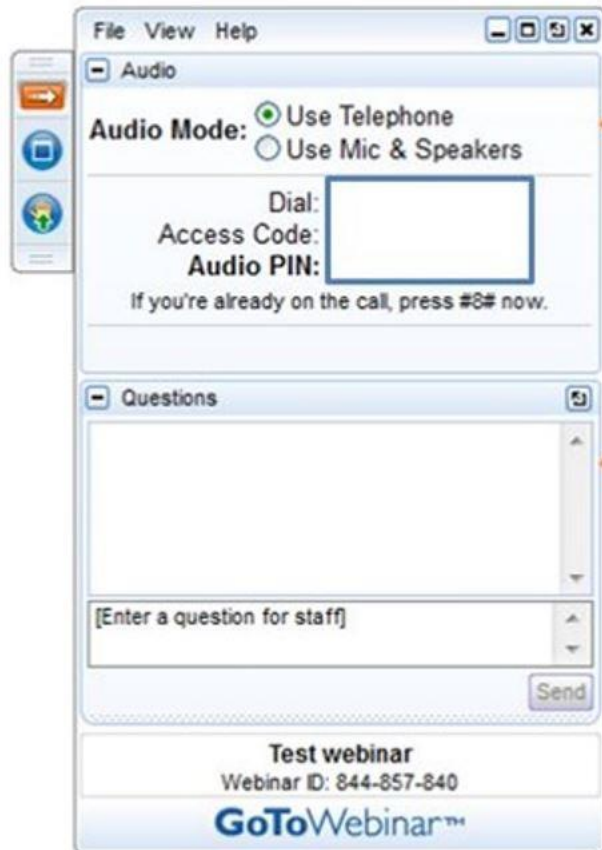
U.S. DEPARTMENT OF
ENERGY



Sandia
National
Laboratories



Housekeeping



All participants are in “Listen-Only” mode. Select “Use Mic & Speakers” to avoid toll charges and use your computer’s VOIP capabilities. Or select “Use Telephone” and enter your PIN onto your phone key pad.

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

This webinar is being recorded.

You will find a recording of this webinar, as well as all previous CESA webcasts, archived on the CESA website at

www.cesa.org/webinars

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



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:

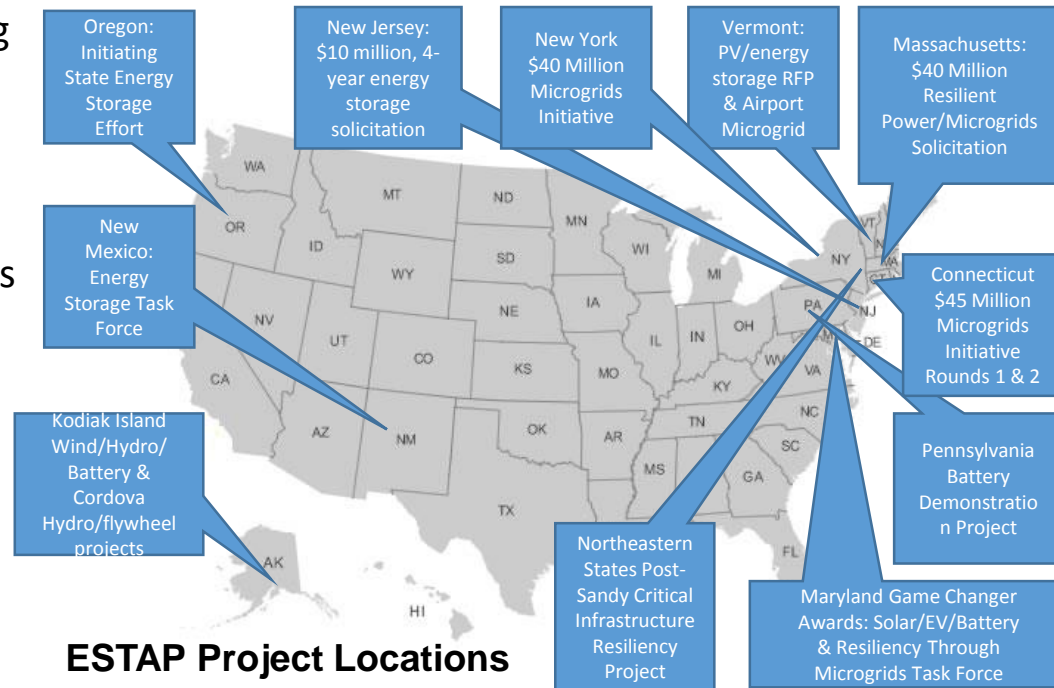
ESTAP is conducted under contract with Sandia National Laboratories, with funding from US DOE.

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



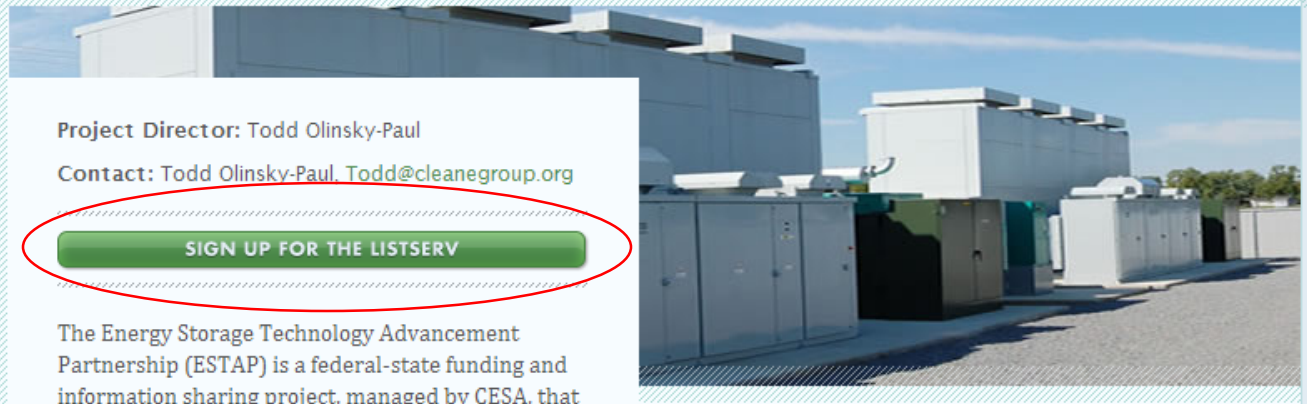


Energy Storage Technology Advancement Partnership

More CESA Projects

Overview

- Energy Storage Events
- Energy Storage News
- Energy Storage Links
- Energy Storage Listserv Signup
- Energy Storage Resources and Webinar Archives



Project Director: Todd Olinsky-Paul
Contact: Todd Olinsky-Paul, Todd@cleanegroup.org

[SIGN UP FOR THE LISTSERV](#)

The Energy Storage Technology Advancement Partnership (ESTAP) is a federal-state funding and information sharing project, managed by CESA, that aims to accelerate the deployment of electrical energy storage technologies in the U.S.

Project Objective

The project's objective is to accelerate the pace of deployment of energy storage technologies in the United States through the creation of technical assistance and co-funding partnerships between states and the U.S. Department of Energy.

ESTAP conducts two key activities:

- 1) Disseminate information to stakeholders through:

NEW RESOURCES

May 1, 2014
The Economics of Grid Defection
 By Rocky Mountain Institute

April 4, 2014
ESTAP Webinar Slides: Microgrid Technologies
 By ESTAP

April 4, 2014
ESTAP Webinar Recording: Microgrid

UPCOMING EVENTS

May 20, 2014
ESTAP Webinar: Commissioning Energy Storage,

[More Events](#)

LATEST NEWS

April 30, 2014
NYSERDA Announces Opening of Battery and

Today's Guest Speakers

Imre Gyuk, Energy Storage Program Manager, US DOE
Office of Electricity Delivery and Energy Reliability

Darren Springer, Deputy Commissioner, Vermont Public
Service Department

Mary Powell, Chief Executive Officer, Green Mountain
Power

Josh Castonguay, Director of Generation and Renewable
Innovation, Green Mountain Power



Energy Storage: Partnering with the States

IMRE GYUK, PROGRAM MANAGER
ENERGY STORAGE RESEARCH, DOE

DOE-ARRA Storage Installations:



2011, NM: 500kW, 2.5MWh with PV



2013, TX: 36MW with Wind



2014, CA: 250kW for Peak Shaving



2014, PA: 20MW for Frequ. Reg.

States are beginning to provide Incentives for Storage

California: 1.3GW Mandate

Hawaii: 200MW Storage Solicitation

New York: 2100\$/kW at Peak

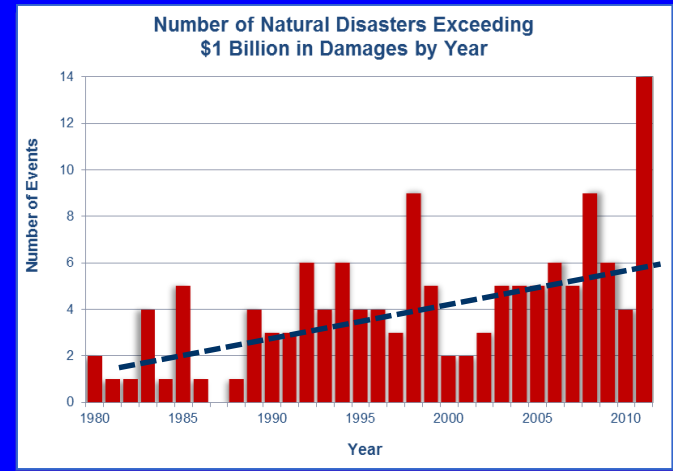
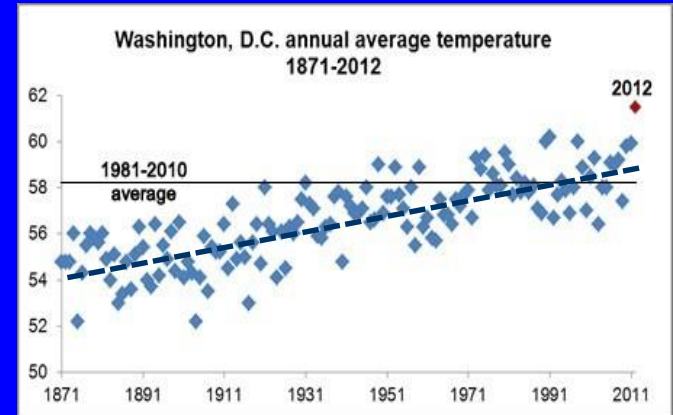
The DOE State Initiative for Storage
will partner with the States
to develop effective local Projects
for Grid Energy Storage

Vermont Project for Resilient Microgrids

Every \$1 on protection measurements
Can prevent \$4 in repairs after a storm!



Tropical Storm Irene in Vermont



Trends indicate the situation
will get worse not better!!

Some 50% of Diesel Generators failed to start during the Sandy Emergency

Microgrids with Renewable Energy and Storage can provide essential Services over an extended Time Period

During non-emergency Periods Storage can provide Demand Management for the User and compensated Services to the Grid

Apartment Buildings – Campuses – Schools – Shopping Centers – Community Centers – Nursing Homes – Hospitals – Police Stations – Gas Stations – etc. etc

Vermont Public Service Dept. – DOE Green Mountain Power

Solicitation issued by VPS. Joint funding by VPS, DOE-OE, GMP

GMP: Rutland, VT
4MW / 3.4MWh of storage
Integrated with 2MW PV
Integrator: Dynapower

Groundbreaking: Aug. 12, 2014

Situated on Brown Field Area

Ancillary grid services, peak shaving during high load periods

System can be islanded to provide emergency power for a resilient microgrid serving a highschool/emergency center.



Washington State Clean Energy Fund:

Solicitation for \$15M for Utility Energy Storage Projects

Selected Projects with UET V/V technology:

- Snohomish PUD (2MW / 6.4MWh) – PNNL -- U of WA
- Avista (1MW / 3.2MWh) – PNNL -- 1 Energy -- WA State

UET V/V technology
was developed at PNNL
with DOE-OE funding

PNNL will participate
in these Projects with
benefit optimization
studies.



Oregon State Initiative:

Energy Storage Workshop, March 22, 2014, Portland
Organized by DOE-OR, OR-PUC, and DOE-OE

Energy Storage Pilot Projects Request for Comments,
July 2014 by DOE-OR in collaboration with DOE-OE

RFP by DOE-OR in preparation

DOE-OE's Grid Energy Storage
State Initiative is proving to be effective in
Creating Interest, Initiating Projects, and
providing Technical and Analytical Support.

Stafford Hill Solar/Storage Project



Josh Castonguay
Director, Generation & Renewable Innovation
Green Mountain Power
August 22, 2014

Stafford Hill Solar Overview

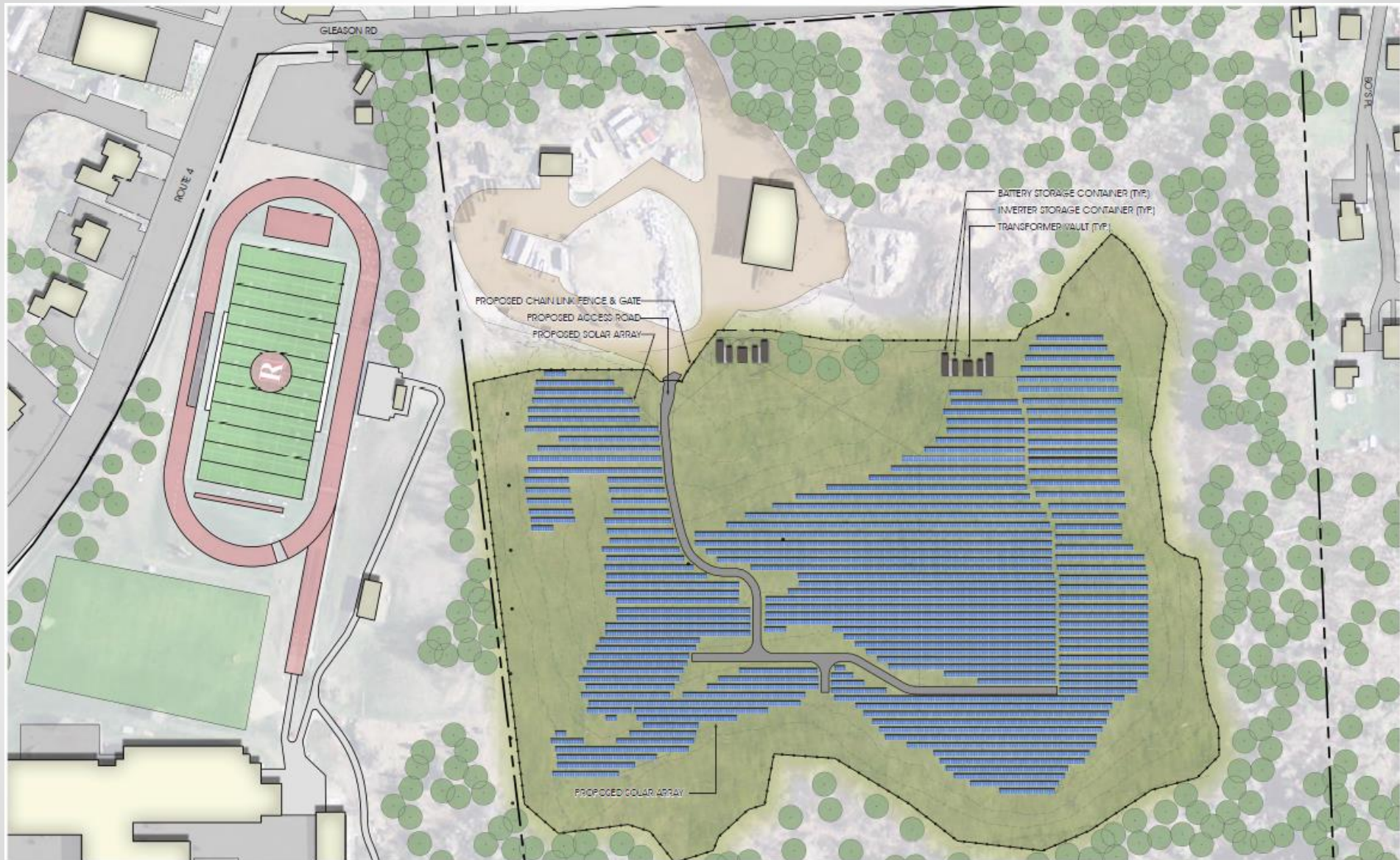
- Consistent with GMP portfolio goals, SPEED goals, VT energy plan
- Some additional benefits not quantified
 - Value beyond 25-year term, potential NTA value
- A cost-competitive way to contribute to Solar Capital goals
- Meaningful revenues to Rutland & Vermont entities
- Use of a non-productive site
 - Sites like this will be critical to public acceptance of development necessary to meet VT renewable goals

Value of Solar PV Output

- Components included in levelized estimate
 - Energy
 - RECs
 - Capacity
 - Transmission (regional network service)
 - Ancillary services
- Additional benefits not quantified
 - End value (past 25 years)
 - DRIPE (market price suppression)
 - Potential for transmission deferral value

Battery Storage Update

- Dynapower (S. Burlington)
 - 4 Multi-Port 500 kW Dynapower Inverters
 - 2 MW / 1 MWh lithium ion batteries
 - 2 MW / 2.4 MWh lead acid batteries
- Combination of LiOn and lead acid provides expanded performance profile
- Exploring the operational capabilities of the technology for VT
- \$300k grant award from CEDF and DOE



GMP Stafford Hill Solar - Illustrative Plan

SCALE 1" = 60'
 0 60 120 180



T. J. Boyle Associates
 landscape architects • planning consultants

Potential Streams of Market Value / Avoided Costs for Energy Storage

- Regulation service to grid
 - Responses (up/down) within seconds, in response to ISO-NE signal
 - Payments for availability, ramping
 - Currently an ISO-NE pilot program
 - Other operating reserves?
- Capacity & transmission charges
 - Extend solar plant production into late afternoon/evening
 - As a load reducer, limit charges based on ISO and VT peaks
- Energy arbitrage
 - Assumed for now to be minimal
- Overall: substantial value, uncertainty in the details
 - Regulation market rules will continue to evolve to accommodate storage and demand side resources
 - Potential operational choices/tradeoffs between products
 - ISO asset, or load reducer?
 - A learning opportunity for GMP and other VT stakeholders

ESTAP Contact Information

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(drborne@sandia.gov)

Webinar Archive: www.cesa.org/webinars

ESTAP Website: <http://www.cesa.org/projects/energy-storage-technology-advancement-partnership/>

ESTAP Listserv: <http://www.cesa.org/projects/energy-storage-technology-advancement-partnership/energy-storage-listserv-signup/>

