



Federal Energy
Management Program

Federal Home- to-Work Electric Vehicle Program Guide

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List of Acronyms

AC	alternating current
AFV	alternate fuel vehicle
BEV	battery electric vehicle
CFR	Code of Federal Regulations
DOE	U.S. Department of Energy
EIA	U.S. Energy Information Administration
EV	electric vehicle
EVSE	electric vehicle supply equipment
FAST	Federal Automotive Statistical Tool
FCEV	fuel cell electric vehicle
FEMP	Federal Energy Management Program
FleetDASH	Fleet Sustainability Dashboard
GOV	government-owned vehicle
GSA	General Services Administration
NREL	National Renewable Energy Laboratory
PHEV	plug-in hybrid electric vehicle
ZEV	zero-emission vehicle
ZPAC	ZEV Planning and Charging

Executive Summary

One mission of the U.S. Department of Energy's Federal Energy Management Program (FEMP) Fleet program is to help federal fleet managers meet or exceed statutory requirements related to energy and environmental performance. To further this mission, FEMP provides resources to support Federal agencies with acquiring alternative fuel vehicles (AFVs) and reducing petroleum use. Electric vehicles (EVs) are AFVs and help agencies meet federal fleet requirements. Federal fleets include government-owned EVs used for home-to-work travel. The purpose of this document is to serve as a guide for Federal agencies in developing their own internal program documents to manage government-owned EVs used for home-to-work travel. Federal agencies should consult their counsel and consider their own policies and authorities in the implementation of any policies or best practices regarding government-owned EVs used for home-to-work travel.

The guide provides key considerations for agencies, including launching a pilot program to fine-tune best practices, conducting a cost-benefit analysis to compare home versus public charging, and exploring cost-effective solutions, such as installing standard outlets instead of dedicated charging stations. The guide underscores the importance of legal and financial considerations, such as verifying agency authority to install home charging infrastructure at an employee's home, ensuring the availability and appropriateness of using agency funds for home charging infrastructure, and understanding the tax implications of reimbursements.

Given the unique challenges of charging these vehicles at an employee's residence, this guide also provides information to help an agency determine the need for EV charging infrastructure at an employee's home to support government EV charging. It outlines alternative methods for collecting charging data for reporting purposes and reimbursing employees for the electricity used.

In summary, this document serves as a comprehensive guidance resource for Federal agencies in developing their own program resources that promote the efficient and effective use of EVs for home-to-work travel while ensuring compliance with Federal regulations and sustainability objectives.

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1 Introduction

This document is intended to serve as a guide for Federal agencies in developing their own internal program documents regarding government-owned electric vehicles (EVs) used for home-to-work travel. Developed by the U.S. Department of Energy's (DOE's) Federal Energy Management Program (FEMP) and the National Renewable Energy Laboratory (NREL), this guide offers suggestions and considerations as agencies build out their own best practices around requirements for home charging government-owned EVs.

1.1 Background

One mission of the FEMP Fleet program is to help Federal fleet managers meet or exceed statutory requirements related to energy and environmental performance. To further this mission, FEMP provides resources to support Federal agencies with acquiring alternative fuel vehicles (AFVs) and reducing petroleum use. EVs are AFVs and help agencies meet Federal fleet requirements.

1.2 Applicability

This guide focuses on EVs, including battery-electric vehicles (BEVs) and plug-in hybrid electric vehicles (PHEVs), both of which are considered zero-emission vehicles (ZEVs). While a fuel cell electric vehicle (FCEV) is also considered a ZEV, FCEVs are not addressed in this guide. If an FCEV is placed with an employee authorized for home-to-work, the employee will fuel the vehicle with hydrogen at an agency-owned or publicly available hydrogen fueling station. If future FCEVs include an option to plug in for electricity, then FCEVs may be considered for future home charging.

EV charging infrastructure can refer to an outlet used to charge the EV or a charging station, which is also referred to as electric vehicle supply equipment (EVSE). For home charging, an agency may consider two types of EV charging infrastructure for an employee's home: Level 1 and Level 2. The type of EV charging infrastructure required will depend on the type of EV (BEV or PHEV), battery size or capacity, dwell time (how long the EV is at one location and can regularly be plugged in), and daily driving requirements. A summary of Level 1 and Level 2 EV charging is shown in Table 1.

Table 1. EV Charging at Home: Level 1 and Level 2 Specs and Use Cases

	Level 1 Charging	Level 2 Charging
Voltage	120-V alternating current (AC)	208- or 240-V AC
Electrical Service Type	Conventional wall outlet and three-prong plug or hardwired	14–50 National Electrical Manufacturers Association outlet or hardwired
Charging Time-to-Range Ratio	2–5 miles of range per hour of charging	~25 miles of range per hour of charging
Applications	PHEVs and BEVs with lower daily vehicle miles traveled or infrequent trips	BEVs

1.3 Assumptions

This section identifies key considerations regarding legal and financial authority for a Federal agency to implement programs on home-charging government-owned EVs. Note that this is not an exhaustive list. As each agency's situation may differ, agencies should review and verify these considerations in advance of implementing programs to install home-charging equipment for government-owned EVs for employees who have home-to-work authorization. This guide is drafted on the assumption that the following key considerations have been verified by individual agencies:

- Agency has determined that it has the legal authority to install EV charging infrastructure required to charge a government-owned EV at an employee's home.
- Employees will only be authorized for home-to-work transportation consistent with applicable Federal laws. By statute, certain Federal officials are authorized for home-to-work transportation, as are employees who meet certain statutory criteria, as determined by their agency head. The Federal officials authorized by statute are the president, the vice president, and other principal Federal officials and their designees, as provided in [31 U.S.C. 1344\(b\)\(1\)](#) through [\(b\)\(7\)](#). Those employees engaged in field work or faced with a clear and present danger, an emergency, or a compelling operational consideration may be authorized for home-to-work transportation, as determined by their agency head. No other employees are authorized for home-to-work transportation.
- Agency has budget to cover costs to install the EV charging infrastructure required to charge a government-owned EV at an employee's home, as well as the costs to reimburse an employee for the electricity used to charge the government-owned vehicle (GOV) at their home. Agencies should confirm with their legal counsel whether such expenses would be considered a personal expense. Agencies should also complete necessary expense analysis to authorize these expenses/reimbursements. See Section 1.4 for more information on necessary expense analyses.

- Agency should determine whether compensation for EV charging infrastructure costs or accidental overpayment is considered taxable income or a legitimate reimbursable expense.
- Agency has an existing home-to-work policy in place that complies with 41 Code of Federal Regulations (CFR) §102-5—Home-to-Work Transportation.¹

1.4 Necessary Expense Analysis

EVs authorized for home-to-work use will require access to EV charging infrastructure at or near employee homes. Agencies should conduct a necessary expense analysis to determine whether they have the authority to use appropriated funds to directly pay employees or their installation contractors for the costs of (1) installing or repairing an agency-owned charging station at employee homes, (2) upgrading employees' existing electrical equipment to allow for charging, and (3) electricity used to charge government-owned EVs at employee homes.

A necessary expense analysis is a routine analysis regularly conducted by agency general counsel offices in coordination with agency budget offices. Agencies are encouraged to conduct this analysis at the department/agencywide level to reduce administrative burden, and to work from existing authorized reimbursements, as this type of necessary expense for charging home-to-work authorized vehicles is largely analogous to other necessary expenses the agency has likely already approved.

1.5 Best Practices

When developing agencywide program documents for home-to-work EVs, agencies should consider the following best practices:

- Start with a pilot program at a single site or a few strategic sites. Identify a small subset of home-to-work authorized employees to assign an EV. Track lessons learned from the pilot program and update internal practices as needed.
- Before determining whether home charging is needed at the employee's home, first identify whether the home-to-work vehicle has an alternative reliable charging method during the workday (e.g., on-site charging where the employee works).
- Conduct a cost-benefit analysis to compare the costs of using on-site or public charging versus the costs of installing and using EV charging infrastructure at the employee's home.
- Consider installing a 120-V or 240-V outlet rather than a hardwired Level 2 EVSE unit. Installing outlets costs less and may not require relinquishing equipment if the employee no longer requires a government-owned EV.
- Consider a Level 1 (120-V) outlet to charge PHEVs and low-mileage BEVs when:
 - Level 1 provides sufficient charging for the home-to-work EV to meet the operations/mission requirements

¹ See <https://www.ecfr.gov/current/title-41/subtitle-C/chapter-102/subchapter-A/part-102-5>.

- The employee has a 120-V outlet sufficiently close to their off-street parking space for the government-owned EV
 - The employee's electrical panel only has capacity for adding a 15- to 20-A breaker and adding Level 2 (e.g., 40 A) would require a panel upgrade.
- Consider limiting acceptance to the pilot program to employees who own a home and have available off-street parking. Nonetheless, for longer-term efforts, the agency program documents should also address requirements that may be needed to support charging home-to-work EVs in rental units and homes that lack off-street parking.
- Where feasible, install telematics in all home-to-work EVs to track electricity used at the employee's home to charge the government-owned EV. Telematics offers the most reliable solution to gather and report required EV charging data. If installing telematics on the vehicle is not feasible, alternative methods are described in Section 5.1 for metering charging data.
- For employees that are on call or may need to respond to emergencies, consider creating program guidance that requires the EV to be brought home with a minimum state of charge (e.g., 80%) or a full fuel tank (if PHEV) when parked at the employee's home. This will ensure that the vehicle will be able to respond to a call or emergency as needed.

2 Roles and Responsibilities

Successful implementation of a home-to-work EV program requires that multiple organizations engage in a coordinated effort (Figure 1). Key responsibilities in this effort are managed between what this guide refers to as the National Project Leader, which would support the agency's home-to-work program, and a designated Facility Coordinator, which would support the local agency site. In large organizations, Regional Coordinators may be required to help manage the reporting and create a consistent methodology for the region. Each agency will likely use different titles for these roles, but these titles are meant to represent roles held within the agency to lead efforts for developing and deploying the home-to-work EV program. Further, there will likely be many other roles and departments involved in developing, approving, and deploying the home-to-work EV program, but for simplicity and to provide an example, refer to the roles discussed below.



Figure 1. EV home-to-work charging program workflow

Illustration by Fred Zietz, NREL

The primary objective of these roles is to launch a successful program that serves the needs of users and complies with any agency requirements and needs.

- **National Project Leader:** Responsible for developing and distributing the agency home-to-work vehicle program documents and providing oversight to the program, which includes ensuring that the practices comply with Federal law and regulations as well as internal agency policies. This role is also responsible for coordinating the

necessary expense analysis to determine whether appropriated funds are available for agencies to reimburse employees for work-related expenses, including expenses related to charging an EV at an employee's home. To help ensure consistency across the agency, the National Project Leader should also provide agency-specific recommendations for the tracking of electricity use, developing electricity reimbursement rates for government-owned EV charging at an employee's home, and guidance on decision-making for when electrical upgrades are permitted at an employee's home for the purpose of charging a government-owned EV.

- **Regional Coordinator (Optional):** Responsible for reporting to the National Project Leader on the program effectiveness and to serve as a resource for Facility Coordinators. Agency structure and size will determine whether one or more Regional Coordinators will be necessary to serve as intermediaries between the National Project Leader and each Facility Coordinator.
- **Facility Coordinator:** Responsible for identifying employees that are authorized for home-to-work vehicles, placing EVs with the employee, and being the employee's main point of contact for questions about the program. They will manage the process for determining whether electrical upgrades are needed in the employee's home, determining and sharing the electricity reimbursement rate for government EV home charging, running reports each month to reimburse the employee, and tracking data as necessary for agency-level Federal Automotive Statistical Tool (FAST) reporting requirements.
- **Employee:** The Facility Coordinator will need to work closely with the employee when placing a home-to-work EV. Installing circuits and charging equipment in an employee's home and reimbursing for electricity use to charge a government EV is a new concept, and it may take some time for employees to feel comfortable. Some level of training may need to be provided to the employee on both the home-to-work EV reimbursement program and how to use the EV.

3 Vehicle Assessment

When placing a home-to-work government-owned EV with an employee, it is helpful to understand how the vehicle will be used and where the vehicle is parked throughout the day. This information can be used to determine what vehicle make/model options may be suitable for placement, including considerations to the vehicle size/type, range requirements, BEV or PHEV, and other vehicle specifications necessary for mission operations. For a list of ZEVs and their stated electric range, refer to the General Services Administration's (GSA's) Zero Emission Vehicle fact sheet.²

FEMP's ZEV Planning and Charging (ZPAC) tool³ and the Fleet Sustainability Dashboard (FleetDASH)⁴ are two tools that can help analyze ZEV suitability for home-to-work vehicles. These tools provide a detailed analysis of the ZEV suitability for each existing vehicle in an agency's inventory. Use the ZPAC tool for agency- or site-level analysis, and FleetDASH when looking at a vehicle or subset of vehicles.

In addition to identifying ZEV suitability, FleetDASH also examines where fueling events take place (e.g., gas stations used to fill the vehicle) and whether existing public EVSE is nearby. This can help fleet managers understand public charging opportunities for a potential home-to-work vehicle.

² GSA, <https://www.gsa.gov/buy-through-us/products-and-services/transportation-and-logistics-services/fleet-management/fleet-electrification/alternative-fuel-vehicles>.

³ FEMP, <https://www.energy.gov/femp/using-zero-emission-vehicle-planning-and-charging-tool>.

⁴ DOE, <https://federalfleets.energy.gov/FleetDASH/>.

4 Home-to-Work EV Charging Infrastructure

4.1 Assessing Charging Infrastructure Needs

There are three main options for charging a home-to-work EV: (1) charge at agency EVSE; (2) charge at public EVSE; or (3) charge at the employee's home. The decision tree in Figure 3 on the next page serves as a model to help determine what type of charging should be considered for the employee assigned a home-to-work EV. If the agency determines that home charging is appropriate, the agency should collect additional information from the employee regarding where the vehicle will be placed and primarily dwell when not used. An example employee survey is provided in the Appendix, which provides suggested questions for employees to answer to help the Facility Coordinator make an informed decision as to whether EV charging is recommended to be installed at the employee's home.

If the agency determines that home charging is appropriate, consider whether a Level 1 or Level 2 charger is needed to meet the vehicle's operational needs. For PHEVs, Level 1 charging is sufficient to recharge the battery if it charges overnight daily. For BEVs, the right choice will depend on the miles the vehicle travels and how long the vehicle dwells at the charging location. If installing EV charging infrastructure at an employee's home, consider that Level 1 charging is cost-effective, minimizes capital investment, and can often meet the vehicle's recharging needs. An example of the state of charge of a BEV (the state of charge being how much charge the vehicle has at any given time) that travels 50 miles per day and has access to a Level 1 charger to recharge overnight is shown in Figure 2.

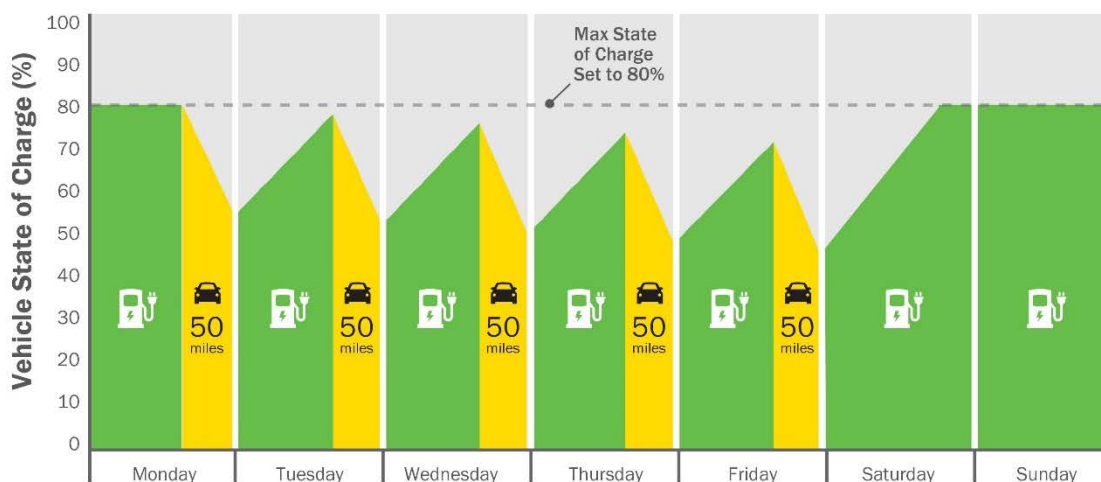


Figure 2. Example of a fleet vehicle state of charge using a Level 1 EVSE overnight

Illustration by Fred Zietz, NREL

Home Charging Decision Tree

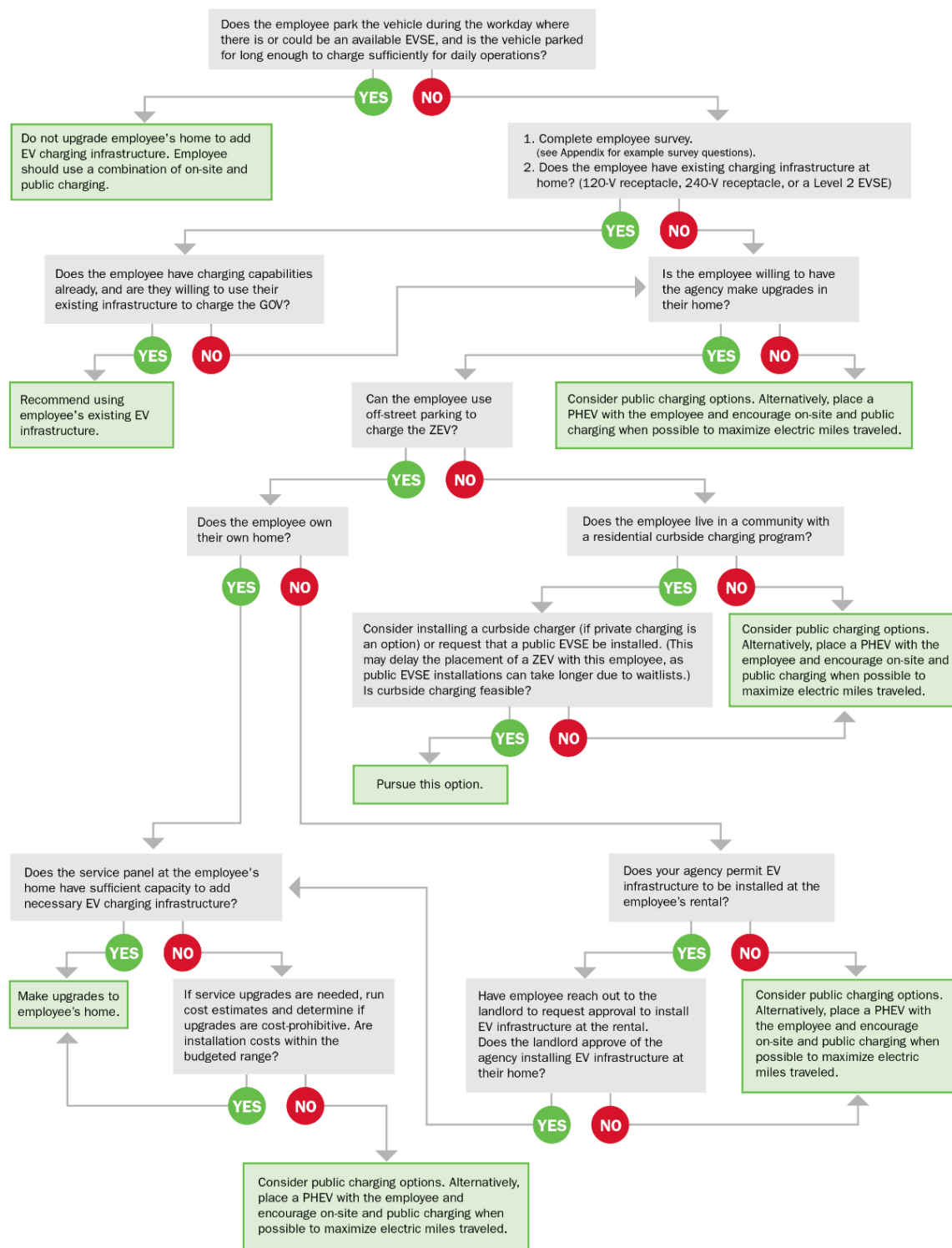


Figure 3. Example home charging decision tree

Illustration by Fred Zietz, NREL

Importantly, an employee might move to another home location or to a job that no longer requires the use of a home-to-work vehicle. The infrastructure assessment must be reevaluated each time an employee moves, when the electrical capacity changes at the employee's home, and when the home-to-work vehicle's operational needs or mission changes, to assess whether the change impacts the EV's charging needs.

4.2 Installation

For home-to-work EVs for which the recommendation is to make upgrades to an employee's home, National Project Leaders should create agency guidance for the Facility Coordinators to identify the most cost-effective charging and installation strategies. Below are suggested best practices to incorporate into agency program documents:

- Before completing any work or analysis, the Facility Coordinator should get authorization from the employee. The employee should decide whether to participate in the home-charging reimbursement program. If the employee is a renter, obtain written authorization from the landlord as well.
- Include guidance on how to complete an assessment of the employee's home and what information to collect during the assessment to create consistency between sites. See the Appendix for an example employee survey.
- If the employee has existing EV charging infrastructure, such as a 120-V/240-V outlet or Level 2 EVSE, the Facility Coordinator should:
 - Confirm with the employee that they are willing to use that existing infrastructure to charge the government-owned EV
 - Ensure that the EV charging infrastructure power level is sufficient to support the agency mission
 - Complete a home assessment to verify that the existing infrastructure has been installed to code. A physical site inspection may not be required, and photographs may be sufficient for verification.
- For those employees that require electrical upgrades to their home to either add a 120-V/240-V outlet or EVSE, the Facility Coordinator should:
 - Retain the services of a certified electrician to complete the required work
 - Receive written authorization that the employee (and property landlord if the employee rents) is willing to have the infrastructure installed
 - Work with the employees to coordinate installation.

Table 2 includes different options that could be considered if it has been determined that home charging is appropriate.

Table 2. At-Home EV Charging Infrastructure Installation Options

Option	Use This Method If...
Utilize Existing EV Charging Infrastructure	<ul style="list-style-type: none"> Employee already has EV charging infrastructure in place. Facility Coordinator has determined that the available charger type (e.g., Level 1, Level 2) is sufficient to meet the charging needs of the home-to-work EV. Electrician has confirmed that the existing infrastructure was built to code. The Facility Coordinator has confirmed with the employee that the existing infrastructure is within reach of a parking space and will be available to use to charge the home-to-work EV as needed to meet operations.
Install 120-V Outlet	<ul style="list-style-type: none"> Facility Coordinator has confirmed that a Level 1 charger will be sufficient to charge the home-to-work EV as needed to meet operations. Electrician has verified that the existing panel has capacity to install a 120-V outlet. Facility Coordinator has confirmed with the employee that the placement of 120-V outlet will be within reach of a parking space that can regularly be used to charge the home-to-work EV as needed to meet operations.
Install 240-V Outlet	<ul style="list-style-type: none"> Facility Coordinator has confirmed that a Level 2 charger is needed to charge the home-to-work EV as needed to meet operations. Facility Coordinator has confirmed that the EV will either come with a 240-V adaptor for the cord set or one will be purchased. Electrician verified that there is capacity in the existing panel to install a 240-V outlet. Facility Coordinator has confirmed with the employee that the placement of 240-V outlet will be within reach of a parking space that can regularly be used to charge the home-to-work EV.
Install Plug-In Level 2 EVSE	<ul style="list-style-type: none"> Facility Coordinator has confirmed that Level 2 EVSE is needed to charge the home-to-work EV to meet operations. Facility Coordinator has determined that using a 240-V outlet is not recommended for the installation (e.g., network capabilities are required to track electricity use for reimbursement). Facility Coordinator has confirmed with the employee that the placement of the Level 2 EVSE will be within reach of a parking space that can regularly be used to charge the home-to-work EV as needed to meet operations. Level 2 EVSE would be considered property of the agency and would need to be tracked and inventoried as required per CFR 2 CFR § 200.311. If/when the employee no longer needs the government-owned EVSE or if they move, there should be program guidance in place for how the employee is required to relinquish the EVSE back to the agency.
Install Hardwired Level 2 EVSE	<ul style="list-style-type: none"> Facility Coordinator has confirmed that a Level 2 charger is needed to charge the home-to-work EV to meet operations. The Facility Coordinator has confirmed with the employee that the placement of Level 2 EVSE will be within reach of a parking space that can regularly be used to charge the home-to-work EV to meet operations. Level 2 EVSE would be considered property of the agency and would need to be tracked and inventoried as required per CFR 2 CFR § 200.311, Real Property.⁵ If/when the employee no longer needs the government-owned EVSE or if they move, there should be program guidance in place for how the employee is required to relinquish the EVSE back to the agency.

⁵ See <https://www.ecfr.gov/current/title-2/subtitle-A/chapter-II/part-200/subpart-D/subject-group-ECFR8feb98c2e3e5ad2/section-200.311>.

4.3 Infrastructure Costs

The National Project Leader should collaborate with the Facility Coordinator to develop localized cost thresholds for Level 1 and Level 2 EV charging infrastructure installations. These thresholds can serve as targets, helping to identify cost-effective installation projects. Although most projects should adhere to these targets, unique situations may warrant approval for projects exceeding the target spend, which should be assessed on a case-by-case basis.

This guidance suggests two general approaches to managing infrastructure costs for home EV charging installations. The first approach involves the Facility Coordinator managing the installation at the employee's home. This includes the Facility Coordinator retaining a contractor for the installation; obtaining, reviewing, and approving quotes; and paying the contractor directly for the approved installation.⁶ The Facility Coordinator would also be responsible for coordinating with the employee throughout this process.

The second approach is giving an employee a set allowance amount to cover the costs of adding EV charging infrastructure to their home, in which case the employee would retain a contractor to complete the installation. This option should only be utilized if the agency has the authority to provide an employee an allowance for this purpose. The National Project Leader should discuss and understand the scope of tax implications with agency counsel. This allowance would cover the cost of electrical upgrades and necessary hardware and equipment for the installation. After the installation, agencies should have a professional and licensed contractor inspect the setup to ensure it meets relevant code requirements before the government-owned EV begins charging at the employee's home.

Employees receiving an allowance may be eligible for Federal, state, utility, and/or local incentives to help cover all or part of the installation costs. To learn about potential Federal tax credits for residential EV charging, refer to the Alternative Fuels Data Center information on Federal tax credits for EVs and charging infrastructure.⁷ To look up available incentives for home charging, use the Alternative Fuels Data Center Laws and Incentives and search by jurisdiction (Federal and state) of employee's home.⁸

⁶ Agencies should consult their legal counsel to ensure that applicable contracting and procurement authorities are followed in providing home EV charging installations.

⁷ DOE Office of Energy Efficiency and Renewable Energy, Alternative Fuels Data Center, <https://afdc.energy.gov/laws/ev-tax-credits>.

⁸ Alternative Fuels Data Center, https://afdc.energy.gov/laws/search/#/?technology=ELEC&technology=PHEV&incentive=RBATE&incentive=TAX&user=IND&status=enacted&status=amended&law_type=INC&law_type=STATEINC&law_type=UPINC&jurisdiction=US.

5 Electricity Tracking and Reimbursement

5.1 Metering Electricity Used To Charge Home-to-Work EVs

Federal agencies report fuel consumption for all fleet vehicles to FAST each year, which includes electricity used in authorized home-to-work EVs. The following vehicle-level data are required in the annual FAST submission:

- **Vehicle identification:** to assign charging events to a vehicle
- **Date:** to determine the fiscal year of the fueling event
- **Location:** to separate out the amount of fuel added to the vehicle and the cost of the fueling event by state
- **Fuel/type volume:** to report the estimated fuel consumption of the vehicle (for a BEV, this includes just the electricity in kilowatt-hours consumed by the vehicle; for a PHEV, this includes both the electricity in kilowatt-hours and number of gallons for any other fuel sources, such as gasoline, consumed by the vehicle)
- **Fuel cost:** to report on the cost of the fueling event for vehicles where the cost of fueling is not covered in the vehicle's monthly lease (e.g., agency-owned vehicles).

While not required, FEMP recommends that fleets track data, including charging and fueling information, through their Fleet Management Information System throughout the year and not just look at their vehicle-level data at the end of the fiscal year. Effective fleet management needs reasonably complete, current, and accurate information about the vehicles and their operations throughout the year.⁹

Four options are presented below to identify best practices and the different options for tracking electricity used to charge home-to-work EVs.

5.1.1 Best Practice: Use Vehicle Telematics Data



Vehicle telematics provides the best practice for measuring EV electricity consumption on a vehicle level. EVs with telematics devices installed provide simple and accurate reporting of electricity fueling for both BEVs and PHEVs.

Fleet vehicles that have a telematics device installed are capable of tracking vehicle charging data. Telematics track charging sessions for a vehicle, including the date, location, charging time, beginning and ending state of charge, and total kilowatt-hours added during the session (referred to as Energy Added in Geotab's EV charging report, for example). This provides simple and accurate reporting of the total electricity consumption of the EV through the previous fiscal year.

Once it has been determined that an employee will be issued a home-to-work EV, a zone or geofence can be added around the employee's home in telematics. Reach out to your

⁹ In general, agencies should strive to request the minimum amount of information required for tracking and reimbursements. Agencies should consult with their legal counsel and privacy experts to ensure that personally identifiable and sensitive information is being stored, tracked, managed, and viewed pursuant to relevant authorities.

telematics point of contact for instruction and guidance on how to create a geofence, or zone around an employee's home, and generate an EV charging report with the necessary data. The information from this charging report can be used to track the previous month's electricity added to the home-to-work EV at the employee's home.

Below are a few considerations if/when using telematics to track the energy added to the home-to-work EV at the employee's home to calculate a reimbursement for the electricity used to charge the government-owned EV:

- The zones added to the telematics dashboard around employee homes must be updated regularly to account for employees moving to a new location and to add/remove zones as home-to-work vehicles are assigned/reassigned. This will likely be the responsibility of the Facility Coordinator.
- Administrative access can restrict who within the telematics dashboard can view the GPS locations of home-to-work vehicles. Employee home address information is personally identifiable information, and only authorized users may view the vehicle location within a telematics system and run EV charging reports. Refer to your site or agency's cybersecurity assessment for guidance on access.
- Work with your telematics point of contact to create a customized report that automatically calculates kilowatt-hours added during charging sessions completed at the employee's home for the previous month and calculates the reimbursement amount based on the electricity reimbursement rate.
- For home-to-work EVs with telematics that have the option to turn off the location-sharing feature, referred to as Restricted Data Mode if using Geotab, the Facility Coordinator would still be able to run the EV charging report to capture the charging session data (vehicle identification, date and time, kilowatt-hours added, etc.), just without the charging location. For this method, the driver would also need to track the charging sessions (time stamp and location, such as home, public, on-site), and the Facility Coordinator would need to review the charging report to sum kilowatt-hours added during any home-charging sessions for the previous month to calculate the correct reimbursement amount.

5.1.2 Alternative: At-Home Networked EVSE



If telematics is not installed on the vehicle, then agency-owned networked EVSE could be installed at the employee's home to track electricity used to charge the government home-to-work EV using the EV service provider dashboard. Note that this option typically requires that the:

- Agency pays networking fees to access the charging data
- Employee has a wireless internet connection or cellular service that can reliably connect to where the EVSE is located.

5.1.3 Alternative: Networked Submeter



If telematics is not installed on the vehicle, then a networked submeter could be installed in the employee's panel used to charge the home-to-work EV. This option may require a monthly or annual networking fee to access the charging data and pay for the cellular service (if required), or it may be able to connect to the employee's home via wireless internet.

Some utilities offer specialized residential EV charging rates, where the electricity rate for charging an EV is different from the rate for other household electricity use. For employees living in areas served by such utilities, the utility typically installs a separate meter to track the electricity used specifically for charging an EV. This approach could serve as an alternative for agencies seeking to track electricity used to charge a government-owned EV at an employee's home. However, it would require the employee to share their utility bill each month.

If using this option, the employee may need to track when they charge the government EV versus when the power source is used for the employee's personal or nongovernmental purposes.

5.1.4 Alternative: Driver Charging Logs



If telematics is not installed on the vehicle, a log can be used for the driver to record the charging session data. Note that this option is not automatic and relies on the driver to submit accurate information for each charging event. For this option, the driver logs should collect, at a minimum:

- Vehicle identification
- Date
- Location
- Odometer at the start of the charging session
- Total kilowatt-hours added during the session (if available via the vehicle onboard computer or mobile app) or the state-of-charge percentage or miles before and after the charging session
- Cost to charge (for public EVSE charging sessions).

If using the state of charge from a driver log, the following equation can be used to estimate the kilowatt-hours added:

$(\text{vehicle battery size [kWh]}) * (\text{state of charge percentage increase during charging session}) = \text{kWh added during charging session.}$

If using this method, consider uploading the charging session data to the Fleet Management Information System on a regular basis. The logs can be used to sum kilowatt-hours for all charging sessions at the employee's home.

5.2 Electricity Reimbursement Rate

To reimburse employees for the electricity used to charge a home-to-work EV at their home, the agency may choose to develop an electricity reimbursement rate, or the agency may instead elect to establish a flat reimbursement rate. Rates should be reviewed and evaluated regularly in response to utility rate and tariff updates.

5.2.1 State Residential Reimbursement Rate

- Identify the state in which each employee's home is located.
- Determine the residential electricity rate for the state. The U.S. Energy Information Administration (EIA) publishes the average residential electricity rate for each state and updates them annually.¹⁰

5.2.2 Utility Service Territory Reimbursement Rate

- Use the U-Finder Tool¹¹ to identify the utility service territory in which employees with home-to-work EVs live.
- Determine the residential electricity rates for each of those locations. Use the EIA database to look up the average residential electricity rate for each utility¹² (updated every year). Alternatively, agencies can use NREL's Utility Rate Database¹³ to find specific utility tariff plans.

5.2.3 Unique Reimbursement Rate for Each Employee

- Create a form for employees to certify their home utility service and the rates (\$/kWh) that the utility charges them for electricity. Rates should be provided for different months (if they differ).
- Use the weighted average of the employee's utility rate for the different months to estimate the \$/kWh electricity rate for each employee to develop a reimbursement rate.
- Alternatively, have employees submit their utility bill each month so that the electricity reimbursement rate accounts for any monthly fluctuations. This could be submitted to the Facility Coordinator or hired out to be completed by a contractor.

5.2.4 Flat Rate

- This option may be ideal for vehicles in instances in which it will be challenging to track the amount of kilowatt-hours added to charge the vehicle at home (e.g., vehicles with telematics waivers and employees who decline networked EVSE or an EVSE meter).
- Determine a flat rate to reimburse employees for electricity used to charge the government-owned EV (e.g., \$/month). This could be based on an average residential

¹⁰ EIA, <https://www.eia.gov/electricity/data/browser/>.

¹¹ DOE, Alternative Fuels Data Center, <https://afdc.energy.gov/utility-finder>.

¹² EIA, https://www.eia.gov/electricity/sales_revenue_price/.

¹³ NREL, Utility Rate Database, https://openei.org/wiki/Utility_Rate_Database.

rate for the state and average miles driven by home-to-work vehicles. The flat rate should also consider the vehicle battery size and efficiency.

- Consider providing employees with the option to provide evidence if the flat rate reimbursement does not fully reimburse them for the amount they paid in electricity the prior month to charge the government-owned EV. Consider allowing them to submit that amount as a reimbursable expense.
- National Project Leaders should coordinate with their procurement and legal team to understand the tax implications of a flat rate reimbursement and communicate that to employees.

5.2.5 Employees Living in Multifamily Housing (or Using Private/Public EVSE)

- For employees with access to community EV charging stations, consider allowing the employees to expense their monthly charging expenses. If the community EVSE accepts the WEX fueling card, use the WEX card to track charging costs.
- Fees from multifamily EV charging stations commonly include costs for more than just electricity, including networking, maintenance, and profits. They often cost more than standard home charging.

5.3 Example Reimbursement Process

Below is an example reimbursement process.

- 1) Facility Coordinator uses monthly charging report to determine the total number of kilowatt-hours added to the home-to-work EV while charging at the employee's home.
- 2) Using the electricity reimbursement rate developed from the guidance in Section 5.2, the Facility Coordinator calculates the total reimbursement amount for each employee.
- 3) The Facility Coordinator provides the reimbursement amount with documentation to the employee.
- 4) The employee submits a reimbursement request through the normal expense reporting channels.
- 5) Each month, the accounting office reimburses the employee for the total electricity cost used to charge the home-to-work EV for the previous month.

6 Insurance and Liability

Agencies should ensure that contractors selected to support home-to-work installations have appropriate liability coverage. This may include coverage for installation as well as maintenance, repair, or replacement of the EV charging station hardware/equipment at an employee's home. The following bullets summarize considerations to reduce risk and liability to the agency:

- Ensure installation of the EV home-charging circuits and equipment is done using a licensed and insured professional electrical contractor and follows all local electrical codes, up to and including permits and final inspection of the EV home-charging circuits and equipment.
- Consider negotiating with the contractor to include a warranty period for the installation, in which the contractor would cover costs if the installation/equipment needed maintenance or repairs within that warranty period. Consider requiring the contractor to name the agency or facility as an additional insured and agree to indemnify the government. The Facility Coordinator should maintain a copy of all related documents that pertain to the installation of the EV home-charging circuit and equipment.
- For 120-V or 240-V outlet home installations (not an EVSE unit), consider relinquishing the ownership of the outlet to the employee.
- Determine the conditions under which the employee would be responsible for any maintenance, repair, or replacement of the EV charging station hardware/equipment at their home. This includes outlining if and how an investigation will be conducted to ascertain whether the agency or the employee is responsible for these costs. The employee's responsibilities in this regard should be clearly communicated to them.
- Consider documenting how the cost of repair or replacement of the EV charging equipment will be covered in the event of property loss.
- Consider documenting an employee's agreement to the agency's home-to-work program documents, which could include electricity reimbursement policy and process to report maintenance/repairs. Any documentation should be done according to the individual agency's employee agreement practices.
- Establish who the employee should contact if a loss occurs related to the installed EV home-charging infrastructure or equipment at the employee's home.

7 Pilot

When first starting a home-to-work EV program, consider beginning with a pilot effort. The pilot can be used as an opportunity to collect lessons learned that will help with plans to scale up the program. When identifying home-to-work EV candidates for the pilot, consider the following likely “ideal” EV placement candidates:

- Employee owns the home or has access to EV charging infrastructure that is reliably available to charge the home-to-work EV (either a 120-V/240-V outlet or EVSE).
- Employee volunteers to get an EV replacement and is positive about the program.
- Employee’s electric panel has capacity to add a breaker for a 120-V outlet, 240-V outlet, or Level 2 EVSE.
- Employee has an off-street parking spot in which to charge the government EV when needed.
- Vehicle has lower daily mileage and will not require midday public charging.
- Employee is willing to provide feedback on the program.

The goal of the pilot is to test the home-to-work EV best practices and identify modifications to enhance the program’s operations. Given the unique missions of each agency, a one-size-fits-all approach may not be effective. Therefore, a pilot program is crucial for agencies to determine the most effective ways to develop the program as well as how to communicate and train employees on home-to-work EV usage. This pilot will help refine the details, leading to a more successful rollout as additional EVs are gradually integrated into the fleet for home-to-work travel.

8 Additional Considerations

The National Project Leader should develop home-to-work EV program documents or amend the agency's existing policies to include considerations for EVs.

Other considerations that could be included, if relevant, are:

- **Driver education:** Training and other educational material will likely need to be developed to inform home-to-work EV drivers of new requirements for requesting charging reimbursement, such as instructions for submitting charging reimbursements, finding public charging stations, and changing vehicle settings to charge during off-peak hours to help keep electricity costs down.
- **Relinquishing of equipment:** When an employee no longer requires a home-to-work EV, the charging cords should be returned along with the vehicle. If a Level 2 EVSE or networked submeter was installed, consider creating guidance regarding how the Facility Coordinator should coordinate with the employee to initiate removal for use at another employee's home. This should not include removal of electrical infrastructure, including the circuit, conduit, wiring, and outlet. Documented home-to-work EV program guidance should provide instructions to employees regarding how and what must be returned.

9 Reporting

National Project Leaders and Facility Coordinators should be familiar with the required reporting listed below. In addition, National Project Leaders and Facility Coordinators should know what home-to-work EV data must be tracked and measured to meet these reporting requirements.

- FAST Annual Fleet Data Submission: Report on the fuel consumption for each fleet vehicle in the previous fiscal year in the fuel portion of the submission. For home-to-work EVs, this includes:
 - Total energy dispensed to the vehicle during charging events (i.e., number of kilowatt-hours added) when the vehicle charges at the employee's home, on-site, or at a public charging station
 - Cost of the energy dispensed to the vehicle, and the location (state) of the fueling.

If the vehicle charged in locations in more than one state during the fiscal year, one fuel entry with energy dispensed and cost is required for each state.

- For PHEVs, the fuel entries for electricity consumption may also be accompanied with similar fuel entries describing the vehicle's consumption of other fuels (e.g., gasoline).
- FAST Annual Fueling Center and EVSE Inventory Submission: Report on installed home-to-work EVSE in the "Data-HTW EVSE" tab. Home-to-work EV charging infrastructure should not be included in either the "Data-Fueling Centers" or the "Data-EVSE" tabs in this submission.
 - Each row of information on the "Data-HTW EVSE" tab includes all home-to-work charging infrastructure for a single ZIP code. This includes a point of contact (such as the National Project Leader or the Facility Coordinator) and the number and types of home-to-work EVSE in that ZIP code.
 - Agencies reporting on home-to-work charging stations in this submission must ensure that submitted information does not include any information about individual employees. The point of contact listed for each location should be an organizational contact, such as the Facility Coordinator or National Project Leader, and not the employee who has EV charging infrastructure installed at their home. Home-to-work employee names, contact information, and addresses must not be included. The FAST support team specifically reviews agency submissions for this type of information and will follow up with the agency point of contact if such information is included to request the agency resubmit without the information of concern.

Both FAST data submissions relevant to an agency's use of home-to-work EVs, described above, are intended to be coordinated at the agency headquarters level. An important element of successfully implementing a home-to-work EV charging program will be ensuring that the required information from the local program is managed throughout the fiscal year and available to the agency headquarters point(s) of contact responsible for those data submissions. For home-to-work EVs, this includes ensuring charging data for those vehicles (energy, cost,

location) is incorporated into the agency's fleet information management system(s) on a timely basis through the year just as any other type of fuel is. For EVSE installed at employee residences, this includes having current and complete information about locations, numbers, and types of EVSE installed in support of the home-to-work EV program.

Appendix: Example Questions for Employee Home Infrastructure Assessment

- Provide your name, email, and phone number.
- Where is your primary work location?
- What is your home address?
- Do you live in a single-family home, duplex, or townhouse? [Answer questions below if yes.]
 - Was your home built before 1960?
 - Do you own your home?
 - Do you have a garage?
 - Do you have an off-street parking space where the government-owned EV could park, and can the government-owned EV park there on a nightly basis?
 - Do you have existing EV infrastructure (120-V/240-V EVSE outlet) that you could use to charge the GOV? If 120-V or 240-V, is the outlet on a dedicated circuit (i.e., circuit not used to serve other uses, such as lights, other outlets, etc.)?
- Provide photos of the:
 - Desired parking location for the GOV
 - Desired location for a 120-V/240-V outlet or EVSE to be installed
 - Inside of the electrical panel, the electrical panel schedule (often on the door of the panel), as well as the sticker indicating the total amperage of the panel
 - Approximate distance from the service panel to the outlet/EVSE to the parking space.
- Do you live in an apartment or condominium?
 - Does your apartment or condominium have existing EV infrastructure (120-V/240-V EVSE outlet) or are they planning to install infrastructure for tenant use?
 - Is there a nearby shared parking garage/lot where the government-owned EV could be parked on a nightly basis with EV infrastructure (120-V/240-V EVSE outlet)? If yes, what is the cost for parking/charging?
- How many days per year do you bring a home-to-work vehicle to your home?
- On average, how many miles per day do you drive the vehicle (including miles driving to/from your home)?

- How many days does the vehicle travel more than 250 miles and without access to existing public EVSE? Use the Alternative Fueling Station Locator¹⁴ to find available charging stations (search for direct current fast chargers and either Combined Charging Systems or North American Charging System plug, as appropriate).
- Do you anticipate a relocation or work reassignment in the next 2 years?
- Is there anything else you would like to share about your home-charging situation?

¹⁴ See https://afdc.energy.gov/stations#/find/nearest?fuel=ELEC&ev_levels=dc_fast.

Bibliography

DOE Federal Energy Management Program. “Using the Zero-Emission Vehicle Planning and Charging Tool.” <https://www.energy.gov/femp/using-zero-emission-vehicle-planning-and-charging-tool>.

DOE Office of Energy Efficiency and Renewable Energy (EERE). “Fleet Sustainability Dashboard.” <https://federalfleets.energy.gov/FleetDASH/>.

DOE EERE Alternative Fuels Data Center. “Alternative Fueling Station Locator.” https://afdc.energy.gov/stations#/find/nearest?fuel=ELEC&ev_levels=dc_fast.

_____. “Search Federal and State Laws and Incentives.” https://afdc.energy.gov/laws/search#/?technology=ELEC&technology=PHEV&incentive=RBATE&incentive=TAX&user=IND&status=enacted&status=amended&law_type=INC&law_type=STATEINC&law_type=UPINC&jurisdiction=US.

_____. “Tax Credits for Electric Vehicles and Charging Infrastructure.” <https://afdc.energy.gov/laws/ev-tax-credits>.

_____. “U-Finder.” <https://afdc.energy.gov/utility-finder>.

EIA. “Electric Sales, Revenue, and Average Price.” https://www.eia.gov/electricity/sales_revenue_price/.

_____. “Electricity Data Browser.” <https://www.eia.gov/electricity/data/browser/>.

GSA. “Alternative fuel vehicles.” <https://www.gsa.gov/buy-through-us/products-and-services/transportation-and-logistics-services/fleet-management/fleet-electrification/alternative-fuel-vehicles>.

_____. *Home-To-Work Transportation*. U.S. Code 41 CFR Part 102-5. (September 12, 2000). <https://www.ecfr.gov/current/title-41/subtitle-C/chapter-102/subchapter-A/part-102-5>.

NREL. “Utility Rate Database.” Open Energy Information, Data and Resources. https://openei.org/wiki/Utility_Rate_Database.

Office of Management and Budget. *Real property*. U.S. Code 2 CFR Part 200 Subpart D – Property Standards. (April 22, 2004). <https://www.ecfr.gov/current/title-2/subtitle-A/chapter-II/part-200/subpart-D/subject-group-ECFR8feb98c2e3e5ad2/section-200.311>.

The White House Council on Environmental Quality. *Implementing Instructions for Executive Order 14057: Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability*. The White House, 2022. https://www.sustainability.gov/pdfs/EO_14057_Implementing_Instructions.pdf.

For more information, visit: energy.gov/FEMP

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