Washington
Green Transportation Program
Moving forward with Washington's public fleets

Terms to Know

Vehicles

EV: All vehicles powered by an electric motor.

BEV: Battery EV that runs on an all-electric motor using a rechargeable battery. Plug into an EV charger. BEVs cannot use gas.

FCEV: Fuel-cell EV. The electric motor is powered by a hydrogen fuel cell.

ICE: Internal combustion engine that uses fossil fuel.

PHEV: Plug-in hybrid vehicle with Level 1 or Level 2 charging. These have an ICE *and* electric motor that can charge or use gas.

ZEV: Zero-emission vehicle. Produces zero exhaust emissions of greenhouse gases, particulates, or any criteria pollutants.

Hybrid: Vehicle with both an electric motor and ICE. Regenerative braking charges the battery.

Regenerative braking: Braking system in a PHEV, BEV, or hybrid that transfers energy from the brakes to the vehicle battery.

Battery range: Distance an EV can travel using stored electricity.

Electrical & EV charging terms

AC and DC: Alternating current and direct current. The U.S. electricity grid operates on AC. Typical household outlets are 110 to120 volts AC. Electric car batteries operate on DC.

Kilowatt (kW): The rate of electricity use—a measurement of power. Either AC or DC power delivery. The higher the power, the faster the charging speed.

Kilowatt hour (kWh): The amount of electricity used to run a 1,000-watt application for 1 hour.

EVSE: EV supply equipment that delivers electricity to a vehicle. Also EV charging station.

Load management: Proactively planning to take advantage of lower electricity rates using software to shift where energy is used, such as by EV chargers, to times when there is less demand, typically at night or midday. More power can go to fewer charging ports or less power to more ports.

On-board charger (OBC): Charger in the vehicle that converts AC from the grid to DC when charging the vehicle battery. The OBC determines the rate at which the vehicle can accept the electric charge. Different OBC units can handle power from 3.3 to 22 kW.

Open Charge Point Protocol (OCPP): How EV charging management systems communicate with connected EV charge points to manage charging sessions and enable remote diagnostics while ensuring secure data exchange.

Duty cycle: Hours per day or proportion of time that a vehicle is operated per day, week, etc.

Dwell time or charging window: Hours in the duty cycle when vehicles are idle so they can charge.

Vehicle to grid (V2G): Technology that enables energy stored in the EV battery to be pushed back to the power grid.

Utility terms

Electricity rates: Amount charged for energy consumption per kWh. These rates can vary throughout the day depending on when the demand on the grid is highest.

Electric load profile: Electricity consumption over time, typically daily. Used to calculate the power required each hour per day. Knowing when vehicles consume energy helps fleet managers plan for anticipated electricity rates.

Demand charge: Additional fee charged by utilities to maintain a constant supply of electricity. Utilities apply demand charges based on the maximum amount of power used in an interval (typically 15 minutes) during the billing cycle, outside their normal electricity rates. Load management can help reduce demand charges.

Time of use (TOU): Electric rates based on when electricity is used. TOU rates discourage electricity use during peak periods of consumption and encourage use when there is excess grid capacity. Incentivized periods may change as more EVs are charging and more renewable energy is added to the grid.

In front of meter: Transmission wire, substations, transformers, and other equipment on the utility's side of the electric meter.

Behind meter: Equipment and electricity uses on the consumer side of the electric meter.

Distributed Energy Resource (DER): An opportunity to provide on-site clean power to supply electricity for vehicle charging. Battery storage for clean power is often included.

Future proofing: Planning for growth in EVs and charging infrastructure expected in 5 to 7 years.

EV charging: speeds & levels

Charging speed: How fast energy is transferred from the electrical supply to the vehicle's battery. Speed varies by charging level depending on air temperature, electrical supply, OBC size, and battery capacity and temperature.

Level 1 (L1): 110 V or 120 V, such as a common indoor or outdoor wall outlet. Safe L1 charging requires a dedicated circuit, typically 20 A. The slowest charging option.

Level 2 (L2): 208 V to 240 V. L2 charging stations use a 40 A circuit often found in residential, workplace, and public locations.

DC Fast Charge (DCFC): 480 V or higher. DCFC uses commercial three-phase power and can deliver power at various speeds.

Combined Charging System (CCS): Supports AC and DC charging power levels up to 350 kW. The charging ranges from 50 to 150 kWh.

CHAdeMO: Charging plug used in DCFC systems. The only DC standard able to offer vehicle-to-grid (V2G) connectivity.

J1772: Plug/port style for L2 charging. Part of the CCS configuration.

Tesla Superchargers: Proprietary charging system and port (250 to 400 kWh) that can only be used for Tesla vehicles. The port also includes the AC L2 plug in.

SAE: Society of Automotive Engineers, the governing body that sets vehicle charging standards for the connectors AC-J1772, DC-CCS/Combo, and CHAdeMO.

Funding

Total cost of ownership (TCO): The total cost of buying and owning a vehicle, including incentives, upfront costs, and operations and maintenance. EVs typically have a lower TCO than ICE vehicles due to lower operation cost and less maintenance required.

Low Carbon Fuel Standard or Clean Fuel Standard: Market-based policies in some states to reduce carbon intensity in fuels. Organizations with EVSE can benefit from LCFS or CFS credits for switching from high carbon-intensive fuel to less carbon-intensive fuel.

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***Our Mission Statement**: Creating Energy Solutions*