

Welcome to the National Council on Electricity Policy

Annual Meeting

The Meeting will begin at 1:00 PM Eastern

May 12, 2017
Washington, DC and via webcast

NCEP Annual Meeting Webcast

- ▶ Welcome and Webcast Protocol
- ▶ NCEP Business Meeting
- ▶ NCEP Activities and Projects
- ▶ Supporting Generation and Transmission Flexibility: Siting on Brownfields and Other Existing Infrastructure Sites
- ▶ Reliability, Resiliency, and Recovery: Collaboration Strategies that Support Cyber and Infrastructure Assurance
- ▶ Wrap Up and Adjourn

Welcome and Webcast Protocol

Jan Brinch

National Council on Electricity Policy (NCEP)

Miles Keogh

National Association of Regulatory Utility
Commissioners and NCEP

Kerry Worthington

NARUC and NCEP

Acknowledgements

- ▶ Thank you to the U.S. Department of Energy and the National Energy Technology Laboratory for supporting this work.
- ▶ Thank you all for participating in today's Annual Meeting webcast. We welcome your questions, comments, and perspectives.

NCEP's Benefits

- ▶ A “marketplace of ideas” encouraging multiple viewpoints, not requiring unanimity but rather an exchange of perspectives
- ▶ A forum for unbiased information, not a policy-making organization
- ▶ No lobbying or legislative advocacy
- ▶ A place to discuss and debate “outside the box” ideas, for peer exchange, and to improve electricity policy for the betterment of all

NCEP Organizational Structure

- ▶ Executive Committee: Composed of 12 individuals representing national interests:
 - ▶ Energy and air regulatory agencies
 - ▶ State legislatures and energy offices
 - ▶ Consumer advocacy agencies
- ▶ Policy Committee: Self-identifying and composed of participating state officials

NCEP Business Meeting

Commissioner Elizabeth B. “Lib” Fleming
South Carolina Public Service Commission

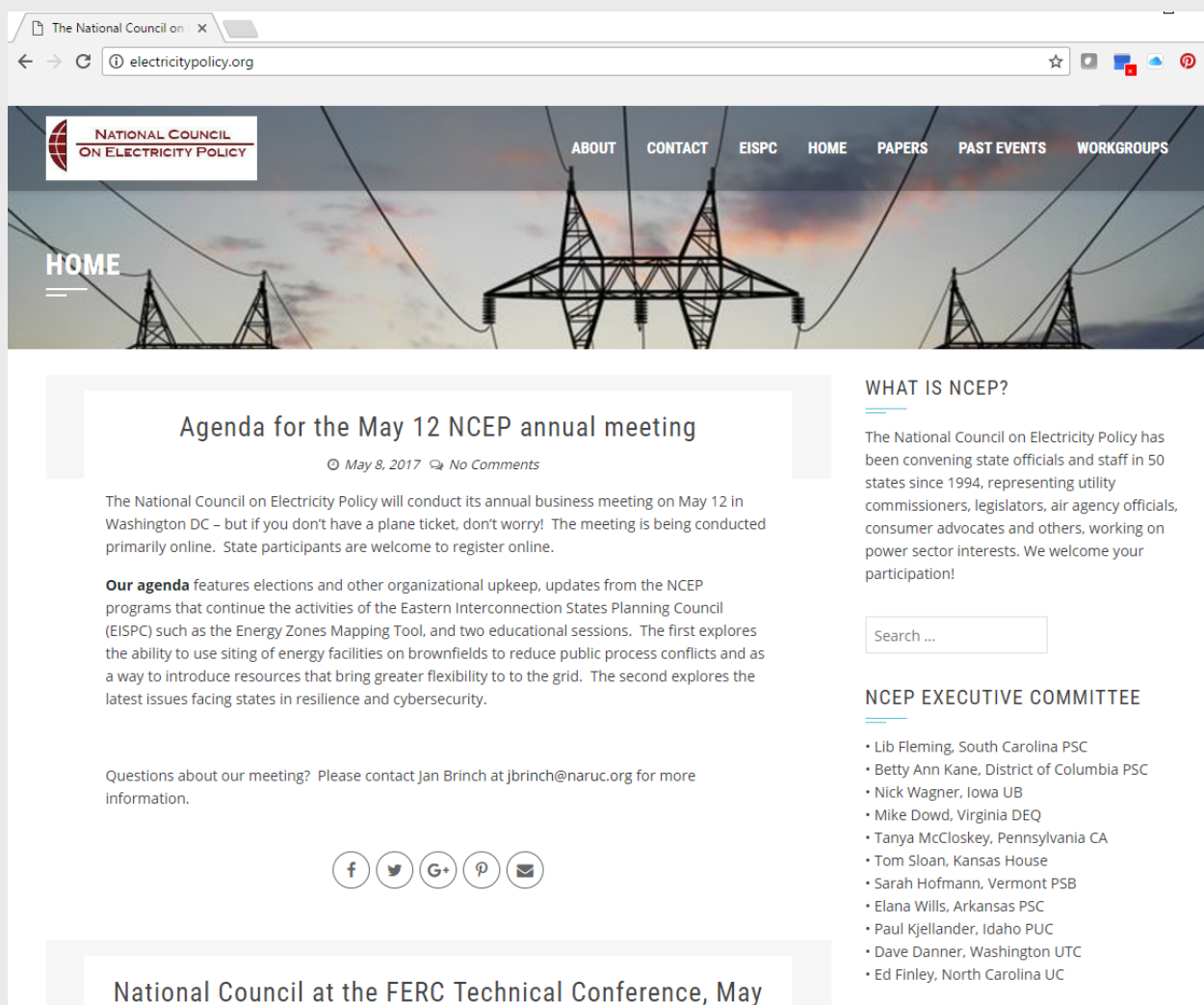
Executive Committee

- ▶ Hon. Lib Fleming, *South Carolina*
- ▶ Hon. Betty Ann Kane, *District of Columbia*
- ▶ Hon. Nick Wagner, *Iowa*
- ▶ Hon. Sarah Hofmann, *Vermont*
- ▶ Hon. Elana Wills, *Arkansas*
- ▶ Hon. Paul Kjellander, *Idaho*
- ▶ Hon. Dave Danner, *Washington*
- ▶ Hon. Chairman Ed Finley, *North Carolina*
- ▶ Rep. Tom Sloan, *Kansas State Legislature*
- ▶ Mike Dowd, *Virginia Department of Environmental Quality*
- ▶ John Chatburn, *Governor's Office of Energy Resources, Idaho*
- ▶ Tanya McClosky, *Office of Consumer Advocate,*
Pennsylvania

Amendment to the NCEP Guiding Principles

- ▶ Guiding Principles passed unanimously on April 25, 2016
- ▶ One change approved today, May 12, 2017: The words “Policy Committee” are hereby changed to “Members,” “NCEP Members,” or “the membership” throughout the Principles document
- ▶ As previously mentioned, the National Council is guided by an Executive Committee; all other Council members engage in policy discussions, but are not an exclusive policy committee.

Website Roll-Out



NARUC Resolution

Resolution on the National Council on Electricity Policy

WHEREAS, Key electricity decisions are no longer solely in the domain of State electricity regulators and primary questions and implications of environmental regulations, such as those pertaining to the *Clean Power Plan*, require the participation of State air and environmental regulators, State legislators, consumer advocates, and others, to both improve their relevance and to serve as a counter-balance to the perspectives of utilities and other energy companies; *and*

WHEREAS, In 1994 NARUC served as a co-founder of the National Council on Competition and the Electric Industry; *and*

WHEREAS, Between 1994 and the present this forum has convened key stakeholders in State government on the most pressing electricity issues of the day; *and*

WHEREAS, In 1999 this Council was re-named the National Council on Electricity Policy (NCEP); *and*

WHEREAS, The National Council has served as a valuable resource for research on energy efficiency and regulation, environmental regulation, infrastructure finance, critical infrastructure protection, and other issues; *and*

WHEREAS, The National Council has served as an honest broker of conversation on these and other topics that serve multiple agencies and interests; *and*

WHEREAS, In December 2009 the National Council's *Utility of the Future in a Carbon Constrained World* Conference served as the launch pad for initiatives among State legislatures and commissions, as well as air agencies; *and*

WHEREAS, The relevance of the National Council was further heightened when it convened *The Three Interconnections Meeting: Facing the Future With Interconnection-Wide Planning* in 2013 that brought together decisionmakers from three energy interconnections to harmonize best practices in transmission planning; *and*

Budget Report

Commissioner Nick Wagner
Iowa

2017-2018 NCEP Direction

Miles Keogh
NARUC & NCEP

NCEP Activities and Projects

Jan Brinch

National Council on Electricity Policy (NCEP)

Federal-State Jurisdictional Approaches to Emerging Electricity Technologies and Grid Modernization – Opportunities for State Action

Miles Keogh, NARUC and Commissioner Sarah Hofmann, Vermont

- ▶ *“State and regional collaborative processes may yield less ambiguity, better common efforts, and the development of tools that bridge and improve policy-making in the public interest.”*
- ▶ *From NCEP’s Testimony at May 1-2, 2017 FERC Technical Conference on State Policies and Wholesale Markets*

Applying Valuation to Baseload – Experts Roundtable – January 2017

Miles Keogh
NARUC

Energy Resource Valuation Framework

Patrick O'Connor
Oak Ridge National Laboratory (ORNL)

Introduction to the DOE GMLC Grid Services and Technologies Valuation Framework Project

Patrick O'Connor

Oak Ridge National Laboratory

NCEP Annual Meeting
May 12, 2017

Valuation challenges... straight from the headlines

The New York Times | <https://nyti.ms/2m5JLsL>

N.Y. / REGION

Nuclear Plant's Closing Raises New Fears for Jobs and Taxes

By LISA W. FODERARO FEB. 28, 2017

ALBANY — For years, many Westchester County residents and elected officials clamored for the Indian Point nuclear power plant to be shut down, citing what they said was the untenable risk it posed in an area as populated as greater New York City.

But since January, when Gov. Andrew M. Cuomo announced plans for just such a shutdown, attention has turned to the devilish details. At a hearing on Tuesday, Democratic and Republican lawmakers sought reassurances from state energy officials, the plant's owner and others that the closing would not disrupt the state's power supply or be financially ruinous to local communities.

The hearing touched on issues such as energy reliability, lost jobs, the affect on the area's property tax base and how spent fuel on the site would be stored. In

Clean Energy Cultivates Farm Leases

A Steady Income Stream

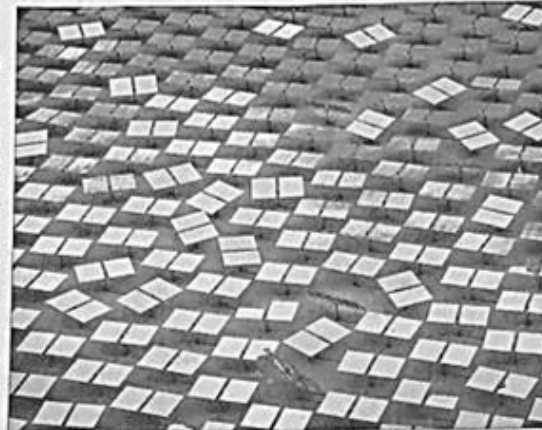
Solar power companies pay top dollar in rent amid falling commodity prices

BY BLOOMBERG NEWS

For more than a century, Dawson Singletary's family has grown tobacco, peanuts and cotton on a 630-acre farm amid the coastal flatlands of North Carolina. Now he's making money from a different crop: solar panels.

Singletary has leased 34 acres of his Bladen County farm to Strata Solar for a 7-megawatt array, part of a growing wave of solar deals that are transforming U.S. farmland and boosting income for farmers.

Farmland has become fertile territory for clean energy, as solar and wind developers in North America, Europe and Asia seek more flat, useless expanses to build. That's so been a boon for struggling U.S. midsize farms that must contend with falling commodity prices. There is not a single crop that could have grown on that land it would generate the income it we get from the solar farm," Singletary, 65, says.



Solar panels can help farmers diversify their income with revenue that's not subject to market fluctuations.

ate with commodity prices, says Andy Olsen, who

Bill seeks to drastically reduce value of privately produced solar power

Jessie Higgins, Evansville Courier & Press 10:04 p.m. CT Feb. 18, 2017



(Photo: MIKE LAWRENCE / COURIER & PRESS)

Local solar energy users are facing off against big utility companies this month over a proposal that would drastically reduce the value of privately generated solar power in Indiana.

Senate Bill 309 (<https://iga.in.gov/legislative/2017/bills/senate/309#>)'s supporters say solar is overpaid for their power, and the bill sets a fairer price.

"People think this bill is anti-solar, and that's just not true," said Chase Kelley, a spokesman for the Indiana Solar Energy Association.

But, critics fear the move could destroy Indiana's budding solar industry.

"I'm very concerned for what affect this will have on the solar industry," said Susan Sirinella, a member of the Green Team at Bethlehem United Church of Christ, which recently installed a solar system on its church. "It would make it hard to recover your investment."



FEATURE

What's the value of energy storage? It's complicated

Experts agree storage costs are falling, but few are sure of how to value storage

By Herman K. Trabish • Oct. 20, 2015

The Challenge and Project Motivation

- ▶ Different **users**, different **technologies**, with different **value streams**, all **measured differently**
- ▶ Lack of transparency and consistency prevent comparability
 - Meaningful discussions require us to **speak the same language**
- ▶ Long-Term Vision: “Generally Accepted Valuation Principles”
- ▶ Near-Term Goal: 3-Year (2016-2018) effort to develop an initial framework. Lab expertise guided by Stakeholder Advisory Group



What exactly is “the framework”?

- ▶ Guidance—not a model—drawing from wealth of existing knowledge and capabilities
- ▶ Step-by-step how to systematically and transparently conduct valuation as a process—conversely how to interpret and compare studies
 - ❑ *How to ask the **right question**...what values to who?*
 - ❑ *What and how to **model and measure** “value”...a range of options?*
 - ❑ *What makes results **credible**?*
 - ❑ *How do you use results to **inform a decision**?*
- ▶ Tangible products forming the framework (currently being drafted)
 - ❑ The guidelines document: Principles and process of valuation
 - ❑ A common language: Glossary, terminology, taxonomy
 - ❑ Best-available capabilities: Catalog of Valuation Methods and Tools
- ▶ Vetted and improved via test-cases

The Stakeholder Advisory Group (SAG)

- ▶ Diverse group of ~20 senior personnel from six sectors balanced between regions, sizes, technologies, and interests :
 - ☐ Regulators/legislators
 - ☐ Grid RTOs/ISOs
 - ☐ Utilities
 - ☐ Developers/Suppliers
 - ☐ Advocacy groups
 - ☐ Researchers
- ▶ Group (face-to-face, webinars) and individual “one-on-one” feedback
 - ☐ Grounding of abstract framework in real-world needs
 - A process to follow and practical outputs (“a valuation checklist”)
 - Diverse concerns: Value of solar, impact of over-reliance on gas, valuing cyber security, etc
 - ☐ Potential user base and dissemination mechanism—key partners in test cases
- ▶ More input beyond the SAG on the need and challenge from you all is very welcome

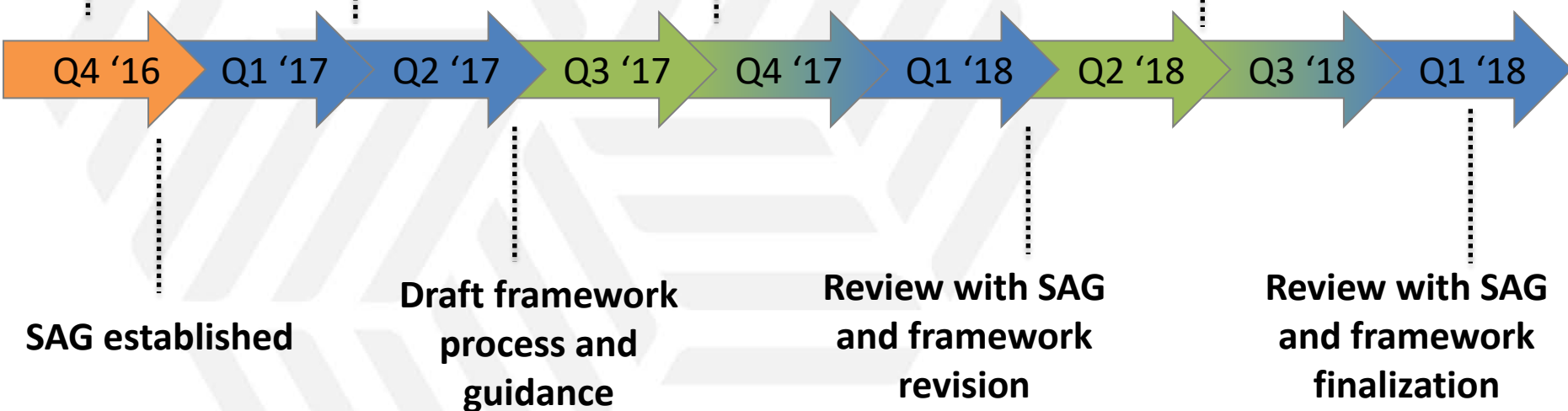
Project Timeline and Next Steps

**Long-Term Vision
developed**

**Review of current
approaches to
Valuation**

**Test Case 1: Bulk
Power System**

**Test Case 2:
Distribution
System**



Thank You!

Contact: Patrick O'Connor (oonorpw@ornl.gov; 865-574-9984)

For more information on the GMLC visit: <https://gridmod.labworks.org/>

Energy Zones Mapping Tool: Status and State Use

Vladimir Koritarov
Argonne National Laboratory (ANL)



ENERGY ZONES MAPPING TOOL: STATUS AND STATE USE

NCEP Annual Meeting
May 12, 2017

VLADIMIR KORITAROV
JAMES KUIPER

Argonne National Laboratory



EZMT | Energy Zones Mapping Tool

A map-based tool for identifying areas within the United States that may be suitable for clean power generation.

- Web-based publicly available mapping tool
- Can be used to perform suitability modeling and analysis to identify and map geographical areas highly suitable for clean energy development (potential clean energy zones)
- Can be used to analyze proposed energy corridor paths
- Includes a searchable database of energy-related policies and regulations

EZMT SUPPORTS CLEAN ENERGY RESOURCE AND CORRIDOR PLANNING

- Free online mapping tool helps identify potential clean energy resource areas and energy corridors
- Provides clean energy resource data, screening criteria, and policy information in one website
- Generates user-customized maps of areas that fit specified screening factors and criteria
- Generates potential route alternatives for energy corridors
- Assists with clean energy resource and transmission corridor planning

Over 300 GIS data layers:

- Energy resources and infrastructure
- Environmental/cultural
- Siting factors
- Reference/jurisdictional

EZMT | Energy Zones Mapping Tool

Help | Login | Register

About the Project | Energy Resources | Data | Policies & Regulations | Maps | Documents | Links | Launch Tool

EZMT | Energy Zones Mapping Tool

A map-based tool for identifying areas within the United States that may be suitable for clean power generation.

Launch Tool

About the Tool

The Energy Zones Mapping Tool is a free online mapping tool to identify potential clean energy resource areas within the United States.

This web site provides information [about the project](#), background on the [energy resources](#), and details on the [data](#) layers used in the tool. There are also links to [policies and regulations](#), printable [maps](#), [documents](#), and related [links](#).

See our [YouTube Channel](#) for an archive of EZMT webinars and training videos.

Features

- Nine energy resources: [Biomass](#), [Clean Coal](#), [Geothermal](#), [Natural Gas](#), [Nuclear](#), [Solar](#), [Storage](#), [Water](#), and [Wind](#)
- Flexible modeling of power plant and corridor siting factors such as slope and land protections
- Tools to generate and analyze potential corridor routes
- Searchable database of policies and regulations

Getting Started

Click the [Launch Tool](#) button above to start the tool, on the image below to view an introductory [video](#), or use the Help menu at the top of the page for more detailed directions.

We are interested in your feedback. Please email your comments to ezmt@anl.gov.

Partners and Sponsors

This project is funded by the U.S. Department of Energy, Office of Electricity Delivery and Energy Reliability. The Eastern Interconnection States' Planning Council (EISPC) led the original development, with research support and technical assistance from Argonne National Laboratory, National Renewable Energy Laboratory, and Oak Ridge National Laboratory. [More >](#)

Privacy/Security | News | About Us | User Community | Contact Us

News

March 07, 2017
[New EZMT Capabilities Video](#)
A new 3-minute video showing some of the main capabilities of the EZMT is available...

December 22, 2016
[New Map Layers](#)
The following [mapping layers](#) were added:
• Hydro Run-of-River Max Monthly...

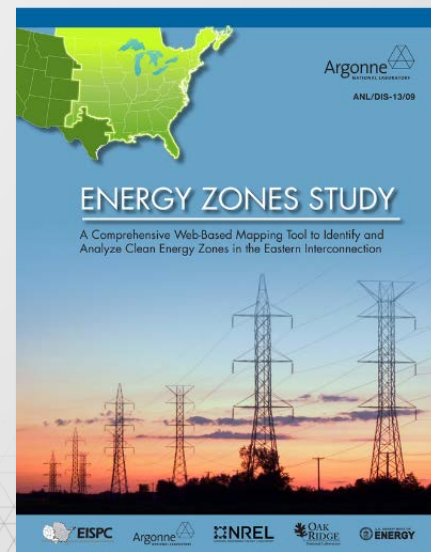
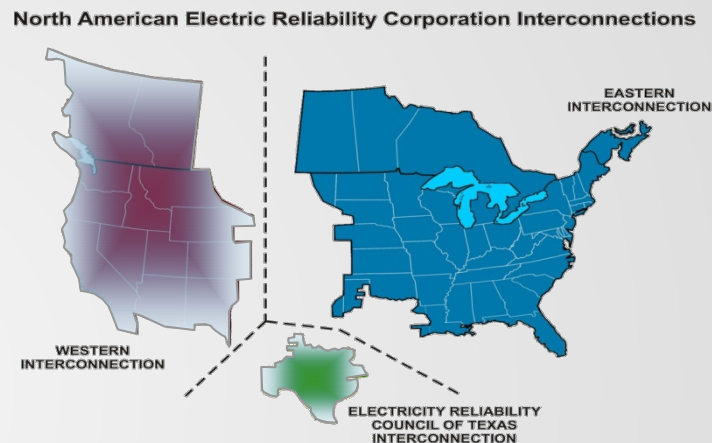
December 12, 2016
[Updated and Extended Layers](#)

<http://ezmt.anl.gov>

Over 1,570 registered users since April 2013

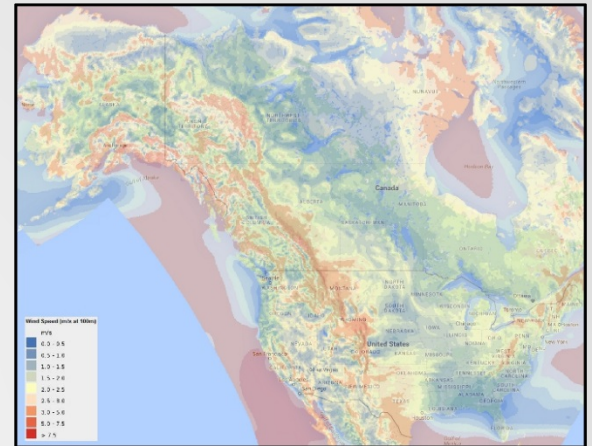
EZMT DEVELOPMENT WAS A COLLABORATIVE EFFORT

- EZMT was developed by Argonne National Laboratory in collaboration with the National Renewable Energy Laboratory (NREL) and Oak Ridge National Laboratory (ORNL).
- Argonne currently collaborates with Sandia National Laboratories (SNL) to integrate energy-water nexus data into the EZMT
- The EZMT was originally developed for the Eastern Interconnection States' Planning Council (EISPC), and focused on the Eastern Interconnection
- The EZMT is now being extended to a full U.S. extent
- EZMT development is funded by the U.S. Department of Energy (DOE), Office of Electricity Delivery and Energy Reliability (OE)



EXTENDING GEOGRAPHIC SCOPE TO ENTIRE UNITED STATES

- November 2015: DOE decision to begin extending the geographic scope to the rest of the U.S.
- Phase 1 (FY16): Mapping Library
 - Over 100 of the 324 mapping library layers extended
 - Prioritized by past usage, use in reports, and new/useful layers identified
- Phase 2 (FY17-FY18): Power Plant and Corridor Models, and Policy Database



THE EZMT SUPPORTS SUITABILITY MODELING OF NINE CLEAN ENERGY RESOURCE CATEGORIES



Wind



Biomass



Clean Coal (with carbon
capture and storage)



Water

Clean Energy Resource Categories



Geothermal



Storage



Solar



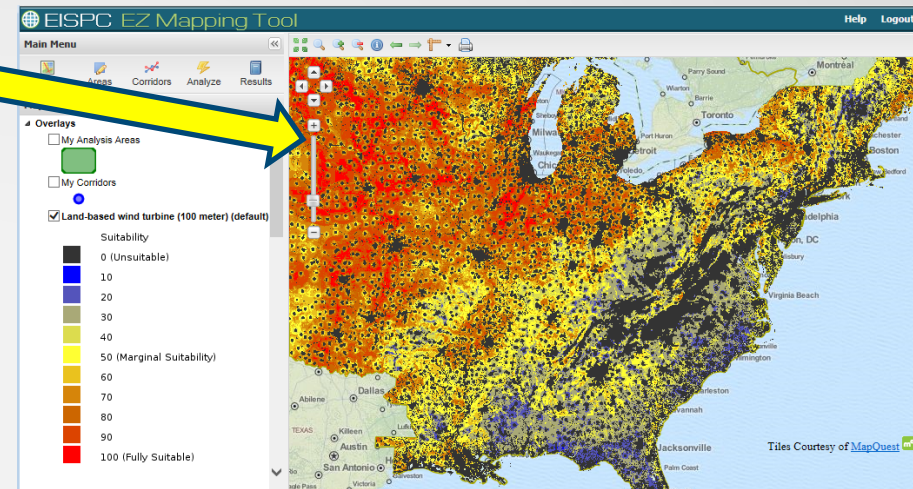
Nuclear



Natural Gas

THE EZMT ALLOWS USERS TO PERFORM CUSTOMIZED SUITABILITY MODELING OF ENERGY RESOURCES

- Models generate “**heat maps**” showing **suitability** of areas for developing clean energy resources
- Suitability modeling inputs include:
 - Energy resource data
 - Land cover/landforms
 - Environmental factors
 - Population density
 - Existing infrastructure
 - Other suitability factors
- Models are user-configurable and fully customizable
- Users can design new models using any of 72 model input layers



The screenshot shows the 'Analyze - Run Models and Reports' window. It contains two tables: 'Models' and 'Reports'.

| Actions | Type | Resource | Name |
|---------|-------------|-------------|---------------------------------------|
| | Power Plant | Coal | New Coal Fluidized Bed (CFB) |
| | Power Plant | Wind | Land-Based Wind Turbine (100m) |
| | Power Plant | Storage | Compressed Air Energy Storage (CAES) |
| | Power Plant | Solar | Concentrating Solar Power (CSP) |
| | Power Plant | Natural Gas | New Combined-Cycle Gas Turbine (CCGT) |

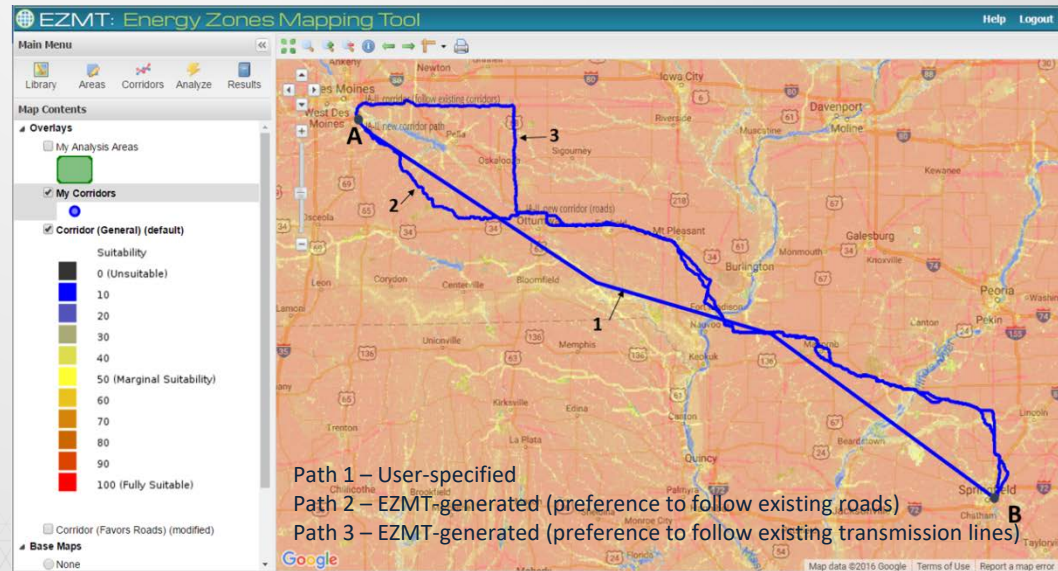
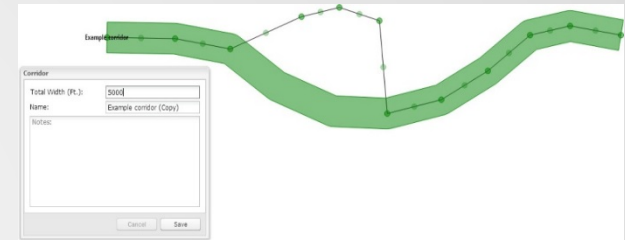
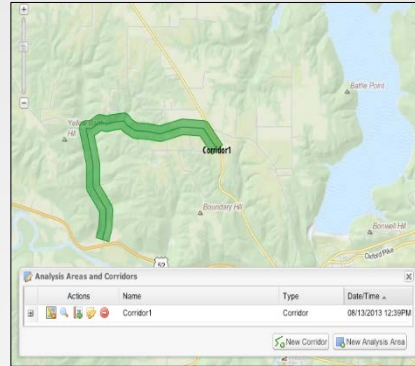
Create New Model

| Actions | Resource | Name |
|---------|-------------------------|-------------------------|
| | Demand-Side Resource | Demand-Side Resource |
| | Electrical Transmission | Electrical Transmission |
| | Habitat | Habitat |
| | Power Plant Water Use | Power Plant Water Use |
| | Storage | Pumped Storage |

SCREENING AND OPTIMIZATION OF POTENTIAL CORRIDOR PATHS

Two analytical options are available:

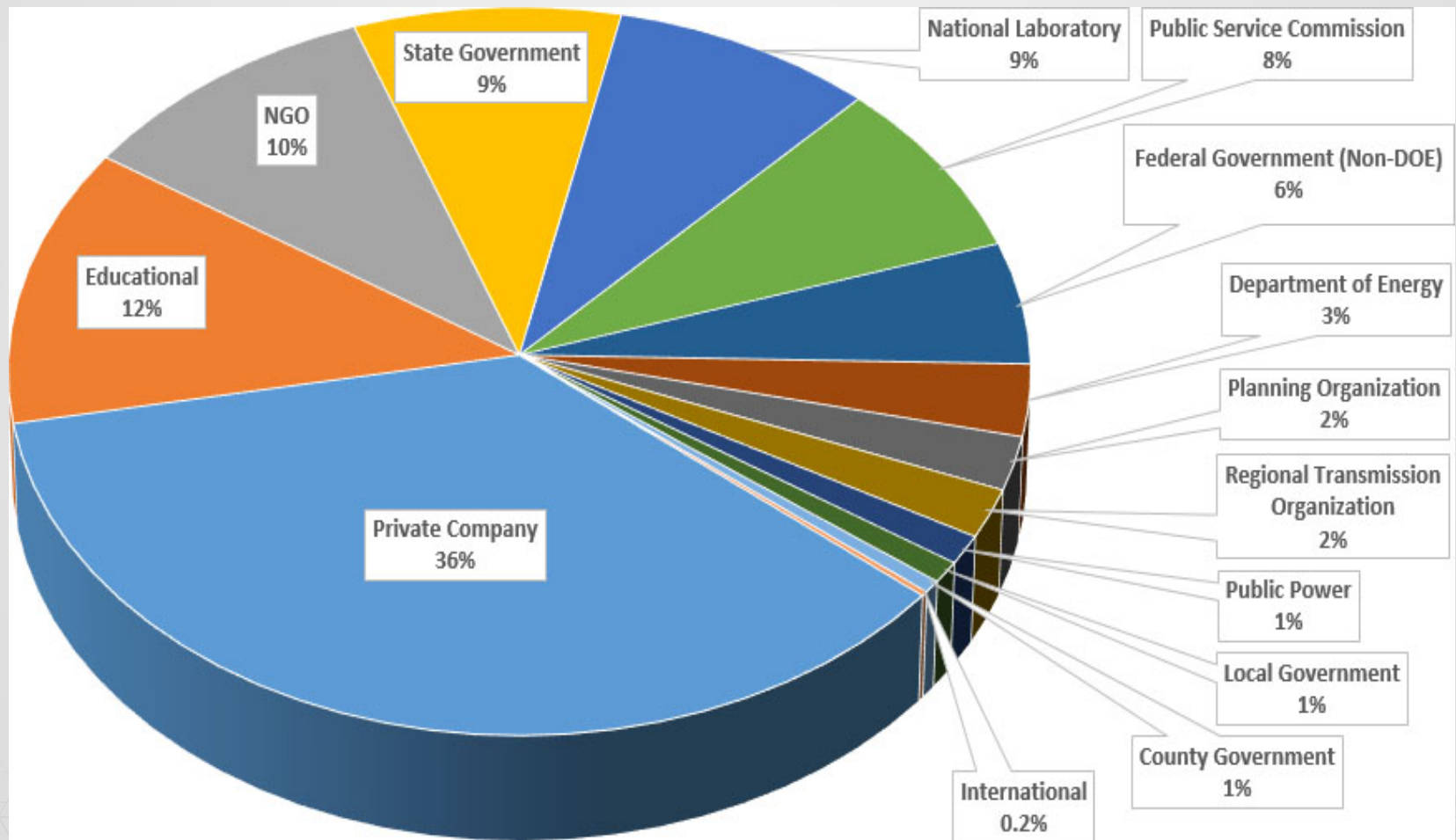
- User can draw a corridor path (variable width) on the screen and run a corridor analysis report
- Let the EZMT find the most suitable path between points A and B, subject to user-specified constraints and siting preferences



Path 1 – User-specified
Path 2 – EZMT-generated (preference to follow existing roads)
Path 3 – EZMT-generated (preference to follow existing transmission lines)

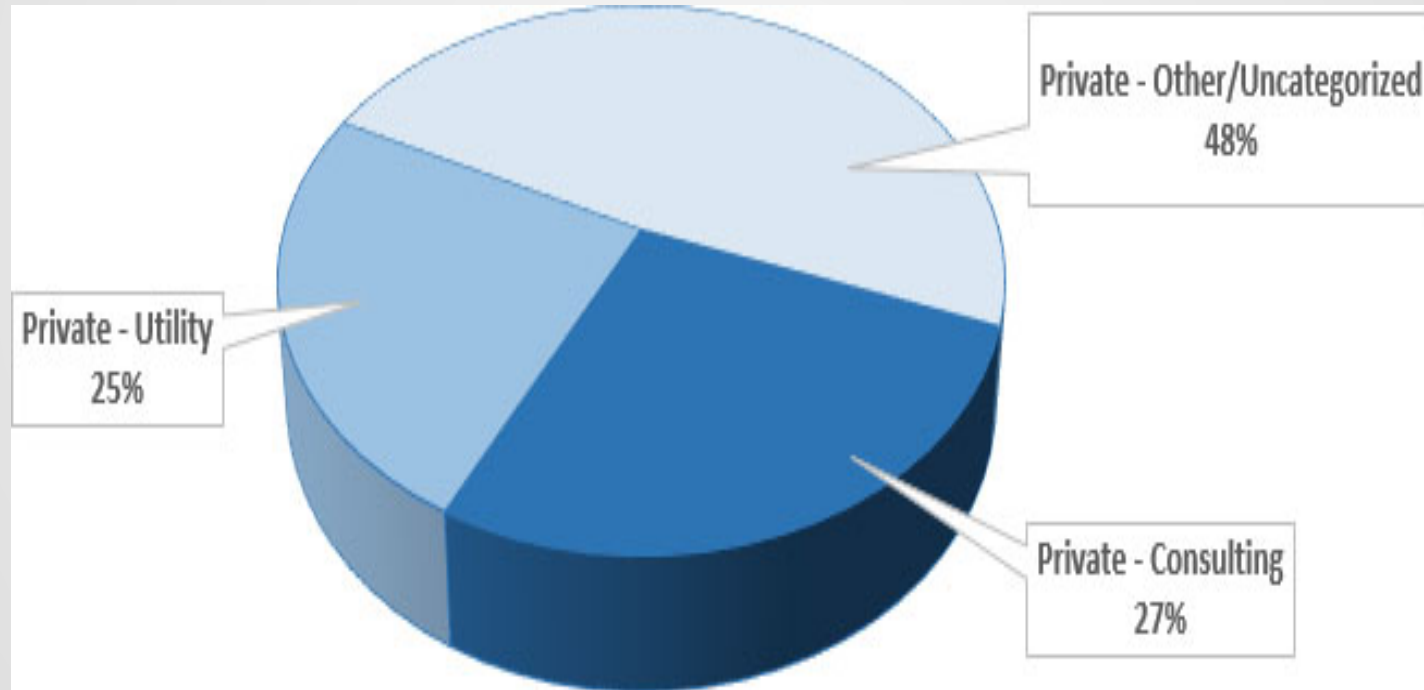
USAGE STATISTICS

- Percentages of registered EZMT users by organization type

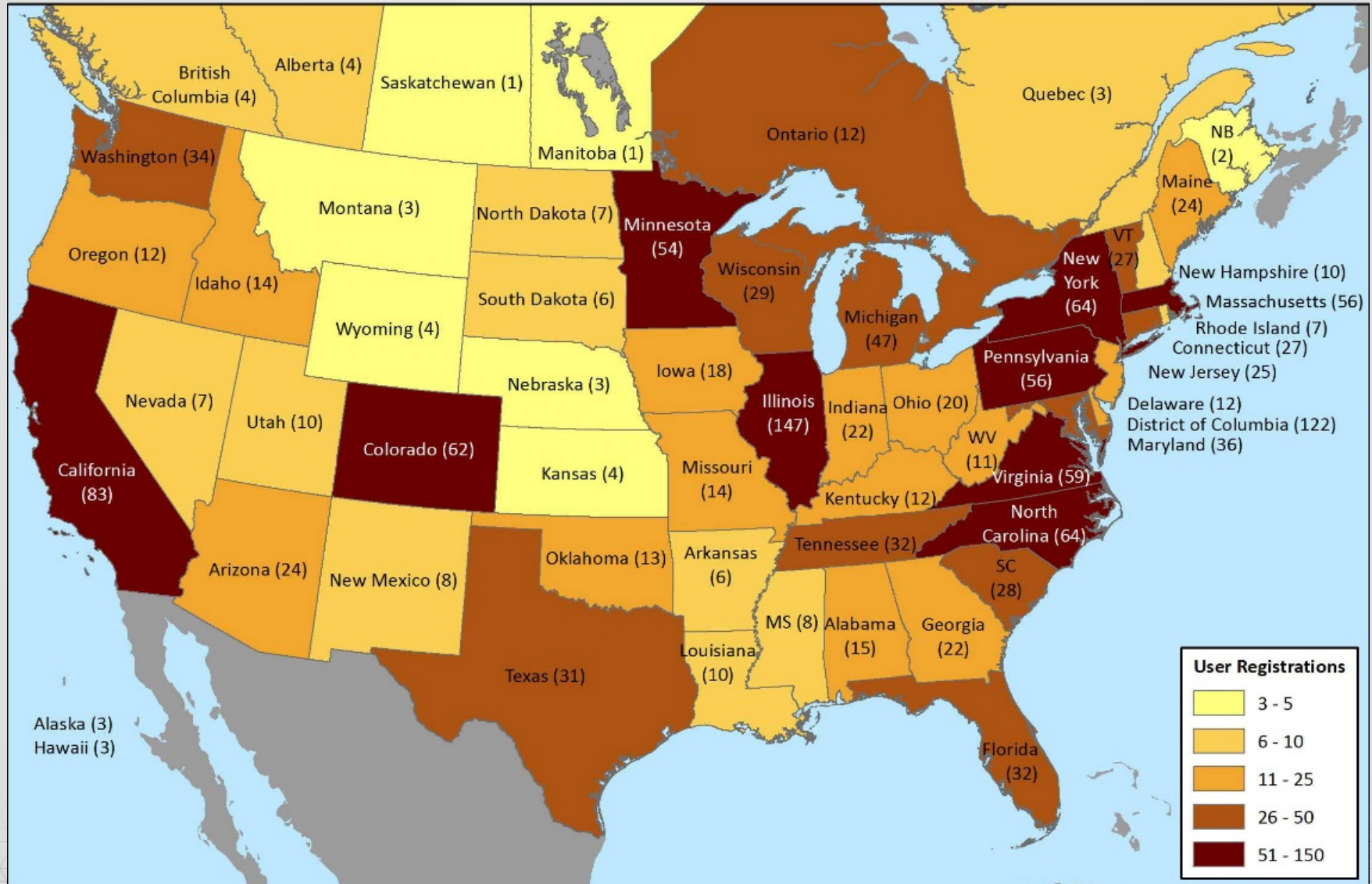


USAGE STATISTICS

- Percentages of registered EZMT users from private companies, by subtype



GEOGRAPHIC DISTRIBUTION OF EZMT USER LOCATIONS



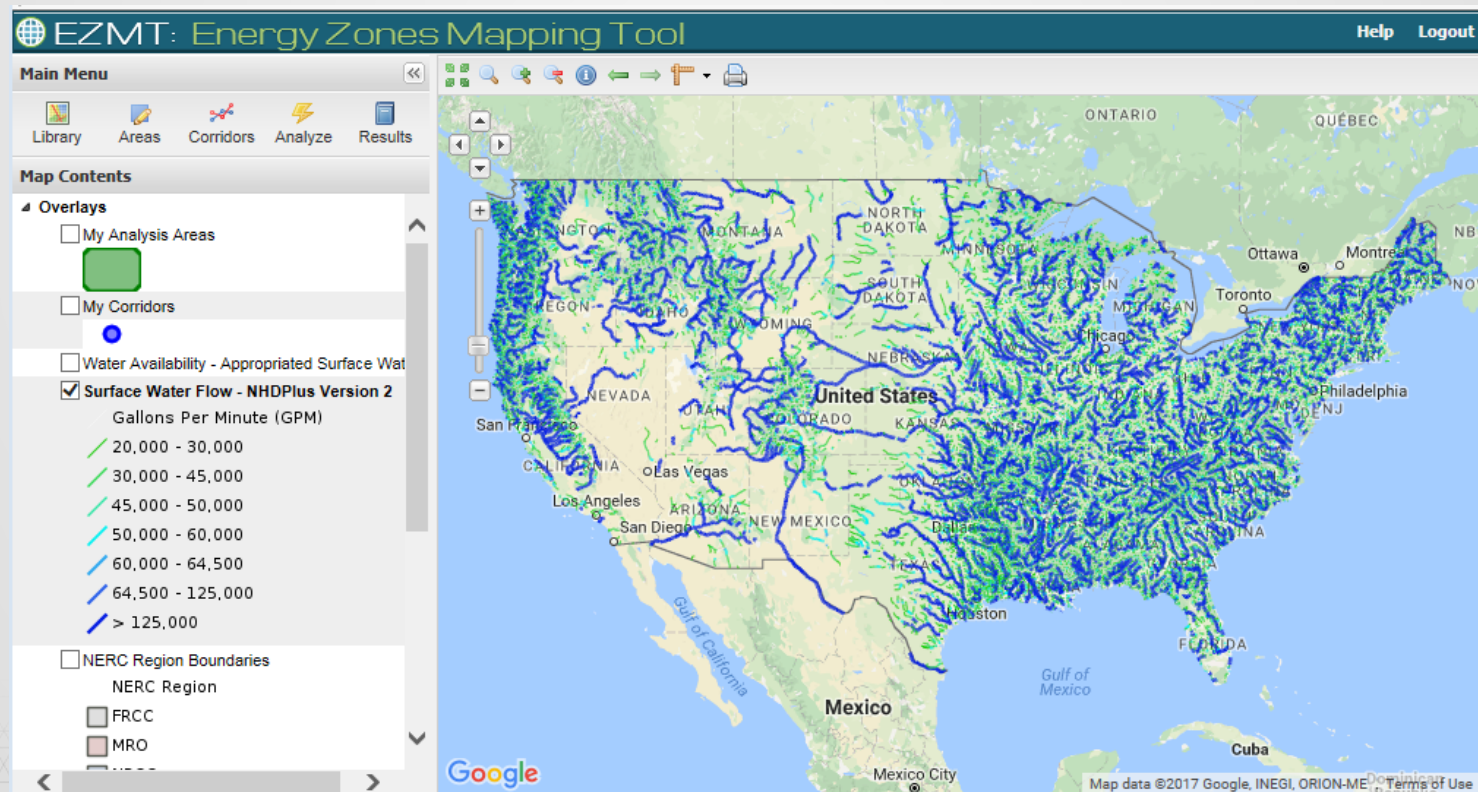
RECENT OUTREACH ACTIVITIES

- Demo for Western Regional Partnership (6/6/16)
- EZMT demo for NV State Historic Preservation Office, and WECC (6/29/16)
- Demo for WECC Environmental Data Working Group (7/22/16)
- EZMT paper presented at Renewable Energy World Int. (REWI) conference (12/9/16)
- Public webinar (12/13/16)
- WECC Environmental Data Working Group (1/5/17)
- Demo for Edison Electric Institute (EEI), (2/6/17)
- Southern New Mexico – El Paso, Texas Joint Land Use Study (SNMEP JLUS), (4/10/17, 5/3/17, and 5/11/17)
- National Park Service (5/4/17)



ENERGY-WATER NEXUS ACTIVITIES

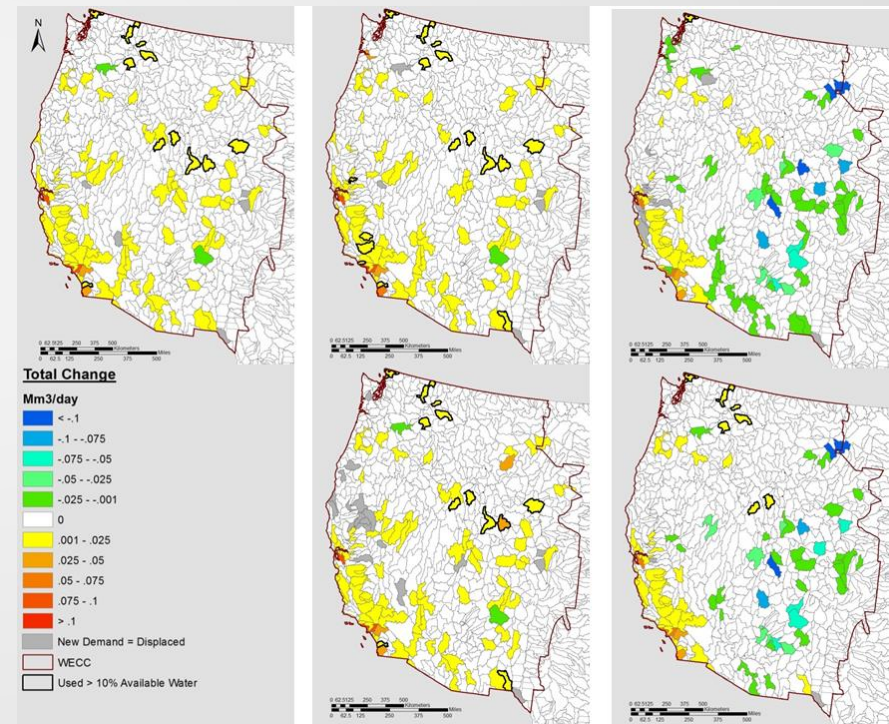
- Collaborating with Sandia National Lab on E-W nexus and climate issues
- Integrating water-related data into the EZMT:
 - Water availability, use, and cost data
 - Information on thermoelectric plant water withdrawal and consumption
 - Projected climate impacts on water resources



WATER FOOTPRINT STUDY FOR EASTERN INTERCONNECTION

- Will calculate changes in thermoelectric water withdrawal and consumption associated with the three primary EIPC/EISPC planning scenarios.
- Estimated changes in water use are due to:
 - Projected power plant retirements, and
 - Additions of new generation.
- Will associate changes in projected thermoelectric water use with available water supply to identify potential energy-water nexus issues.

Example from WECC's long-term transmission planning: Differences in thermoelectric water use for five future planning scenarios



Energy Zones Mapping Tool

- **Contacts:**
Vladimir Koritarov
koritarov@anl.gov, 630-252-6711
Jim Kuiper
jkuiper@anl.gov, 630-252-6206
- **Register for the tool here:**
<http://ezmt.anl.gov>
- **Questions/comments at any time to:**
ezmt@anl.gov



Planning in the Eastern Interconnection

Dave Whiteley

Eastern Interconnection Planning Collaborative
(EIPC)



Eastern Interconnection Planning Collaborative

EIPC, EISPC, and NCEP Collaboration

NCEP Annual Meeting via Webinar

May 12, 2017

Outline

- Revisit EIPC Purpose and Scope of Activities
- Current EIPC Work
- Possible Future Directions

EIPC Purposes Unchanged

- Develop an open and transparent process through an interactive planning dialogue with industry stakeholders
- Foster additional consistency and coordination in the Eastern Interconnection
- Provide an interface with other interconnections
- Provide policy makers and regulators with current and technically sound transmission planning information

EIPC Scope Unchanged

- Model and consider input on regulatory and policy issues from an interconnection-wide view
- Serve as a resource to facilitate analysis of FERC, DOE, and even State transmission policy issues, providing a broad interconnection view of the potential impacts resulting from possible regulations
- Focus on interconnection-wide transmission planning (not regional) – similar to the role that WECC and ERCOT play

EIPC Scope Unchanged Cont.

- Overview and analysis of regional transmission plans using an integrated model of the Eastern Interconnection
- Create models that help explain broader interconnection-wide impacts and that provide policy makers and regulators with current and technically sound information
- Work closely with state and federal regulators, EISPC and stakeholders on issues of interest to them

Current EIPC Work

- Provide input to NERC Frequency Response analysis
- Provide input to DOE Annual Transmission Data Report
- Implementation of a new, simplified approach to sharing CEII information for FERC Order 1000 and NERC MOD 32 purposes
- Development of an EIPC-reviewed production cost data base
- Continue interface with industry groups – e.g. EISPC/NCEP
- Continue to support FERC staff

Possible Future Directions

- Continue development of Roll-up cases matched with updates to the EIPC production cost database
- More in-depth analysis of Roll-up cases, beyond power flow reliability studies, possibly to include production cost simulation and sensitivity analysis
 - Possible platform for future EIPC-NCEP studies
- Consider additional involvement in EI model development associated with NERC Standard MOD-032

Possible Future Directions

- Develop inputs to future frequency response analyses on a consistent, interconnection-wide, basis
 - Projections of low inertia resources may be of interest
- Coordination with NERC and organizations performing wide-area studies to reflect the focus and expertise of each group and to reduce inefficiencies and unnecessary overlap



Comments on Continued Collaboration

- DOE funded studies of future electric transmission system and gas-electric interface demonstrated value in looking broadly at the entire interconnection.
- While that was not a study to develop transmission plans, it proved the value of transmission planning in a collaborative approach, with input from all stakeholders.
 - The process worked!!
 - EIPC models have been used as the starting point for other studies, analyses, and transmission models.
 - One of the 20-year out scenarios seems “pretty close”.
 - Lasting accomplishment – advanced the state of knowledge in the EI.
- EIPC and NCEP can and should continue to lead collaborative approaches on interconnection-wide transmission planning issues, with each organization contributing its expertise.

Questions and Discussion

- Call or email Dave Whiteley
- 314-753-6200
- d.a.whiteley@att.net
- d.a.whiteley@eipconline.com



Supporting Generation and Transmission Flexibility:

Siting on Brownfields and Other Existing Infrastructure Sites

Chairman Betty Ann Kane

Public Service Commission of the District of Columbia
Moderator

Supporting Generation and Transmission Flexibility: Siting on Brownfields and Other Existing Infrastructure Sites

Dian Grueneich
Stanford University

Rich Sedano
Regulatory Assistance Project (RAP)

Michael Dowd
Virginia Department of Environmental Quality



RAP

Energy solutions
for a changing world

Brownfields and Siting: A Confluence of Opportunity

National Council on Electric Policy

Presented by Richard Sedano

May 12, 2017

The Regulatory Assistance Project

50 State Street, Suite 3
Montpelier, VT 05602

Phone: 802-223-8199
www.raponline.org

Introducing RAP and Rich

- RAP is a non-profit organization providing technical and educational assistance to government officials on energy and environmental issues. RAP staff have extensive utility regulatory experience. RAP technical assistance to states is supported by US DOE, US EPA and foundations.
 - Richard Sedano directs RAP's US Program. He was commissioner of the Vermont Department of Public Service from 1991-2001 and is an engineer.

Brownfields and Energy

- Brownfields always a target for
 - Infill development
 - Economic development
 - Fouled environment mitigation
- Connection to energy for a long time
 - Supplemental Environmental Projects
 - Landfill Gas

A category of using disturbed land

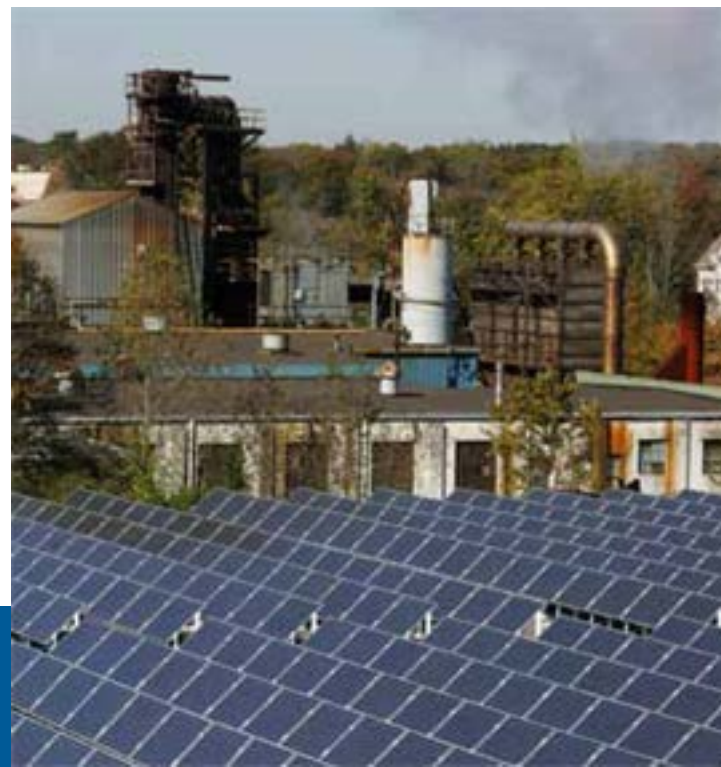
- Repowering
- Colocating on existing rights of way

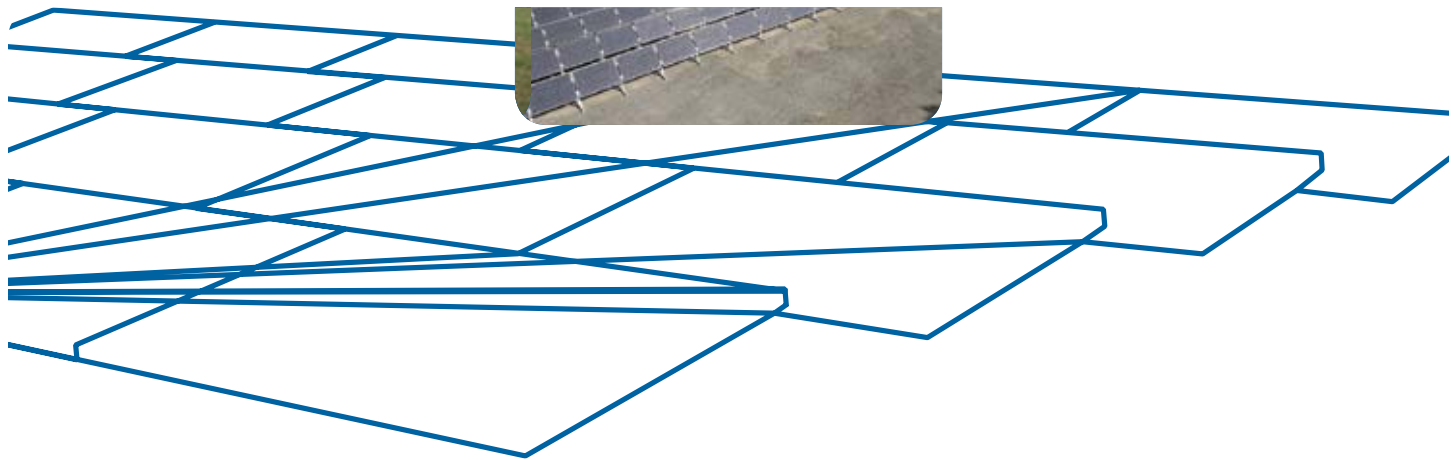
Network Facilities

- Why central siting authorities at the right level are useful
 - Mutual and diverse interests
 - Net societal benefits
 - Considers and mitigates adverse effects
 - Considers alternatives
 - Bias to using disturbed land and brownfields

PV and Brownfields

- Opportunity to mount PV on disturbed land
 - Avoids resource conflicts with pristine land
 - Brockton MA
 - Manufactured gas site
 - Environmental Justice





[From MA DOER](#)

New Challenges from Small Scale

- Distributed resources come in smaller amounts of power
 - And appear in local communities
 - And may be addressed in local plans
 - Will state level siting decisions reflect local plans and their preferences?
 - Will state level siting decisions be vetoed by local plans?

About RAP

The Regulatory Assistance Project (RAP) is a global, non-profit team of experts that focuses on the long-term economic and environmental sustainability of the power and natural gas sectors. RAP has deep expertise in regulatory and market policies that:

- Promote economic efficiency
- Protect the environment
- Ensure system reliability
- Allocate system benefits fairly among all consumers

Learn more about RAP at www.raponline.org

rsedano@raponline.org



The Regulatory Assistance Project

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50 State Street, Suite 3 • Montpelier, VT 05602 • phone: +1 802-223-8199 • fax: +1 802-223-8172

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Supporting Generation and Transmission Flexibility: Siting on Brownfields and Other Existing Infrastructure Sites

Dian Grueneich
Stanford University

Rich Sedano
Regulatory Assistance Project (RAP)

Michael Dowd
Virginia Department of Environmental Quality

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Dian Grueneich

Commissioner Emeritus, CA PUC

Senior Research Scholar, Stanford University

Precourt Institute for Energy

Shultz-Stephenson Energy Policy Task Force

dgrueneich@stanford.edu

Stanford | Precourt Institute for Energy

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SHULTZ-STEPHENSON TASK FORCE ON
Energy Policy

Siting on Brownfields and Existing Infrastructure Sites

- What do we mean by “brownfields”?
 - Blighted, contaminated, or potentially contaminated sites, including abandoned mines, capped landfills, former commercial, industrial, or agricultural properties. Also called “impacted” lands.
- What is a “brightfield”?
 - Renewable energy project built on or near a brownfield.

Important Considerations

- Is existing infrastructure compatible? (gas pipelines, water supply, transmission, etc.)
- Is site compatible with size of new energy project?
- Is the site contaminated? What is its current environmental situation?
- Is there community support for reclamation and development?

Potential Benefits of Brownfield and Brightfield Projects

- Job creation
- Revenue to local government, community site owner, project developer
- Environmental benefits of site cleanup
- Uses existing infrastructure (gas pipelines, transmission lines, substations, etc.)
- Possibly faster, cheaper permitting

Potential Benefits

Build sustainable land development strategy

Leverage existing infrastructure

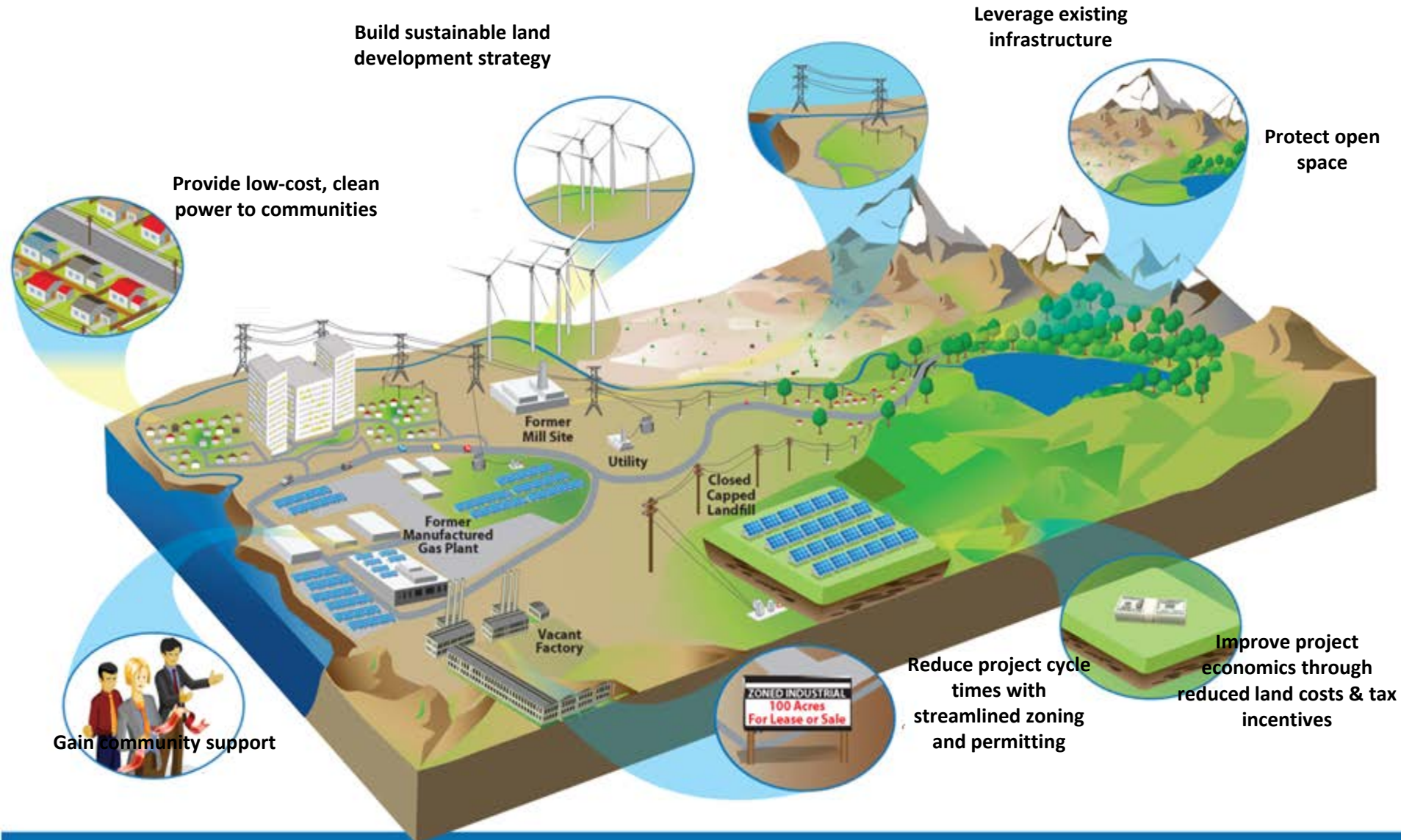
Protect open space

Provide low-cost, clean power to communities

Gain community support

Reduce project cycle times with streamlined zoning and permitting

Improve project economics through reduced land costs & tax incentives



EPA's RE-Powering America's Land

Encouraging siting renewable energy on current or formerly contaminated lands, landfills, and mine sites when aligned with the community's vision

www.epa.gov/re-powering

Solar geomembrane capping landfill



Solar array at Superfund site



Solar array at former manufactured gas plant



Wind turbines installed during remediation at abandoned steel mill



Solar array on landfill cap



Solar array at former foundry

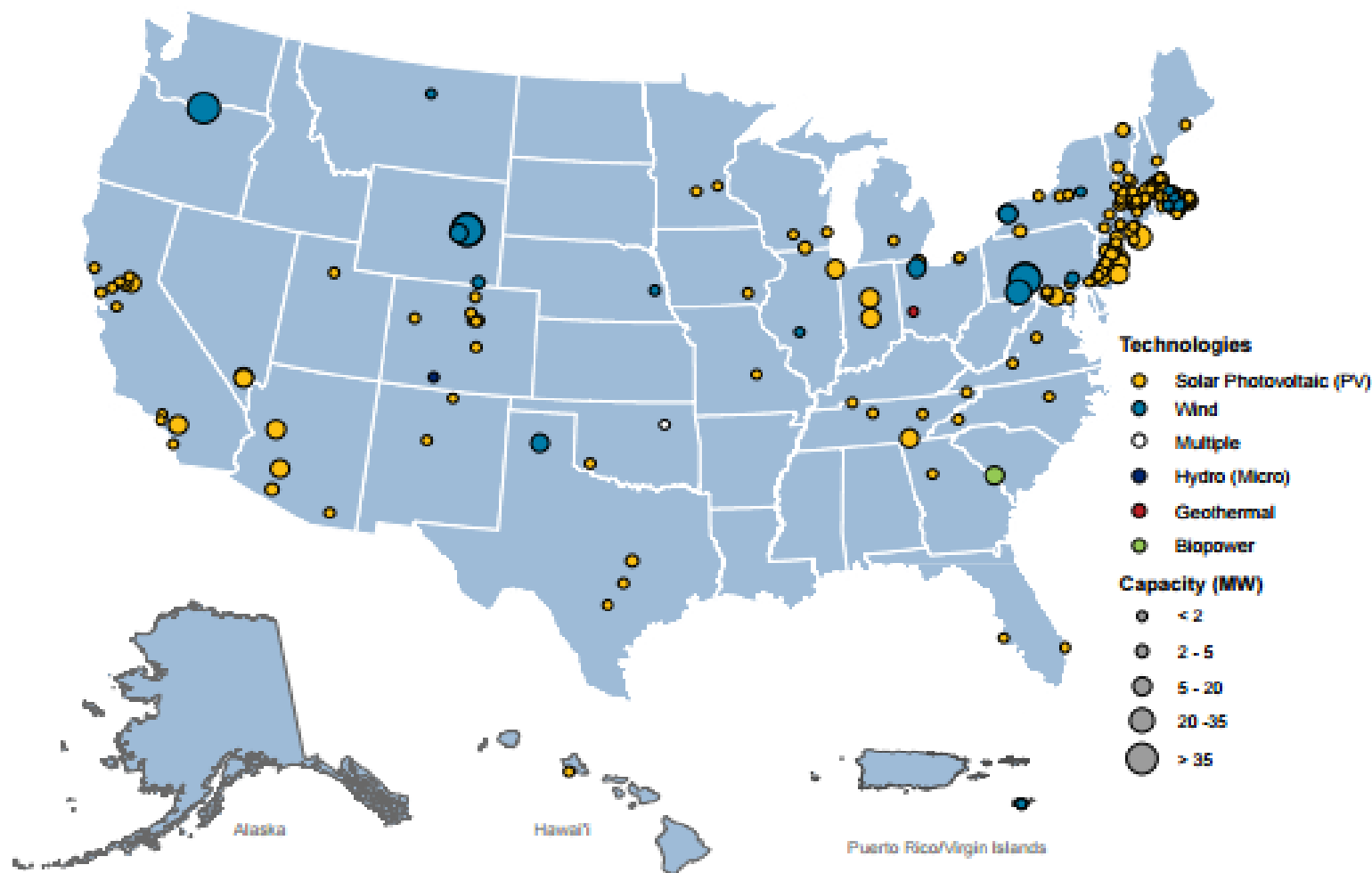


EPA's Re-Powering America's Land

- List of completed renewable energy installations on contaminated sites and landfills
- Mapping (over 80,000 contaminated sites) and Site Screening Tools
- Fact Sheets and Success Stories
- Grants and Technical Resources
- 2017 National Brownfields Training Conference, Dec. 5-7, 2017, Pittsburgh, PA.
www.brownfields2017.org

Brightfield Projects to Date

213 Renewable Energy Projects, Over 1.2 Gigawatt Installed Capacity



This map is for informational purposes only. The information was gathered from public announcements of renewable energy projects in the form of company press releases, news releases, and, in some cases, conversations with the parties involved. This map may not be a comprehensive representation of all completed renewable energy projects on contaminated lands. To provide information on additional projects, please email cleanenergy@epa.gov.

April 2017

| Site/Project Name | City | Type of Site | RE Type | Project Capacity (MW) | Project Type | Completion Date | Summary of Benefits Identified in Publicly Available Documents |
|--|----------------------------|--------------|---------|-----------------------|--------------------------------|-----------------|--|
| ARIZONA | | | | | | | |
| Ajo Solar Project | Ajo | Mine Lands | Solar | 5 | Wholesale Electricity | 2011 | Half of the approximately 50 construction jobs went to local residents. The electricity generated onsite will be sold to Arizona Public Service under a 25-year power-purchasing agreement. |
| Apache Powder | Benson | Superfund | Solar | 0.0014 | Onsite Use - Green Remediation | 1997 | The use of solar and wind energy to power cleanup reduced the groundwater cleanup cost from \$25 million to approximately \$1 million. The cost of solar PV system and windmill pump is three times less than the cost to run power lines and pay for electricity at the site. |
| Bagdad Mine Solar | Bagdad (census-designated) | Mine Lands | Solar | 15 | Wholesale Electricity | 2011 | Power generated by the solar is sold to Freeport-McMoRan under the terms of a 25-year power purchase agreement. The project generates 15 megawatts of electricity, enough to power about 3,000 homes. |
| Desert Star Solar Plant | Buckeye | Landfill | Solar | 10 | Wholesale Electricity | 2015 | Estimated \$15,000,000 - \$20,000,000 of direct and indirect jobs created. The project made to the local economy from this project. More than 1,000 jobs. |
| CALIFORNIA | | | | | | | |
| Aerojet General Corporation Superfund Site | Sacramento | Superfund | Solar | 6 | Wholesale Electricity | 2010 | The project is anticipated to save more than \$10 million in electricity costs over the cleanup project's 25-year life, due to the lower cost of electricity generated by the solar established by the PPA. |
| Camp Pendleton | Camp Pendleton | Superfund | Solar | 1.5 | Wholesale Electricity | 2011 | The Naval Facilities Engineering Command anticipates that the project will save the Marine Corps \$336,000 yearly in electricity costs while increasing its previous solar energy capacity. |
| Cloverdale Landfill | Cloverdale | Landfill | Solar | 1.8 | Wholesale Electricity | 2014 | The Cloverdale project is designed to generate over 2.7 million kilowatt-hours of energy annually, the equivalent of more than 6,000 barrels of oil or 6,000 tons of CO2. |
| Fischer Properties: Depot Park | Sacramento | Brownfield | Solar | 3 | Wholesale Electricity | 2010 | The project provides more than 40% of the electricity load for the depot during peak hours. That is equivalent to 6,335 barrels of oil or 6,335 tons of CO2 avoided from the road. |

| Site/Project Name | City | Type of Site | RE Type | Project Capacity (MW) | Project Type | Completion Date | Summary of Benefits Identified in Publicly Available Sources | Energy Savings | Revenue | Environmental | Job Creation | Other |
|--|----------------|--------------|---------|-----------------------|--------------------------------|-----------------|---|----------------|---------|---------------|--------------|-------|
| Frontier Fertilizer | Davis | Superfund | Solar | 0.06888 | Onsite Use - Green Remediation | 2011 | The system offsets up to 5% of the site's annual electricity use for pump and treat system operations, saving energy costs of approximately \$1,500 per year. | ✓ | | | | ✓ |
| Lawrence Livermore National Laboratory | Livermore | Superfund | Solar | 0.004 | Onsite Use - Green Remediation | 2009 | The self-powered solar treatment units allow ground water treatment at remote areas of the 7,000-acre site without the installation of costly power lines or generators. | | | | | ✓ |
| NASA Jet Propulsion Laboratory (JPL) | Pasadena | Superfund | Solar | 0.564 | Rooftop | 2011 | Under a 20-year power purchase agreement, the PV system is expected to annually generate 869,158 kWh of energy (approximately 20% of the treatment system's electricity consumption, or the equivalent power used by 100 to 125 average Pasadena homes). | ✓ | | ✓ | | |
| Pemaco Superfund Site | Maywood | Superfund | Solar | 0.006 | Onsite Use - Green Remediation | 2007 | Annual electricity cost savings of \$2,839. | ✓ | | | | |
| Regulus Solar Power Plant | Bakersfield | Brownfield | Solar | 82 | Wholesale Electricity | 2015 | The project will contribute to the creation of 1,300 full time equivalent employee years, \$6.1M in property taxes and \$25.4M in sales generated for the county over 20-year life of project. It is anticipated to provide almost \$184 million in revenue to local businesses, governments and households during the first 20 years of operation. | ✓ | ✓ | | ✓ | ✓ |
| Sutter's Landing Landfill Solar | Sacramento | Landfill | Solar | 1.5 | Wholesale Electricity | 2014 | Revenue from the power generated for and consumed by residents and businesses, and from lease payments, will be re-invested to fund park preservation and maintenance. Lease payments to city of \$15,000 per year. | ✓ | ✓ | | | ✓ |
| Tequesquite Landfill | Riverside | Landfill | Solar | 7.5 | Wholesale Electricity | 2015 | A 25-year PPA will help Riverside Public Utilities minimize the effect of rising electricity costs. | ✓ | | | | |
| Travis Air Force Base | Near Fairfield | Superfund | Solar | | Onsite Use - Green Remediation | 2008 | Brings Travis Air Force Base one step closer to shutting down its four groundwater treatment plants that currently cost about \$7,000 a month in utilities to operate. | | | | | ✓ |
| West County Wastewater District | Richmond | Brownfield | Solar | 1 | Onsite Use - General | 2008 | West County Wastewater District will purchase energy at a fixed price over the next 20 years, providing a cost-saving. PG&E's Self Generation Incentive Program mitigated project cost. The PV system is estimated to produce 30% of the wastewater facility's electricity needs. | ✓ | | | | |

City of Sacramento

Sutter's Landing Park/28th St. Landfill



City of Sacramento, CA

Sutter's Landing Park/28th St. Landfill

- Solar system installed at the old 28th St. Landfill in Sacramento
- Facility generates about 1.5 MW
- Project is lead by Conergy
- More information is available at:
<https://www.cityofsacramento.org/Public-Works/RSW/About-RSW/Solar-Park-at-Sutters-Landing>

Marin Clean Energy (Solar One)

Located at Chevron Refinery Brownfield

- Richmond, CA
- Marin Clean Energy, a community choice aggregator, is developer
- Leasing 60 acre brownfield to develop 12 Mw solar facility
- Almost 350 jobs; local training programs
- \$100 M community benefits agreement
- Online by end of 2017



Alamitos Energy Center, CA

- Brownfield powerplant site, with existing infrastructure, including switchyard, transmission, water, emergency service, and gas pipeline
- Will replace older, once-through cooled and less efficient plant
- Will provide fast starting and stopping, flexible, controllable generation with fast ramping capability
- Industrially-zone parcels with existing substations and transmission interconnections

Rancho Seco Solar Power Plant, CA

- Site of closed (1980s) Rancho Seco nuclear power plant
- Provides 11 MW of solar power (2016) (SMUD's SolarShares program)
- Additional land available and may be used for more solar

SCE West of Devers Transmission Upgrade Project, CA

- Existing transmission project, with 3 separate sets of towers
- Project replaced older towers with two new, larger sets of towers
- Re-conductoring lines in existing transmission corridors is good option – replace lower voltage or lower capacity conductors with larger conductors, with minimal ground disturbance



Brownfields & Virginia DEQ's Small Renewable Energy Permit by Rule Program

**NCEP Annual Meeting
May 12, 2017**

**Michael G. Dowd
Director, Air and Renewable Energy Division**

Brownfield Development And Renewable Energy

- Strong desire to increase use of renewable energy in Virginia
- Strong desire to put brownfields, Superfund sites and former strip mines to productive use
- Renewable energy projects are ideal for brownfields because they reduce potential exposure to toxic material and often don't require digging up large amount of land
- Virginia's Small Renewable Energy Project Permit by Rule Program is ideally suited to expedite permitting at brownfields
 - But energy planning is really not part of the equation!

Permit By Rule (PBR) Development

- 2009 Acts of Assembly-Chapter 808
 - Amended Code of Virginia by adding in Chapter 11.1 of Title 10.1 consisting of sections numbered 10.1-1197.5 through 10.1-1197.11
- 2017 Acts of Assembly-Chapter 386
 - Amendments and revised regulations effective 7/1/17
- ***Intent to streamline state approval process for small renewable energy projects by bypassing the State Corporation Commission (SCC) and vesting permitting authority in DEQ***

Definition

- **“Small Renewable Energy Project”** means (i) an electrical generation facility with a rated capacity not exceeding **150 megawatts** that generates electricity only from **sunlight** or **wind**; (ii) an electrical generation facility with a rated capacity not exceeding 100 megawatts that generates electricity only from falling water, wave motion, tides, or geothermal power;; or(iii) an electrical generation facility with a rated capacity not exceeding 20 megawatts that generates electricity only from biomass, energy from waste, or municipal solid waste

State Corporation Commission Exemption

- Non-public utility small renewable energy projects are eligible for PBR and exempt from SCC review
- A small renewable energy project proposed, developed, constructed or purchased by a public utility is eligible for PBR and exempt from SCC review if:
 - *the project's costs are not recovered from Virginia jurisdictional customers under base rates or a rate adjustment clause; or*
 - *the project belongs to a utility aggregation cooperative*

Solar PBR Components

- Notice of Intent (NOI)
- Certification that all local government approvals have been obtained (e.g., zoning)
- Interconnection Studies & Interconnection Agreement
- Certification project doesn't exceed 150 MW;
- A NAAQS analysis
- And a certification that project has applied for or received all necessary environmental permits
- Operating Plan
- Site Plan and Context Map
- Applicant-conducted public meeting and 30-day public comment period, including responses to public comments

Solar PBR Components (Cont.)

- Analysis on impacts to natural resources
 - Wildlife; within 12 months -Department of Game and Inland Fisheries (DGIF)
 - Historic; preconstruction analysis -Department of Historic Resources (DHR)
 - Natural Heritage; within 12 months -Department of Conservation & Recreation (DCR)
- Mitigation plan required to reduce significant adverse impacts
- Payment of fee up \$14K (> 75 MW) and Coastal Avian Protection Zone Review payment of \$1000/MW if located in Chesapeake Bay area

DEQ Permit Review

- Determination of whether application is complete
 - 90 days to make completeness determination
 - Consultation with sister agencies –DGIF, DHR, DCR
- If complete; send a letter authorizing construction and operation
- If incomplete, notify applicant of deficiencies

Program Status

| | |
|---------------------------|----------|
| • Total Notices of Intent | 52 |
| – Withdrawn | 2 |
| • Total Number of PBRs | 10 |
| – Solar | 9 |
| – Wind | 1 |
| • Total approved Capacity | 398 MW |
| • Projected Capacity | 1,752 MW |

Brownfields, Superfund & Strip Mines

- Much interest and discussion
 - One NOI for 80 MW solar project on former strip mine
 - Pre-NOI discussions for projects on former Superfund site
 - Strong state support from Secretary of Commerce and trade and Economic Development Partnership
 - Public support (does not involve agricultural land)
- Waiver of preconstruction historical and natural heritage resource analyses
 - Can allow for issuance of PBRs well short of 90 day deadline
- PBR program well suited to timely issuance of permits for projects on brownfields, Superfund sites and strip mines
 - Win-win! increase renewables and develop brownfields
 - *But are energy concerns left by the wayside?*

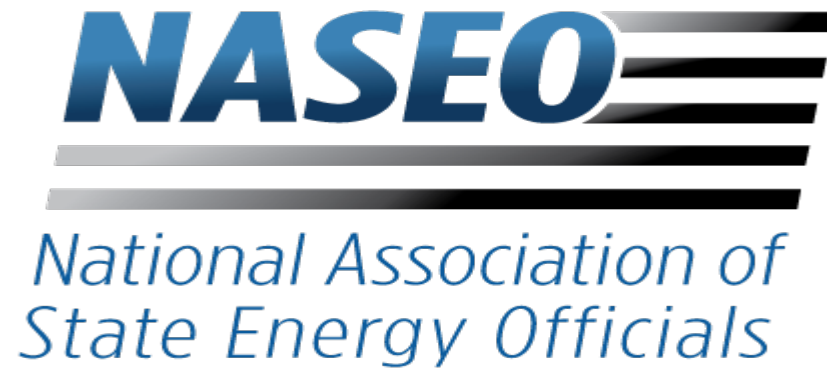
Reliability, Resiliency, and Recovery

Collaboration Strategies that Support Cyber and Infrastructure Energy Assurance

John Chatburn

Idaho Governor's Office of Energy & Mineral Resources

Moderator



**State Energy Assurance Planning:
State Activities and Collaborative
Approaches**

Fred Hoover, Senior Program Director

**NCEP Annual Meeting
May 12, 2017**

Energy Assurance Plan Updates

- When was your state's energy assurance plan last updated?
 - Is your current plan posted on DOE's ISENet?
- Is a new update to your state's energy assurance plan underway or planned?
 - If so, what is the scope of the update (e.g., complete overhaul vs. specific updates and addressing plan gaps)?
- Has your state updated any supplemental plans (e.g., earthquake studies, cybersecurity plans, energy sections of the overall emergency response plan, etc.) to support energy assurance planning efforts?
 - If so, which plans and why?

Multi-State and Regional Coordination

- **When was your state's Energy Emergency Assurance Coordinators (EEAC) contact list last updated within DOE's ISERnet?**
 - Is the list accurate?
- **Do states within your region engage in periodic coordination calls outside of an energy emergency?**
 - If not, would NASEO assistance in facilitating periodic calls be useful?
 - If not, would it be useful to host at least two non-emergency calls per year on risks to the energy infrastructure and energy supply assessments with other EEACs and energy suppliers?
- **Is your state interested in participating in a multi-state energy assurance exercise?**
- **Would your EEAC contacts be interested in gaining access to the U.S. Department of Homeland Security's Homeland Security Information Network?**

Cybersecurity Incident Response Plans

- **Does your state have a cybersecurity incident response plan to address attacks on the energy sector?**
 - If so, when was the plan completed?
- **Have you engaged in discussions with your state's public utility commission and/or emergency management agency on the issue of cybersecurity?**
- **Have you engaged with other, typically, un-regulated utilities (e.g., municipal, rural)? Have you engaged with the petroleum sector?**
 - If so, what level of engagement has taken place and what was the outcome?
 - Are there other state agencies involved in cybersecurity impacting energy?
- **Has your state engaged with the private sector on the issue of cybersecurity?**
 - If so, what level of engagement has taken place and what was the outcome?

Key Findings and Recommendations

– “Liberty Eclipse After Action Report”

- **Key Finding #3** – The evolving nature of cybersecurity threats makes it difficult for PUCs to accurately quantify the cost of cybersecurity investments for rate recovery.
- **Proposed Actions:** DOE/OE should support state PUCs’ understanding of cybersecurity capabilities and the costs of investments, and should work with NARUC to explore cost recovery mechanisms for cyber incidents.
- PUCs could consider reviewing their utilities’ cybersecurity plans on a regular basis (e.g., every 3–5 years or more often), and could help identify gaps and determine how to address the gaps.
- Care should be taken when reviewing sensitive information to avoid disclosing it to unauthorized parties who may use it to disrupt utility operations.

Reliability, Resiliency, and Recovery:
Collaboration Strategies that Support
Cyber and Infrastructure Energy
Assurance - *Panel Discussion*





Booga Gilbertson is the senior vice president of Operations for PSE. She is responsible for electric and gas operations, including emergency response, field operations, asset management, system planning, new construction, engineering, and infrastructure project management. Gilbertson also serves on the board of directors of the Western Energy Institute the EEI National Response Executive Committee.

About Puget Sound Energy



Puget Sound Energy is Washington state's oldest local energy company, providing electric and natural gas service to approximately 1.1 million electric and 790,000 natural gas customers primarily in the Puget Sound area of Western Washington.

- Combined electric and natural gas service
- Electric service
- Natural gas service

Collaboration strategies for infrastructure and cyber energy assurance

- Key attributes of successful reliability, resiliency, and recovery strategies include proactive “blue-sky” programs as well as thoughtful and exercised recovery plans
- Mutual assistance is a force-multiplier for recovery.
- Mutual assistance programs provide proactive and well-organized approaches to pool resources, expertise, equipment, and coordinate priorities
- Successful mutual assistance builds on local structures that are scalable both across sectors and across the country



Lynn P. Costantini, D. Sc., CISSP
Manager, Cybersecurity Compliance
and Oversight
New Jersey Board of Public Utilities

lynn.costantini@bpu.nj.gov



The State of the States

- ▶ Value of collaboration to state regulatory commissions
- ▶ How are we doing?
- ▶ Collaborative trends



Thank you for participating.

Look for website news and updates;
meetings; trainings; webcasts and
podcasts; and more information on our
2016-2017 thematic direction!

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