

6/6/2019

Greenlots Overview

Unlocking the possibilities of the new mobility future



Confidential



greenlots
A Member of the Shell Group

Founded in **2008**
with over a decade of
experience



Headquartered in
Los Angeles,
California



Global footprint with
offices throughout the US
and in Canada, India,
Singapore, and Southeast
Asia



Over **150**
Employees
and contractors
worldwide



Working with
utilities, cities,
automakers and C&I
customers across the US
and the world



Acquired by **Shell**
in February 2019



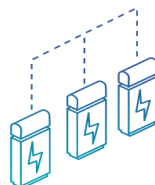
Greenlots is powering the future of electric transportation with industry-leading EV charging software and services



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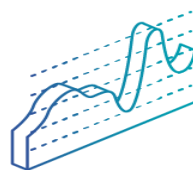
EV Charging Network Software

Operate & monitor your network of charging stations



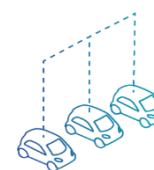
Smart Charging Optimization

Get more power usage from your facility and easily manage energy bills



Digital Mobility Solutions

Digital platforms for fleets and auto OEMs to expand their mobility offering

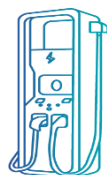


Grid Balancing Services

Aggregate and leverage EV load to maintain grid reliability and efficiency



Our turnkey approach to charging infrastructure



Choice of hardware



Program management



Engineering & Commissioning

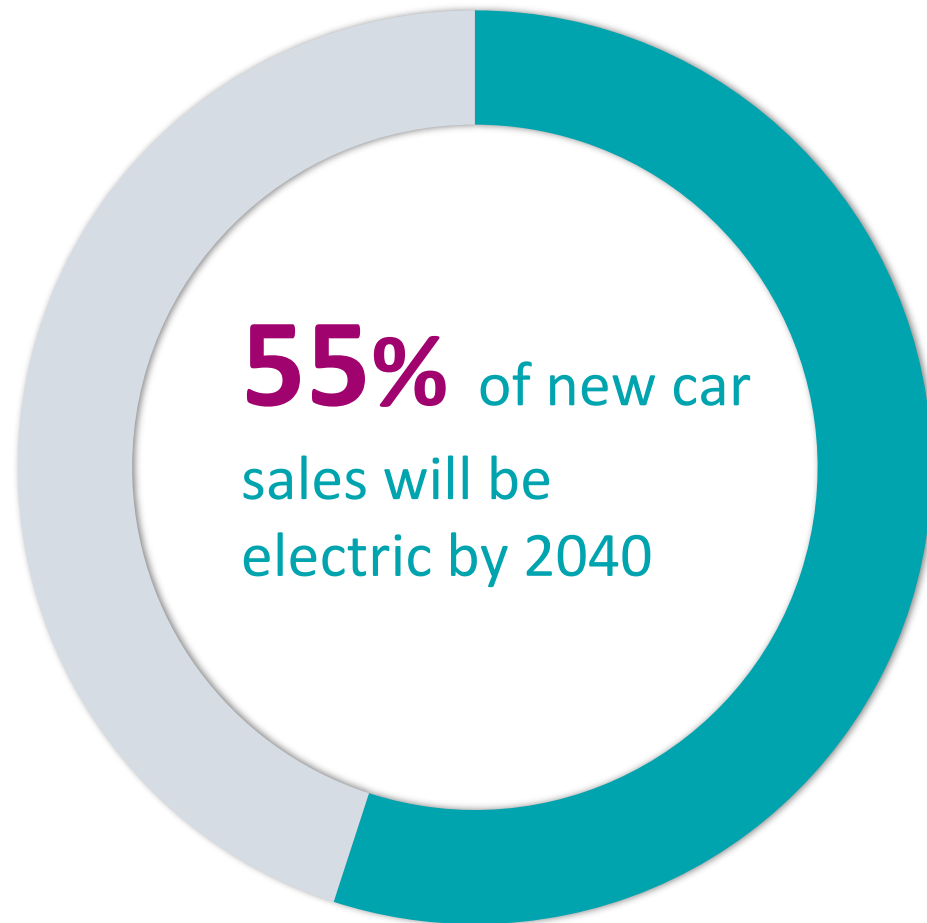


Software & Mobile App



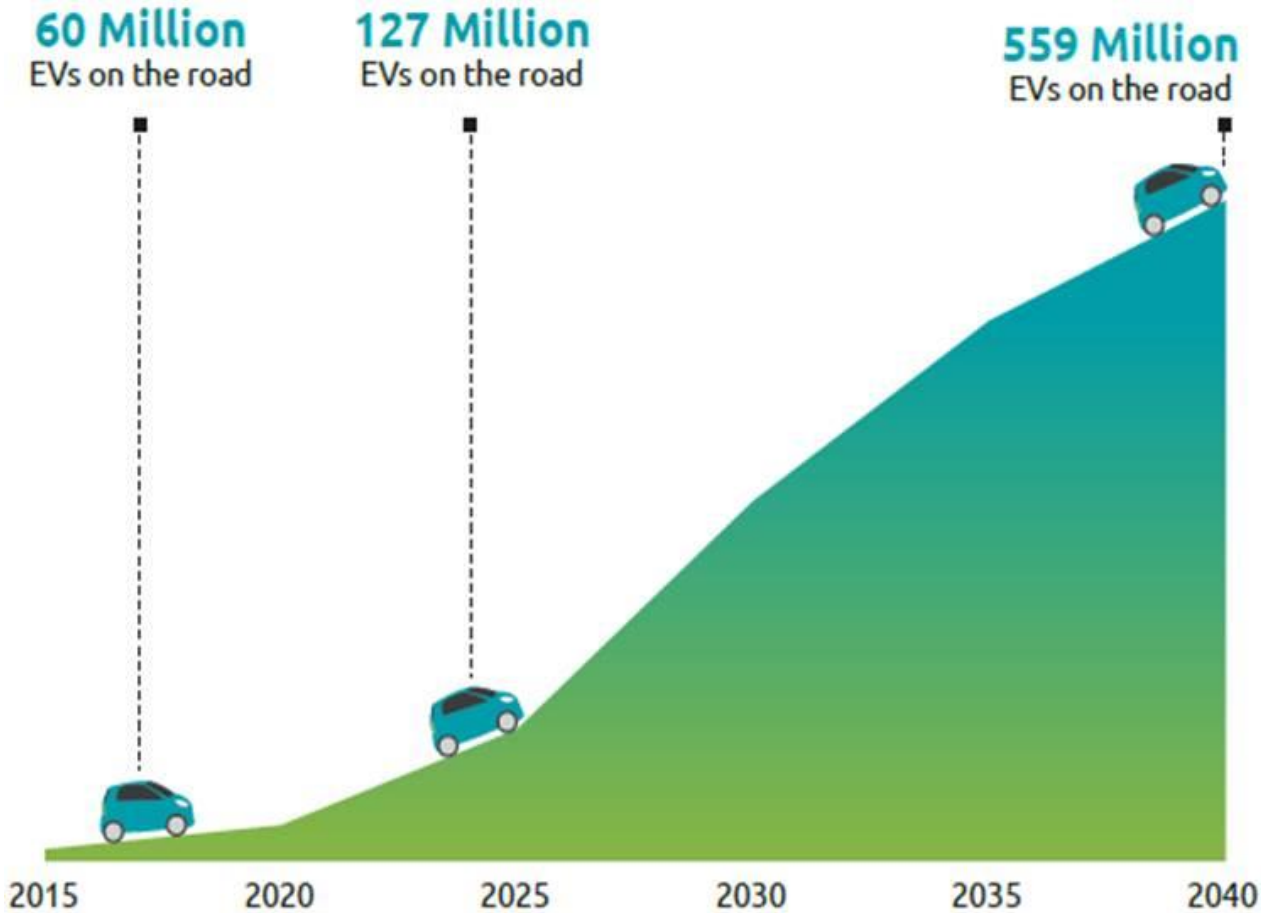
Customer Support and O&M

Over half of new cars will be electric worldwide

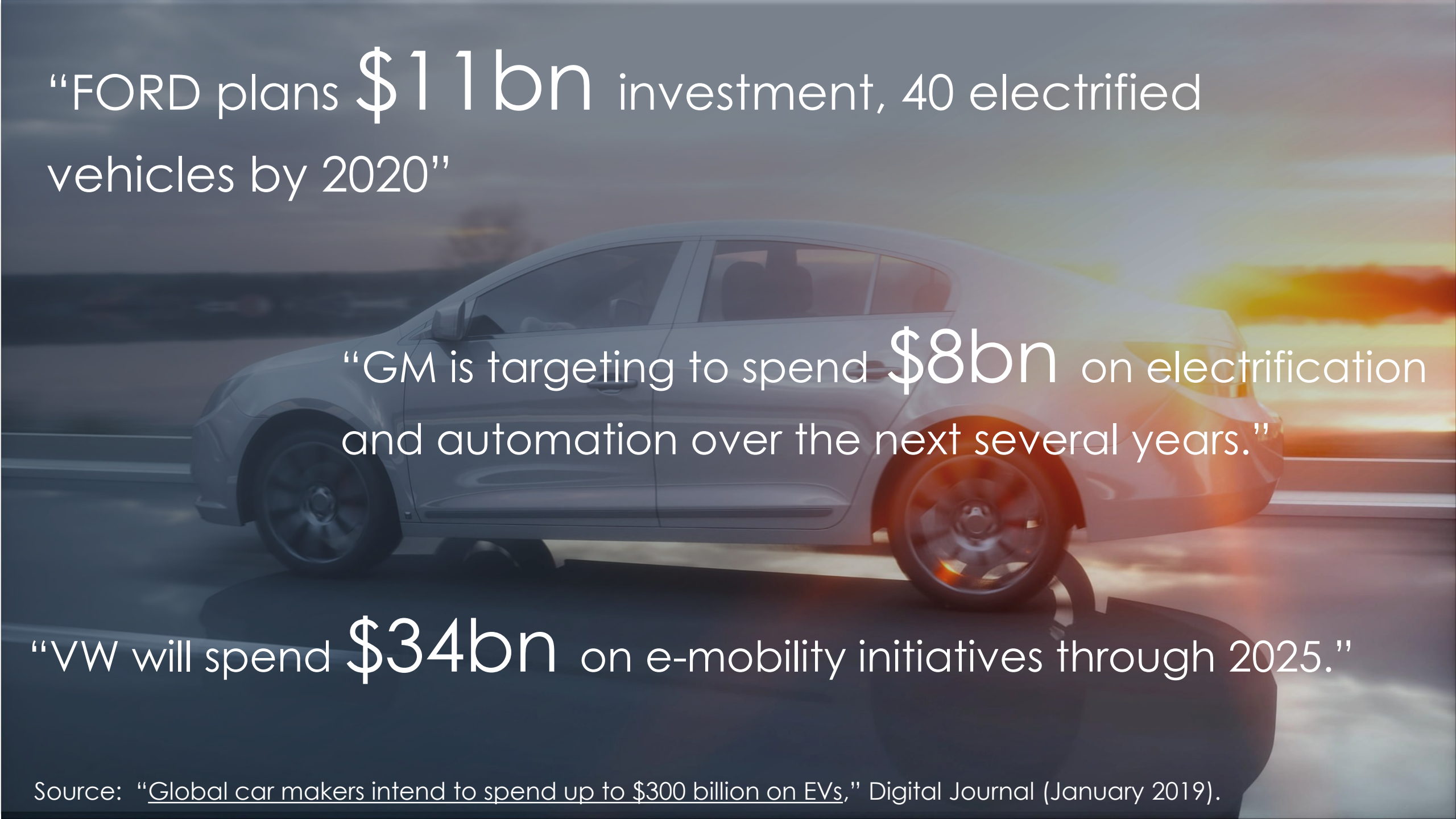


Source: "Long-Term Electric Vehicle Outlook 2018," [Bloomberg New Energy Finance](#) (May 2018).

This means nearly 560 million EVs will be on the road



Source: "Long-Term Electric Vehicle Outlook 2018," [Bloomberg New Energy Finance](#) (May 2018).



“FORD plans \$11bn investment, 40 electrified vehicles by 2020”

“GM is targeting to spend \$8bn on electrification and automation over the next several years.”

“VW will spend \$34bn on e-mobility initiatives through 2025.”

Source: “Global car makers intend to spend up to \$300 billion on EVs,” Digital Journal (January 2019).

We deliver turnkey solutions
for any EV charging application



Our turnkey approach

We work with all EV charging types from residential to high power charging

Level 1 Charging

Range per hour of charge	5 miles
Electric and power spec	120 Volt, 12-16 Amp circuit
Maximum Charging Capacity (kW)	1.44 kW
Charger connector	 Port J1772
Charger cost	None
Application	Suitable for home overnight charging, not suitable for on-the-go or commercial charging

Level 2 Charging

Range per hour of charge	25 – 70 miles
Electric and power spec	208 – 240 Volt, 30 - 80 Amp circuit
Maximum Charging Capacity (kW)	7.2 – 19.2 kW
Charger connector	 Port J1772
Charger cost	Approx. \$1,000 – \$6,000
Application	Common in public or workplaces charging where people will stay for an hour or more

Level 3 Fast Charging

Range per hour of charge	175 – 525 miles
Electric and power spec	208 – 240 Volt, 180 Amp circuit (22kW) 480 Volt 3-phase 80 – 240 Amp circuit (50kW – 150kW)
Maximum Charging Capacity (kW)	22 – 50 kW for DCFC 50 – 150 kW for High Power Stations
Charger connector	  CHAdeMO SAE Combo CCS
Charger cost	Approx. \$25,000 – \$100,000
Application	Perfect for short-time parking places, retail stores, freeway corridors, roadways

Our turnkey approach

We provide a wide range of EV charging hardware options

Level 2

BTCPower



Efacec



EVoCharge



Novacharge



EVBox



CMI



DCFC

BTCPower



Efacec



ABB



Tritium



High Power Chargers

Efacec



ABB



BTCPower



Our turnkey approach

We design, build and maintain so you don't have to

Engineering



Use our experts to provide the electrical load assessment and engineering services

Installation



From charging hardware to electrical equipment we ensure reliable and complete installation of your charging system

Commissioning

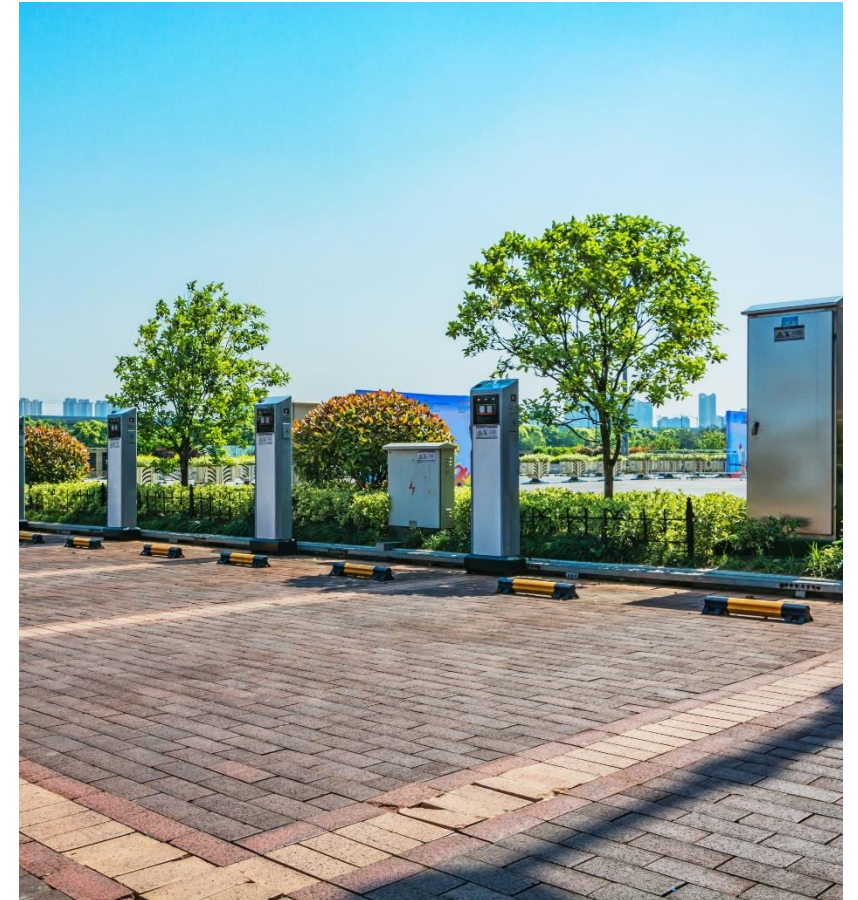


We make sure your new chargers are up and running to verify proper connection and functionality

O&M



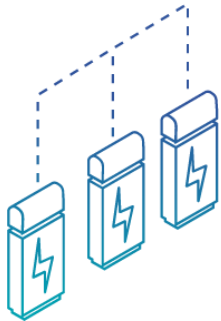
We provide the training, station support, and driver support needed to operate and maintain your charging stations



Our turnkey approach

Cloud-based EV Charging Network Software to easily manage operations

Remote monitoring



Get real-time status of your EV chargers and alerts

Customizable pricing



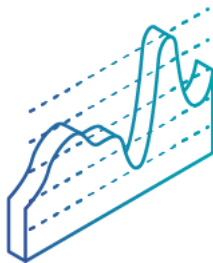
Change and customize pricing of EV Charging to reflect your business needs

Customer billing

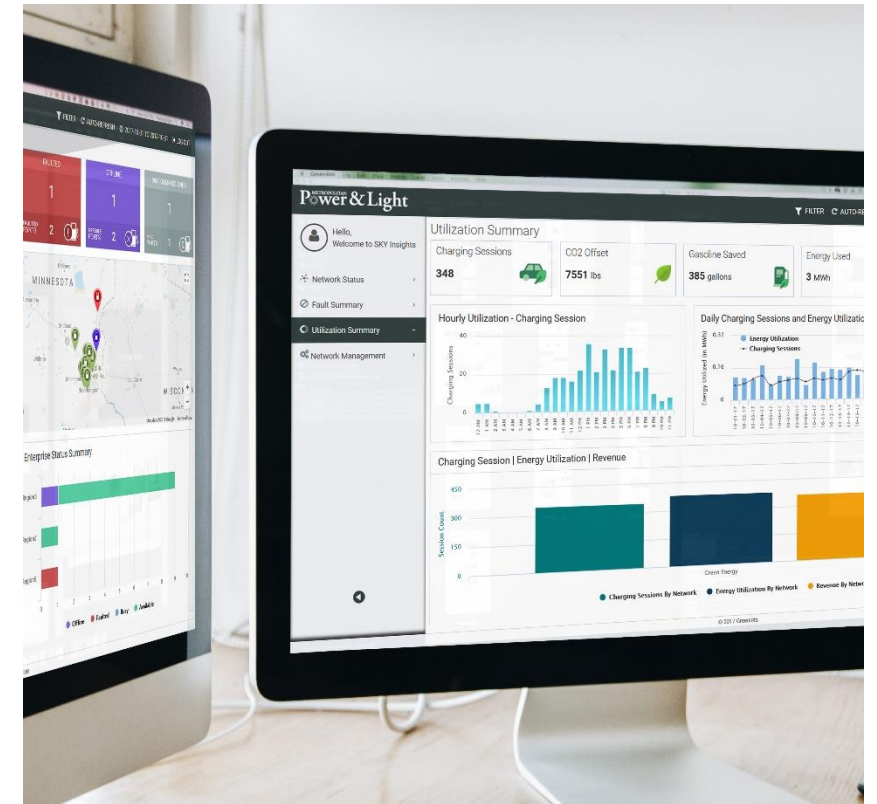


Multiple payment options with secure processing

Advanced reporting

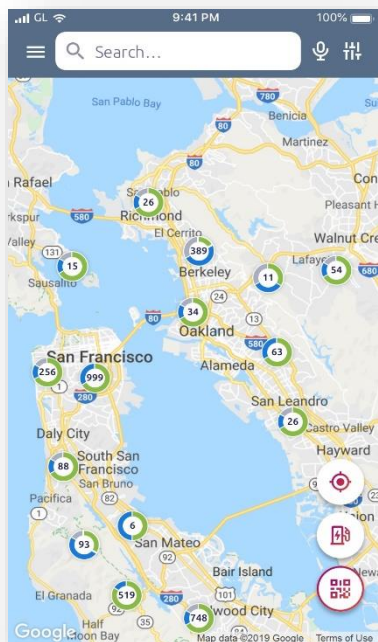


Get charger utilization data to understand your customer's needs



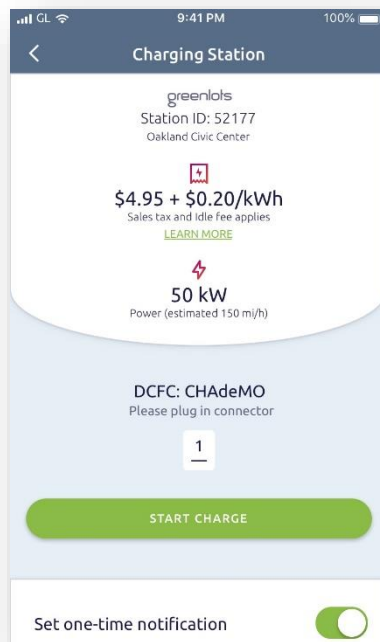
Our turnkey approach

A driver-friendly mobile app that makes charging on the go easy



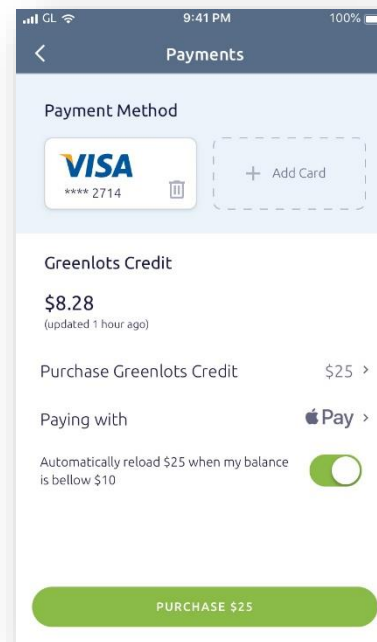
Find the nearest station

Locate a charging station near you that's open, available, and ready to be used



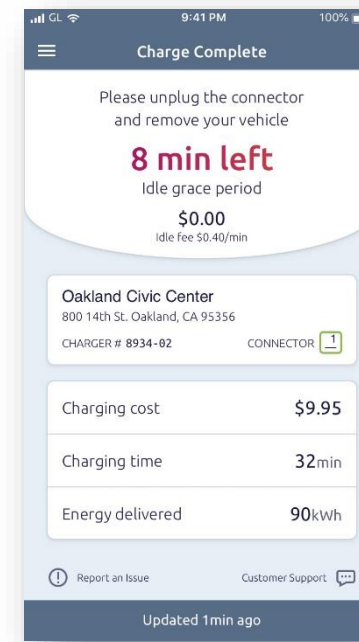
Start and end charging

From your mobile app you can start and end a charge while receiving notifications on charging status



Easily make payments

Pay for your charging session right from our mobile app.



Real-time notifications

Stay up to date with your charging status by receiving notifications direct to your phone

Our turnkey approach

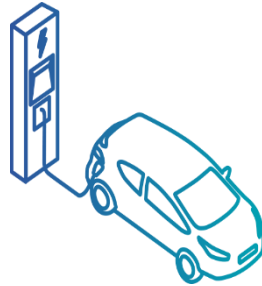
Customer support throughout the driver and customer journey

Training



We will provide hardware and software training during commissioning

Station Support



Operational support for managing your charging stations

Direct Support

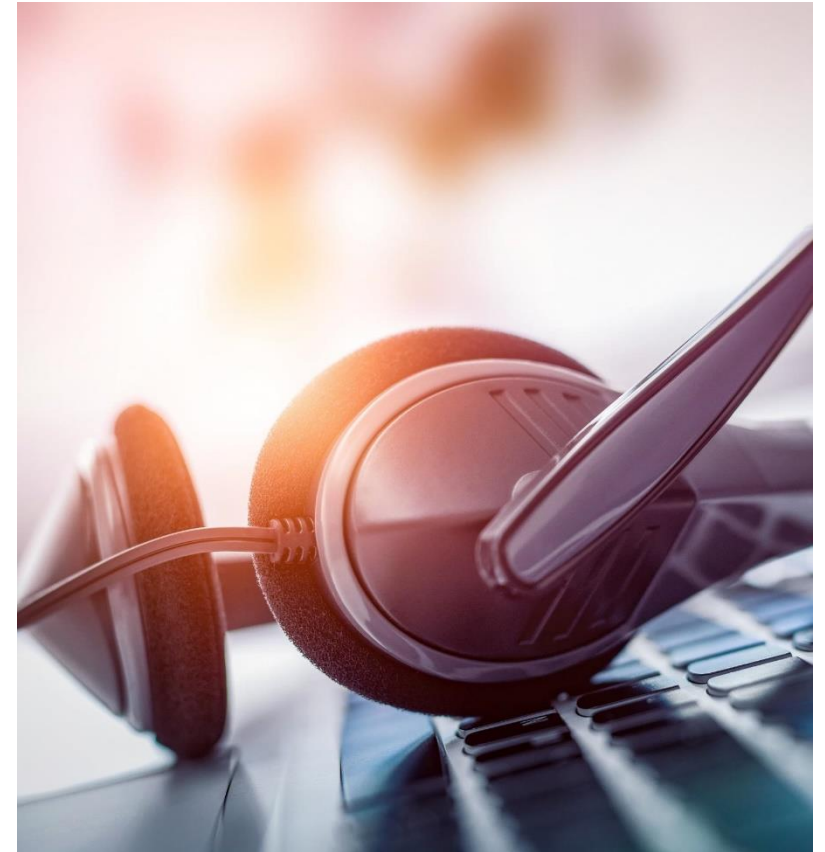


Access our experts during business hours

Driver Support



We provide 24/7/365 customer support for drivers



We offer the latest in EV
Charging Network Software.



Greenlots SKY™ EV Charging Network Software

Manage your charging stations:

- Control sessions in a real-time
- View status and performance of each station
- Receive fault notifications

Set up pricing to reflect your business model:

- Set charging fees based on usage, time, or session
- Assign different pricing rates
- Establish a flat monthly rate or connection fee

Integrated billing and payment systems :

- Drivers can easily make payments by using our mobile app, credit card, RFID card, or calling customer support
- Drivers can track payment and billing history and manage their accounts

Get advanced analytics and reporting:

- View charging utilization data by port, charger, or location
- Create and download customizable reports
- Track key operational performance indicators and schedule maintenance activities

Control and optimize EV Charging load:

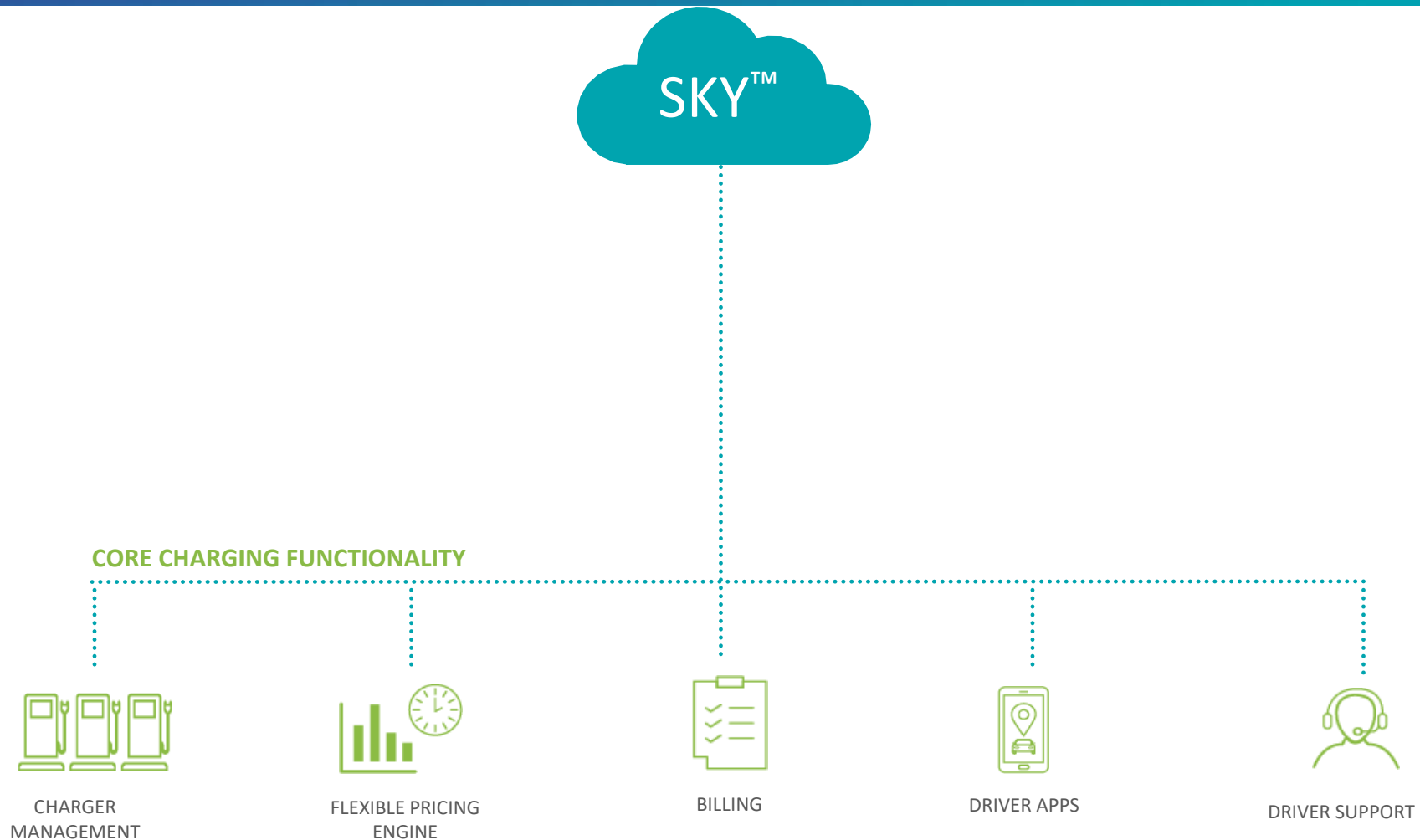
- Automatically prioritize and adjust charging speed
- Deploy flexible pricing to incentivize off-peak charging
- Prioritize building energy load

Engage Drivers with a Mobile App:

- Remotely start and stop a charging session
- Pay for charging directly from smart phone
- Get real time charging updates and check progress

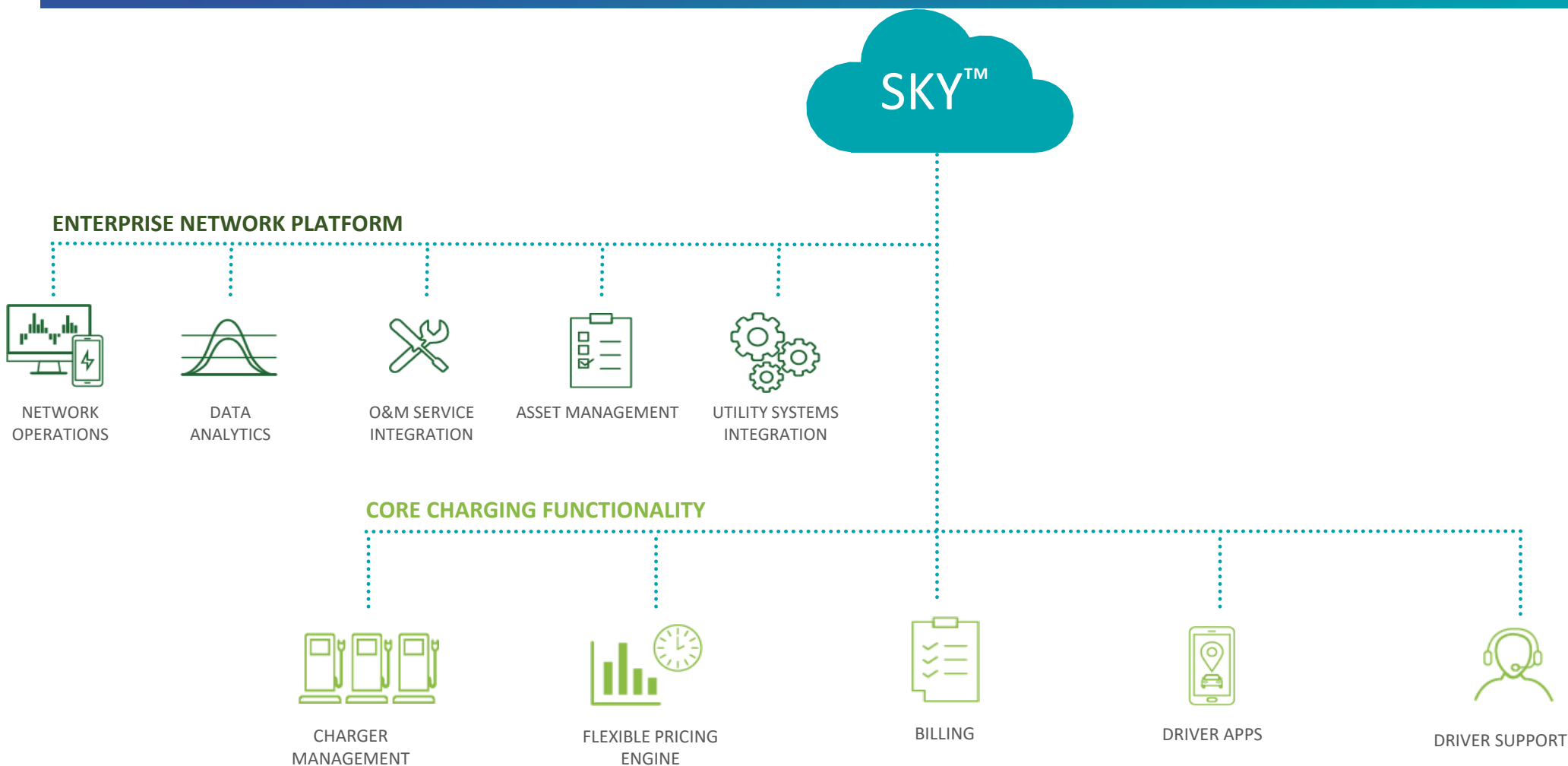
EV Charging Network Software

Core charging functionality



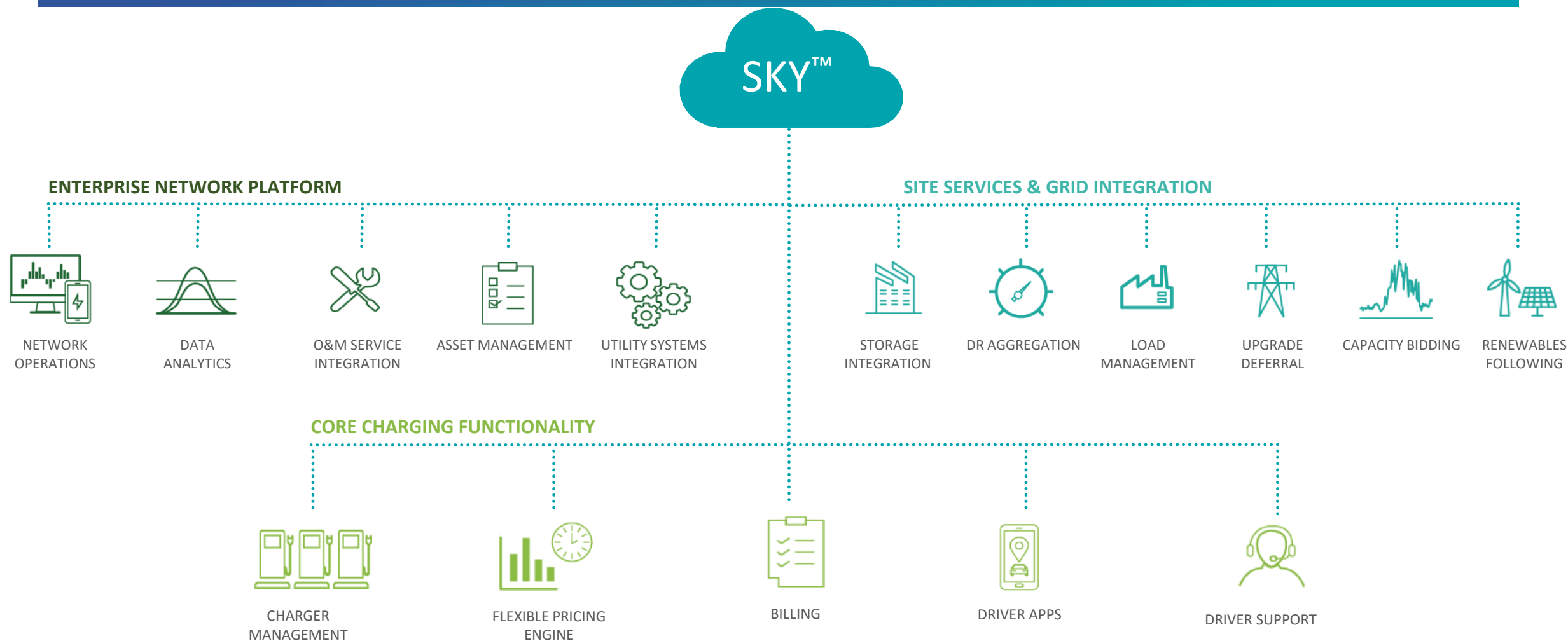
EV Charging Network Software

Enterprise solution for large scale EV charging operations



EV Charging Network Software

Energy management and grid integration capabilities



EV Charging Network Software

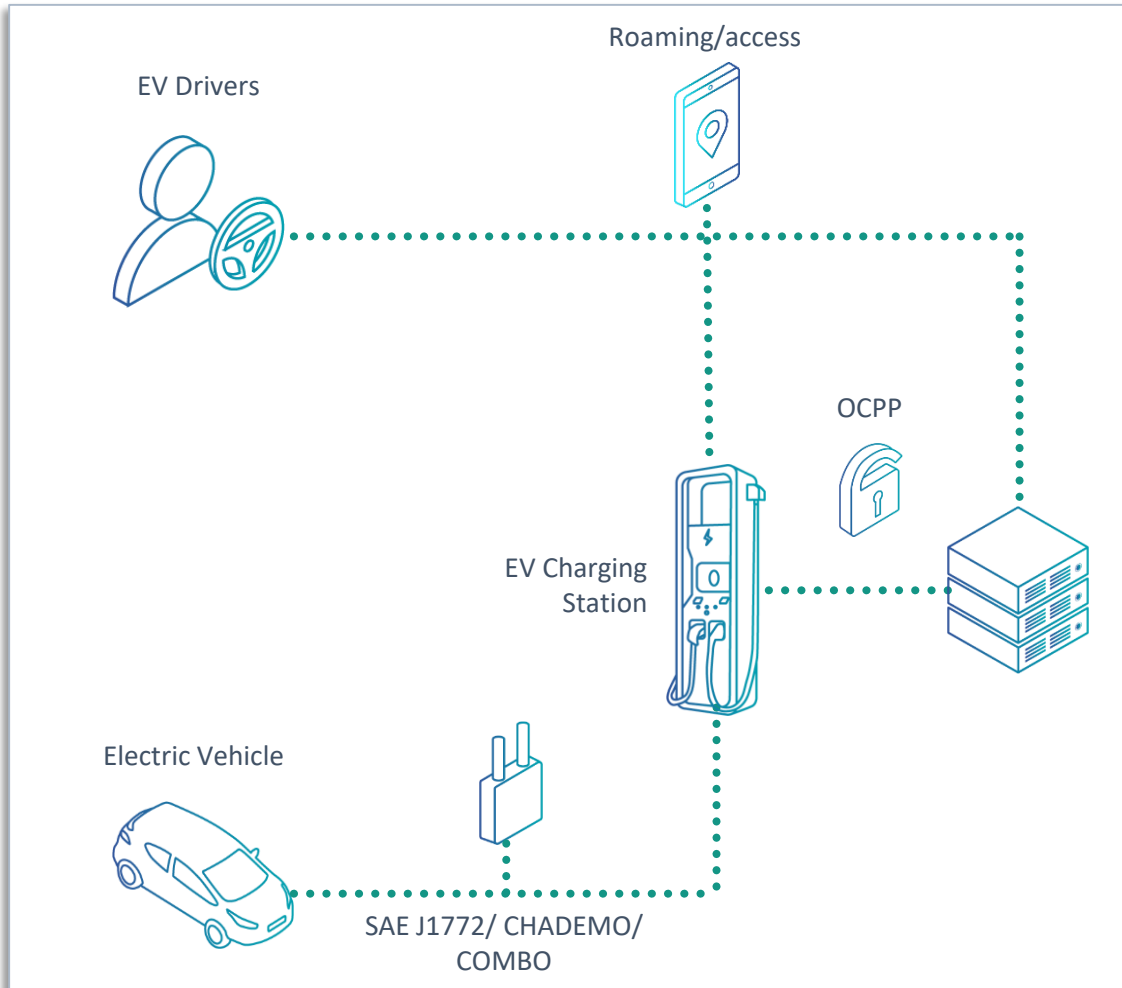
SKY™ Insights for charging utilization data and analytics



- Real-time status of all charging events
- Error / fault notification and automated ticket creation
- Real-time service level agreements management
- View weekly energy utilization rates to better plan for investment
- Predictive analytics for asset reliability optimization

EV Charging Network Software

Built on open standards



Greenlots SKY Network Software is built on open standards and utilizes the Open Charge Point Protocol (OCPP).

Our software provides you great flexibility, as it supports a wide range of charging hardware options regardless of the vendor, can communicate with other software platforms, and integrate into utility demand response programs.

With OCPP you:

- are not locked into one charging network
- can flexibly add or switch to another network
- get technology best practices from around the world
- can easily integrate your EV charging system with other apps, including from other vendors

Smart EV charging and energy optimization

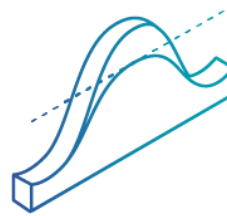


Smart EV charging and energy optimization

Unmanaged EV charging can have significant impacts

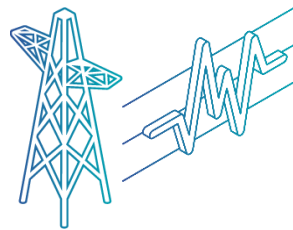
PEAK DEMAND

- System not designed to withstand increase in power demand from EV load
- Incur high energy costs due to peak demand charges
- Expanding electrical infrastructure can be costly or not possible



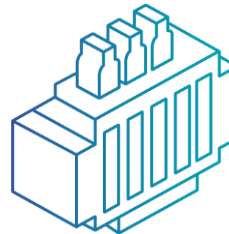
GRID CONGESTION

- Misalignment in power supply & demand leads to changes in voltage & frequency
- Causing rolling brownouts and blackouts



EQUIPMENT FAILURES

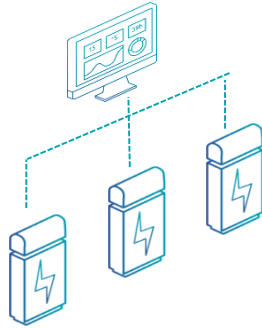
- System not built for new EV load
- New power demand can overload critical assets leading to unplanned outages



Smart EV charging and energy optimization

Greenlots offers smart charging solutions to optimize energy usage

EV Charging Load Sharing



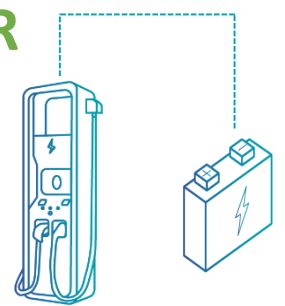
- Our algorithms enable customers to set a maximum charging load limit
- Allowing for automatic sharing of available power between EV chargers when charging load is expected to go beyond its limit.
- Power between the chargers can be distributed evenly or based on charger priority.

EV Charging Load Scheduling



- Load scheduling enables site hosts to prevent or curtail charging sessions during hours when the cost of electricity is high
- This feature is highly beneficial for site hosts with unpredictable loads at their location
- As well as for fleet owners who need vehicles fully charged by a specific time without exceeding load limits

Integrated DER & Storage



- Distributed energy resources (DER), such as energy storage or PV solar systems, provide sites with additional power that can be used when electricity prices are higher than normal.
- Greenlots can easily integrate DER into charging systems, enabling site owners to minimize costs during peak demand by pulling energy from the DER, rather than the grid

Charging hubs with integrated storage and DERs

Making charging on-the-go fast, reliable, and affordable

Fast and affordable charging for drivers

Allow drivers to fully charge in 30 minutes and offer consistent and affordable pricing by pulling power from onsite storage.

Avoid peak demand charges

Automatically discharge power from onsite storage when energy consumption exceeds the maximum power demand set by your energy provider.

Load shifting for lower energy bills

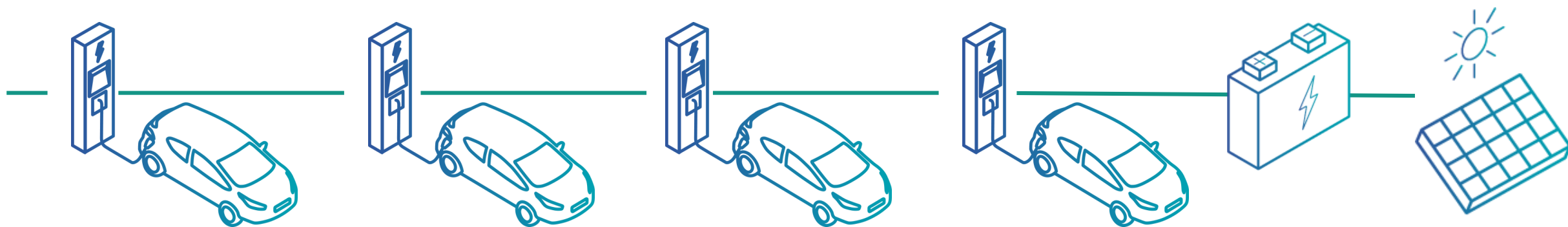
Avoid paying high energy prices and the need to upgrade electrical infrastructure by using onsite storage during periods when electricity prices are high.

Participate in DR while offering full charging services

Allow station owners to participate in DR programs while still offering fast charging for drivers.

Leverage clean energy sources

Provide dispatchable EV charging load during solar over generation, helping increased renewable penetration in the grid.



Success stories and use cases



Our customers & partners

UTILITIES



GOV'TS & BUSINESSES

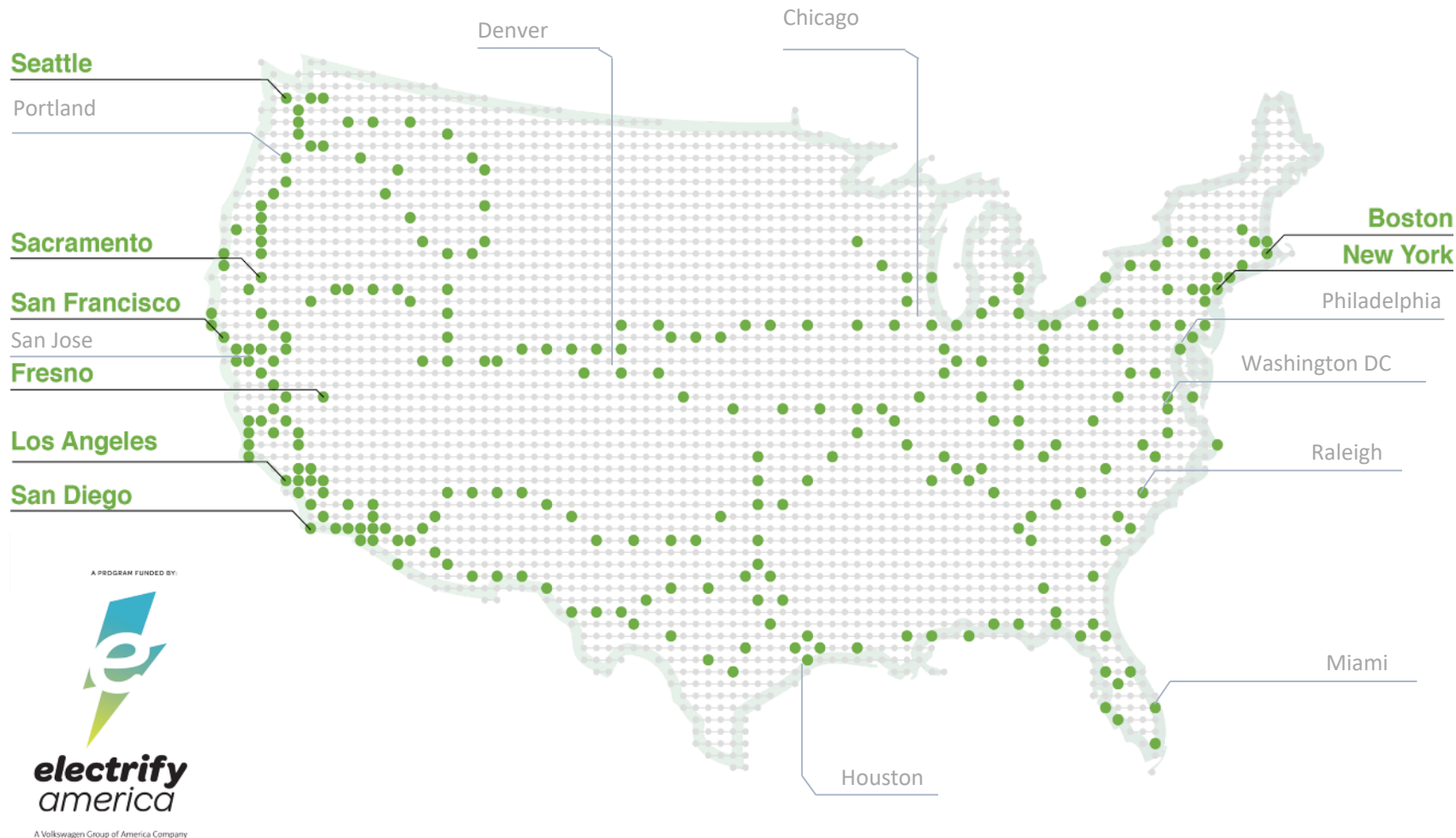


AUTOMAKERS/FLEETS



Success stories

Electrify America: \$2bn investment in EV charging infrastructure



Nationwide Fast Charging Network

Greenlots selected as **sole software provider** to manage **2,500+** high-power fast chargers at **250+** sites along major highways and linked to **17** metropolitan areas in **38** states

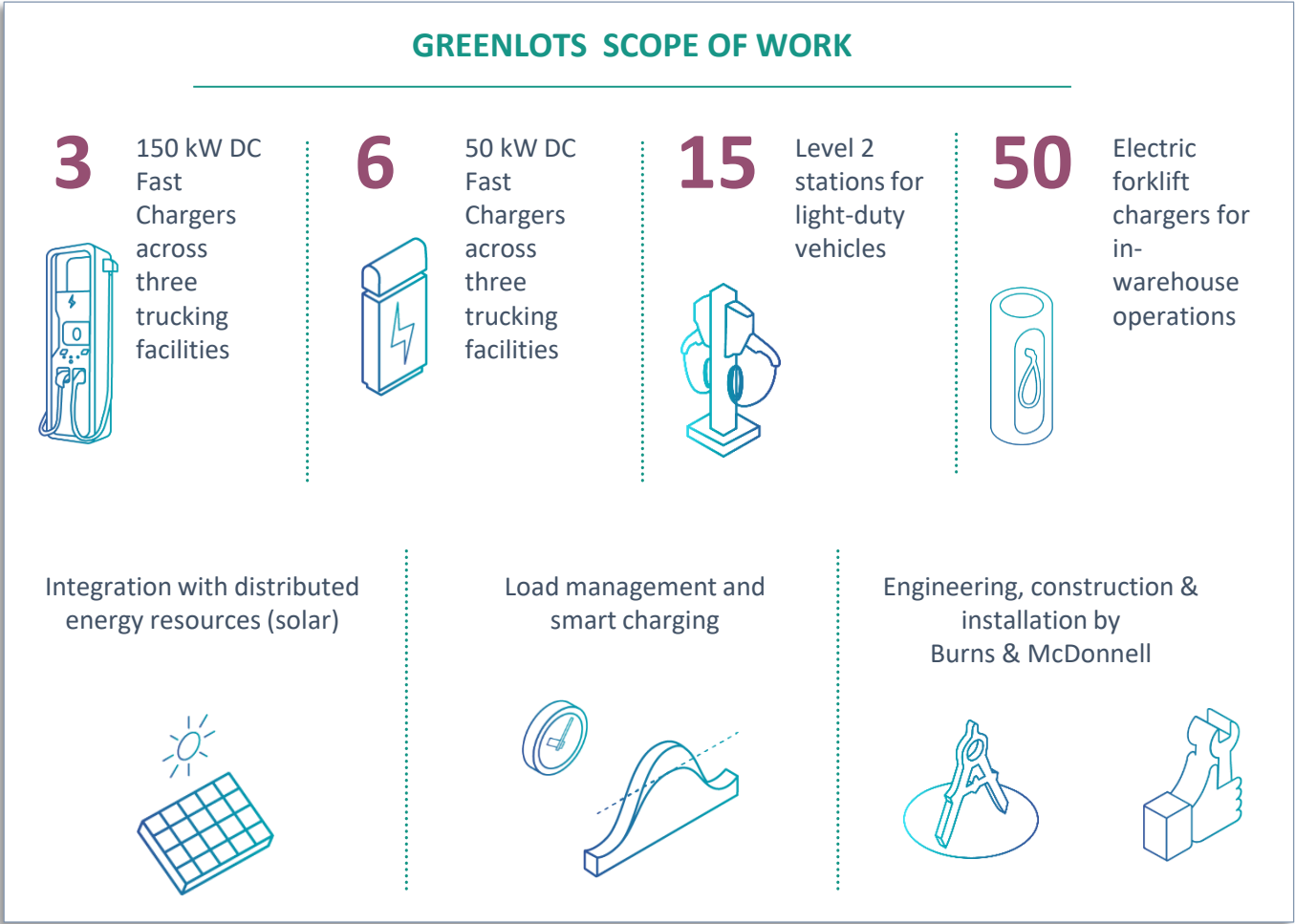


Community-based Charging

Greenlots selected to deploy **900** Level 2 stations at more than **140** workplace and multi-unit dwelling sites in **8** metropolitan areas

Success stories

Heavy-duty electrification with Volvo Trucks



Success stories

LAPD: Fleet charging and load management

Project Overview

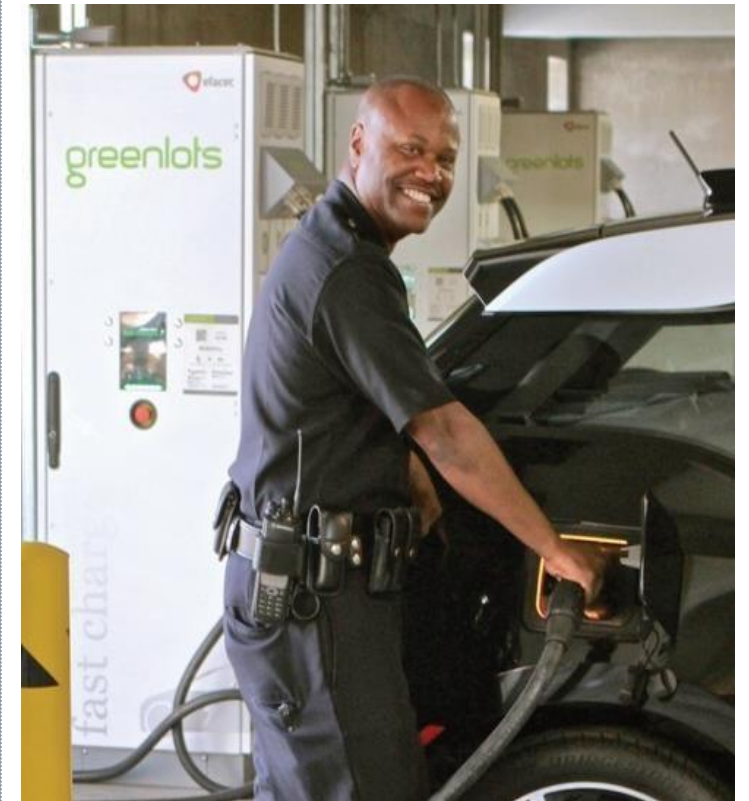
City of Los Angeles has a target of 50% of new city fleet vehicles to be electric by 2017 and 80% by 2025.

- LAPD is largest fleet in the city and first department to go electric with the first 100 BMW i3s out of 500 EVs in total
- Building on open standards allows HW to be selected based on specific site requirements
- Greenlots was selected to provide 100 L2 and 4 DC Fast Chargers at one location with DR capabilities

Key Benefits

Load management avoids electrical infrastructure upgrades and reduces demand charges.

- Responds to real-time electricity demand of building
- Charge optimization and prioritization ensures vehicles are charged when they are needed
- Reporting tracks fleet data, operating cost and efficiencies of an all-electric fleet
- Rolling out charging infrastructure to 25 facilities across city



Success stories

Avista Utilities: Industry-leading pilot for EV deployment

Project Overview

In the state of Washington, Avista partnered with Greenlots to deploy the EV charging infrastructure in residential and workplace areas.

- \$3M pilot project to install EV charging stations in public, residential and workplace areas
- Level 2 and DC fast charging stations
- Greenlots' turnkey solution included site development, installation, branding, billing, analytics and demand response

Key Benefits

Our turnkey EV charging program allowed Avista to install and manage EV charging stations throughout its network.

- Multiple subscription and charging models
- Centralized purchasing, installation and warranty of equipment
- White labeling of customer portal, mobile app and hardware
- Demand response capability



Success stories

BC Hydro: Fast charging network in Vancouver

Project Overview

Launched in 2013, BC Hydro project has deployed 29 DCFC (50kW).

- Greenlots was selected to provide network management capabilities
- Largest multi-manufacturer DCFC network in Canada (mix of ABB, Eaton, Efacec)
- Seamless user experience through mobile app and RFID
- BC Hydro owns the asset and leases it to municipalities, who can opt to collect revenue for charging

Key Benefits

Multiple hardware providers connected to one network management solution using OCPP.

- No monthly subscription for customers
- Supports multiple payment options
- Credit cards via mobile app
- Optional RFID cards
- Phone payments



Success stories

California Energy Commission: DC fast charging project

Project Overview

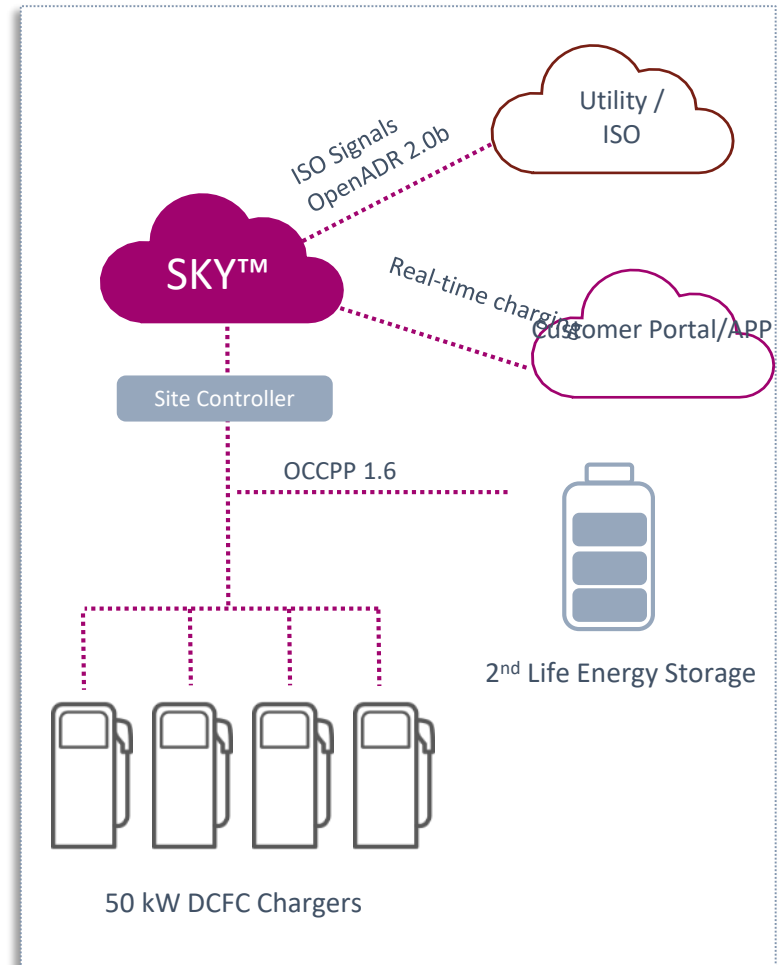
In 2016, the California Energy Commission announced the Advanced Vehicle-Grid Integration Research and Demonstration project.

- Greenlots selected to develop an integrated hardware + software platform to control distributed DC fast chargers and energy storage
- Evaluate grid services potential from the aggregated DCFC loads to offer utility on-peak demand response, renewable integration and fleet scheduling

Key Benefits

Evaluate the benefits and potential of integrating energy storage and EV fast charging in the following applications:

- Site demand-charge reduction
- Demand response
- Renewable integration
- Fleet scheduling
- Second-life battery evaluation



Success stories

Hawaiian Electric: DCFC + Storage

Project Overview

Provided the network management and software integration, including monitoring of battery data.

- Deploy a storage-supported 50kW DCFC with max 23kW grid demand
- Observe performance of DCFC under real-world use
- Assess applicability of overall solution as strategy for demand charge reduction
- Operational since 2015

Key Benefits

DCFC with behind-the-meter storage limits the demand placed on the grid.

- Reduces peak-demand charges for the site hosts
- Delays or eliminates the need for electrical upgrades at site host
- Can provide ancillary services to maintain grid reliability
- Keeps charging costs low for EV drivers



Success stories

Germany: Piloting use of EVs for wind energy storage

Project Overview

German Ministry of Energy funded Project for Smart Charging to integrate wind power.

- Greenlots was selected in 2011 to work with Vattenfall, BMW and Daimler
- Using EV battery capacity to absorb excess wind power at night, using 65 Daimler Vito E-Cell and 25 BMW
- Provided the HomePlug AV-enabled EVSE and played an integral part in system integration and testing

Key Benefits

Take unused wind power during low-demand periods to power electric vehicles.

- Increase utilization of wind energy
- Enhance grid reliability by preventing excess wind power from being dispatched to the grid
- Project contributed to the formation of the HP-GP (HomePlug GreenPHY) standard now used for the CCS connector standard and ISO/IEC 15118



Thank you!

Matthew John Miller

Regional Sales Manager / Bay Area

mmiller@greenlots.com

510.871.9220



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