Preparing Your County for Electric Vehicles

NACo Green Government 2011 Fall Webinar Series

September 15th

NACo is pleased to present this webinar in cooperation with Johnson Controls and the Department of Energy.

NACo National Association of Counties
The Voice of America's Counties

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NACo Fall Green Government Webinar Series

Sept 15 **Preparing Your County for Electric Vehicles**

Oct 13 **Green Purchasing 2.0: No Compromising on Cost & Performance**

Dec 1 **The Future of Financing County Energy Projects**

Housekeeping Items:

If you are having technical difficulties, please send us a message via the chat box on your right. Our organizer will reply to you privately and help resolve the issue.

The chat box is on the right side of the webinar window. The box will collapse so that you can better view the presentation. To unhide the box, click the arrows on the top of the panel.

This webinar will be recorded and made available online to NACo members to view later or review.

Within the next few days you will receive an email notice with the link to the recording with your webinar evaluation survey.

Thank you in advance for completing the webinar evaluation survey. Your feedback is important to us.

Agenda

2:00 **Welcome and Introductions**

2:05 **Infrastructure Necessary for a Robust EV System**
Russell Garcia, Johnson Controls, Inc.

2:15 **County Case Study: Sonoma County**
Amy Bolten, Sonoma County, California Water Agency

2:30 **Overview of Tools**
Mike Simpson, National Renewable Energy Laboratory

2:45 **Q&A**

Question and Answer Session Instructions

Type your question into the chat window, and the moderator will read the question on your behalf.

Thank you for participating in NACo's webinar.

For more information about NACo membership, contact

Andrew Goldschmidt at agoldschmidt@naco.org

or

Ilene Manster at imanster@naco.org

NACo National Association of Counties

The Voice of America's Counties

Thank you for attending today's webinar.

Next in NACo's Green Government Webinar Series:

Green Purchasing 2.0: No Compromising on Cost & Performance
October 13, 2011

To learn more about upcoming NACo webinars, please visit
www.naco.org/webinars

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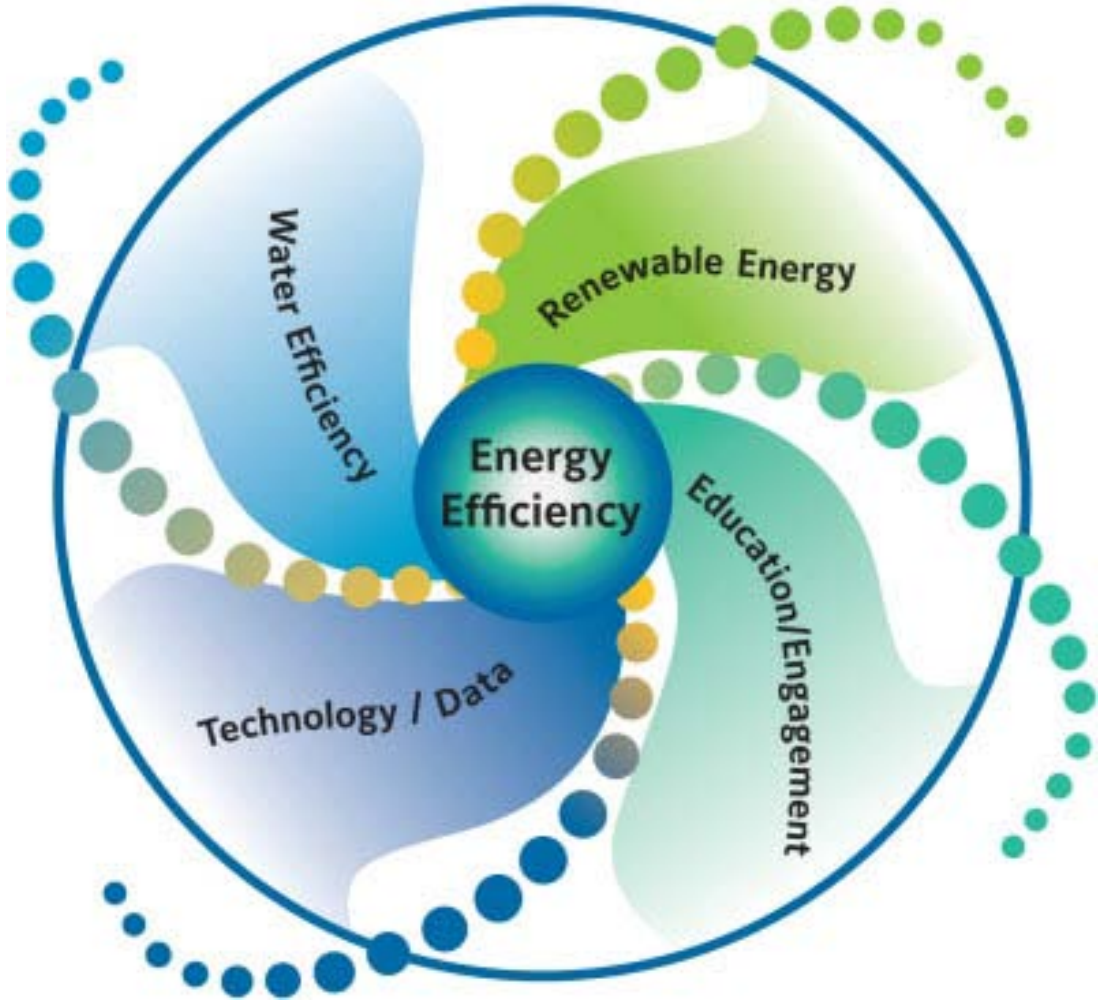
#1 Government need: cut budgets yet develop economy for jobs
#1 Budget item outside of salaries: energy plus always increasing



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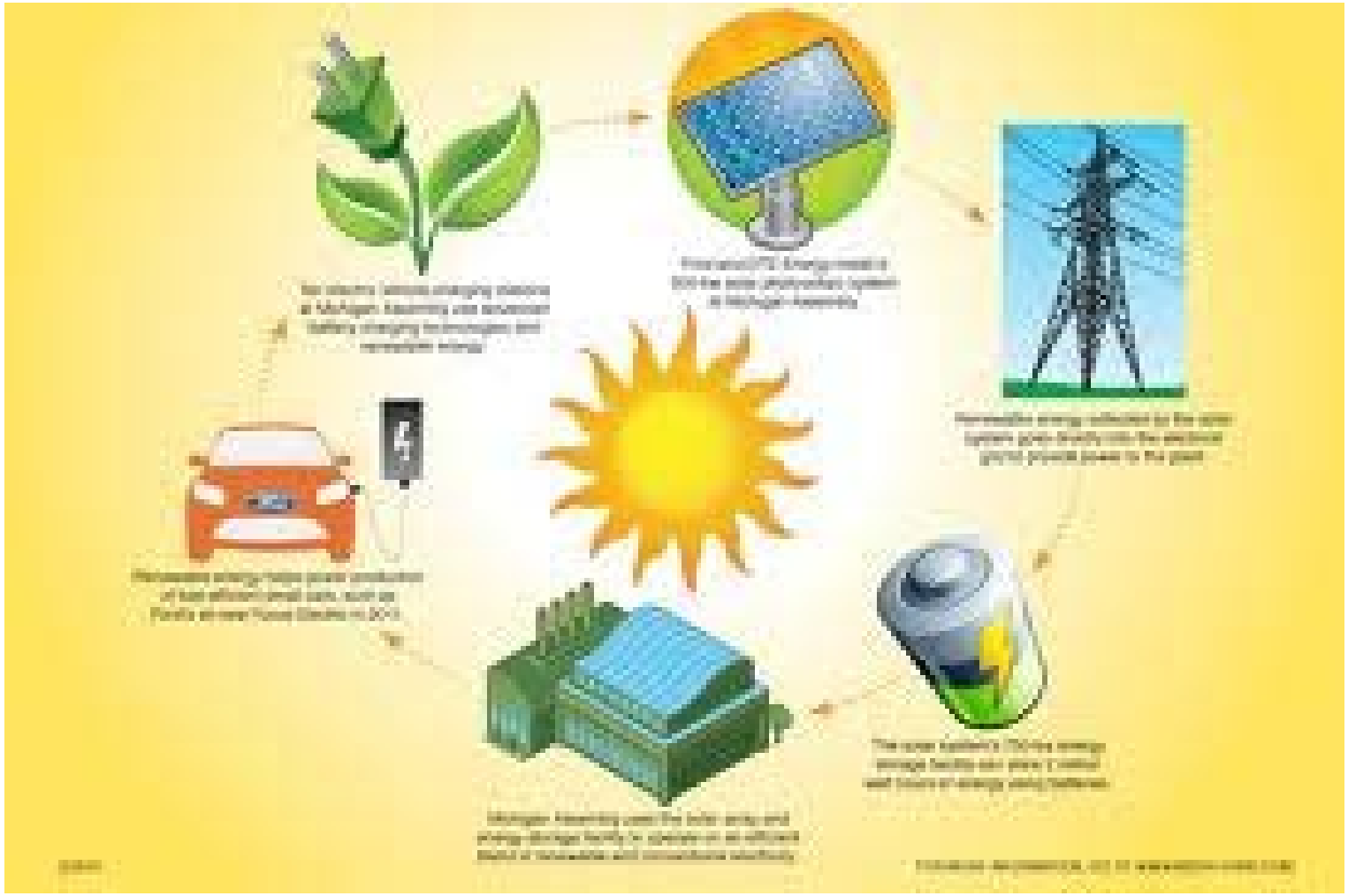
Mark.S.Johnson@jci.com 239-287-6960

Johnson Controls

EV city truck fleets integrated with your grid / Smart Grid:

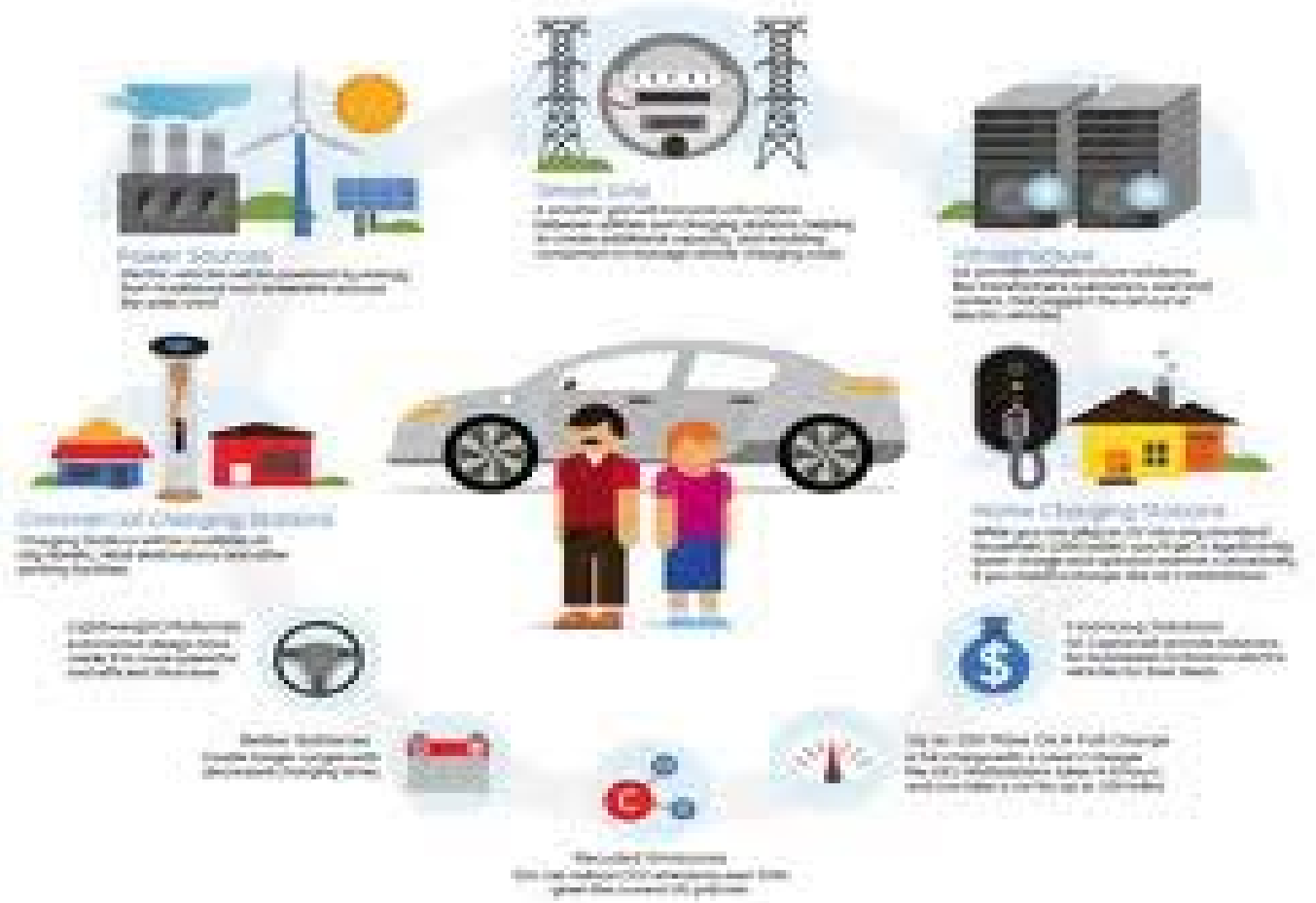
Johnson Controls

EV city truck fleets integrated with your grid / Smart Grid:



Johnson Controls

EV city truck fleets integrated with your grid / Smart Grid:



Electric vehicles have completely sealed cooling systems that do not require refilling, replacement or flushing

•Electric vehicles require no oil changes or tune-ups

•There are no belts to wear out or break and no spark plugs or injectors to clean or adjust

•There is no exhaust system to replace and no liquid fuel system to freeze or clog

Johnson Controls

Houston’s City Hall EV charging station garage & Ford Transit Connect

Johnson Controls

Project Discussion to Identify Goals:

Preliminary audit / Site visit

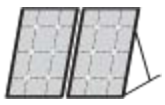
Project commitment

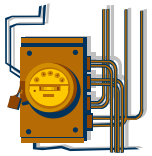
Detailed audit
Sophisticated analysis tools used to gather data and develop customized solution

Energy Performance Contract with Savings Guarantee

Improvements such as:






Lighting, water, HVAC, renewable energy, building upgrades, wireless, Controls / EV's

Lower Water Use

Lower Utility Use

Reduce Waste

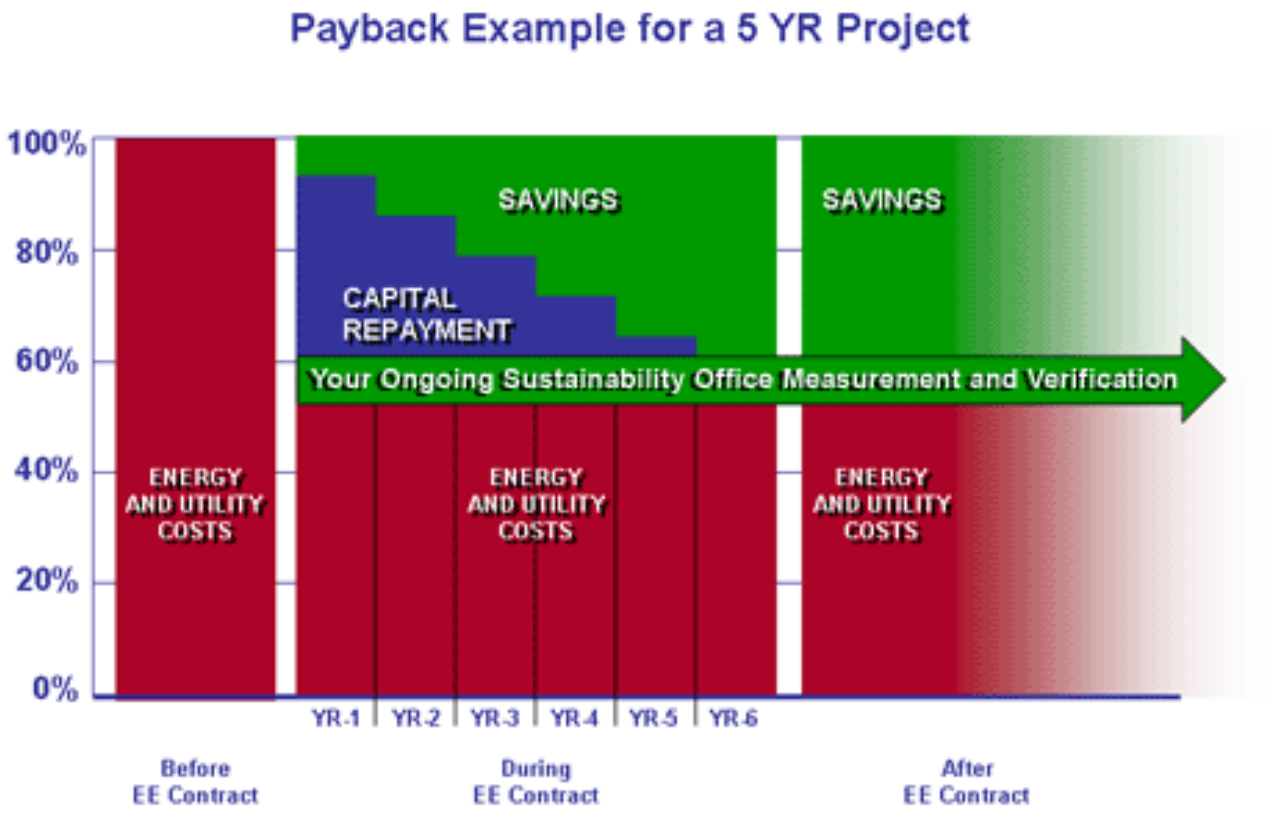
Reduce Emissions

Reduce Ops Budget

Electric Vehicle

Meet Project Goals

How do you pay for your energy budget cuts, Electric Vehicles, EV Charging Stations, retrofits & upgrades: **Energy Savings**



Johnson Controls

Your ideal next steps

Smart Meters, Smart Grid, Sustainable City

The real power of the Smart Grid concept for municipal utilities goes far beyond metering technology and better system control. It lies in the communication network that makes the concept possible – while creating opportunities to deliver popular new services, attract businesses, energize economic growth, and engage residents in community improvement with sustainable solutions.

Meet
- City stakeholder leads meeting: fleet, management, procurement with Johnson Controls to determine needs

Survey
- Survey departments for EV truck needs, identify funding & process procurement

Show
- Showcase success, demonstrate savings & integrate with grid

Johnson Controls

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Mark.S.Johnson@jci.com 239-287-6960

Questions and Answers

Johnson Controls

Sonoma County Local Government Electric Vehicle Partnership

Sonoma County Local Government Electric Vehicle Partnership – born in 2008!

County of Sonoma
Sonoma County Water Agency
Northern Sonoma County Air Pollution Control District
Regional Climate Protection Authority
Open Space District

Cities:

Santa Rosa	Sebastopol
Petaluma	Windsor
Rohnert Park	Healdsburg
Cotati	Cloverdale
Sonoma	

EV Partnership Components

Local Government EV Vehicles and Infrastructure Workgroup

- **Transform public fleets**
- **Build local EV infrastructure**

EV Fleet National Demonstration Project – Bay Area Partnership

- Collaborate and Implement Regional EV Initiatives

Statewide EV Workgroup

- Promote and align state wide efforts

EV Vehicles and Infrastructure Workgroup Goals

Transform Public Fleets through conversion to hybrid and EVs

Facilitate Regional Efforts in infrastructure build-out

Demonstrate EV Viability for the general public

Transform Public Fleets – Get them out on the road for people to see!

County of Sonoma/Sonoma County Water Agency:

• Hybrid Light Duty Vehicles		296
• Plug-in Hybrid Sedans		18
• Electric Sedan		1
• Neighborhood Electric Vehicles		9
• Hybrid Medium Duty Trucks		5
• Hybrid Buses	15	
Total Hybrid and Electric Vehicles	344	

Facilitate Regional Infrastructure Installations

Currently installed charging stations: **40**

To be installed by the end of the year through various grants:

MTC Fleet Grant - **31** for fleet use but public can use

MTC Public Charger Grant - **25** in public locations

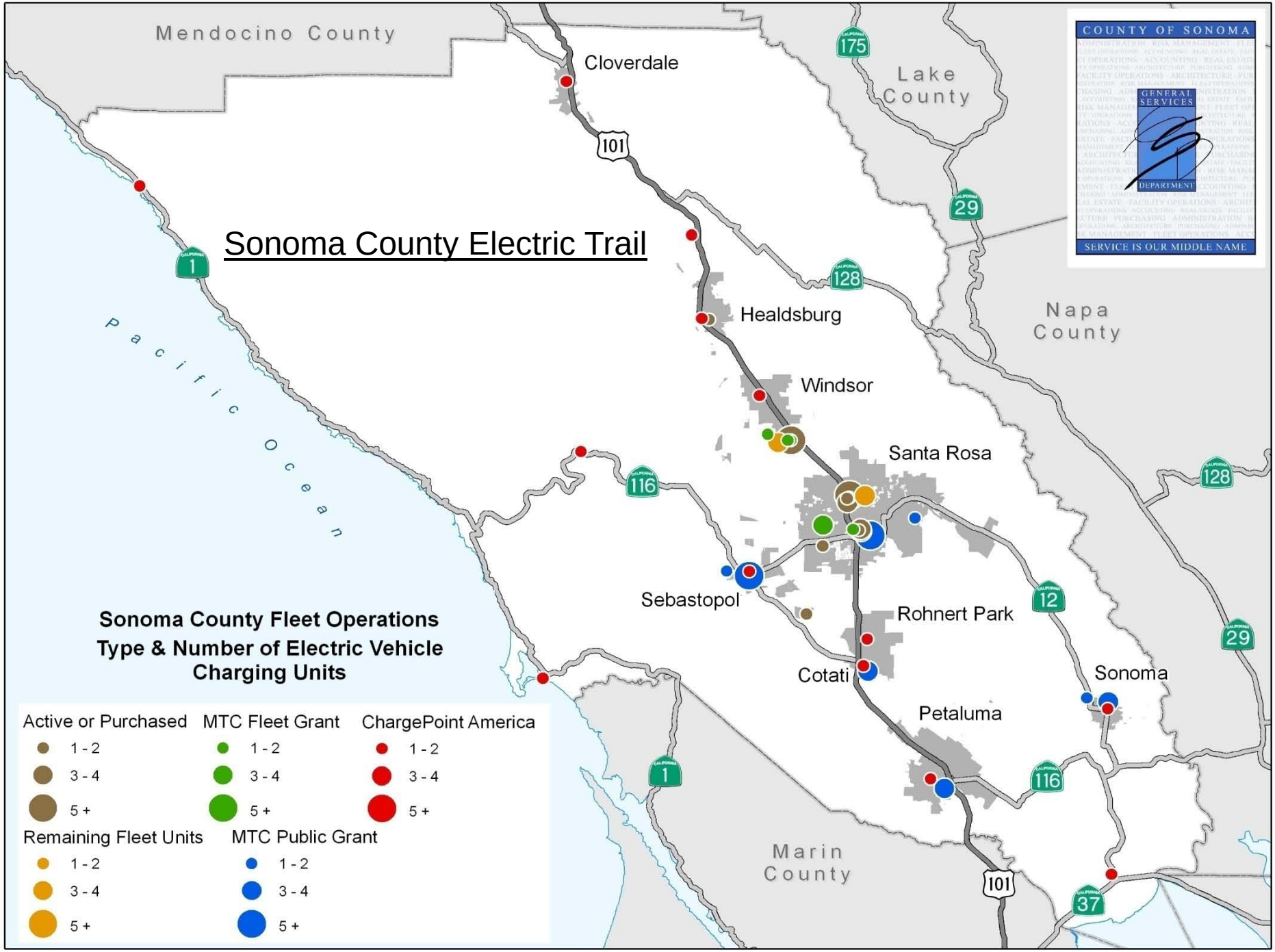
ChargePoint America Grant /NSCAPCD Funds - **20-35** in public locations


PROBLEM WITH STATION
1-888-758-4389
OR
MYCHARGEPOINT.NET
SMALL CAR

Demonstrate and Promote EV Viability

Three simultaneous tracks:

1. Tourism – Sonoma County Electric Trail
2. Outreach to local businesses – Why and how to install charging stations
3. Branding and general public awareness – consistent logo, materials, map, website


Mendocino County
Cloverdale
175
Lake County
101
29
COUNTY OF SONOMA
GENERAL SERVICES
DEPARTMENT
SERVICE IS OUR MIDDLE NAME
Sonoma County Electric Trail
1
128
Healdsburg
Napa County
Windsor
Pacific Ocean
Santa Rosa
116
128
Sebastopol
12
Rohnert Park
29
Cotati
Sonoma
Petaluma
1
116
Marin County
101
37
Sonoma County Fleet Operations
Type & Number of Electric Vehicle Charging Units
Active or Purchased
1 - 2
3 - 4
5 +
MTC Fleet Grant
1 - 2
3 - 4
5 +
ChargePoint America
1 - 2
3 - 4
5 +
Remaining Fleet Units
1 - 2
3 - 4
5 +
MTC Public Grant
1 - 2
3 - 4
5 +

Demonstrate and Promote EV Viability

Three simultaneous tracks:

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Questions

Amy Bolten, Sonoma County Water Agency (Local outreach)

Dave Head, County of Sonoma (Fleet, technical, regional)

Community PEV Readiness Tools

Alternative Fuels and Advanced Vehicles Data Center

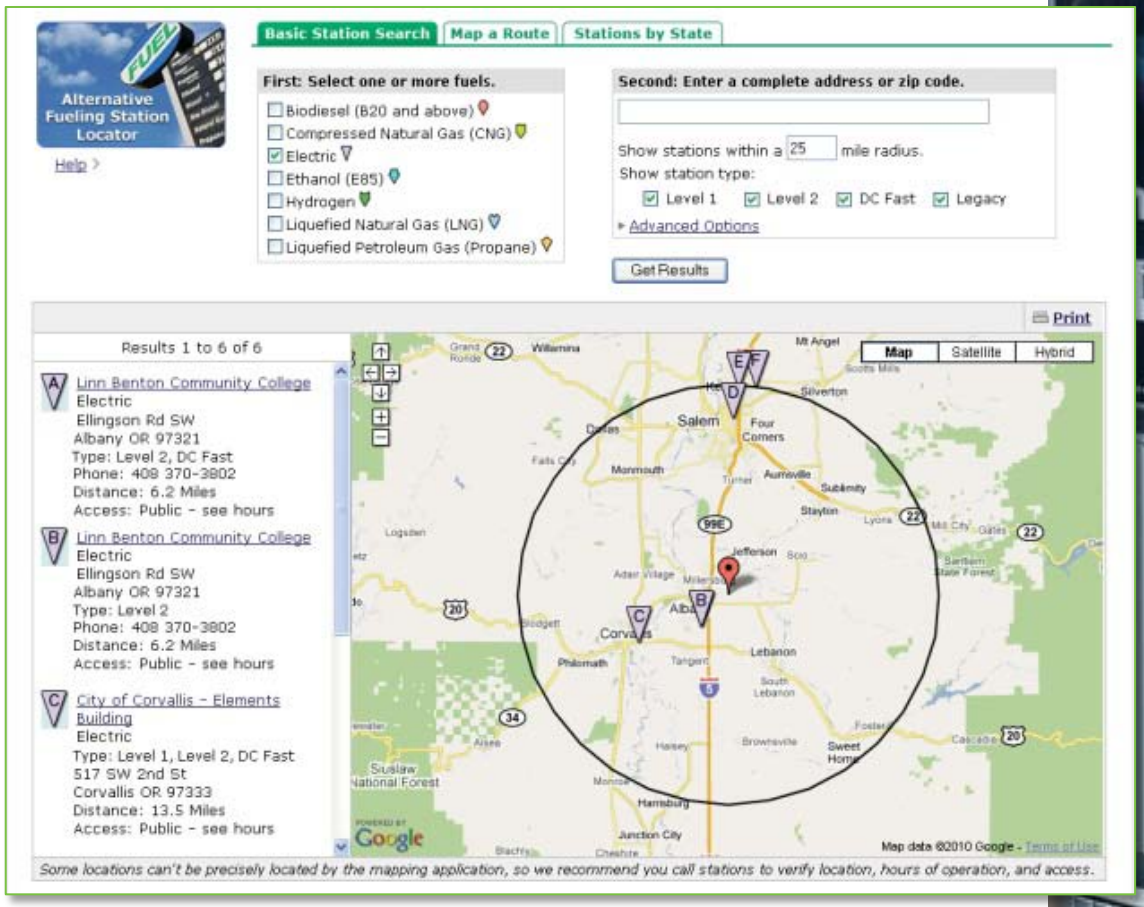
Mike Simpson
Vehicle Systems Engineer
National Renewable Energy Lab

Alternative Fuels and Advanced Vehicles Data Center Toolkit

- AFDC Home
- Alternative Fuel Station Locator
- Emissions Calculator
- Cost Estimations*
- State and Federal Incentives
- EVSE Permitting Template
- Training and Education
  - Clean Cities University
  - Clean Cities TV (Installer Video)
- Publications/Outreach
  - PEV Primer
- Technical Response Service

**Cost calculator is not yet live, but will be soon*

Alternative Fuel Station Locator



GeoEVSE Forum

Government-industry collaboration committed to establishing a repository of public EVSE location data for consumers and industry.

Goals

- Avoid duplication of data collection efforts for EVSE locations
- Enhance the EVSE data in the AFDC station locator
- ***Ensuring DOE continues to collect and provide the most comprehensive collection of EVSE location data***
- Strengthen relationships and improve communication with new industry stakeholders

How fast a vehicle charges depends on the battery type and the type of charging equipment used.

Level 1 = 8 to 20 hours
Level 2 = 3 to 8 hours
DC Fast Charging = < 30 minutes

Find electric charging stations near you.

Electricity Sources and Emissions

Alternative & Advanced Vehicles

Search | Search Help | More Search Options

Site Map
EERE Information Center

- Light-Duty Vehicle Search
- Heavy-Duty Vehicle Search
- Flexible Fuel Vehicles
- Natural Gas Vehicles
- Propane Vehicles
- Hybrid & Plug-In Electric Vehicles
  - Basics
  - Benefits
  - Availability
  - Emissions
  - Charging
  - Batteries
  - Maintenance & Safety
  - Deployment
  - Research & Development
  - Related Links
- Fuel Cell Vehicles
- Diesel Vehicles
- Conversions
- Resale
- Technician Training
- Idle Reduction
- Fuel Economy
- Emissions

Emissions from Hybrid and Plug-In Electric Vehicles

In general, hybrid electric vehicles (HEVs), plug-in hybrid electric vehicles (PHEVs), and all-electric vehicles (EVs) produce lower emissions than conventional vehicles do. When measuring well-to-wheel emissions, the electricity source is important: for PHEVs and EVs, part or all of the power comes from the electric grid.

Electricity Sources and Emissions

EVs and PHEVs running on electricity only have zero tailpipe emissions, but emissions may be produced by the source of electrical power, such as a power plant. Electricity generation is regional, so to get an accurate picture of the emissions created by an electric drive vehicle it is important to look at the sources used to create electricity in a particular area. If the electricity used to charge an all-electric vehicle comes from a nonpolluting, renewable source, such as wind or solar, driving the vehicle produces no emissions.

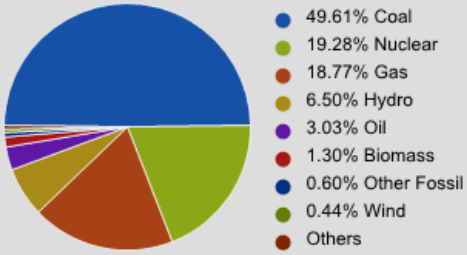
Compare Electricity Sources and Annual Vehicle Emissions

Enter a ZIP code to see a breakdown of the electricity sources used to charge EVs and PHEVs on a local grid and compare the annual emissions generated from vehicles using electricity from the grid, gasoline, or a combination of the two.

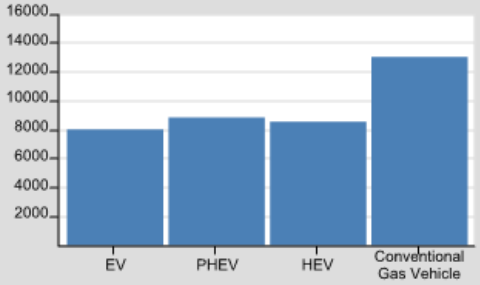
ZIP Code [ ] Find Data

National Averages

Electricity Sources

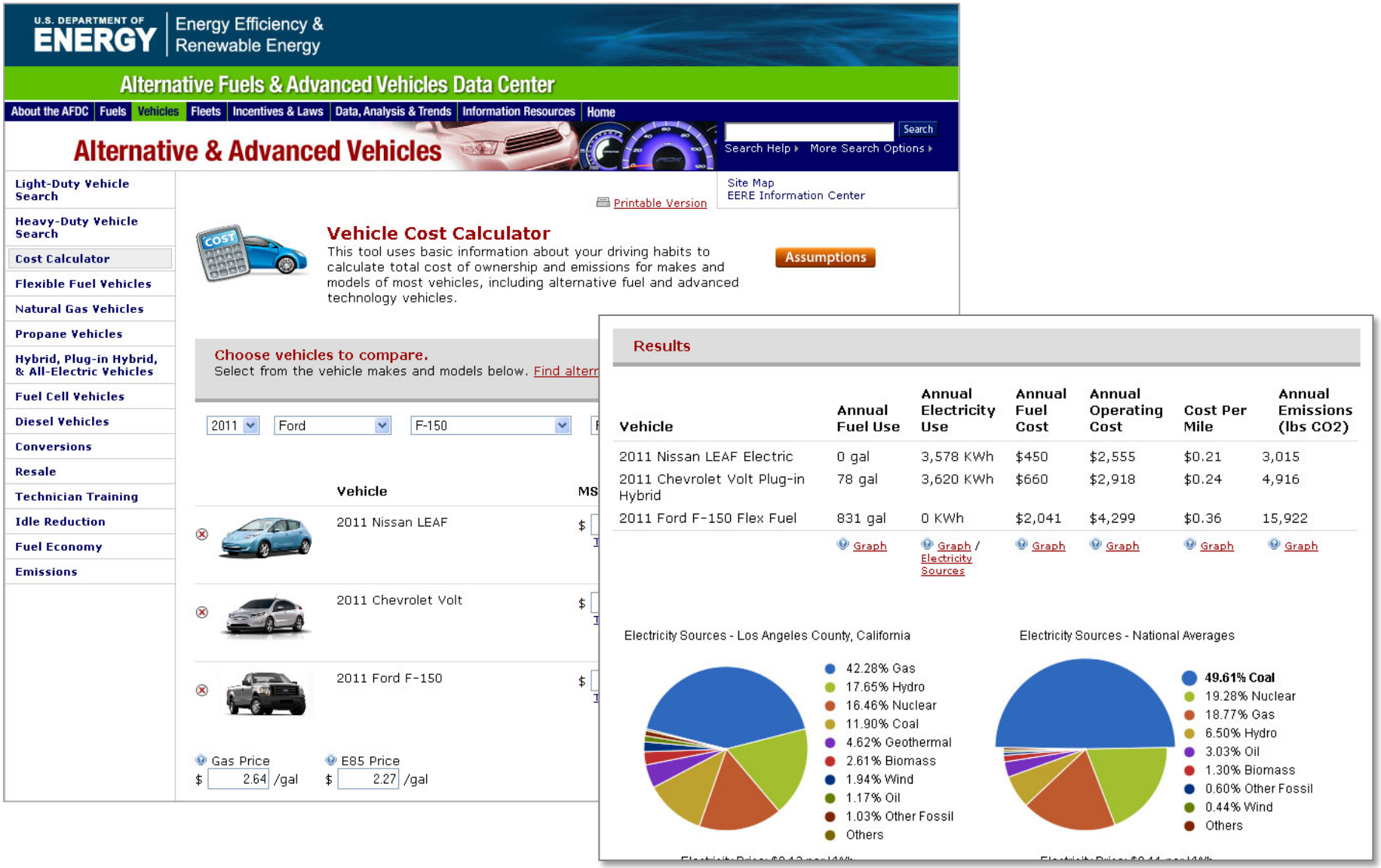


Annual Emissions per Vehicle
(lb of CO_2 equivalent)

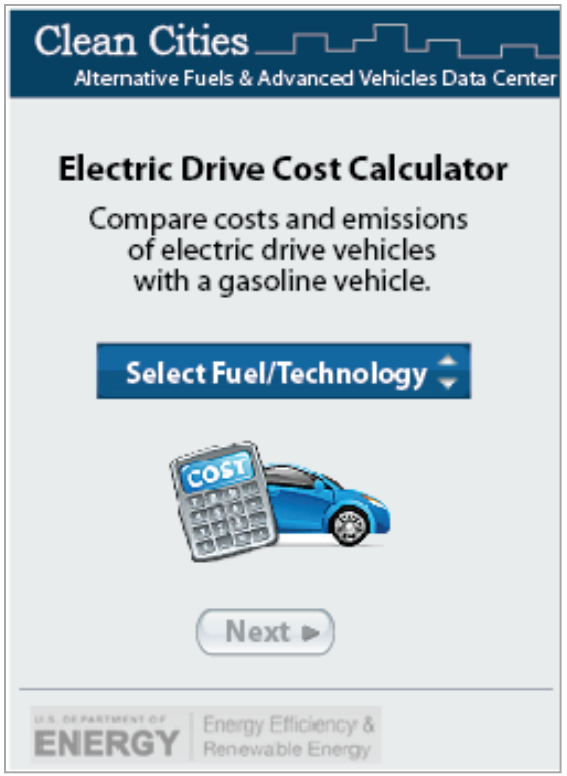


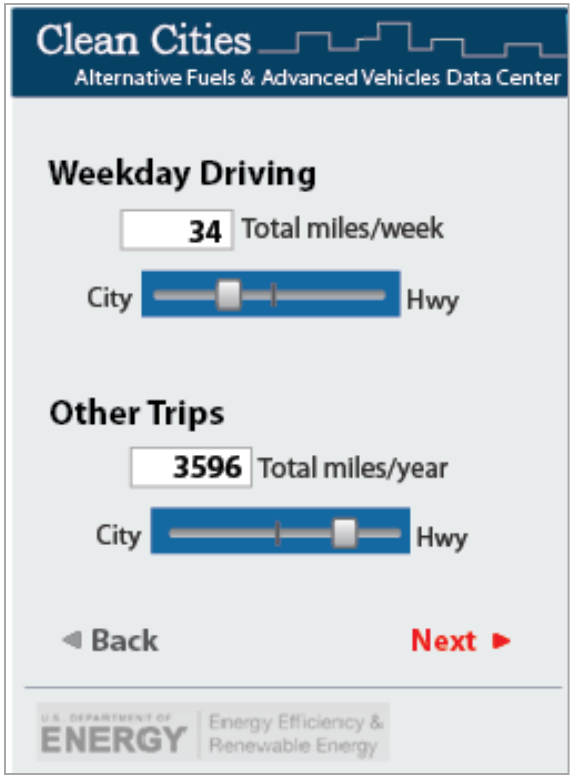
Sources and Assumptions

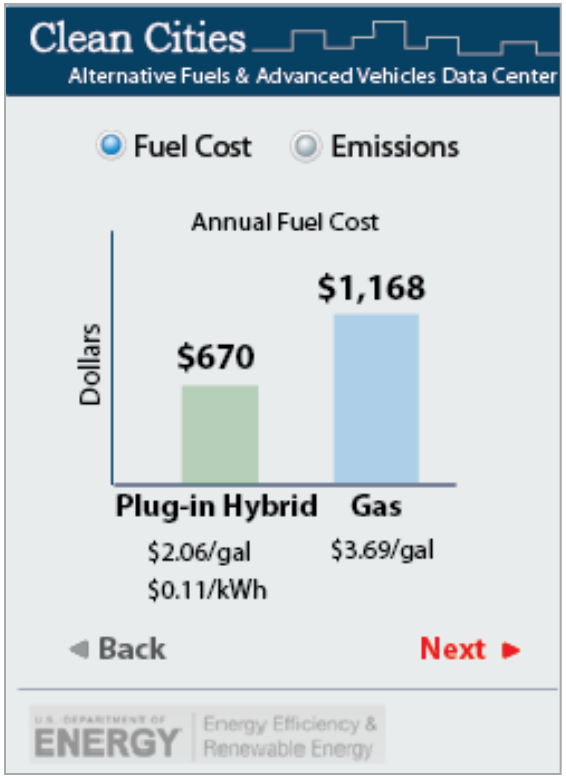
Vehicle Cost Calculator



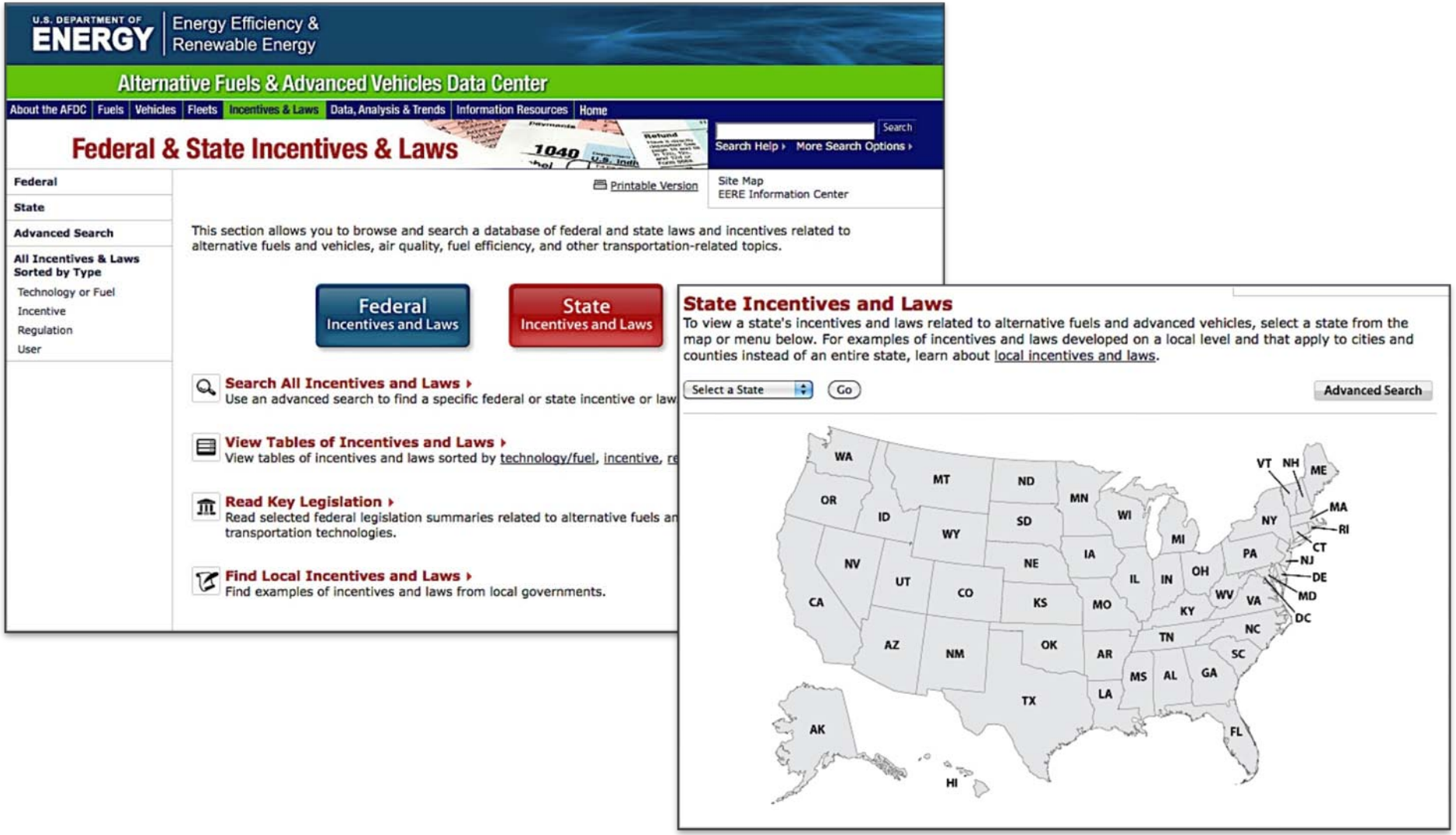
Cost Calculator Widget







State and Federal Incentives Database



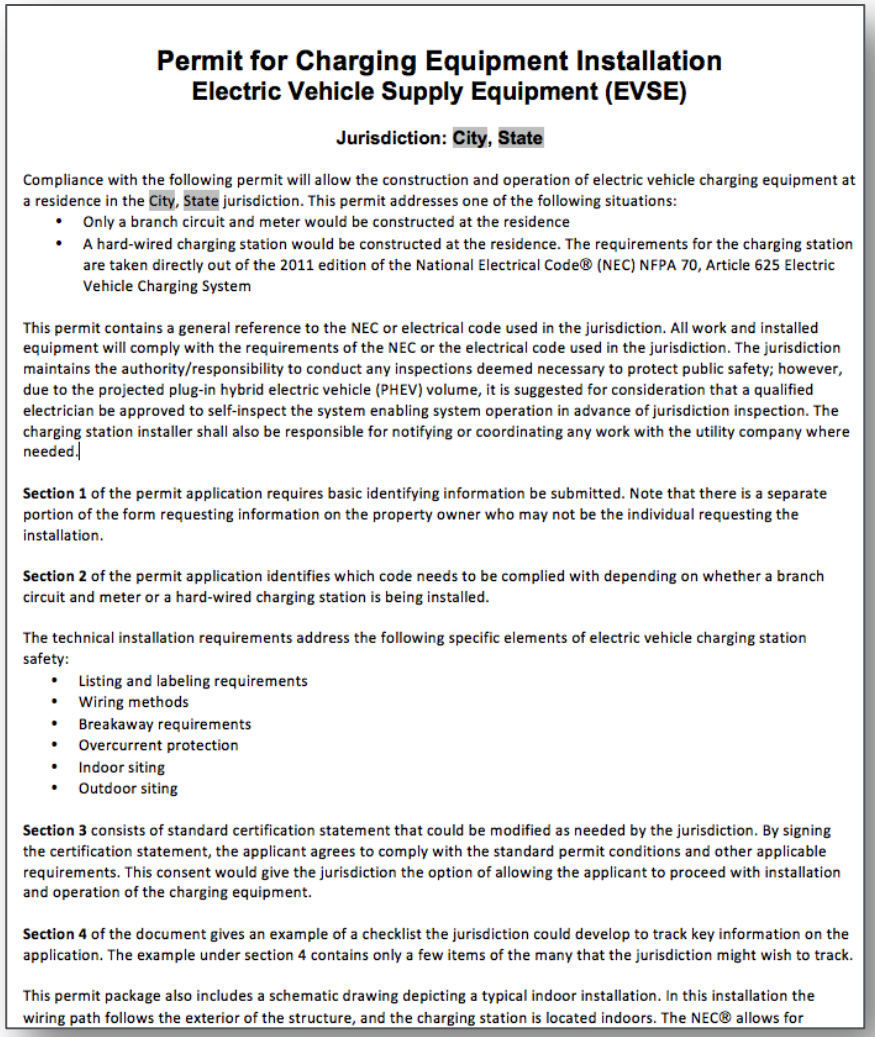
EVSE Permitting

Residential EVSE permitting template

- Designed for permitting and inspecting jurisdictions
- Jurisdictions can modify for specific, unique requirements

Code material

- NEC Article 625
- Sets safety requirements for EVSE installation



Permit for Charging Equipment Installation
Electric Vehicle Supply Equipment (EVSE)

Jurisdiction: City, State

Compliance with the following permit will allow the construction and operation of electric vehicle charging equipment at a residence in the City, State jurisdiction. This permit addresses one of the following situations:

- Only a branch circuit and meter would be constructed at the residence
- A hard-wired charging station would be constructed at the residence. The requirements for the charging station are taken directly out of the 2011 edition of the National Electrical Code® (NEC) NFPA 70, Article 625 Electric Vehicle Charging System

This permit contains a general reference to the NEC or electrical code used in the jurisdiction. All work and installed equipment will comply with the requirements of the NEC or the electrical code used in the jurisdiction. The jurisdiction maintains the authority/responsibility to conduct any inspections deemed necessary to protect public safety; however, due to the projected plug-in hybrid electric vehicle (PHEV) volume, it is suggested for consideration that a qualified electrician be approved to self-inspect the system enabling system operation in advance of jurisdiction inspection. The charging station installer shall also be responsible for notifying or coordinating any work with the utility company where needed.

Section 1 of the permit application requires basic identifying information be submitted. Note that there is a separate portion of the form requesting information on the property owner who may not be the individual requesting the installation.

Section 2 of the permit application identifies which code needs to be complied with depending on whether a branch circuit and meter or a hard-wired charging station is being installed.

The technical installation requirements address the following specific elements of electric vehicle charging station safety:

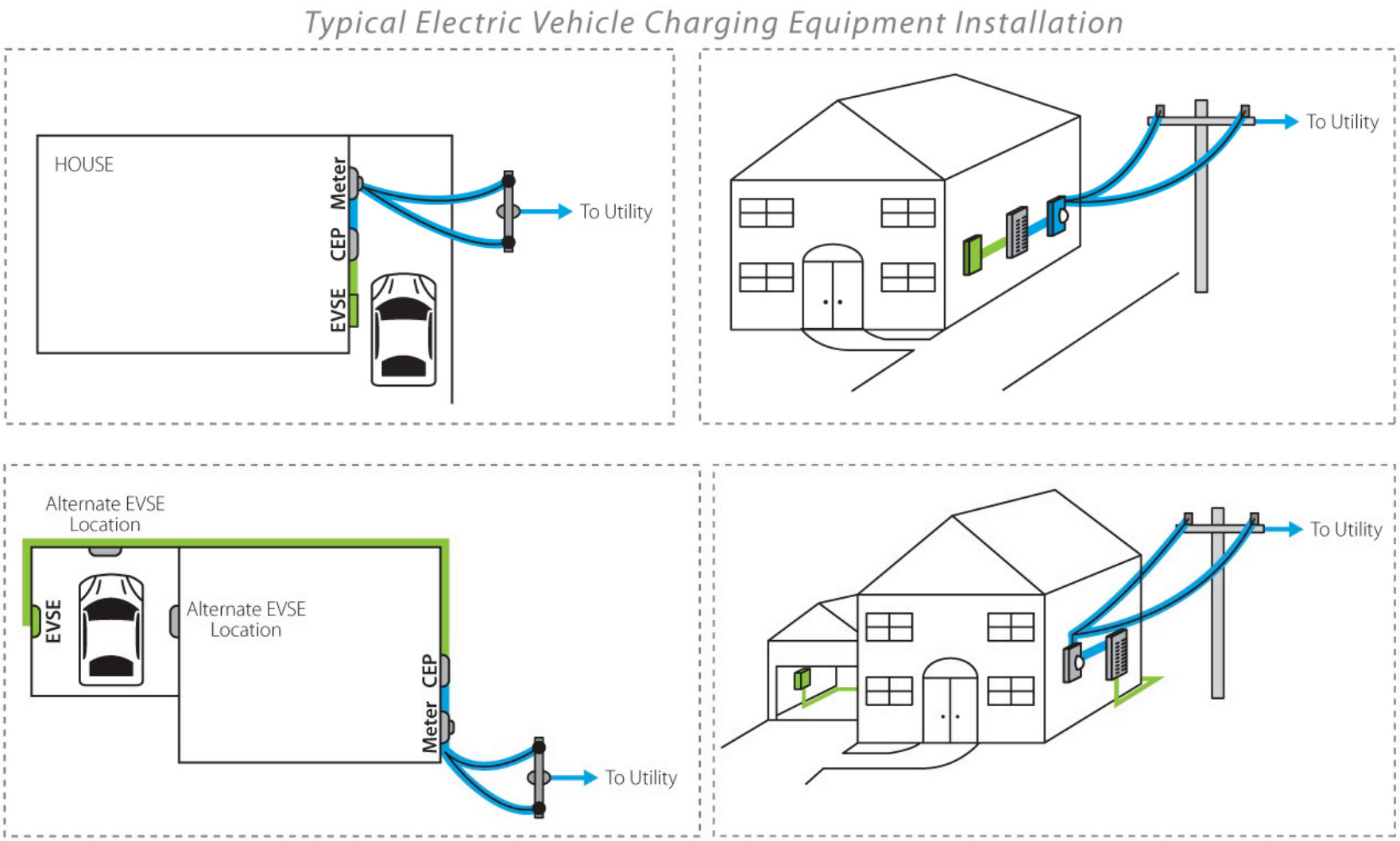
- Listing and labeling requirements
- Wiring methods
- Breakaway requirements
- Overcurrent protection
- Indoor siting
- Outdoor siting

Section 3 consists of standard certification statement that could be modified as needed by the jurisdiction. By signing the certification statement, the applicant agrees to comply with the standard permit conditions and other applicable requirements. This consent would give the jurisdiction the option of allowing the applicant to proceed with installation and operation of the charging equipment.

Section 4 of the document gives an example of a checklist the jurisdiction could develop to track key information on the application. The example under section 4 contains only a few items of the many that the jurisdiction might wish to track.

This permit package also includes a schematic drawing depicting a typical indoor installation. In this installation the wiring path follows the exterior of the structure, and the charging station is located indoors. The NEC® allows for

Permit diagrams provided:
(*options for installer to use in plans*)



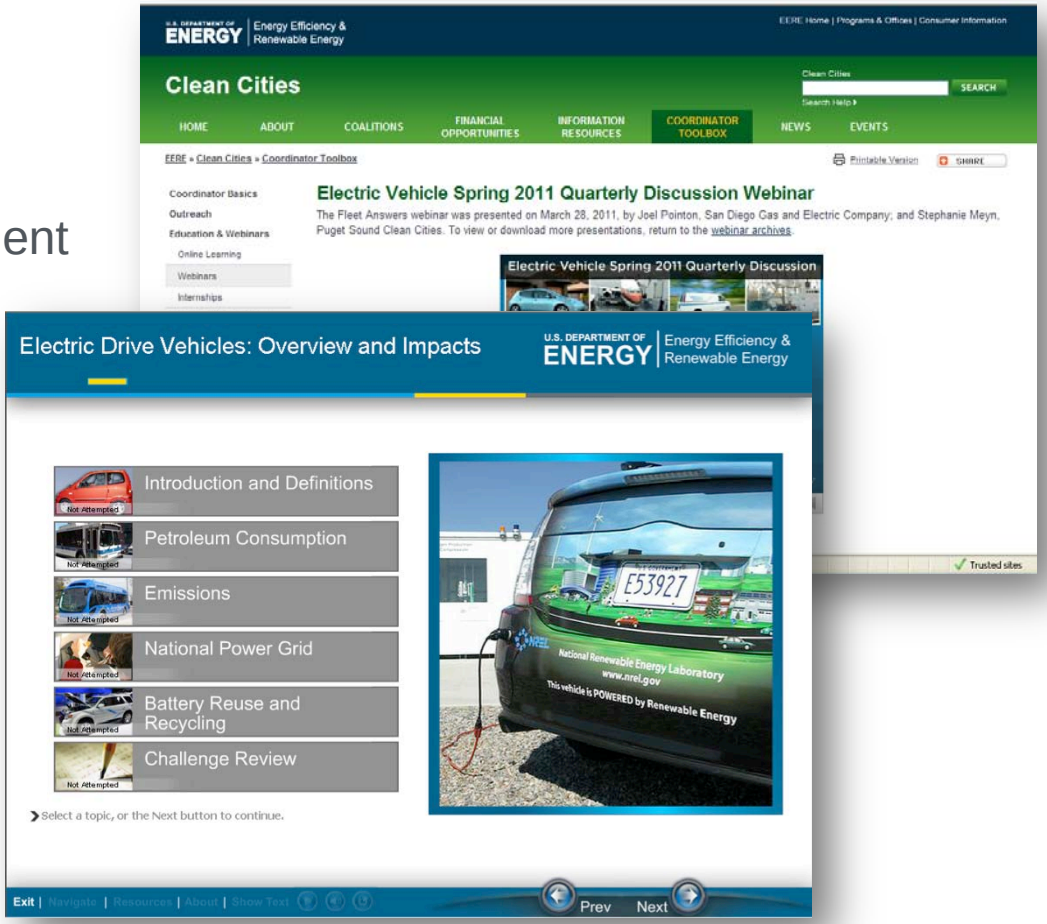
Training & Education

Clean Cities University Courses

- Electric Drive Vehicles: Overview and Impacts

Quarterly EV Webinars

- Lessons learned
- Best practices for deployment
- Training opportunities



Training & Education

Residential Charging Installation Video

- Electrical contractors and installers
- Permitting officials and inspectors
- Collaborative effort between Clean Cities, OEMs, Utilities, EVSE suppliers

Community Readiness Workshop

- Clean Cities Coalitions are developing community EV readiness plans
- Videos of presentations available for local workshops

Residential Charging Installation Training

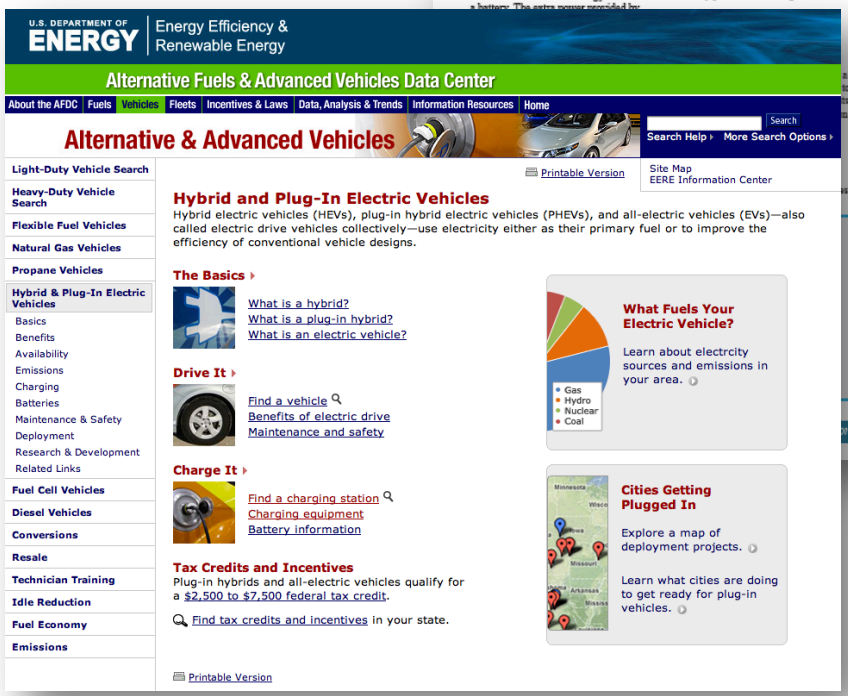
WWW.CLEANCITIES.TV

Publications & Outreach

Hybrid and Plug-In Electric Vehicles fact sheet

Plug-In Electric Vehicle Handbooks (coming soon)

- Consumers
- Fleet Managers
- Station Owners
- Electrical Contractors



Thank you!

NREL's Advanced Technology Vehicle Fleet at Bandimere Speedway

Mike Simpson

Mike.Simpson@NREL.gov

For more information please visit the AFDC:

http://www.afdc.energy.gov/afdc/

Alternative Fuels and Advanced Vehicles Data Center Toolkit

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- Alternative Fuel Station Locator
- Emissions Calculator
- Cost Estimations*
- State and Federal Incentives
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