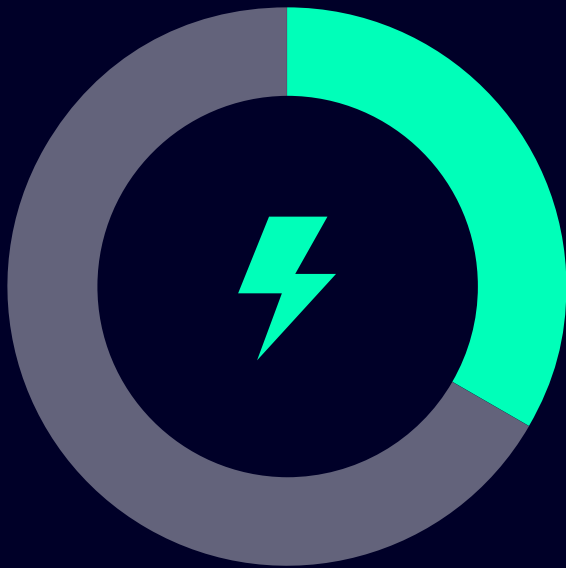


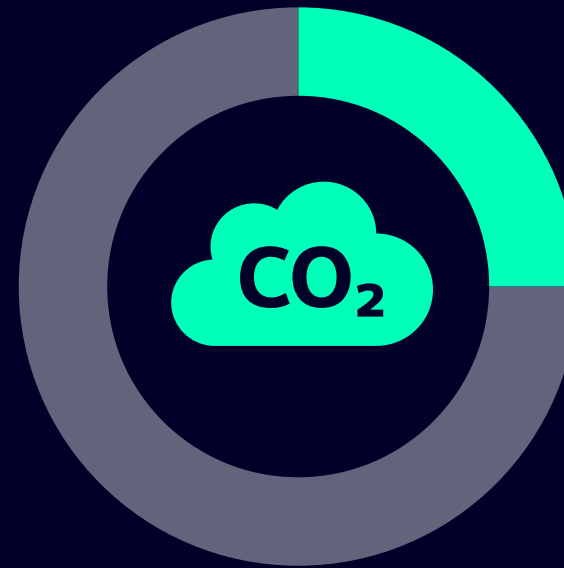
Siemens eMobility®

Electric Vehicle Charging overview
Siemens Financial Services
April 2022
Ross C Mueller & Jerome Penna
SI E Senior Business Developers

Mobility is currently responsible for ...



33%
of all energy
consumed

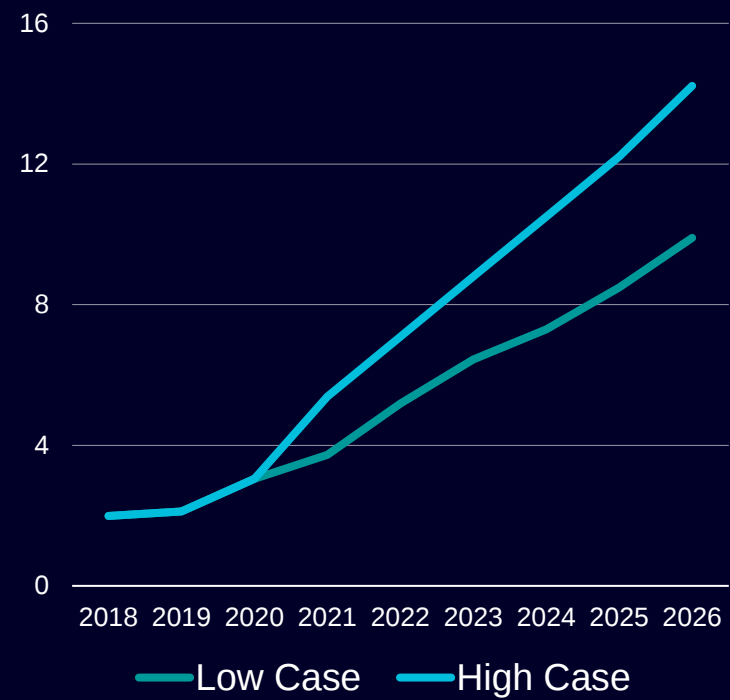


25%
of global CO₂
emissions

The “green recovery”: electric vehicles

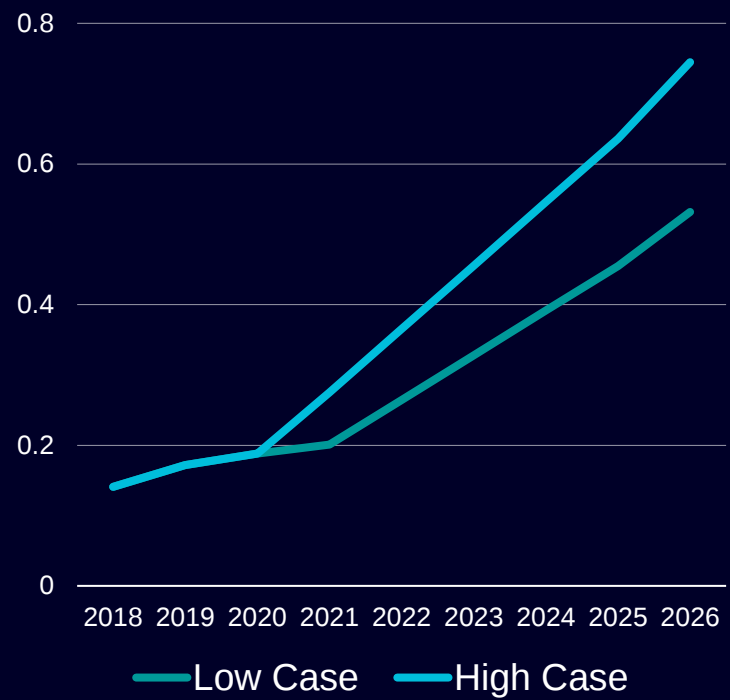
Electric cars

sales forecast in millions



E-buses, E-trucks and light commercial EV

sales forecast in millions



Aggregated growth for all types of electric vehicles 2021-2026:

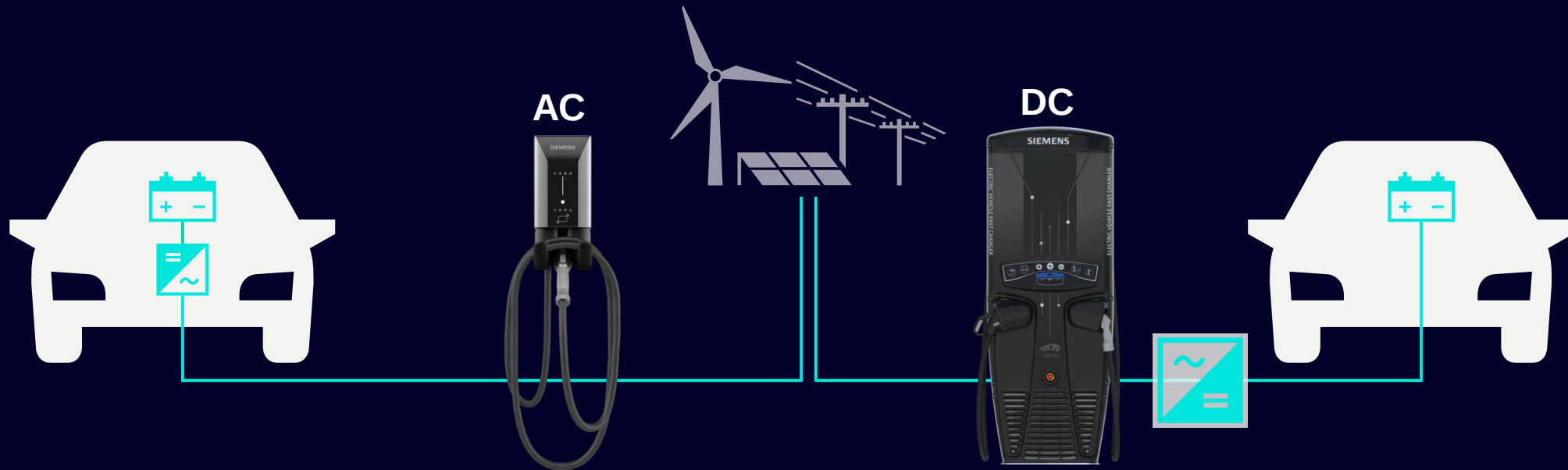
300%*

* Aggregated growth for all types of electric vehicles 2021-2026.

EV 101



AC and DC Charging



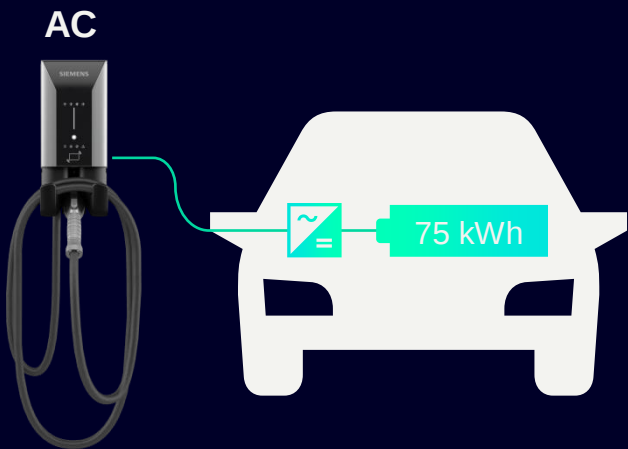
- Onboard inverter inside the EV
- Charging infrastructure has a small footprint and low investment cost
- Charging power rates depend on inverter and electrical supply (7.2 – 11.5 kW)

Perfect for long-term dwelling locations

- Inverter in the charging infrastructure
- Lower investment cost in vehicle, larger footprint and investment in charging infrastructure
- Higher charging power rates possible (300+ kW)

Perfect for fast charging and heavy-duty vehicles

Time for “Refueling” your car depends on charging power and battery



Hours to charge a 75 kWh battery
(charging from 15% to 80%)

7.2 kW AC

240V x 32A

~ 7.5 h (25 miles of range per hour)

9.6 kW AC

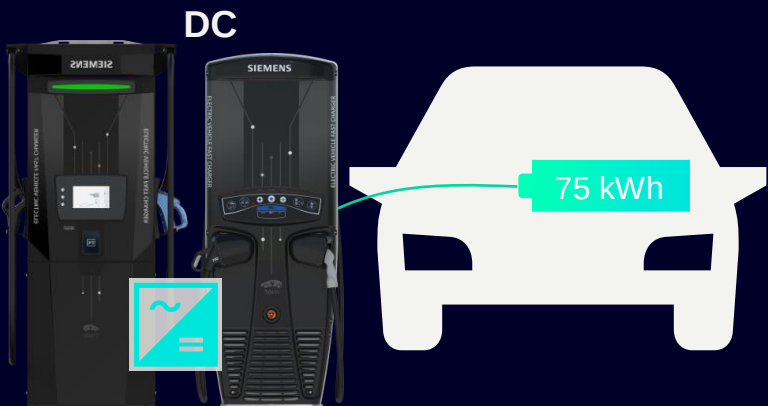
240V x 40A

~ 5.7 h (30 miles of range per hour)

11.5 kW AC

240V x 48A

~ 4.7 h (36 miles of range per hour)



50 kW DC

~ 1 h 20 min.*

100 kW DC

~ 40 min.*

175 kW DC

23 min*

DC fast charging uses 277/480v, 3 phase power. Breaker amperage is 100A for 50 kW and increases to 250A for 175 kW.

*80% of capacity
Real values depend on vehicles, conditions etc.

EV Coupler Types

Understanding EV connectors and charging scenarios

SIEMENS
Ingenuity for Life



CCS1
Combined Charging Standard
Type 1
USA

- Does AC charging
- Does DC Fast Charging
- Most New EV's will adopt CCS1
- **No Adapter to Tesla**
- Opinion: probably new Charging standard going forward
- CHADEMO more Popular in California (Now)
- Equiped on Siemens Charge station for GiddyUp



CHADEMO
Japanese Standard

- DC Fast Charging Only
- Most New EV's will adopt CCS1
- CHADEMO Popular in California
- Siemens Station equipped with CHADEMO
- 50Kw Rate through the adapter

• **Yes Adapter to Tesla* 500.00 ea**



J1772 AC Only

J1772 AC
Tesla Adapter

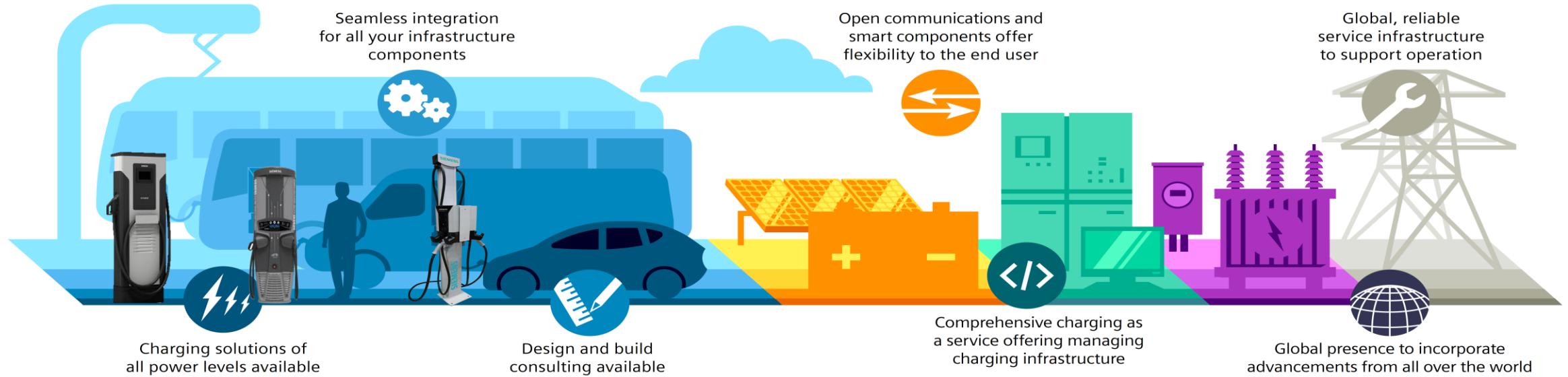


SIEMENS

Siemens Open EV PlugtoGrid™ SIE approach

Siemens PlugtoGrid™

Supplying open end-to-end solutions for any EV application



Design & build

- Large LD infrastructure deployment
- MD/HD depot
- Microgrid
- Greenfield/Brownfield projects
- Infrastructure expansions
- 3rd party chargers

EV chargers

- DC heavy-duty plug in (SiCharge UC)
- High powered pantographs
- AC level 2 (VersiCharge)
- DCFC level 3 (Ultra)

Make-ready equipment

- Power distribution equipment
- Simplifying installations with one vendor

Digital services

- Charger management/billing
- Building management systems
- Load management
- Scheduled charging
- Energy optimization

Asset services

- Onboarding
- Project Financing
- O&M management
- Maintenance and service contracts
- Warranty

Siemens eMobility NAM (USA)

Coverage, Support and Experience



70,000+

Charging points (US Only)

≈12 Years

EV Experience

Support

2,800 Channel Partners
1,000's of service support
personnel

Global Focus

EV Products for UL / IEC / CE / GB/T

eMobility USA Footprint

R&D / Corporate Offices

AC Charging	Atlanta, GA / Germany
DC Bus Charging	Atlanta, GA / Germany
Charging Software	Atlanta, GA / Germany



US Factory Footprint Expanding

AC Charging	International California New plant in F22 in USA
DC Charging	Wendell, NC Alpharetta, GA
Make-ready Panels	Wendell, NC Spartanburg, SC Grand Prairie, TX Pomona, CA



Level 2 AC Chargers VersiCharge™ Commercial / Residential



VersiCharge™ AC Level 2 Chargers

Residential and Commercial Product Offerings



Residential



Smart Residential



- **9.6kW** is hardwired or plug powered with 20ft charging cord. Requires 208/240V, 50A, 2pole
- **11.5kW** is hardwired with 20ft charging cord. Requires 208/240V, 60A, 2pole
- **Smart** Version meets Utility requirements with OCPP over Wi-Fi and Copper ethernet
- **Plug:** SAE J1772

Commercial



Parent / Child Solutions

Features:

- Same 9.6 & 11.5kW specs as Residential but adds **Modbus** TCP / Serial and Wi-Fi / ethernet, cellular OCPP communications.
- **Child Unit** - Wi-Fi, serial and ethernet and can link to parent charger for easy multi unit installation
- **Parent Unit** – includes Ethernet & Cellular gateway
- **Billing or On/Off control** with standard RFID reader. optional QR code or cloud services



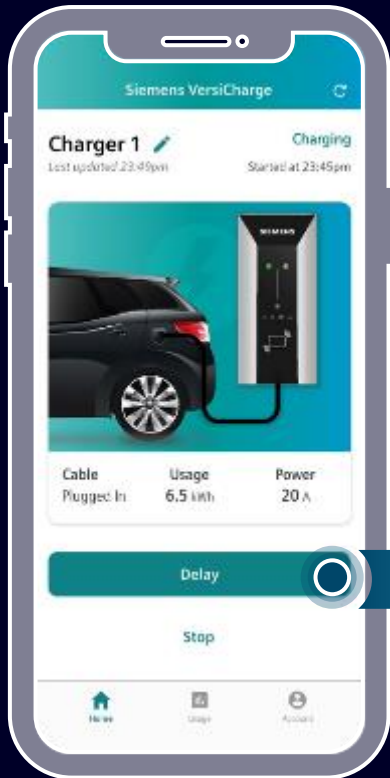
Parent Child

VersiCharge™ AC Level 2 Charger *FREE* App

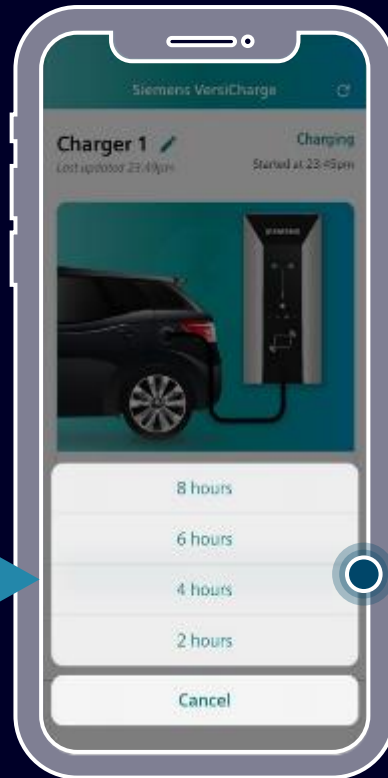
For configuration and basic monitoring / control



Charger status



Choose the delay slot



Charging delay



Energy consumption



Mobile app can be used for controlling charging schedule and monitoring your personal charger



Level 3 DC Chargers VersiCharge Ultra™

VersiCharge Ultra™

Automotive / Fleet Focused Product

One of the fastest growing charging lines

Features

- Dual cord design can accommodate one CCS1 plug and one CHAdeMo plug for maximum flexibility
- Communication via 3G/4G wireless or ethernet wired
- Options include built-in credit card reader and RFID capability
- 175 kW model has an external module to support the power electronics
- Liquid cooled power electronics
- 50 kW unit is proven and widely used in North America, 175 kW unit builds on the success of European projects
- 480V, 3 phase, 100A breaker requirements

The charger can be custom-wrapped to reflect the customer branding



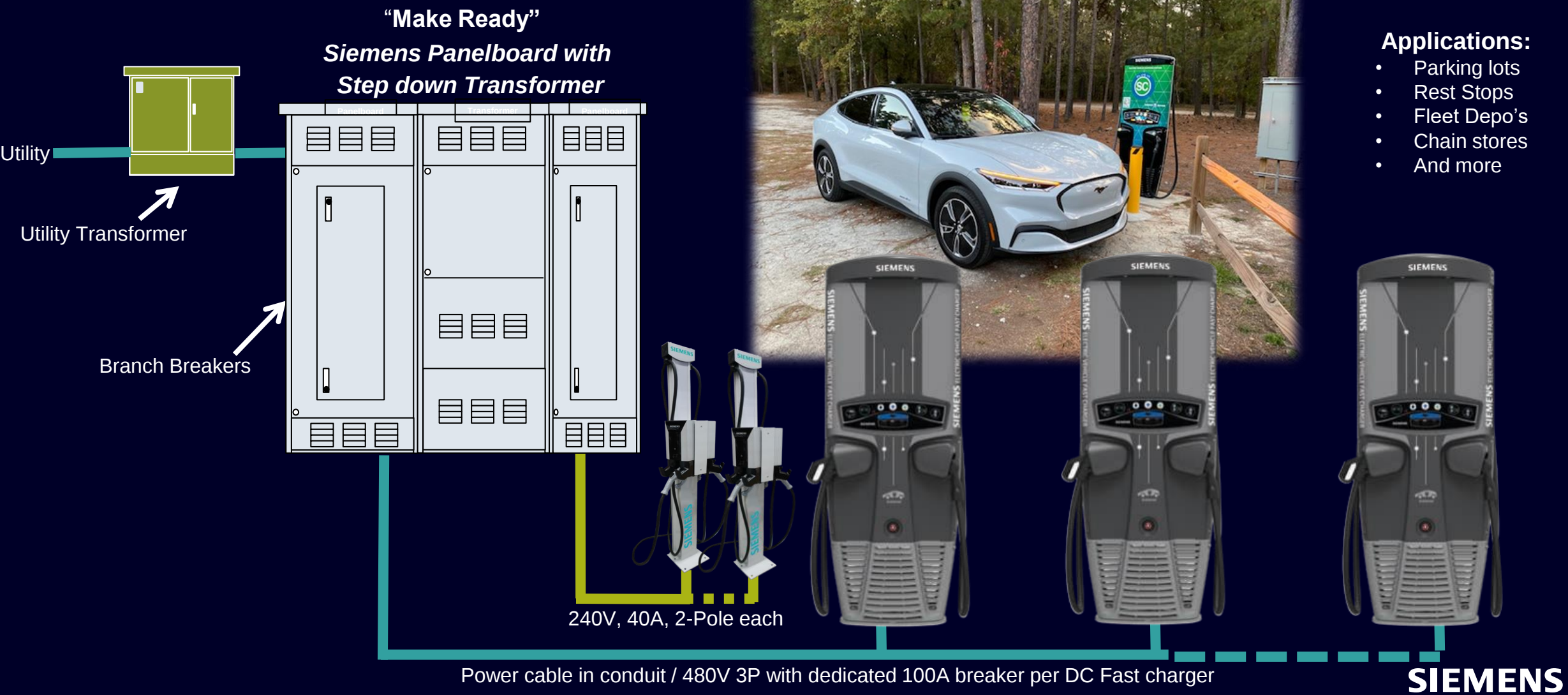
50 kW



175 kW

Ultra50™ DC Fast Charger PlugtoGrid™ Offering

Combined DC / AC Example





Transit Fleet DC Chargers SiCharge UC

The SICHARGE UC product family

Modular and powerful charging solution for your electric fleet

Key Features

- Various power classes up to 450 kW (peak)
- Voltage range up to 1,000 V DC
- Flexible connection options:
 - Compact charger with integrated CCS cable
 - Charging center with:
 - Up to 4 additional CCS-plug dispensers*
 - CCS-based contact hood or automated pantograph



siemens.com/sicharge-uc

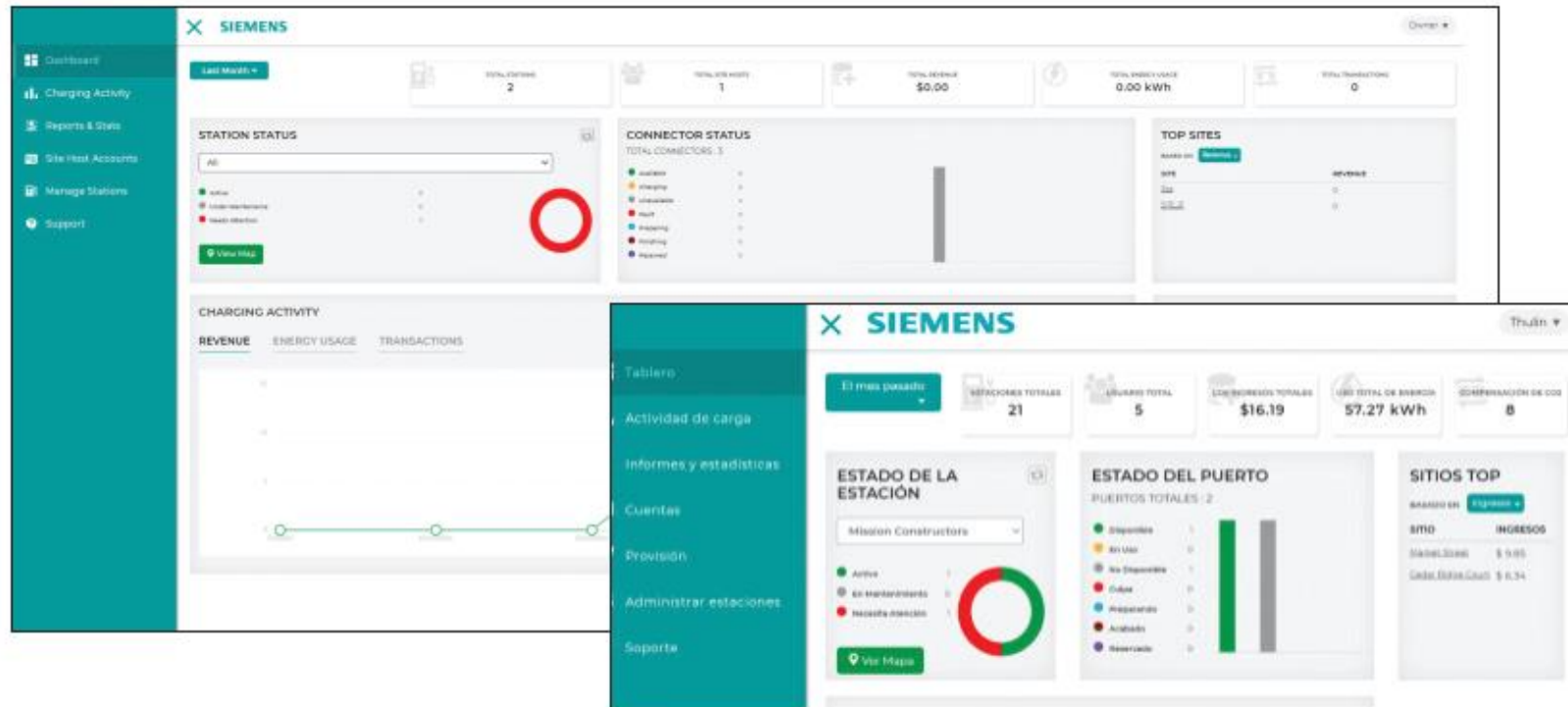


Software Services SaaS

Owner web portal

View station information, including station availability, Charging statistics, accessibility time and more

EV charger owners can quickly view all their charger's information from one easy to read dashboard. Review the charger's usage over time or in groups, manage stations remotely, setup billing rates by kw, time, special events and more. Dashboard screens are also available in Spanish.



Our UL portfolio in action

Complete PlugtoGrid™ Use Case: Atlanta Transit – MARTA



Photo credited by MARTA

Design & Build

- Siemens worked with the consultant CTE and MARTA engineers and GA Power to develop a solution for 3 new bus charging locations

Hardware & Software

- Siemens SICHARGE UC Plug-In
- Siemens SICHARGE UC Pantograph
- Siemens EVC3 Depot Cloud Management
- Siemens electrical equipment



Services

- Complete Project Management & Coordination
- Factory Interop Testing & Commissioning

Complete PlugtoGrid™ Use Case: Charlotte, North Carolina Transit (CATS)



Design & Build

- Siemens worked with the consulting firm and Duke Power to develop a solution for their first electric bus charging project

Hardware & Software

- Siemens SICHARGE UC Plug-In
- Siemens EVC3 Depot Cloud Management
- Siemens electrical equipment

Services

- Complete Project Management & Coordination
- Factory Interop Testing & Commissioning



Photo credited by MARTA



Large E-Commerce Company

- * 1,000's AC chargers
- * 100's of DC Fast Chargers
- * National locations across US
- * Cloud Connection to all chargers
- * Siemens electrical equipment
- * Siemens service support

Industrial Manufacturing Fleet

Ultra175kW depot installation

- Class 6 / 7 truck support
- Siemens Ultra175 units
- Siemens cloud service
- Startup / training



Dispenser
unit



Power
control unit

Restricted | © Siemens 2022 | eMobility



Restricted | © Siemens 2022 | eMobility

Transportation Fleet Application

Penske Truck Expands Heavy-Duty EV Charging in U.S with Siemens



DC fast charging and cloud-management

DC 150 kW fast chargers at Ontario, CA location as well cloud-services to manage fleet

More than chargers

Includes battery storage from Siemens

Penske ramps up EV charging stations

- 6 locations in Southern California
- Recent ruling that all new trucks sold in California should be zero-emissions by 2045

Photo credited by Penske – <https://www.gopenske.com/blog/lease/penske-truck-leasing-continues-to-expand-heavy-duty-electric-vehicle-charging-network>

OEM Custom Design Ability

Ford F150 Lightning Charger



Photo credited by Ford

Designing, building, and manufacturing the Ford F-150 Lightning Charger

- Based on the Siemens VersiCharge platform
- 18,000 bi-directional units committed in first year

Developed app tool used to set up and manage charger

- App will be available on Apple and Android
- Hosting chargers on cloud platform to help provide services

First vehicle to bring V2G at mass scale

- Over 200,000 trucks reserved
- Charger can also connect to solar inverters

Siemens EV Charging Portfolio for Enterprise Accounts – DC Fast Charging & Depot



Up to 450kW



Up to 175kW

Class 6 / 7 / 8 Heavy Duty Fleet

- DC Fast Charging for Automobile/Trucks
- DC Heavy Duty Vehicle Charging

Public or Private Installation Options

- Public facing DC Fast Chargers with Credit Card readers for day
- Depot Style configuration for a reduced electrical footprint and cost savings

Services

- Custom Branding for public facing chargers
- Owner Management Software Tools
- Fleet Management Tools

Siemens EV Charging Portfolio for Large Campus – DC Fast Charging & Depot



Electric Bus Fleet

- DC Fast Charging for Bus
- Depot Charging, On-route

Public or Private Installation Options

- Public facing DC Fast Chargers with Credit Card readers for day
- Depot Style configuration for a reduced electrical footprint and cost savings

Services

- Custom Branding for public facing chargers
- Owner Management Software Tools
- Fleet Management Tools

Siemens EV Charging Portfolio for Large Campus – AC Chargers



Campus & Residential Charging

- Charges all EV cars up to 11.5kW
- Supports standard plug design – SAEJ1772
- Billing or On/Off control with RFID or QR code
- Wi-Fi, Ethernet, and 4G capable
- Support key communications such as OCPP 1.6

Flexible Installation Options

- Wall Mountable, Post Mount, Cable Retraction Systems, Integration Partners

Services

- Brand Label Opportunities
- EVSP Onboarding Services
- Driver Cell Phone App
- Owner Management Software Tools

Future - Optimizing Charging Lots @ Scale with new Versicharge XL



Challenge

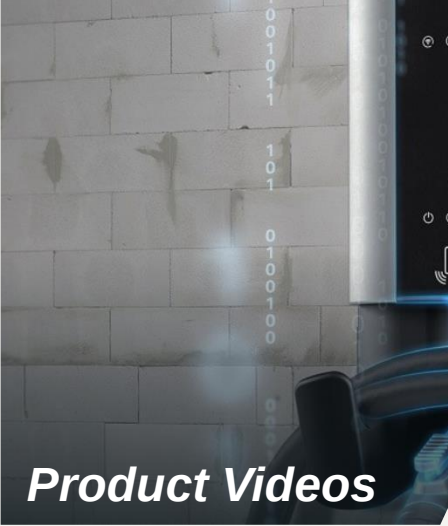
- Electrify thousands of vehicles quickly
- Scale up across multiple locations
- Utilize existing parking locations

Solution

- Prefabricated charging infrastructure that will install quickly, reduce ground installation work, and be modular for easy future expansion

Result

- AC and DC charging stations with Siemens Make Ready
- Faster install, lower cost



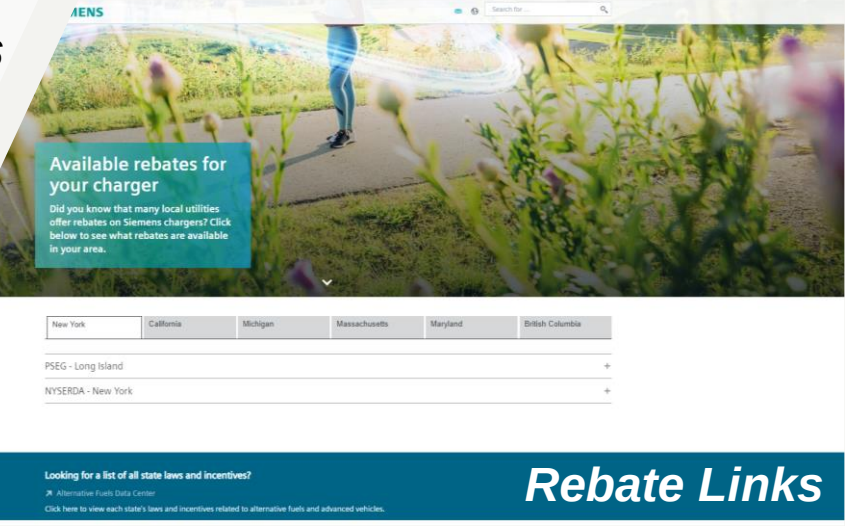
Product Videos



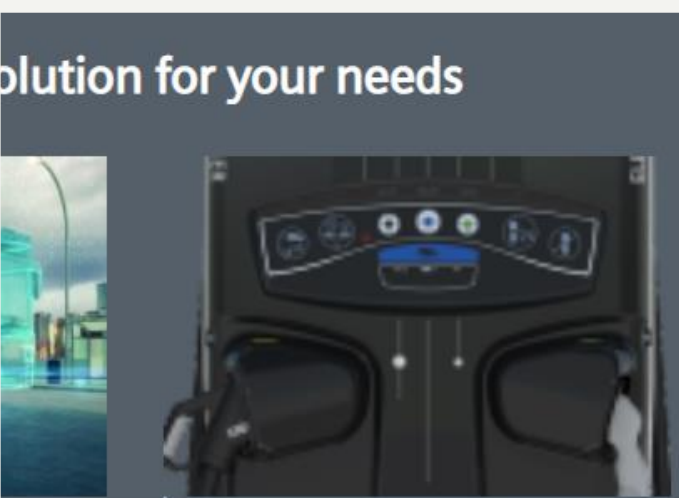
Customer Videos



Seminar Presentations

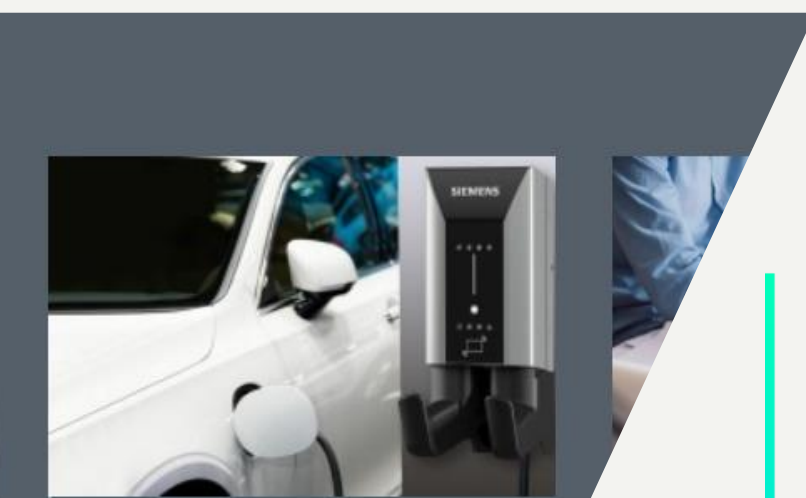


Rebate Links



Level 3 DC Fast Charging

The VersiCharge Ultra™ from Siemens is a reliable and robust electric vehicle fast charger with an attractive design that is easy to install and operate.



Flexible level 2 AC charging

VersiCharge™, the industry's most flexible and versatile line of electric vehicle charging systems for residential and commercial applications.



Online Support - eMobility Web Site

Providing Product information, Specifications, Video's, Rebate Info and more

www.USA.siemens.com/emobility

SIEMENS

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