



The Parker Ranch installation in Hawaii

PREPARING for the ARRIVAL of ELECTRIC VEHICLES

November 3, 2010

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Vermont Energy Investment Corporation and
Southwest Energy Efficiency Project
DOE Technical Assistance Program
Team 4 – Program & Project Development &
Implementation



- Technical Assistance Project (TAP) Overview
- Preparing for the Arrival of the Electric Vehicle
 - Elements of Developing an EV Infrastructure Plan
- Resources
- Q&A



- Questions and discussion after presentation
 - Have your questions ready
- To ask a question/make a comment
 - If you want facilitator to read your question – Type your question in “questions” box, specify speaker to address
 - If you want to speak – use “Raise hand” function and type question in “questions” box, when you are recognized you will be un-muted



DOE's Technical Assistance Program (TAP) supports the Energy Efficiency and Conservation Block Grant Program (EECBG), the State Energy Program (SEP) and the Better Buildings grantees by providing state, local, and tribal officials the tools and resources needed to implement successful and sustainable clean energy programs.



TAP offers:

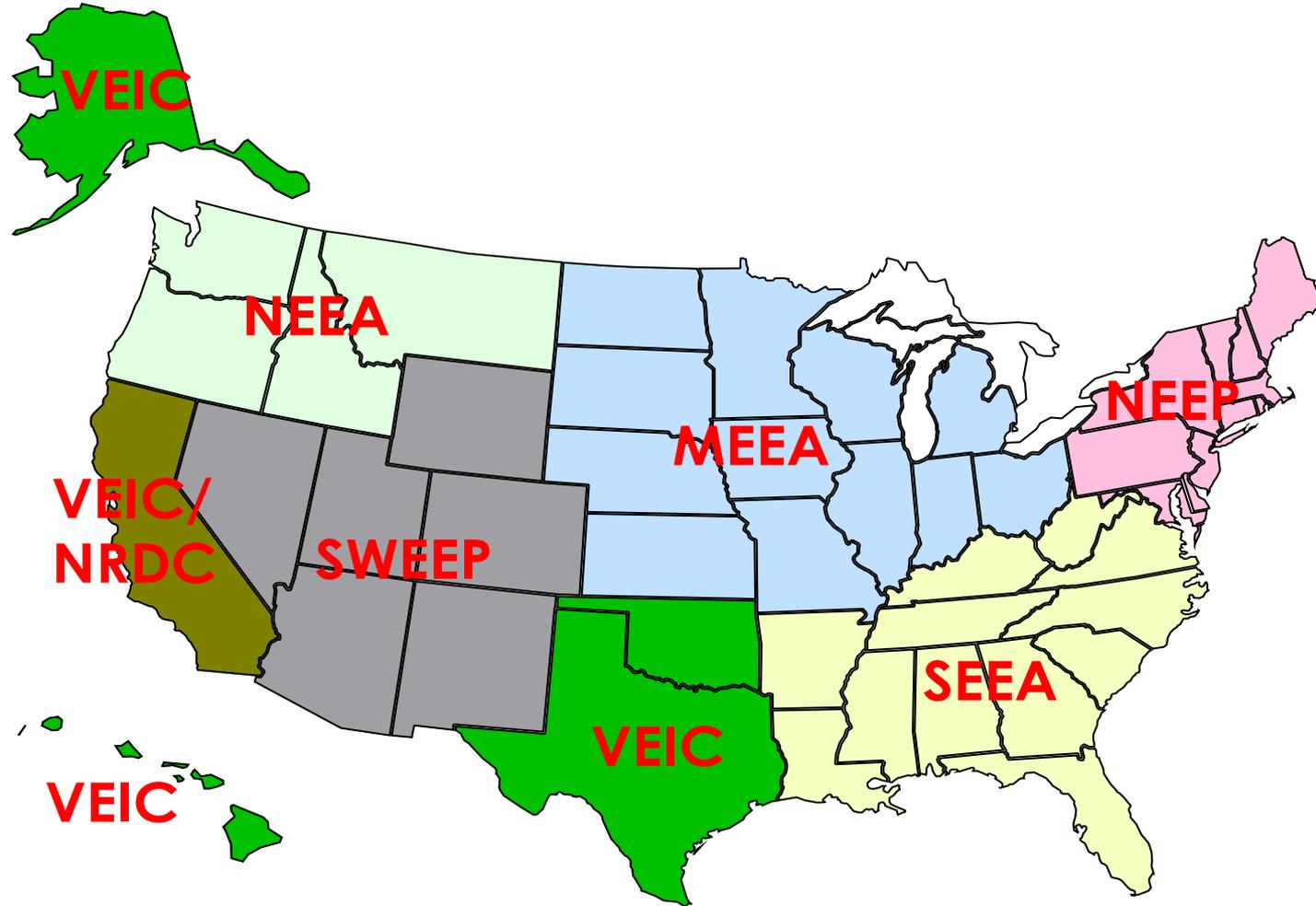
- One-on-one assistance
- Extensive online resource library, including:
 - Webinars
 - Events calendar
 - TAP Blog
 - Best practices and project resources
- Facilitation of peer exchange

On topics including:

- State and local capacity building
- Energy efficiency and renewable energy technologies
- Program design and implementation
- Financing
- Performance contracting

<p>State and Local Capacity Building</p>	<ul style="list-style-type: none"> • Trainings • Workshops • Peer-to-peer matching
<p>Technical</p>	<ul style="list-style-type: none"> • Renewable energy siting and development • Review of technical specs for RFPs • Strategic planning, energy management, and conservation strategies • Green building technologies • Building codes
<p>Program Design and Implementation</p>	<ul style="list-style-type: none"> • Policy and program development • Coordinating rate-payer funded dollars with ARRA projects and programs • Sustainable community and building design • State and regional EE and RE assessments and planning • EE and RE portfolio program design elements
<p>Financial</p>	<p>Program design support and guidance on financing mechanisms such as:</p> <ul style="list-style-type: none"> • Revolving loan funds (RLFs) • Property-assessed clean energy (PACE) • Loan loss reserves and enhanced credit mechanisms
<p>Performance Contracting</p>	<ul style="list-style-type: none"> • Designing and implementing a performance contract • Leveraging private investment • Reducing institutional barriers • Tracking and comparing programs

Who We Are: Team 4



NORTHWEST
ENERGY
EFFICIENCY
ALLIANCE



ACEEE, NRDC: National Support



- Government - D.O.E. Initiatives and ARRA Funding
 - EV Project
 - Clean Cities
 - Smart Grid, FERC Definition
 - Federal and State Tax Credits
 - Battery R & D
- Industry – New Vehicles: Private and Commercial. Utilities, Google, Microsoft, GE, HSBC, On-Star, Synch, iPhone apps
- Public and Private – Advocacy Groups: environmental, technological, energy security focused

- Identify Stakeholders for Plan
- Review of Regulations and Permitting
- Long Range Plan
 - Short Range Plans to achieve Long Range Plan
- Where to Invest in EV Infrastructure
- Networking and Smart Charging
- Public Education

Identify Stakeholders to Include in Development of Plan

- Utility
- Local Government: mayor, fleet manager, city planners
- Local businesses including vehicle dealers
- EVSE suppliers
- Non-profits
- Local/Federal agencies – MPOs, RPCs, Air Quality staff



System of safety & standardization

- Mandatory safety
 - Federal mandates
 - Local statutes
- Voluntary standardization
 - Industry standards



- Applicable authorities
 - Occupational Health & Safety Regulations
 - National Electric Code
 - Underwriters Laboratories Standards
 - Society of Automotive Engineers Standards



- Process of controlling building changes – including LEED certification, Locational Efficiency, Smart Growth synergies
 - Process required by International Building Code
 - Supports code compliance
 - Enforces local planning requirements
 - Maintains accurate tax base
 - Generates fee income



- Permitting procedure varies by jurisdiction
 - Online permit
 - Over-the-counter permit
 - Plan check
 - Planning review



- Inspection required
 - Authorized 3rd party
 - Authority Having Jurisdiction (AHJ)
- Expedited – Vehicle Dealer facilitation



- Residential EVSE permitting
 - Typically involves addition of a branch circuit
 - May involve service upgrade
 - May require a load calculation

- Residential process streamlining – 48 hour?
 - Online permitting using installation details
 - Self or 3rd party inspection using qualifications

Commercial EVSE permitting

- Requires one or more additional branch circuits
- Requires load calculation
- Requires planning review if outside



- Estimate where you think city will be in 10 years, where you want to get to
 - Forecasting number of EVs and demand for charging infrastructure
- Clean Cities Coalitions – D.O.E. emphasis on planning, e.g., National Household Travel Behavior Studies – EV Project “micro-climating”
- FHWA/HUD/EPA “Sustainable Communities” initiatives and funding opportunities.

- Level 1 : Standard 110 volt outlet
 - Ubiquitous
 - 10-13 hours to charge 16 kWh battery (Volt)
 - Estimated cost: free
- Level 2: 220 or 240 volt outlet
 - Clothes Dryers
 - 4 hours to charge Volt
 - Estimated Cost: Residential-\$2,000-\$9,000
- Level 3: 480+ volts
 - Less than 30 minutes to charge Volt
 - Estimated Cost: \$25,000-\$75,000



- 1st-Home charging
 - 63% of potential EV users preferred charging at home (EPRI)
 - Level 1 may already exist for many homes
 - Determine number of homes with garage, carport with at least Level 1 charging capability (54% nationwide)
 - Level 2 may require upgrades, permitting
 - Potential EV Project and vehicle manufacturer incentives

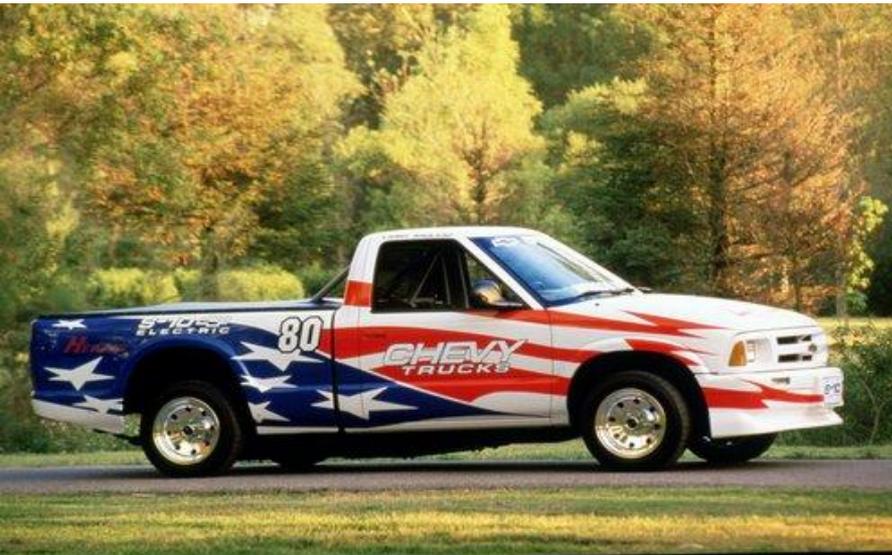
- 2nd - Work/Business
 - Places where vehicles will be parked for 6-8 hours during a day
 - Parking garages, park and ride, transit stations, on job sites
 - Level 2
 - Revenue and “good will” business attraction opportunities



- 3rd – Public Charging
 - Level 2: Shopping, restaurants, theatres etc...places vehicles will be left for a couple hours
 - Work with businesses to promote interest in hosting stations
 - Potential renewable generation opportunities
 - Level 3: Along major corridors
 - Spaced to reduce range anxiety
 - Electrical Infrastructure an issue, 480 volt
 - eTec and AeroVironment industry leaders
- Data Collection and Analysis
 - Define areas with high population/employment densities, high traffic volumes
 - Maybe not needed where people have easy access to home charging

Key Program Elements – Need for Coordination

- Controlled or Uncontrolled Charging: Grid-optimized System Approach or Unmanaged Grid consequences
- Co-Benefits Potential: Networking facilitates “cell phone model” = consumer and provider advantages



- Networking facilitates data collection for aggregation = eventual V2G and V2H, demand response, market participation, e.g. Ancillary Services
- Networking facilitates storage and capture of renewables; standardized battery architecture an eventual goal for end-of-life service as UPS
- Networking facilitates data collection for Renewable Portfolio Standards, RGGIs, Low Carbon Fuel Standards, Carbon Counting/Credit Trading, Climate Action Plans, Sustainable Communities, e.g., “Micro-Climating” – maximizing investment for future needs

- Charging scenarios with a Smart grid interface
 - Staggered charging: discrete amounts over an identified interval
 - Off peak charging: benefits utility and consumer
- Real time rates
- Time-of-use rates
- Demand response
 - Grid critical peaks
 - Distribution overload

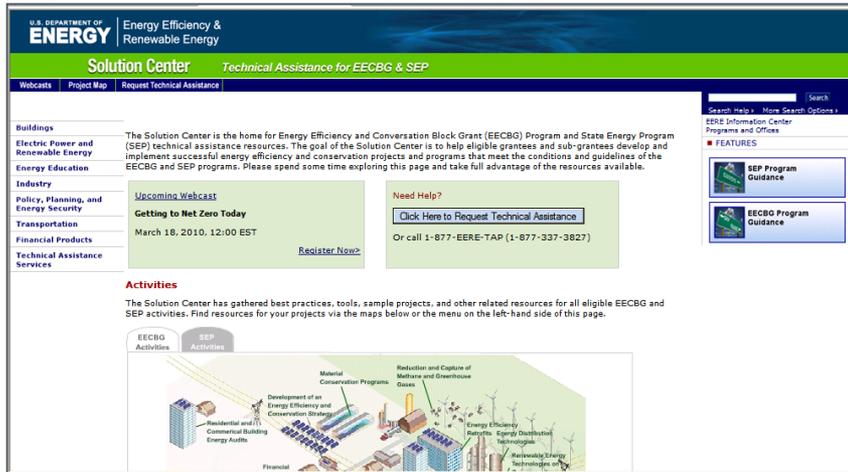


- Public need education on EVs and EVSE so that reality matches expectations
 - How far will vehicles go without charge?
 - Difference between PHEV and EV
 - Prius (PHEV 10); Volt (PHEV 40); Leaf (EV)
 - Different charging requirements
 - Depending on driving distances, different vehicles for different drivers
 - Where are public charging stations?
 - Costs of Home Level 2 installation
- Ensuring technicians can repair and maintain vehicles

- National Household Travel Survey <http://nhts.ornl.gov/index.shtml>
- EPA/HUD/FHWA Sustainable Communities <http://www.epa.gov/dced/partnership/index.html>
- EPA Smart Growth <http://www.epa.gov/livability/codeexamples.htm>
- EDTA <http://www.electricdrive.org/>
- Plugin Recharge! <http://www.pluginrecharge.com/>
- Department of Energy
 - Clean Cities http://www1.eere.energy.gov/cleancities/info_resources.html
 - Alternative Fuels Data Center <http://www.afdc.energy.gov/afdc/fuels/electricity.html>
 - NREL <http://www.nrel.gov/vehiclesandfuels/ctts.html>
 - Smart Grid <http://www.oe.energy.gov/smartgrid.htm>
 - The EV Project
 - Ecotality <http://www.theevproject.com/overview.php>
 - Coulomb Technologies <http://www.coulombtech.com/>
 - Plug-in Hybrid Electric Vehicle Charging Infrastructure Review <http://avt.inel.gov/pdf/phev/phevInfrastructureReport08.pdf>
- Project Get Ready <http://www.projectgetready.org/>

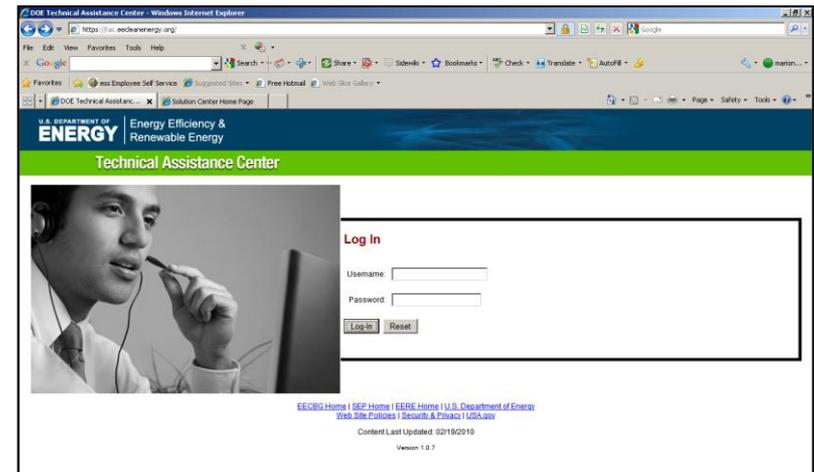
We encourage you to:

1) Explore our online resources via the [Solution Center](#)



The screenshot shows the 'Solution Center' website for the U.S. Department of Energy. The header includes the department logo and 'Energy Efficiency & Renewable Energy'. Below the header, there are navigation tabs for 'Webcasts', 'Project Map', and 'Request Technical Assistance'. The main content area is divided into several sections: 'Buildings' with a description of the Solution Center's purpose; 'Energy Education' with a link to 'Upcoming Webcast' titled 'Getting to Net Zero Today' (March 18, 2010, 12:00 EST); 'Industry' with a 'Need Help?' section containing a 'Click Here to Request Technical Assistance' button and a phone number (1-877-EERE-TAP); and 'Activities' with a description and a diagram showing various energy efficiency and conservation strategies like 'Material Conservation Programs', 'Reduction and Capture of Methane and Greenhouse Gases', 'Energy Efficient Networks', and 'Renewable Energy Technologies'.

2) Submit a request via the [Technical Assistance Center](#)

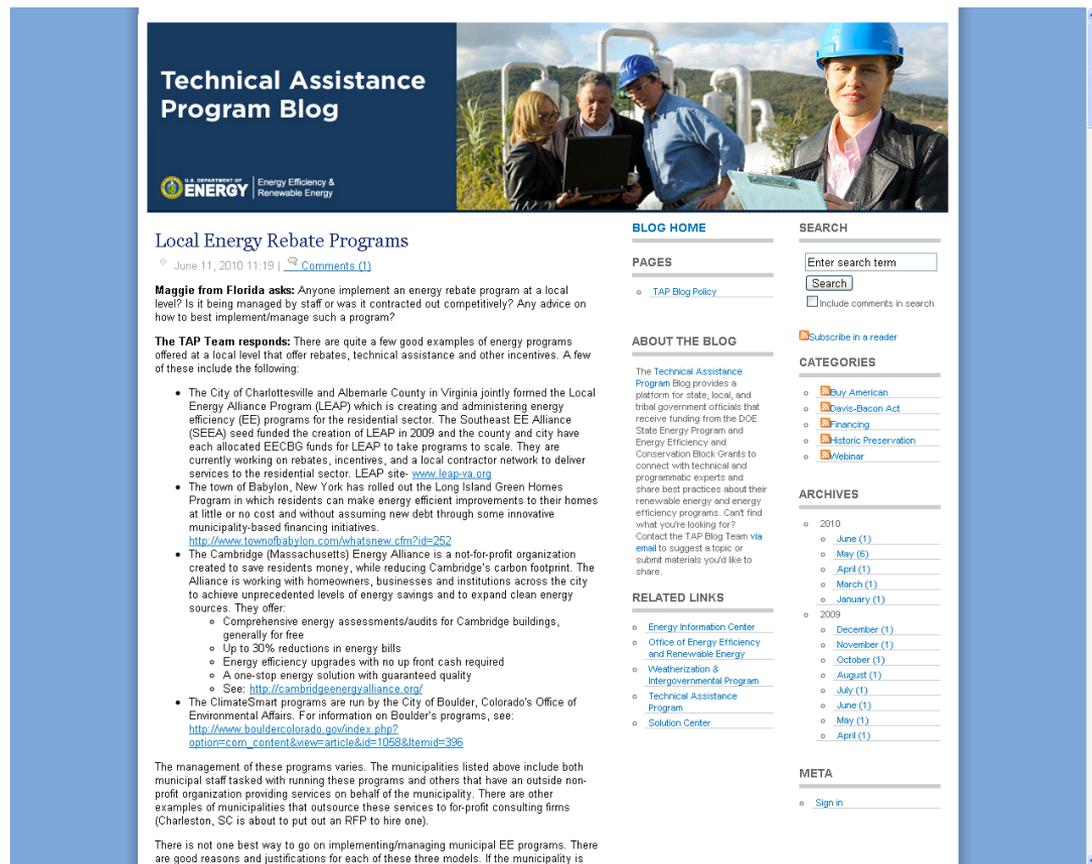


The screenshot shows the 'Technical Assistance Center' website in a Windows Internet Explorer browser window. The header features the U.S. Department of Energy logo and 'Energy Efficiency & Renewable Energy'. The main content area is titled 'Technical Assistance Center' and includes a 'Log In' section with 'Username' and 'Password' input fields, and 'Log In' and 'Reset' buttons. Below the login section, there are links for 'EERC Home', 'SEP Home', 'EERE Home', 'U.S. Department of Energy', 'Web Site Policies', 'Security & Privacy', and 'USA.gov'. The footer indicates 'Content Last Updated: 02/19/2010' and 'Version: 1.0.7'.

3) Ask questions via our call center at 1-877-337-3827 or email us at solutioncenter@ee.doe.gov

Access the TAP Blog!
<http://www.eereblogs.energy.gov/tap/>

Provides a platform for state, local, and tribal government officials and DOE's network of technical and programmatic experts to connect and share best practices on a variety of topics.



Technical Assistance Program Blog

U.S. DEPARTMENT OF ENERGY Energy Efficiency & Renewable Energy

Local Energy Rebate Programs

June 11, 2010 11:19 | [Comments \(1\)](#)

Maggie from Florida asks: Anyone implement an energy rebate program at a local level? Is it being managed by staff or was it contracted out competitively? Any advice on how to best implement/manage such a program?

The TAP Team responds: There are quite a few good examples of energy programs offered at a local level that offer rebates, technical assistance and other incentives. A few of these include the following:

- The City of Charlottesville and Albemarle County in Virginia jointly formed the Local Energy Alliance Program (LEAP) which is creating and administering energy efficiency (EE) programs for the residential sector. The Southeast EE Alliance (SEEA) seed funded the creation of LEAP in 2009 and the county and city have each allocated EECBG funds for LEAP to take programs to scale. They are currently working on rebates, incentives, and a local contractor network to deliver services to the residential sector. LEAP site- www.leap-va.org
- The town of Babylon, New York has rolled out the Long Island Green Homes Program in which residents can make energy efficient improvements to their homes at little or no cost and without assuming new debt through some innovative municipality-based financing initiatives. <http://www.townofbabylon.com/whatsnew.cfm?id=252>
- The Cambridge (Massachusetts) Energy Alliance is a not-for-profit organization created to save residents money, while reducing Cambridge's carbon footprint. The Alliance is working with homeowners, businesses and institutions across the city to achieve unprecedented levels of energy savings and to expand clean energy sources. They offer:
 - Comprehensive energy assessments/audits for Cambridge buildings, generally for free
 - Up to 30% reductions in energy bills
 - Energy efficiency upgrades with no up front cash required
 - A one-stop energy solution with guaranteed quality
 - See: <http://cambridgeenergyalliance.org/>
- The ClimateSmart programs are run by the City of Boulder, Colorado's Office of Environmental Affairs. For information on Boulder's programs, see: http://www.boulder.colorado.gov/index.php?option=com_content&view=article&id=1058&Itemid=336

The management of these programs varies. The municipalities listed above include both municipal staff tasked with running these programs and others that have an outside non-profit organization providing services on behalf of the municipality. There are other examples of municipalities that outsource these services to for-profit consulting firms (Charleston, SC is about to put out an RFP to hire one).

There is not one best way to go on implementing/managing municipal EE programs. There are good reasons and justifications for each of these three models. If the municipality is

BLOG HOME

PAGES

- [TAP Blog Policy](#)

ABOUT THE BLOG

The Technical Assistance Program Blog provides a platform for state, local, and tribal government officials that receive funding from the DOE State Energy Program and Energy Efficiency and Conservation Block Grants to connect with technical and programmatic experts and share best practices about their renewable energy and energy efficiency programs. Can't find what you're looking for? Contact the TAP Blog Team via email to suggest a topic or submit materials you'd like to share.

RELATED LINKS

- [Energy Information Center](#)
- [Office of Energy Efficiency and Renewable Energy](#)
- [Weatherization & Intergovernmental Program](#)
- [Technical Assistance Program](#)
- [Solution Center](#)

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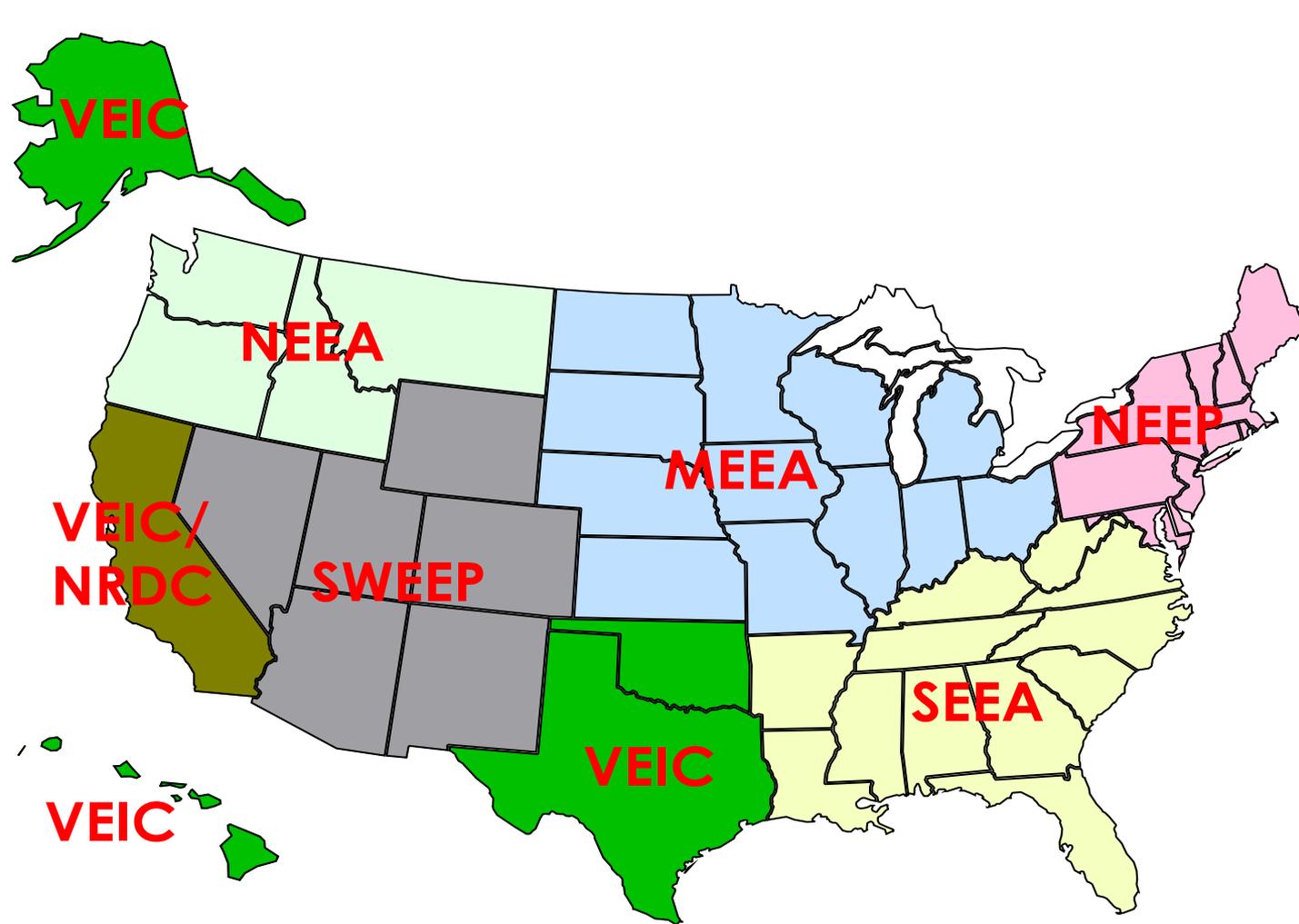
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 - [June \(1\)](#)
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META

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Who We Are: Team 4



ACEEE, NRDC: National Support



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Please join us again:

Title: **Preparing for the Arrival of Electric Vehicles**

Host: George Little, Mike Salisbury, and Bob Yuhnke,
VEIC/SWEEP

Date: November 3, 2010

Time: 2:00-3:00 EDT

Title: **Effective O&M Policy in Public Buildings**

Host: Susy Jones, NEEP

Date: November 4, 2010

Time: 2:00-3:00 EDT

Title: **Local Power Empowers: CHP and District Energy**

Host: Jay Wrobel, MEEA

Date: November 8, 2010

Time: 2:00-3:00 EST

Title: **Driving Demand: Working with and Learning from Contractors**

Host: Merrian Fuller, LBNL

Date: November 9, 2010

Time: 2:00-3:15 EST

Title: **EM&V101: General Approaches to Tracking Data and Estimating Savings**

Host: Julie Michals, NEEP

Date: November 10, 2010

Time: 2:00-3:00 EST

Title: **Energy Efficiency Rebate Programs 101**

Host: Catul Kiti, Senior Manager Energy Efficiency Programs, ICF
International

Date: November 15, 2010

Time: 12:00 - 2:00 PM EST

Title: **State Clean Energy Policy Impact**

Host: Liz Doris, NREL

Date: November 17, 2010

Time: 3:00 - 4:15 PM EST

Title: **Negotiating and Entering Into an ESPC**

Host: Meg Giuliano, ICF International and Sentech

Date: November 18, 2010

Time: 1:30 - 2:30 PM EST

For the most up-to-date information and registration links, please visit the Solution Center webcast page at www.wip.energy.gov/solutioncenter/webcasts