
Updated
November 2022

# EV Charging Infrastructure in the US Report

Prepared by: **Global Transmission Research**

# Overview of the EV market (1/2)

- The US is the second-largest market for EVs in terms of sales, after China. Between 2012 and 2021, more than xx million plug-in electric vehicles (PEVs) were sold in the US. Of these total sales, xx million units (xx%) were pure electric vehicles (EVs) (which are also known as battery electric vehicles or BEVs), and xx units (xx%) were plug-in hybrid electric vehicles (PHEVs).
- As of June 2022, the US had xx,xxx public charging (networked and non-networked) stations with xxx,xxx charging outlets. About xx% of these outlets were of Level 2 category, and xx% were DC fast chargers. The remaining were Level 1 charging outlets (xx%). ChargePoint has the largest network in the US.
- California is a clear leader accounting for more than xx% of the total EV sales in 2021 and with a well-established charging infrastructure. Tesla dominates the EV market in the US, accounting for about xx% of the new EVs registered in 2021. Other key electric automobile manufacturers are General Motors, Nissan, Ford, and Toyota.
- The US has set the target to install 500,000 public chargers nationwide compatible with all vehicles and technologies by 2030. To support the goal, federal funds have been allocated under the Bipartisan Infrastructure Law (BIL), passed in November 2021, and under the Inflation Reduction Act (IRA) passed in August 2022.

## Existing EV market and charging infrastructure

**PEV fleet as of 2021**


**Public EV charging infrastructure as of June 2022**


**Charging stations** **Charging outlets**

## EV market and charging infrastructure targets

**50% EV sales share by 2030**

**500,000 public chargers by 2030**

Source: Alternative Fuel Data Center (AFDC), US Department of Energy (DOE); Global Transmission Research

# Overview of the EV market (2/2)

## Policy and regulation

- The US states have both federal and state-level support for EVs and building the related.
- Federal tax incentives and funding are available for setting up EV charges. Many states also provide incentives for building public charging stations.

**Federal support**

- Federal funds have been allocated under the Bipartisan Infrastructure Law (BIL), passed in November 2021, and under the Inflation Reduction Act (IRA) passed in August 2022.
- Other funding programs are also available to support the electrification of transportation.

**State support**

- Presently, over 45 states and District of Columbia offer incentives in the form of tax credits for EV and charger purchases, reduced registration fees, and excise tax waivers; rebates to fleet acquisition goals, exemptions from emissions testing or utility time-of-use (TOU) rate reductions.
- California is the leader in promoting EV and related infrastructure. Other active states are New York, Washington, New Jersey, Colorado, Massachusetts, Illinois, and Texas.
- Incentive programs vary from state and even by city. Some programs will pay for the installation and equipment up front, while some re-reimburse customers the installation cost, etc.

## Technology and standards

- The US is exploring the use of new technologies, such as V2G (vehicle-to-grid), V2H/B (Vehicle-to-home/building), and wireless charging (which can recharge vehicles without a cable).
- Other charging solutions being explored and used include pantograph charging (specifically for heavy vehicles), battery swapping (for making EVs affordable), and range extension system (for catering short and long-distance requirements separately for better efficiency)
- These technologies have shown great potential to improve the speed and cost-effectiveness of charging infrastructure.

# Overview of federal policy and regulations

- In 2021, the Biden Administration set a national target of achieving 500,000 electric vehicle (EV) chargers and 50% EV sales share in 2030. To support these goals, huge funding allocations have been made for EV and EV supply equipment (EVSE) under the Bipartisan Infrastructure Law (BIL), enacted as the Infrastructure Investment and Jobs Act (IIJA) in November 2021. In 2022, the government announced the National Electric Vehicle Infrastructure (NEVI) Formula Program under BIL for building a nationwide EV charging network. Further in 2022, the Inflation Reduction Act (IRA) extended tax credits for EVs and EVSEs.

- Historically, EVs received a major thrust with the Energy Independence and Security Act (EISA) of 2007, the Energy Improvement and Extension Act (EIEA) of 2008, and the American Recovery and Reinvestment Act (ARRA) of 2009. These legislations provided federal tax credits and grants for the purchase of new EVs and charging facilities.

**2007-09**

**Federal grants and incentives for EVs** under EISA of 2007, EIEA of 2008 and ARRA of 2009

**2015**

**FAST Act:** Allows designation of AFC including for EV charging

**2016**

**Volkswagen Settlement[1]:** Pledge to invest USD2 billion in charging infrastructure for ZEVs over a 10-year period

**2020**

**Further Consolidated Appropriations Act of 2020** and **Consolidated Appropriations Act of 2021**, reinstated the alternative fuel infrastructure tax credit until the end of 2021

**2021**

**National target:** 500,000 EV chargers;
50% EV sales share in 2030
**BIL/IIJA** includes USD7.7 billion for nationwide network and USD7 billion for EV supply chain
**Executive order:** 100% ZEV acquisitions of federal vehicle fleet by 2035; 100% light-duty ZEV acquisitions by 2027
**EV Charging Action Plan** released including establishing Joint Office of DOE and DOT; and new solicitation for AFCs

**2022**

**IRA** extends and expands tax credits for EVs and EVSEs up to 2032
**NEVI Formula Program** under BIL**:** DOE and DOT announce USD5 billion funding over 5 years for National EV Charging Network; USD5 billion **Clean School Bus Program 2022-26** under BIL; USD5.5 billion expansion of **Low- and No-Emission Transit Vehicle Program** under BIL; DOT releases **EV Rural Charging Toolkit**

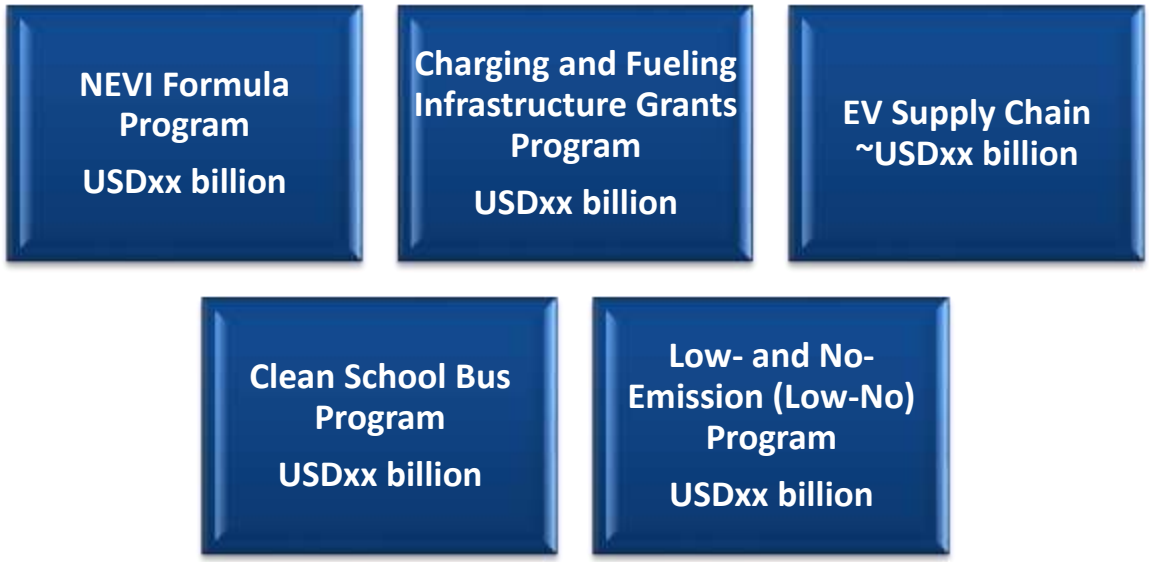
Notes: FAST Act – Fixing America's Surface Transportation Act; AFC – alternative fuel corridors; DOT – Department of Transport; DOE – Department of Energy; NEVI – National Electric Vehicle Infrastructure; 1 – Legal settlement over violations of the Clean Air Act. Volkswagen pledged to invest USD2 billion over a 10-year period in zero-emissions vehicle (ZEV) infrastructure and education in select cities through its Electrify America initiative. Of that amount, USD800 million is to be spent in California.
Source: US Department of Energy (DOE); Global Transmission Research

# BIL/IIJA funding programs for EV and EVSE

## Funding programs for EV and EV charging infrastructure

- EVs and EVSE are eligible for USDxx billion of the IIJA funding, which includes funding in three broad areas – USDxx billion dedicated to the deployment of EVs and related infrastructure only; USDxx billion dedicated to the deployment of all types of clean vehicles and fueling infrastructure, which includes EVs and charging infrastructure; and USDxx billion for grid and battery-related investments.
- With an emphasis on a wider reach to rural areas, DOT released an EV Rural Charging Toolkit as a one-stop resource for rural communities to plan and implement EV charging infrastructure projects in order to take full advantage of federal funding for EV charging stations under the BIL/IIJA.

## Key funding programs for EV and EV charging infrastructure under BIL/IIJA



# California

# Key regulations and initiatives (1/2)

## EV targets

- Signatory to the ZEV MOU.
- xx million ZEVs on the road by 2030, and xxx battery electric chargers (including xxx DCFC) by 2025.
- All new cars and passenger trucks sold in California must be ZEVs by 2035, making it the first state to ban sales of new internal combustion engines or gas-power vehicles by then.
- By 2030, xx million public and shared chargers are required to meet demands of xx million passenger EVs in the state.*

## Implementing agencies

- California Energy Commission (CEC)
- California Public Utilities Commission (CPUC)
- California Air Resources Board (CARB)

## Key programs and incentives

- Implemented through CARB, Clean Vehicle Rebate Project (CVRP) offers rebates for purchase or lease of new ZEVs and PHEVs. The rebates are for up to USD4,500 for fuel cell electric vehicles (FCEVs), USDxx for battery electric vehicles (BEVs), and USDxxx for PHEVs. Additional rebates of USDxxx is available for low-income customers. CARB offers CVRP for the public fleet as well. State budget of 2021-22 includes USDxxx million allocation for the program to cover three years of funding. No new funding would be allocated to CVRP in the proposed 2022-23 budget, but USDxx million would be available to support higher CVRP rebate amounts for low- and moderate-income households.
- Funded by the CEC, California EV Infrastructure Project (CALeVIP) provides funding to local governments to implement EVSE incentive programs for Level 2 and DCFCs. Incentives range USDxxx-USDxxx per connector for commercial-grade Level 2 EV chargers and USDxxx-USDxxx for high-powered DCFCs. By end-2021, CEC has allocated USDxxx million for charger rebates through CALeVIP, while co-funding partner contributions aggregated over USDxxx million.
- Formerly known as the Alternative and Renewable Fuels and Vehicle Technology Program (ARFVTP), Clean Transportation Program (CTP) is implemented through CEC with funding facility to promote deployment of clean transportation and fuel technologies, and charging infrastructure.
- The state is also receiving USDxxx million under the Volkswagen Settlement to be invested by Electrify America in building charging infrastructure for ZEVs over ten years.

Notes: *Estimates are as per CEC analysis done in 2021.

# Key regulations and initiatives (2/4)

## California's Plans Under the NEVI Program

- Published in August 2022, it focuses on the construction of fast-charging stations near interstates, US routes and state routes throughout California while utilizing federal funding available under the NEVI program.
- The plan was approved in September 2022 by the US Joint Office of Energy and Transportation.
- Funded by the federal Infrastructure Investment and Jobs Act of 2021 (IIJA), California expects to receive a total of USDxx million for the program over the next five years. Under this, close to USDxx million has already been approved.
- The state has plans to use USDxx million in funding during the first two years to primarily provide connectivity for passenger vehicles throughout the state and will look for investment avenues for heavier vehicle classes.
- This funding will also support upgrades to existing infrastructure, charging stations' operation and maintenance costs, community and stakeholder engagement, workforce development, and related mapping and signage.
- The IIJA funds will add to efforts to complete a 6,600-mile statewide charging network and deploy xx million chargers by 2030 to meet the anticipated charging needs of the state's EV fleet.

## Advanced Clean Cars II - ZEV regulation

- In August 2022, CARB approved the Advanced Clean Cars II rule which would take the state's already growing ZEV market and robust motor vehicle emission control rules and augment them to meet more aggressive tailpipe emissions standards and ramp up to 100% ZEVs. The rule establishes a year-by-year roadmap to meet the 2035 target.
- The new regulation accelerates requirements that automakers deliver an increasing number of zero-emission light-duty vehicles each year beginning in model year 2026. Sales of new ZEVs and PHEVs will start with 35% that year, build to 68% in 2030, and reach 100% in 2035.
- The regulation applies to automakers and covers only new vehicle sales. It mandates enhanced durability and warranty requirements

# Key regulations and initiatives (3/4)

## EV Charging Reliability Transparency Act

- In September 2022, Bill No 2061 (sponsored by FLO and ChargerHelp) was signed into Law by the state governor requiring EV charger reliability data to be published by charger operators.
- It requires CEC, in consultation with the CPUC, to develop uptime recordkeeping and reporting standards for selected EV chargers and charging stations by January 1, 2024.
- It authorizes CEC to consider additional reliability metrics, as specified, and to hold a public workshop (in consultation with CPUC) to discuss and identify industry best practices and charger technology capabilities to increase reliability.
- Beginning January 1, 2025, it requires CEC to assess the uptime of charging station infrastructure and to update it every 2 years as well as make the data publicly available
- It would repeal these provisions as of January 1, 2035.

## Mandatory EV Charging Station Building Standards

- Recently published by California Building Standards Commission (CBSC) requiring pre-wiring for EV charging station installation in parking spaces at one- and two-family dwellings with attached private garages, multi-family dwellings, commercial facilities, and public buildings in the California Green Building Standards Code within the California Building Standards Code.
- Minimum EV charging station prewiring installation requirements are based on the number of parking spaces
- Public facilities requited to install handicap-accessible EV charging stations when installing new or additional EV charging stations
- On January 1, 2023, CBSC will host a workshop to evaluate demand for EV charging infrastructure, electric load forecasts, and statewide transportation electrification goals and use the workshop's findings to recommend updates to EV charging station building standards.

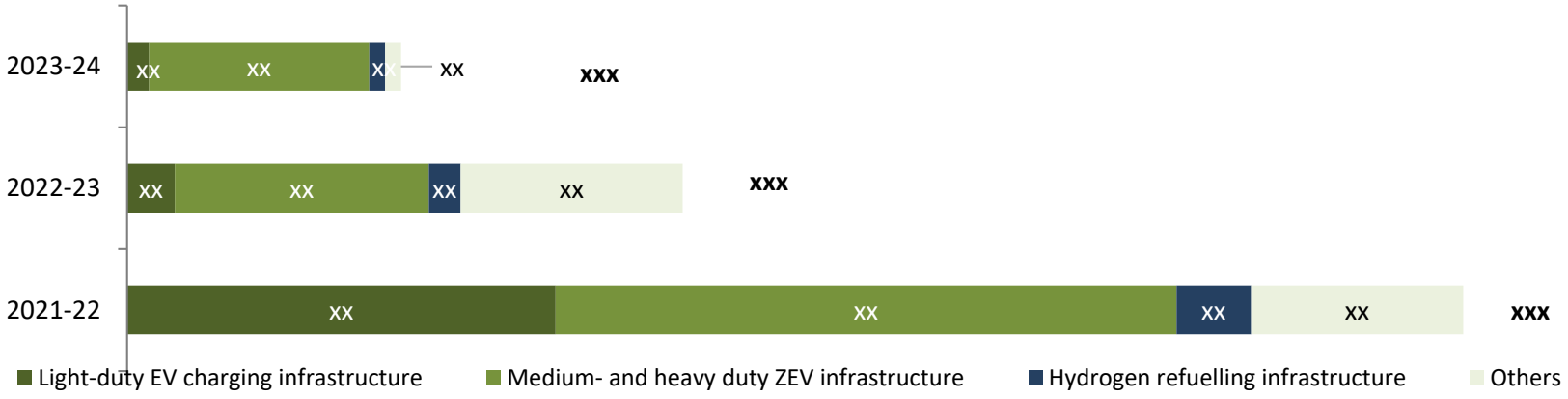
# Key regulations and initiatives (2/2)

## California's CTP for 2021-2023

**Clean Transportation Program (CTP)**

- CTP is running in its 13th year now. By August 2021, CTP funded (or committed to funding) xxx charging connectors for PEVs, including xxx at multi- and single-family homes, xxx for fleets, and xxx at workplaces; xxx public and shared private Level 2 and Level 1 chargers; and xxx public DCFC chargers and and xxx Level 2 chargers along highway corridors and urban metropolitan areas.
- It has made cumulative awards worth USDxx million to fund the above EV charging infrastructure including USDxxx million for CALeVIP to provide EV incentives throughout California.
- Notably, in November 2021, CEC announced the second multi-year funding plan (2021-23), amounting to USDxxx billion increasing the budget of CTP by six times. This includes USDxxx million from the 2021-22 state budget besides USDxxx million in program funds.

## Figure 1: Proposed funding under CTP 2021-2023 (USD million)



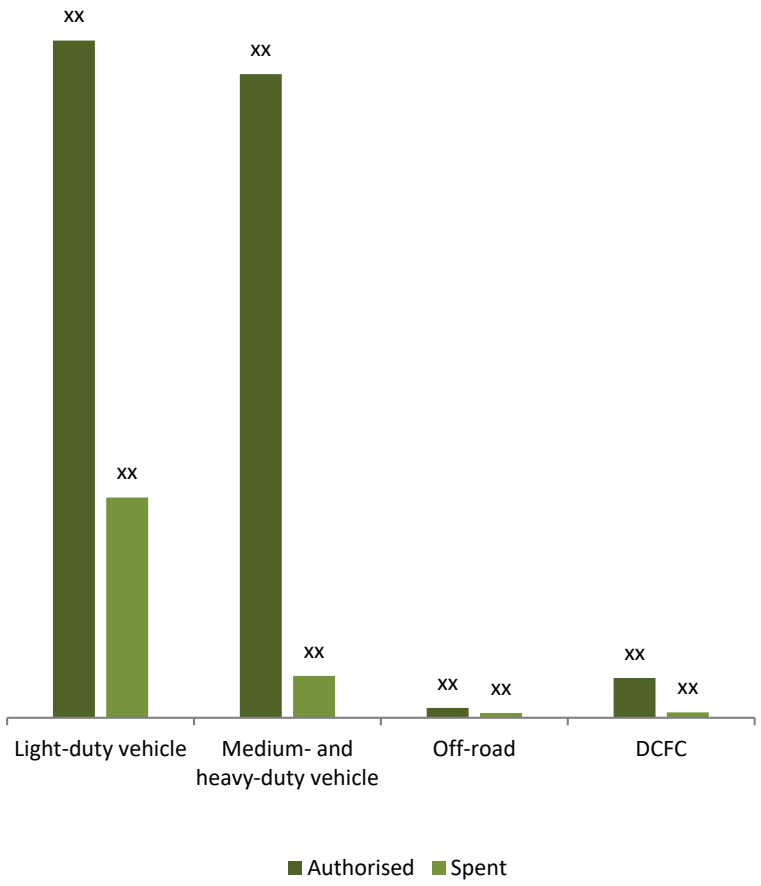

Source: CEC; Global Transmission Research

# Utility charging infrastructure programs

## Utility charging infrastructure programs

- CPUC allows investor-owned utilities (IOUs) to own and operate charging stations on a case-by-case basis and continues to accept and review applications for future transport electrification investments.
- In 2016, it approved pilot programs for Public Service Energy & Gas (PSE&G), San Diego Gas and Electric (SDG&E) and Southern California Edison (SCE) to install xxx, xxx, and xxx charging stations, respectively. These utilities subsequently submitted applications worth USDxx billion, of which USDxx million worth of EV charging projects were approved between 2017 and 2018.
- In 2019, CPUC authorised USDxx million for PG&E, SCE, SDG&E, and Liberty Utilities to install approximately xx ports at schools, parks and beaches. In 2020, it approved USDxx million Charge Ready Light-duty program for implementation by SCE to install xxx Level 2 and xxx DCFC ports while the USDxx million Power Your Drive Extension program authorised SDG&E to install xxx ports.
- Overall as of November 2021, of the approximately xxx ports authorised for light-duty passenger vehicles, more than xxx have been energised. For medium- and heavy-duty sectors including on-road and off-road nearly xxx ports have been energised and of the xxx DCFC public ports authorised xx have been energised.
- According to state Senate Bill 676, IOUs can be authorised up to USDxx million for vehicle-to-grid focused pilot programs starting 2022-23.

## Figure 2: CPUC authorised transport electrification investments as of November 2021 (USD million)




Source: CPUC; Global Transmission Research

# EV charging technologies (1/7)

## AC and DC charging technologies

- Charging equipment for plug-in electric vehicles (PEVs) (including hybrid EVs and battery EVs)) is classified by the rate at which the batteries are charged.
- Charging times can range from less than 20 minutes to 20 hours or more based on factors such as percentage of battery life remaining, the quantum of energy it holds, the type of battery, as well as the type of charging equipment (i.e., charging level and power output).

### Level 1 (AC)

- **Power output**: 1.4 kW
- **Range per hour of charging**: 2 to 5 miles
- **Connector type**: J1772 connector
- **Typical use**: Home charging, long term parking
- **Charging time from empty**: 40-50 hours (BEV); 5-6 hours (PHEV)
- Provides charging through a 120 V AC plug

- **As of June 2022, about xx% of public EVSE ports in the US were Level 1.**

### Level 2 (AC)

- **Power output**: 1.5-19.2 kW
- **Range per hour of charging** 10 to 20 miles
- **Connector type:** J1772 connector
- **Typical use**: Home, public and workplace charging
- **Charging time from empty**: 4-10 hours (BEV); 1-2 hours (PHEV)
- Provides charging through 240 volt (V) (generally found in residential applications) or 208 V (generally found in commercial applications)

- **As of June 2022, about xx% of public EVSE ports in the US were Level 2.**

### Level 3 (DCFC)

- **Power output**: 50-350 kW
- **Range per hour of charging** 180-240 miles
- **Typical use**: Public charging
- **Charging time from empty**: 20 mins – 1 hour (BEV)
- Provides charging through 208/480 V AC three-phase input
- There are 3 types of DC fast charging systems based on type of port on the vehicle: SAE Combined Charging System (CCS), CHAdeMO, and Tesla (*discussed in next slide*)

- **As of June 2022, over xx% of public EVSE ports in the US were DC fast chargers.**

Notes: AC – alternating current; DCFC – direct current fast charger; EVSE – electric vehicle supply equipment; BEV – battery electric vehicle; PHEV – plug-in hybrid electric vehicle
Source: AFDC, US DOE; Global Transmission Research

# EV charging technologies (2/7)

## AC and DC charging technologies

- Different chargers (Level 1, 2 and 3) have different connectors or plugs which are plugged into the EV to charge. Multiple types of connectors can be available on an EVSE port, but only one vehicle will charge at a time.

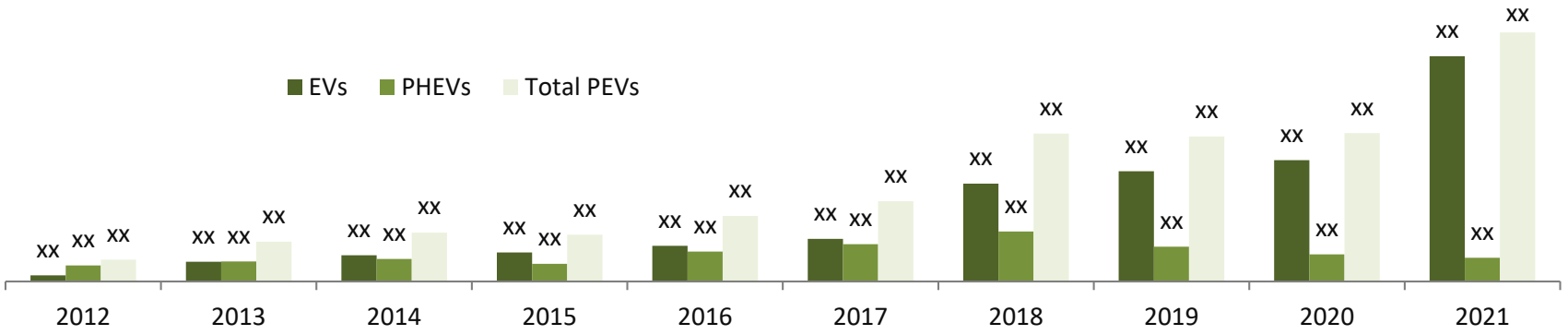
| Charger | Connector | Details |
|---|---|---|
| Level 1 (AC) |  J1772 | SAE J1772 standard connector (often referred to simply as J1772) is used with most Level 1 and Level 2 charging equipment. |
| Level 2 (AC) | | |
| Level 3 (DC fast charger) |  CCS | CCS connector (also called as J1772 combo) can be used with Level 1, Level 2, and DCFC equipment. For DCFC, this connector has two additional bottom pins. |
| |  CHAdeMO | The CHAdeMO connector is the most common of the three connector types for Level 3 chargers. It is based on the CHAdeMO DC charging standard for EVs and enables seamless communication between the car and the charger. |
| |  Tesla | Tesla vehicles have a unique connector that works for all their charging levels including their fast charging option, called a supercharger. |

Source: AFDC, US DOE; Global Transmission Research

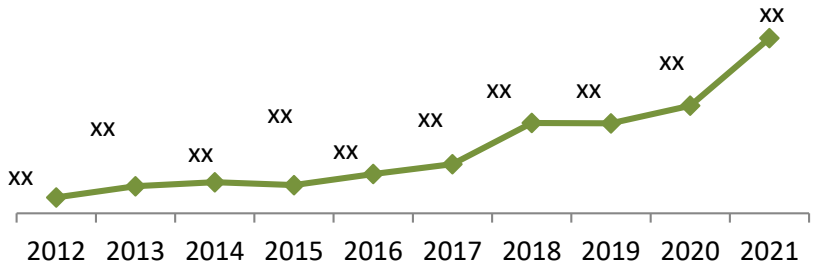
# Growth in sales of electric vehicles

- Between 2012 and 2021, more than xxx million plug-in electric vehicles (PEVs) were sold in the US. Of these total sales, xx units (xx%) were pure electric vehicles (EVs) (which are also known as battery electric vehicles or BEVs), and xxx units (xx%) were plug-in hybrid electric vehicles (PHEVs).
- While PHEV sales fell in 2021, sales of pure EVs increased leading to an overall increase in sales of PEVs by about xx% in 2021.
- Total PEV sales accounted for close to xx% of total light-vehicle sales in 2021.

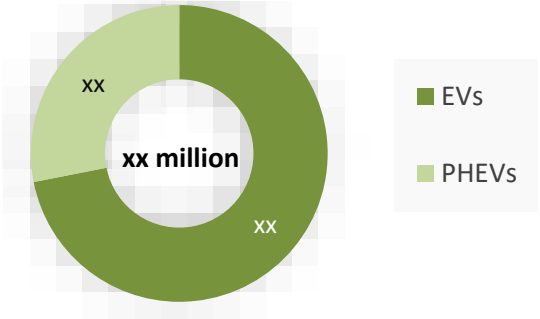
## Annual sales of EVs and PHEVs in the US ('000)




## Growth in the share of PEVs in light-duty vehicle sales in the US (%)




## Share of EVs and PHEVs in total PEV sales during 2012–21 (%)




Notes: EV – all electric vehicles, PHEV – plug-in hybrid EVs; PEV – all plug-in EVs (including pure EVs and PHEVs)
Source: AFDC, US DOE; Vehicle Technologies Office, US DOT; Global Transmission Research

# Growth in public charging infrastructure

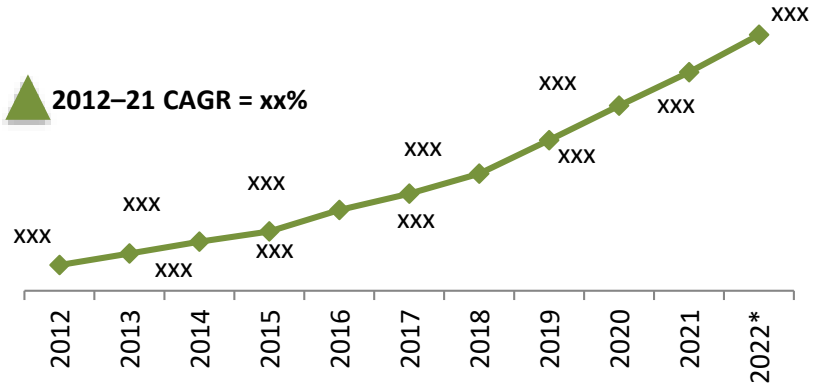
## Existing public charging infrastructure, June 2022

**xxxx**
**Public charging stations**

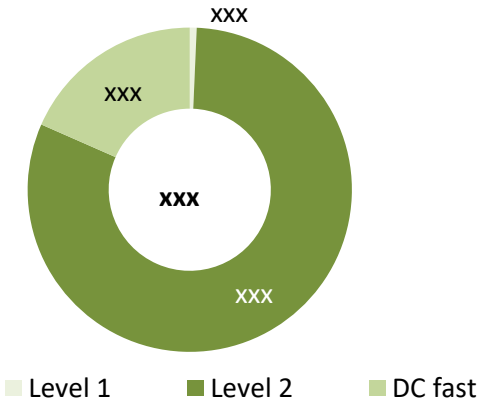
**xxxx**
**Charging outlets**

- The US has two types of charging stations – networked and non-networked. Networked charging stations are connected remotely to a larger network and are part of an infrastructure system of connected chargers. Non-networked are stand-alone units and are not connected to larger infrastructure. They are not accessible remotely.
- As of June 2022, the US had xxx public charging (networked and non-networked) stations with xxx charging outlets.
- About xx% of these outlets were of Level 2 category, and xx% were DC fast chargers (DCFCs). The remaining were either Level 1 (xx%).
- ChargePoint has the largest network in the US.

## Growth in public EV charging outlets




## Public EV charging outlets by category, June 2022

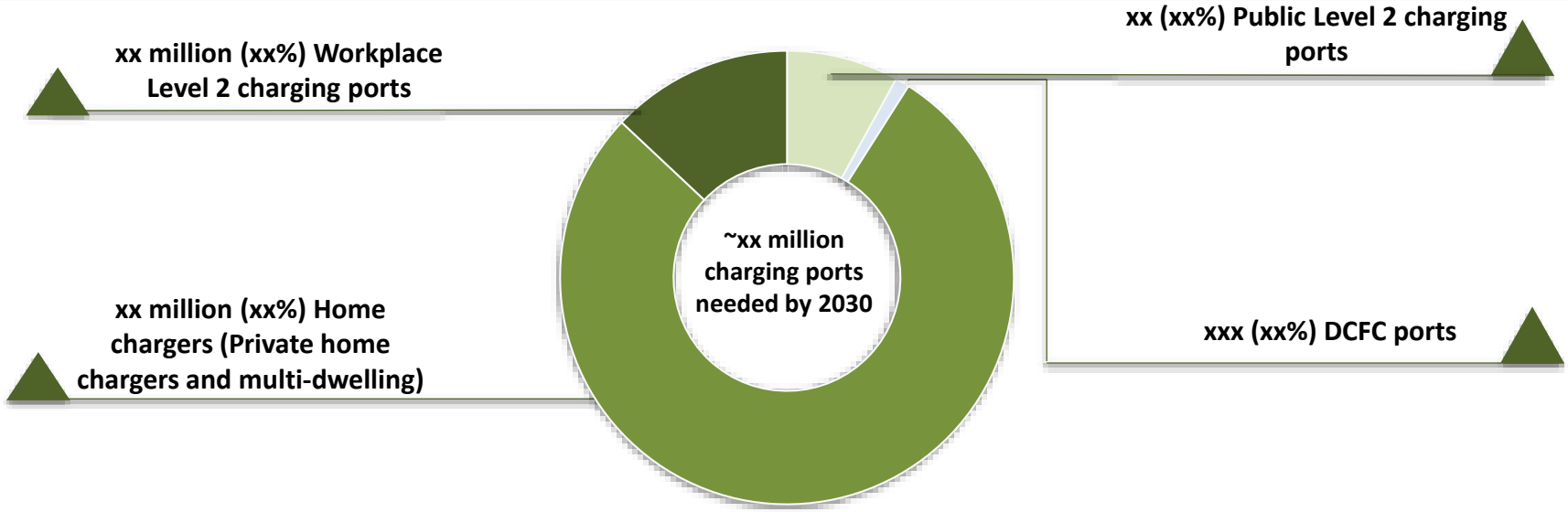



Notes: One station can have multiple charging outlets/slots of various categories. Charging outlets figure does not include 50 legacy chargers which were designed prior to the development of the Level 1, Level 2, and Level 3 standards. These are usually compatible with a single manufacturer's vehicle.
*Figure as of June 20, 2022
Source: AFDC, US DOE; EV Adoption; Statista; Global Transmission Research

# Charging infrastructure targets and needs, 2030

- According to ICCT estimates, to support the expected growth in EVs by 2030, private and public charging ports will need to grow to xx million by 2030, including xxx public Level 2 chargers, xxx DCFCs, xxx million workplace Level 2 chargers, and xxx million home chargers (private home and multi-dwelling).
- California has set aggressive EV deployment targets which requires xx million public and shared chargers to be installed by 2030. More than xxx chargers were installed till June 2021, with an additional xxx planned by 2025. These figures fall short of the state's target of reaching xxx chargers by 2025. The state's 2021–22 budget includes USDxx million to help fill the gap and ensure that the requisite charging infrastructure is put in place.
- Another state which is pursuing ambitious EV deployment goals is New York. Under its Evolve New York program, the New York Power Authority (NYPA) plans to invest USDxxx million on EV infrastructure to achieve the state's goal of having at least xx new EV fast charging by 2025.
- Leading network charging operators have set ambitious targets as well. For instance, ChargePoint anticipates a growth of nearly xx% (CAGR) in the US from xxx million charging ports in 2021 to about xxx million charging points by 2025. Tesla also plans to almost triple its size of superchargers to approximately xx by 2023 from xxx as of 2021. Furthermore, EV Connect pledged to help Southern California Edison (SCE) to deploy xx EV chargers by 2025.

**EV charging infrastructure by category in 2030**




Source: ICCT; Global Transmission Research

# Key highlights of utility EV charging programs

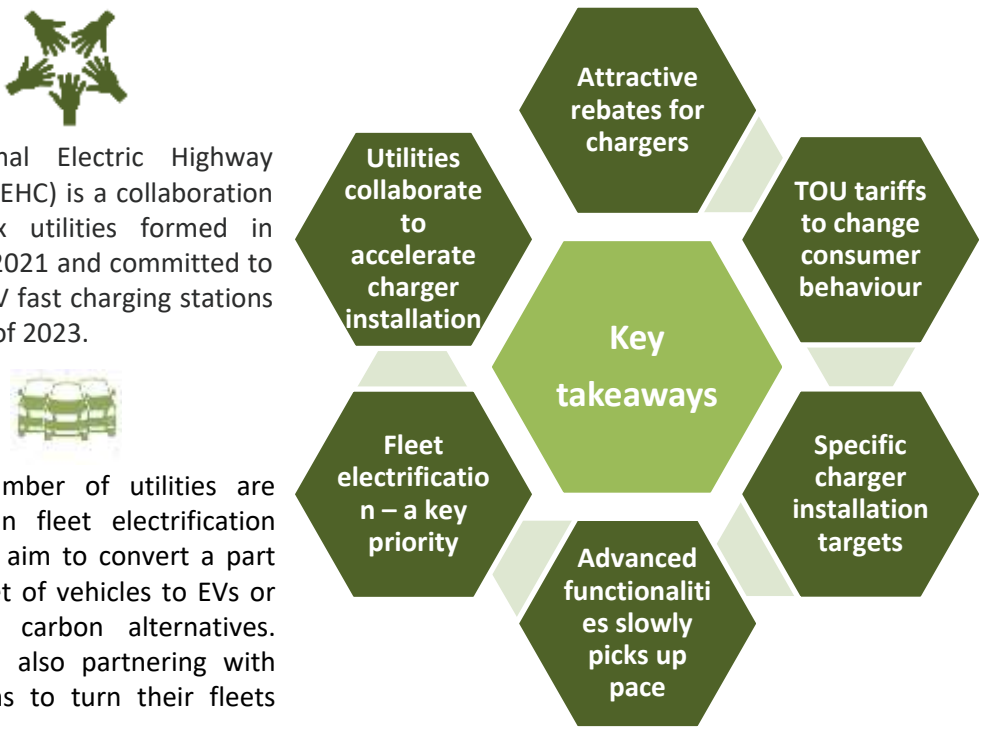
*Global Transmission Research* reviewed 20 leading American utilities to analyze their electric vehicle (EV) charging plans and targets, look at their services and offerings in the e-mobility space, as well as charging tariffs.

All utilities are offering rebates for installation of EV chargers – upfront payment for installation of chargers subject to a ceiling (depending upon the type of charger Level 1 or 2; public/private/multi-dwelling) and/or a fixed percentage of cost of chargers is covered.

**Key programs**

- Make Ready (ConEdison, Dominion Energy, Georgia Power, National Grid)
- Park & Plug (Duke Energy)
- Charge NY (New York Power Authority)
- EV Driven (First Energy Potomac Edison)
- EV ACE

The National Electric Highway Coalition (NEHC) is a collaboration of over xx utilities formed in December 2021 and committed to providing EV fast charging stations by the end of 2023.




Several utilities (xx of 20) are offering time-of-use (TOU) tariffs to encourage EV users to charge during off-peak hours in order to reduce load on the grid. Tariffs vary according to the time of the day, weekdays/weekends as well as seasons.

A large number of utilities are focussing on fleet electrification where they aim to convert a part of their fleet of vehicles to EVs or other zero carbon alternatives. Utilities are also partnering with organisations to turn their fleets "green".

A majority of the utilities (xx of 20) have specific EV charger installation or investment targets up to 2025, 2030 or beyond. For instance, ConEdison has a target of installing xxx charging plugs by 2025 and National Grid plans xx charging ports by 2025.

A few utilities are working on advanced functionalities like demand response (DR) or vehicle-to-grid (V2G) pilots. These include Duke Energy Florida which is undertaking a DR program and PG&E which plans to test a first vehicle-to-home EV charger pilot in 2022

# 3.2.15 Public Service Energy and Gas (PSE&G)

# Plans and targets

| Overview | |
|---|---|
| **Headquarters** | • Newark, New Jersey |
| **Revenue (2021)** | • USDxxx million |
| **Key service areas** | • New Jersey |

## PSE&G's EV charging initiatives

❑ **Supporting New Jersey's target to have xx light-duty vehicles on road by 2025**.

**Clean Energy Future program**

❑ Received approval for the program from New Jersey Board of Public Utility (BPU) in January 2021
❑ Plans to invest USDxx million in setting up EV charging network in New Jersey during 2021-26.
❑ Offsets the cost of make ready infrastructure needed to operate EV chargers.
❑ Set up three types of chargers: residential smart chargers; Level 2 mixed use chargers; and DCFCs.
❑ The program also includes provisions for discounted charging during off-peak hours.

**Infrastructure Advancement Program**

❑ Plans to invest USDxx million over the next four years to install about xx EV chargers and associated infrastructure at xx PSE&G locations to support company's transition to electric fleets.
❑ Plans to invest USDxx million over the next four years for setting up last mile connectivity (Make-ready infrastructure) for EV and distribution energy resources (DERs) penetration.

**During 2013–20, PSE&G**

❑ Provided xx chargers to more than xx New Jersey hospitals, colleges and businesses in a pilot program to encourage EV commuting.
❑ Developed one of the largest EV employee incentive programs in the state with xx chargers at company locations.
❑ Collaborated with BMW, EVgo and ChargEVC to promote EV and related infrastructure.

# Rebates and programs

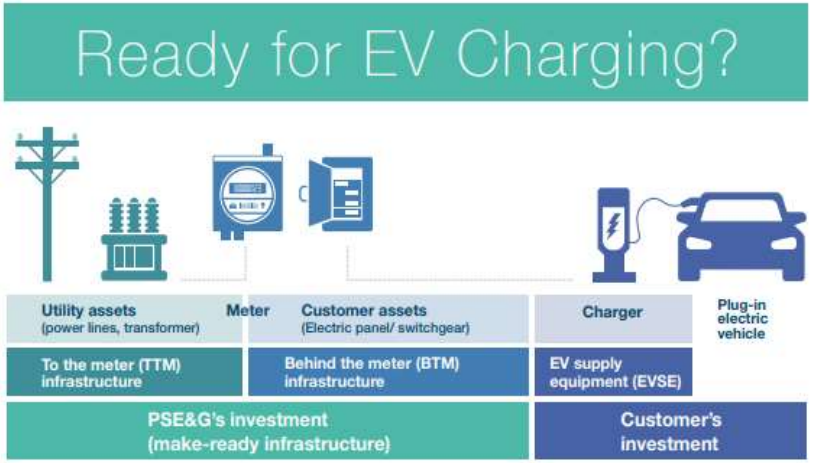
## PSE&G Electric Vehicle Charging Program

PSE&G is offering three sub-programs within the EV program

- Residential smart charging customers
- Level 2 mixed-use commercial charging customers
- Public DCFC customers

Benefits Summary

| Benefit: | Residential | Mixed-Use | Public DCFC |
|---|---|---|---|
| Purchase of an electric vehicle | ☒ | ☒ | ☒ |
| Purchase of an EV charger | ☒ | ☒ | ☒ |
| Behind the Meter (BTM) upgrades | ✓ | ✓ | ✓ |
| Pole to Meter (PTM) upgrades | ✓ | ✓ | ✓ |
| Off-Peak Charging | ✓ | ☒ | ☒ |
| Demand Charge Rebate | ☒ | ☒ | ✓ |




## Rebates under Electric Vehicle Charging Program

| | Rebate |
|---|---|
| **Residential smart charging customers** | Up to USDxx for behind the meter installation of Level 2 charger |
| | Up to USDxx of pole to meter utility service upgrades (if needed) |
| | Credit on charging during off-peak periods |
| **Level 2 mixed-use commercial charging customers** | Up to USDxx(1) for the behind the meter installation of Level 2 chargers |
| | Up to USDxx for pole to meter utility service upgrades (if needed) |
| **Public DC fast charging (DCFC) customers** | Up to USDxx(2) per site for behind the meter installation costs for DCFC chargers |
| | Up to USDxx of pole to meter utility service upgrades (if needed) |
| | Demand Charge Rebates to help lower your electricity bill |

Note: Off-peak periods are defined as 9 PM-7 AM Monday-Friday, and all day Saturday-Sunday. (1): The incentive is calculated based on the number of chargers installed; this sub-program offers up to USD7,500 per charger installation for up to 4 chargers per site; (2) The incentive is calculated based on the number of chargers installed; this sub-program offers up to USD25,000 per charger installation for up to 4 chargers per site. Source: PSE&G

# Tariffs and collaborations

## Residential Load Management (RLM) rate schedule exclusively for EV usage

| | Rate (USD per kWh) |
|---|---|
| **Service Charge** | **xx** |
| **On-Peak Charge including sales and use tax (SUT) (7 AM to 9 PM)** | |
| • October-May | xx |
| • June-September | xx |
| **Off-Peak Charge including SUT (all other hours)** | |
| • October-May | xx |
| • June-September | xx |
| **Non-utility Generation Charge** | xx |
| **Solar Pilot Recovery Charge** | xx |
| **Green Programs Recovery Charge** | xx |
| **Tax Adjustment Credit** | (xx) |
| **Zero Emission Certificate Recovery Charge** | xx |

Note: In addition, the company is also seeking approval from state regulator for its Distribution Demand Charge Rebate which will be applicable for sole usage is for DCFC EV charging and ancillary energy consumption (communications, area lighting, etc.) and who meets all of the requirements of this special provision, will qualify for a Distribution Demand Charge Rebate.
Source: PSE&G

## Collaborations

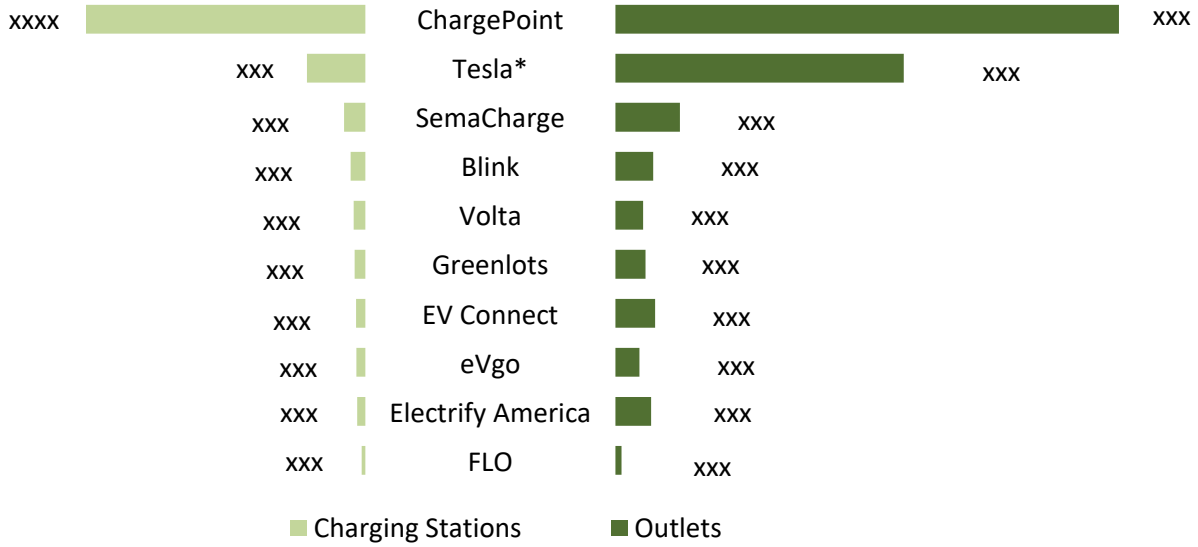
**PSE&G partnered with xx** to offer PSE&G customers and employees substantial promotional incentives towards the purchase of an EV in February 2018.

**PSE&G partnered with xx to** install fast-charging stations at five rest areas along the New Jersey Turnpike and Garden State Parkway in 2017.

**PSE&G joined xx**, a not-for-profit coalition formed to identify programs and policies to accelerate EV growth in New Jersey in 2016.

# Overview of EV charging network operators

- The US EV charging space is dominated by ten key players. Among them, ChargePoint owns the maximum number of stations and charging outlets followed by Tesla which has a network of Destination chargers (Level 2) as well as superchargers (DCFC).
- Majority of the charging network operators are privately owned, except three which are publicly listed companies.
- Several operators are entering into various collaborations among themselves as well as with government agencies, utilities and industry to expand their network.
- Particularly, charging network operators are working together towards interoperability of chargers within the US. For instance, ChargePoint, Greenlots, EV Connect and FLO announced roaming partnership to expand charging network interoperability across North America. Network operators are participating in various EV charging programs administered by state agencies and utilities.
- Further, many of them have tied up with automobile companies like Mercedes, Kia, General Motors as well as retail chain stores to grow their network and increase visibility and awareness. They are also partnering with various associations and industries to support heavy-duty vehicles like trucks as part of their fleet expansions.
- Many of them are also looking for growth opportunities in other global markets especially in Europe.




Notes: DCFC – direct current fast charger; * Figures include both Tesla Destination and Superchargers
Source: AFDC, US DOE; Global Transmission Research

# Blink Charging

| Key information | |
|---|---|
| **Headquarters** | • Florida, US |
| **Ownership** | • NASDAQ-listed |
| **Infrastructure** | • Established in 2009.<br>• US: xxx public Level 2 chargers and xx DC fast charging outlets. |
| **Key markets** | • Blink and its subsidiaries currently have equipment deployed or provide EV charging services in xx countries.<br>• US (largest market)<br>• Expanding its presence in Europe, Israel, Asia, the Caribbean and South America.<br>• Entering into Belgium, Netherlands and Luxembourg (through acquisition of Belgian EV car charging company Blue Corner NV), Greece, Israel, Latin America and India. |
| **2021 revenue** | • USDxx million |

## Recent developments

### 2020

- Announced the acquisition of U-Go stations, Inc. and its portfolio of xx DCFC charging locations.
- Announced a JV agreement with Envoy Technologies to deploy xx fast, Level 2 Blink chargers till xxxx.
- Received USDxx million EV charging equipment order from InterEnergy group to deploy xxx chargers in the Dominican Republic and Panama.

### 2021

- Was awarded nearly USDxxx million in existing EV infrastructure grants, rebates, and incentives from various local, state, and federal programs through December 2021.
- Announced an agreement with General Motors to make public charging more convenient for GM vehicle owners.
- Announced cooperation with Bisimoto Engineering to promote Blink as their charging solution of choice and to support EV adoption nationwide.

### 2022

- Announced a cooperation with Bridgestone Retail Operations, to deploy xx Blink IQ 200 charging stations at xx Firestone complete auto care and wheel works tire and automotive service centers.
- Awarded USDxx by the MassDEP to install xx dual-port 75-175 kW DCFC stations across Massachusetts.
- Launched xx new products including xx new charger types that offer nextgen EV charging technology across the EV ecosystem.

Notes: DCFC – direct current fast chargers; JV – joint venture; MassDEP- Massachusetts Department of Environmental Protection