Photo by Dennis Schroeder, NREL 57502.

Need help planning for the future of electric vehicles?

DOE's tools help states make informed decisions about implementing electric vehicles and their charging infrastructure.

States increasingly must make informed decisions about electric vehicles (EVs) and related charging infrastructure. These decisions will determine the future of vehicle electrification. To do so, many states will use funds from the Environmental Mitigation Trust Agreements from the Volkswagen Clean Air Act Settlement.

Under this settlement, Volkswagen will provide a combined $2.9 billion to all 50 states, Puerto Rico, and the District of Columbia for projects that help reduce nitrogen oxide (NO_x) emissions through the use of alternative fuels and technologies like EVs. California alone will receive $423

million, and 20 other states will each receive at least $50 million. Another $59.4 million will go to Tribal beneficiaries.

To leverage funds most efficiently and maximize the value of EV-related investments, states need information, data, and tools to help model scenarios and plan for the future of EVs locally.

The U.S. Department of Energy (DOE) and its national laboratories provide extensive information on EVs including both community planning and charging infrastructure. This information can help states implement EV and charging infrastructure projects using settlement funds. The following tools represent a sampling of key DOE resources available to states and other jurisdictions.

Community Planning

EV Plus Grid Workshop Initiative
evplusgridworkshop.com

- An initiative to explore and discuss the transition to EVs from different stakeholder perspectives

- Facilitates conversations about pilot programs and industry applications to share knowledge and experiences with EVs and charging infrastructure

Clean Cities Coalition Network
cleancities.energy.gov

U.S. Department of Energy

- Local coalitions that connect transportation stakeholders with experts, information, and resources to assist with alternative fuels, fuel economy improvements, and emerging transportation technologies

- Helps states find answers to technical questions, overcome obstacles to deploying alternative fuels and advanced vehicles, and make informed decisions to reduce fuel use

Transportation-Related Consumer Preference Data
nrel.gov/transportation/consumer-data.html

- Data and analysis on consumer preferences for alternative fuel and advanced vehicles and their effects on energy use in transportation

- Enhances understanding of opportunities and barriers for implementing projects for alternative fuel and advanced vehicles

SLOPE: State and Local Planning for Energy
gds.nrel.gov/slope

- A tool that enables data-driven energy planning by integrating dozens of sources for energy efficiency, renewable energy, and sustainable transportation data and analyses

- Conveys intricate data to decision makers that can enable deeper analyses of energy planning scenarios

TEMPO: Transportation Energy and Mobility Pathway Options
nrel.gov/transportation/tempo-model.html

- A national transportation demand model that allows for production of long-term scenarios that incorporate EV charging behavior and charging infrastructure

- Increases awareness of potential transformations in energy demand, connections to other industries, and opportunities for transportation technology/fuel adoption

Charging Infrastructure

Electric Vehicle Infrastructure Projection Tool (EVI-Pro) Lite
afdc.energy.gov/evi-pro-lite

- A tool to predict EV charging demand based on car travel patterns, EV attributes, and charging station characteristics

- Estimates how much EV charging infrastructure is needed at a city- and state-level, and helps utilities visualize how EV charging affects their energy load profile

Compass: Transportation Energy Analysis Model
anl.gov/tcp/compass-transportation-energy-analysis-model

- A model for the complex behavior and interactions between travelers, agencies, and service providers for EV charging

infrastructure planning, technology adoption, and systems optimization

- Anticipates the long-term energy and environmental impacts of new transportation trends based on consumer choices and stakeholder decisions

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Alternative Fueling Station Locator
afdc.energy.gov/stations?fuel=ELEC

- A tool for locating existing charging stations for EVs (also available as a map of charging ports by state: afdc.energy.gov/data/10366)

- Supports EV charging infrastructure planning and nominating highways under the Federal Highway Administration's Alternative Fuel Corridors Program: fhwa.dot.gov/environment/alternative_fuel_corridors

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DER-CAM: Distributed Energy Resources Customer Adoption Model
gridintegration.lbl.gov/der-cam

- A model for optimizing distributed energy resource investments for buildings and multi-energy microgrids

- Facilitates decisions about EV charging infrastructure by modeling renewable microgrids and analyzing the impact on the electric grid

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ENGAGE Energy Modeling Tool
nrel.gov/state-local-tribal/engage-energy-modeling-tool.html

engage

- A tool for planning and simulating cross-sector energy systems with high shares of variable generation and storage at geographic scales ranging from remote villages to entire continents

- Supports planning electricity generation and transmission assets as well as

analyzing the implications of complex energy decisions based on cost, land, and EV charging infrastructure

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Electric Vehicles

GREET: Greenhouse gases, Regulated Emissions, and Energy use in Technologies Model
greet.es.anl.gov/greet.models

- A tool for simulating the energy use and emissions output of various vehicle and fuel combinations to consider greenhouse gas emissions, water consumption, and air pollutants

- Provides a complete picture of the energy and environmental impacts of vehicle technologies by considering the full life cycle from well to wheels

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Autonomie Vehicle System Simulation Tool
autonomie.net

- A software environment and framework that uses MATLAB for automotive control-system design, simulation, and analysis to model energy consumption and vehicle performance

- Assesses the cost and energy consumption of advanced vehicle technologies

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Advanced Vehicles Testing Data
avt.inl.gov/evse-type/all-evse-types

- Research results and benchmark data to validate the performance of EVs and charging infrastructure, including wireless charging, conductive charging, and power quality

- Aids development of codes and standards for EVs and charging systems using data and results from on-road and laboratory testing and evaluation

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AFLEET: Alternative Fuel Life-Cycle Environmental and Economic Transportation Tool
afleet-web.es.anl.gov/home

- A tool to examine the environmental and economic costs and benefits of alternative fuel and advanced vehicles

- Estimates petroleum use, greenhouse gas emissions, air pollutant emissions, and cost of ownership for light-duty and heavy-duty vehicles

Fleet DNA: Commercial Fleet Vehicle Operating Data
nrel.gov/transportation/fleettest-fleet-dna.html

- A tool for visualizing the broad operational range of medium- and heavy-duty vehicles in commercial fleets from various vocations and weight classes

- Informs decisions about advanced vehicle technologies based on data from commercial fleets with similar vehicle applications

Alternative Fuel and Advanced Vehicle Search
afdc.energy.gov/vehicles/search

- A tool that helps fleets find and compare alternative fuel vehicles, engines, and hybrid/conversion systems

- Identifies EVs available on the market (also see the chart of EV Registrations by State: afdc.energy.gov/data/10962)

Find a Car
fueleconomy.gov/feg/findacar.shtml

- A tool for finding and comparing light-duty vehicles, including EVs and plug-in hybrids, by make, model, class, MPG, and more

- Includes fuel economy ratings, cost estimates, and emissions ratings for light-duty vehicles

Federal Fleets EV Champion Training
energy.gov/eere/femp/electric-vehicles-federal-fleets

- A four-part training series that covers core concepts needed for adopting EVs and planning for charging infrastructure

- Educates fleet and facility managers interested in developing expertise on vehicle electrification

Examples of State EV Strategies

Investments in EV charging from utilities and programs supported by DOE and others have enabled some states to implement new strategies, which serve as a model for others. Examples include:

EV Charging for Multi-Unit Dwellings

Find resources from the Alternative Fuels Data Center for EV charging at multi-unit dwellings, such as condos and apartments. afdc.energy.gov/fuels/electricity_charging_multi.html

Utility Charging Programs

Search the Laws and Incentives database on the Alternative Fuels Data Center for utility and state incentives for EVs. afdc.energy.gov/laws/search

Electric School Buses

Explore resources on electric school buses from the Alternative Fuels Data Center. afdc.energy.gov/vehicle-applications/school-transportation

Learn about Electric School Bus Evaluation from the National Renewable Energy Laboratory. nrel.gov/transportation/fleettest-electric-school-bus.html ∎

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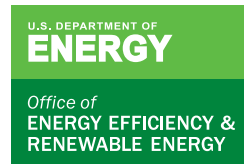
For more information, visit:
energy.gov/eere/wipo