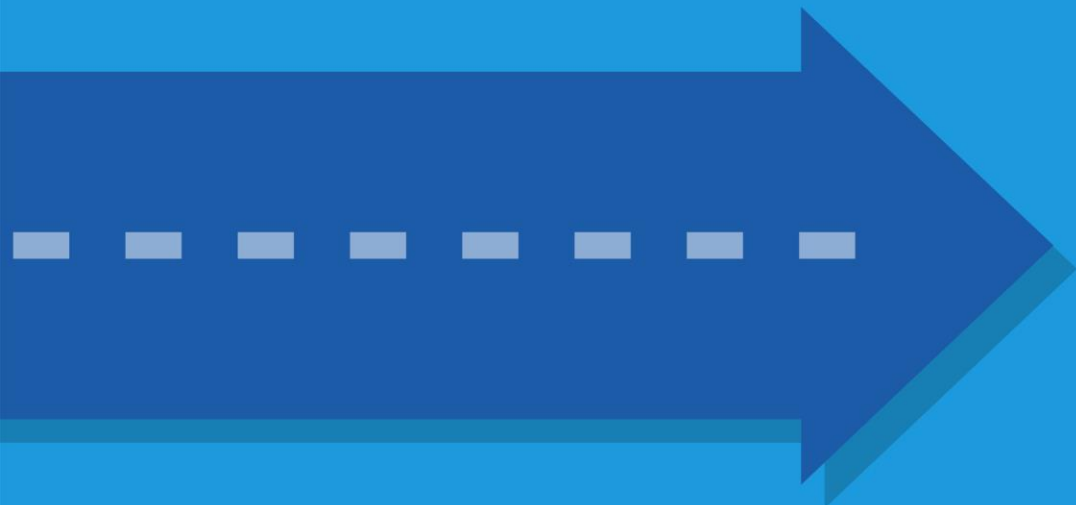




LION



ALL-ELECTRIC

CLASS 8 URBAN TRUCKS



COMPANY OVERVIEW



MISSION STATEMENT

Lion Is an innovative manufacturer of zero emission vehicles. Lion was founded in 2008 with the intention to revolutionize the transportation industry.

Lion stands out as the North American electric school bus OEM leader, having deployed over 250 electric school buses, with more than three million miles of service. Additionally, Lion is in the final stages of commercializing its collection of Class 6 and Class 8 industrial trucks.

We currently manufacture our own chassis, body, and battery packs and have the capacity to build 2,500 vehicles per year with our current manufacturing infrastructure.

With our several infrastructure deployments and our will to improve the environment, we have created a curriculum for clean air communities to share our electric vehicle knowledge well beyond our customer circle – setting the standards for training and service.

Always actively seeking new technologies, Lion vehicles have unique features that are specifically adapted to its users and their everyday needs. We believe that transitioning to all-electric vehicles will lead to major improvements in our society, environment and overall quality of life.

Mission Statement

-

Be the leader in Design, Manufacturing and Distribution in the all-electric School/Shuttle Bus and Heavy-Duty Truck Markets in North America.

LION TODAY

275 employees

2 000 indirect jobs

Factory

- Saint-Jérôme, Québec, Canada

Experience Centers

- Sacramento, California
- Los Angeles, California
- Albany, New York

Purpose-Built for All-Electric

- ✓ **Chassis** – We build our own chassis
- ✓ **Battery** – We build our own battery-packs
- ✓ **Conception** – Design for efficient maintenance
- ✓ **Design** – Optimized performance
- ✓ **Innovation** – Smart charging, telemetry
- ✓ **Future** – Positive legacy



PRODUCT ROADMAP

2011



LION 360

Type C

Disel School Bus

2016



LIONC

All-Electric

Type C

School Bus

2019



LIONM, LION8, LIONA

All-Electric Midi/Minibus

All-Electric Class 8 Urban Truck

All-Electric Mini School Bus

Q2 - 2020



LION8 - TRACTOR, LION8 - REFUSE

All-Electric Class 8 Tractor

All-Electric Refuse Truck

PRODUCT ROADMAP (CONT.)

Q3 - 2020



LION D, LION 8 - BUCKET

All-Electric Type D School Bus

All-Electric Bucket Truck

Q4 - 2020



LION 6

All-Electric Class 6

Urban Truck

2021



LION 5, LION 7, LION 8 - BOOM, AMBULANCE

All-Electric Class 5 Urban Truck

All-Electric Boom Truck

All-Electric Ambulance

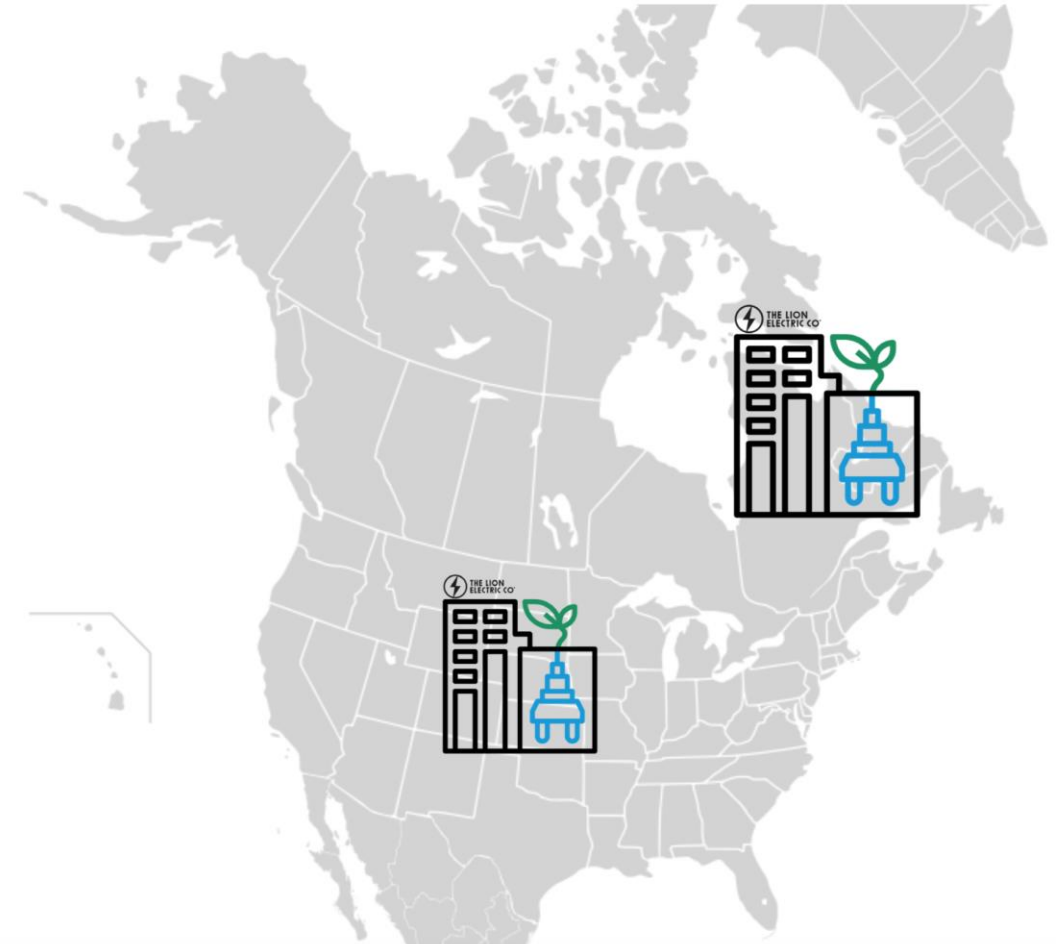
MANUFACTURING CAPACITY

Saint-Jerome Facility

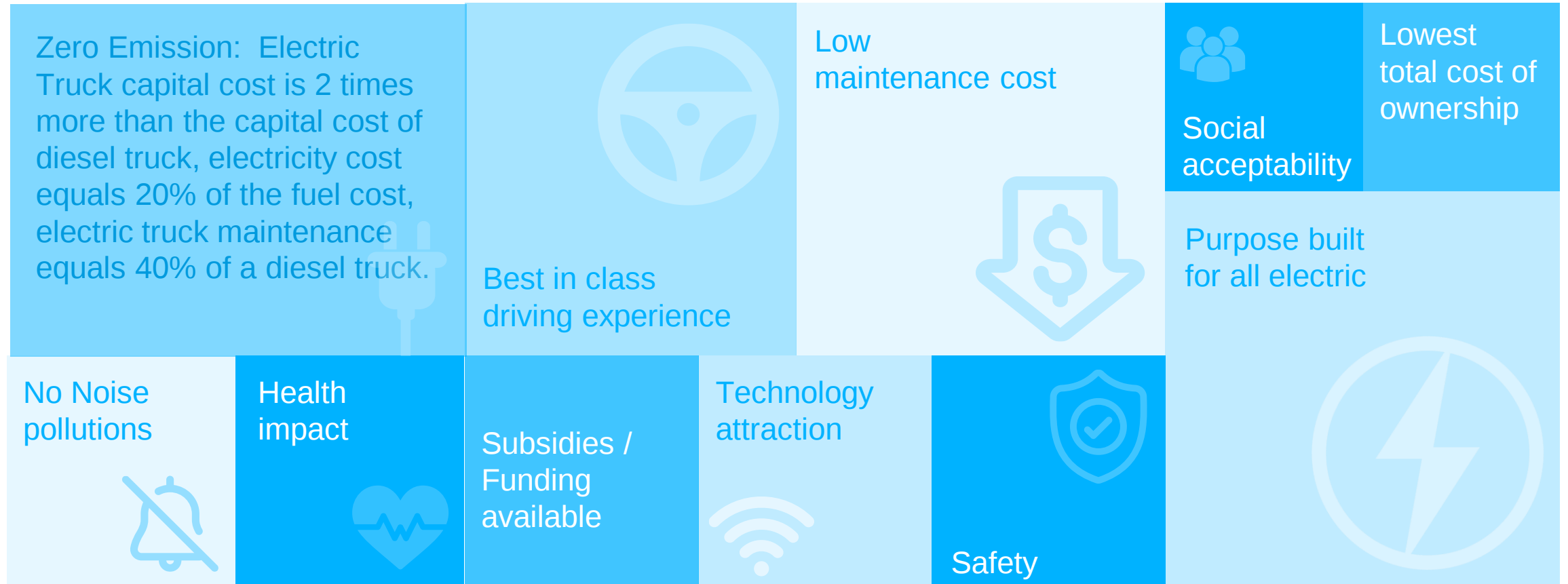
- Annual production capacity of 750 school busses, 750 shuttle busses and 1,000 trucks
- Intention to increase truck capacity to 2,250 per year via automation investments
- Potential to further increase capacity in the future with further automation

US Factory

- Plan to build a highly-automated truck factory in the US
- Location TBD based on source of demand (e.g. strategic partnership), supplier relationships, state subsidies, etc.
- Initial capacity of 3,000 units per year, with potential to increase to 10,000+ over time



ADVANTAGES



GREENHOUSE GAS EMISSION

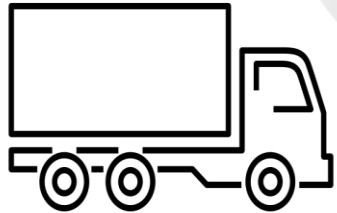
There's approximately **16.5 million trucks** and **500,000 school buses** in North America



School Bus Impact:

23 TONS

of GHG per year



Truck Impact:

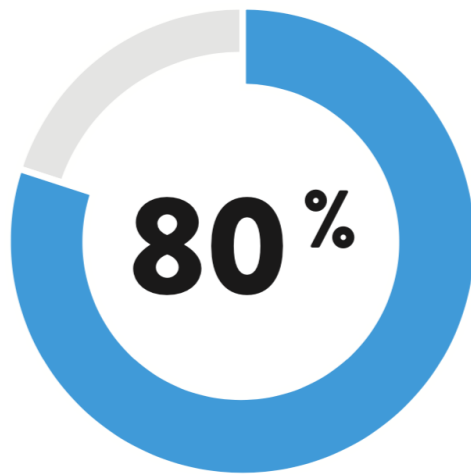
100 TONS of GHG per year

By electrifying **25%** of heavy-duty vehicles and **90%** of school buses, we save close to **423 M GHG tons**

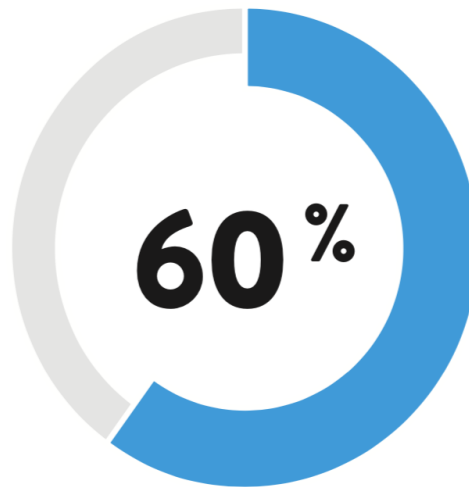
ADVANTAGES OF ELECTRIFICATION

SAVINGS

ELECTRIC VS DIESEL



**ENERGY COSTS
REDUCTION**



**MAINTENANCE COSTS
REDUCTION**



**ZERO-EMISSION
SOLUTION**



**LOWEST TOTAL COST
OF OWNERSHIP**



NO NOISE POLLUTION



LOW MAINTENANCE



**BEST-IN-CLASS
DRIVING EXPERIENCE**



SAFE

THE MORE YOU DRIVE, THE MORE YOU SAVE!

All Electric Trucks

**Won California State BID
Contract - Department of
General Services (DGS)**

ZERO EMISSION TRUCK

With All-Electric Automated
Arm and Collection Body



LION8: Automated Side Load Refuse Truck



LION8 - REFUSE



SAVINGS
ELECTRIC
VS. HYDRAULIC

50%

REDUCTION OF
THE ENERGY CONSUMPTION
OF AN ELECTRIC
VS. HYDRAULIC ON
AN ELECTRIC CHASSIS



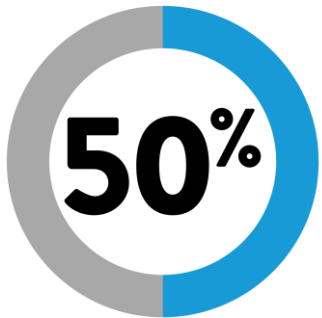
- ✓ Best turning radius
- ✓ Offers up to 1,200 homes to collect on a single charge
- ✓ No hydraulic fluid or pumps
- ✓ All compaction and arm movements are powered by the battery that drives the electric motors

ALL-ELECTRIC REFUSE TRUCK



SAVINGS

Electric vs Hydraulic



Reduction of the energy consumption of an electric vs hydraulic on an electric chassis

ADVANTAGES

- ✓ 250 miles on a single charge
- ✓ 1,200 homes to collect
- ✓ No hydraulic fluid or pumps
- ✓ All compaction and arm movements are powered by the battery that drives the electric motor

PROMOTIONAL VIDEO



CONTACT US !



DRIVE THE FUTURE TODAY
WITH LION ELECTRIC TRUCK !

Contact us for a demonstration!

Charles Williams

Sales Manager, Western Region

Phone: (714) 955-9083

charles.williams@thelionelectric.com



ALL-ELECTRIC REFUSE TRUCK



TECHNICAL SPECIFICATIONS



WEIGHT & DIMENSIONS	Cabin Length	60.25 in
	Cabin Width	101.5 in
	Cabin Height	107 in
	Wheelbase	220 in **
	Curb Weight	24 600 lbs
	Gross Vehicle Weight Rating (GVWR)	54 600 lbs
ELECTRIC POWERTRAIN	Top Speed	65 mph
	Maximum Power	470 HP
	Maximum Torque	2507 ft-lbs
	Range	Up to 250 miles
	Battery Capacity	Up to 480 kWh
	Motor & Inverter	SUMO HD HV3500-9 Phases // TM4 / Dana
	Transmission	Direct Drive // WithoutTransmission
	Charging Type	Level II (J1772) & III (CCS-Combo)
CHASSIS	Level II - Charging Time	5 - 16 hours
	Level III - Charging Time	1.5 - 5 hours
	Front Axle	14 600 lbs // Hendrickson
	Rear Axle	Tandem 40 000 lbs // Dana
	Suspension	Air Suspension // Hendrickson
	Braking	Air Disc Brakes // Bendix

LION8 - CLASS 8 URBAN TRUCK



LION8

TECHNICAL SPECIFICATIONS

WEIGHT & DIMENSIONS	Cabin Length	60.25 in
	Cabin Width	101.5 in
	Cabin Height	107 in
	Wheelbase	220 in **
	Curb Weight	24 600 lbs
	Gross Vehicle Weight Rating (GVWR)	54 600 lbs
ELECTRIC POWERTRAIN	Top Speed	65 mph
	Maximum Power	470 HP
	Maximum Torque	2507 ft·lbs
	Range	Up to 250 miles
	Battery Capacity	Up to 480 kWh
	Motor & Inverter	SUMO HD HV3500-9 Phases // TM4 / Dana
	Transmission	Direct Drive // Without Transmission
	Charging Type	Level II (J1772) & III (CCS-Combo)
	Level II - Charging Time	5 - 16 hours
CHASSIS	Level III - Charging Time	1.5 - 5 hours
	Front Axle	14 600 lbs // Hendrickson
	Rear Axle	Tandem 40 000 lbs // Dana
	Suspension	Air Suspension // Hendrickson
	Braking	Air Disc Brakes // Bendix

* Specifications may vary and are customized according to the application and the customer's need

** Many wheelbase available



- ✓ Heavy-duty truck with the lowest cost/mile in North America
- ✓ Increased up-time
- ✓ Low maintenance

LION8 – SINGLE AXLE TRUCK



TECHNICAL SPECIFICATIONS

WEIGHT & DIMENSIONS	Cabin Length	60.25 in
	Cabin Width	101.5 in
	Cabin Height	107 in
	Wheelbase	194 in **
	Gross Vehicle Weight (GVW)	36,400 lbs
	Tare Weight - Range 90 mi / 130 mi / 170 mi	16,371 lbs // 16,915 lbs // 17,459 lbs
ELECTRIC POWERTRAIN	Payload - Range 90 mi / 130 mi / 170 mi	20,029 lbs // 19,485 lbs // 18,941 lbs
	Top Speed	65 mph
	Maximum Power	310 HP
	Maximum Torque	1,800 ft·lbs
	Range	Up to 170 miles
	Battery Capacity	Up to 320 kWh
	Motor & Inverter	SUMO MD - 6 Phases // TM4 / Dana
	Transmission	Direct Drive // No Transmission
	Charging Type	Level II (J1772) & III (CCS-Combo)
	Level II - Charging Time	8 - 16 hours
CHASSIS	Level III - Charging Time	2 - 4 hours
	Front Axle	14,600 lbs // Hendrickson
	Rear Axle	20,000 lbs // Dana
	Suspension	Air Suspension // Hendrickson
	Braking	Air Disc Brakes // Bendix



ALL-ELECTRIC TRACTOR TRUCK

TECHNICAL SPECIFICATIONS



WEIGHT & DIMENSIONS	Cabin Length	60.25 in
	Cabin Width	101.5 in
	Cabin Height	107 in
	Wheelbase	200 in - 244 in **
	Combine Weight Rating	110,000 lbs
ELECTRIC POWERTRAIN	Top Speed	65 mph
	Maximum Power	536 kW
	Maximum Torque	5,300 ft·lbs
	Range	Up to 250 miles
	Battery Capacity	Up to 480 kWh
	Transmission	Direct Drive // 2-3 ratio available
	Charging Type	Level II (J1772) & III (CCS-Combo)
	Level II - Charging Time	5 - 16 hours
CHASSIS	Level III - Charging Time	1.5 - 5 hours
	Suspension	Air Suspension // Hendrickson
	Braking	Air Disc Brakes // Bendix

AVAILABLE RANGE & PAYLOAD



LION8



LION8

Single Axle:

kWh	MILES	GVWR
168 kWh	90	34,600
252 kWh	130	34,600
336 kWh	170	34,600

LION8



LION8

Tandem Axle:

kWh	MILES	GVWR
168 kWh	90	54,600
252 kWh	130	54,600
336 kWh	170	54,600
420 kWh	200	54,600
504 kWh	250	54,600



LION8

Tractor

kWh	MILES	GVWR
252 kWh	100	80,000
336 kWh	135	80,000
420 kWh	170	80,000
504 kWh	325	80,000
588 kWh	380	80,000
672 kWh	435	80,000

LION8

Refuse



kWh	MILES	GVWR
168 kWh	90	60,000
252 kWh	130	60,000
336 kWh	170	60,000
420 kWh	200	60,000
504 kWh	250	60,000

LION8: Tandem Axle Tractor (6X4)



LION8: Drayage Truck



LION8: Bucket Truck



400 MODEL

THE LION8 100% ELECTRIC POWERTRAIN

The Onboard Charger/Inverter



THE ONBOARD CHARGER

AC CHARGING | AC/DC CONVERTER

The onboard charger converts incoming alternating current (AC) into direct current (DC) to store in the battery. The capacity of the onboard charger represent the maximum power input that the vehicle can accept from the Mobile Connector, Wall Connector or public charging stations.

DC CHARGING

Charging with direct voltage (DC charging) is also possible. However, the supply of a direct voltage via a public electricity system is complex. Superchargers and other DC fast charging stations do not use the onboard charger.

AUXILIARY DRIVE | DC/AC CONVERTER

In the reverse case, the direct voltage from the battery is converted into a 3-phase alternating voltage to power the HV accessories on the vehicle (Hydraulic pump for p/s & brakes, A/C compressor, air brake/suspension compressor. The inverter is also known as transducer, or DC/AC converter.

V2G

Vehicle-to-grid can be used with gridable vehicles, that is, plug-in electric vehicles (BEV and PHEV), with grid capacity. Since at any given time 95 percent of cars are parked, the batteries in electric vehicles could be used to let electricity flow from the vehicle to the electric distribution network and back. This represents an estimated value to the utilities of up to \$4,000 per year per car.



THE EVSE : ELECTRIC VEHICLE SUPPLY EQUIPMENT

EVSE stands for electric vehicle supply equipment and its function is to supply electric energy to recharge electric vehicles. EVSEs are also known as EV charging stations, electric recharging points or just charging points. EVSEs can provide a charge for the operation of electric vehicles or plug-in hybrid electric-gasoline vehicles.

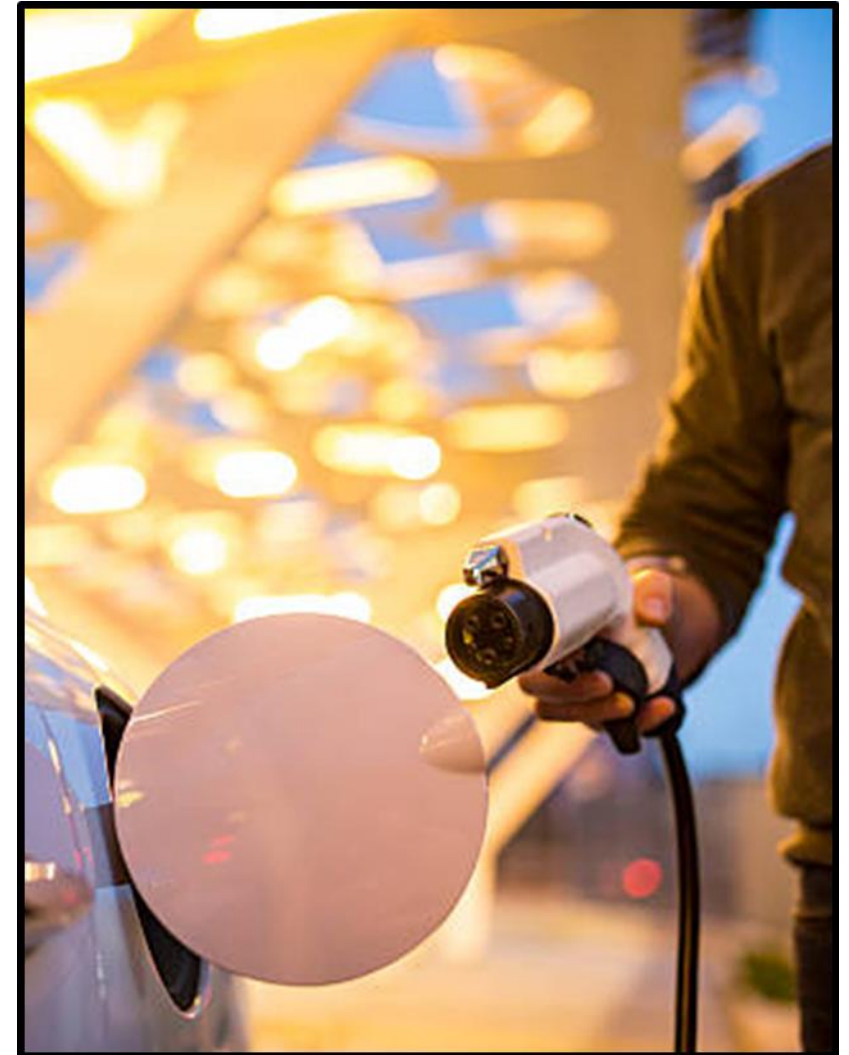
MAIN FEATURES

EVSE stands for electric vehicle supply equipment and its function is to supply electric energy to recharge electric vehicles. EVSEs are also known as EV charging stations, electric recharging points or just charging points. EVSEs can provide a charge for the operation of electric vehicles or plug-in hybrid electric-gasoline vehicles.

THE MAIN FEATURES :

- ⚡ Safety
- ⚡ The high power terminals are not live before negotiation protocol
- ⚡ Detection of short circuit to ground ; GFCI Fault (Ground Fault Circuit Interrupt)
- ⚡ Facilitate the activation and deactivation of charging
- ⚡ Detect and verify the pilot signal
- ⚡ Self-diagnosis of faults

THE EVSE



TECHNOLOGY THAT ADOPTS TO YOUR OPERATION:



INDUSTRY STANDARD CHARGING



Level 2 – J1772

AC charging of 15 to 30 kW

Complete charge – between 5 to 16 hours



Level 3 – CCS COMBO

DC charging of 50 kW and more

Complete charge – between 1.5 to 5 hours

THE DIFFERENT PINS IN A LEVEL 2 SAE J1772 CONNECTOR



THE DIFFERENT PINS IN A LEVEL 3 SAE J1772 COMBO CONNECTOR



THE LION ACADEMY,
Lion leads the heavy-duty
EV certifications and is
creating new standards for
zero-emission vehicles.



Assistance with Funding
Opportunities Available



Global
Infrastructure
Assistance



Best-In-Class Technical
Support & Training Programs

MAINTENANCE SUPPORT PLANS

MULTIPLE ADDITIONAL OPTIONS FOR SERVICE AND MAINTENANCE IN ADDITION TO THE LION EXPERIENCE / SERVICE / PARTS CENTERS :



Mobile Service / Tech / Maintenance Teams



Remote maintenance through telematics



24H parts centers and availabilities across North America



Dedicated service teams, including trainers, technicians, trucks, etc.



Leverage National and Regional Service Networks

Lion Electric Co., USA Truck Team
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THE LION
ELECTRIC CO.



THANK
YOU



Power In Progress

