

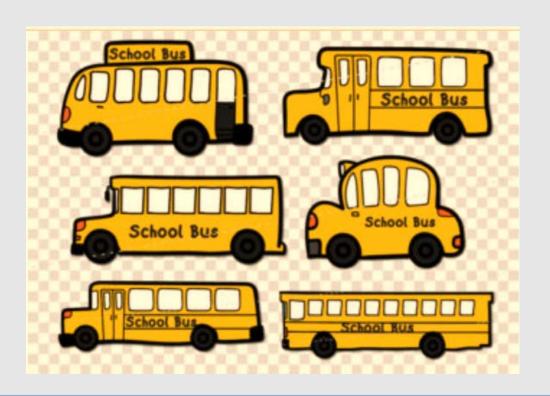


# ADVANCED ENERGY CONFERENCE

March 2018



## Significant Greenhouse Gas Emissions



- There are 46,500 diesel school buses in New York
- CO<sub>2</sub> is the principal Greenhouse Gas (GHG)
   emitted from diesel engines
- Kids are particularly vulnerable to GHG
- GHG have harmful repercussions on the environment, human health and generally on our society



AN ALL-ELECTRIC SCHOOL BUS SOLUTION IS AVAILABLE

## **LION OVERVIEW**

- Theelionc is the first all-electric school bus in North America
- Only zero-emission solution
- 1 million miles driven and counting
- Built with materials that have already proven themselves
- Lion been designing electric buses for 7 years
- The is in its third commercialization year
- Lion sold hundreds of electric Type C school buses in North America
   Lion (SCALM) ching it electric minibus in the summer of 2018;
- the will meet customer needs in paratransit,
   school, and public transportation requirements
- Lion is developing class 5 to 8 all-electric trucks. Class

1 MILLION
MILES
DRIVEN...
AND
COUNTING





## **Benefits of an All-Electric**

Bus



## **ELECTRIFYING SCHOOL BUSES IS INEVITABLE**

Electrifying school buses is the only environmental, social and economical solution that makes possible protecting our most precious capital, **our children** 

- North America is aiming to be a green and electric society with a healthy population and healthy children.
- The is a proven and reliable solution that is available now

#### · Current Dan gymente

Lion deployed 75 buses in Quebec in the last 2 years

Lion deployed 50 buses in California in the last year

Lion will deploy 25 buses more in California than last year

Lion is deploying 15 buses in Ontario this month Electric school buses adapt well to all climates



#### **Key Takeaways from current deployments:**

- 1. Lion provides additional charging infrastructure knowledge, selects charging equipment based on needs and assists with infrastructure installment
- 2. Lion provides enhanced training to school districts and provides Lion EV certification to key employees
- 3. Lion provides additional route options based on needs to reduce range anxiety while maximizing the return on



## **Additional All-Electric Solutions**



## ellonm & ellona

- The LIONM meets the urban paratransit transportation expectations
- Low floor and design optimized for paratransit
- The LIONA is a mini school bus
- Flexible configuration options
- All-electric powertrain
- Safe, high-performance lithium-ion (NMC) batteries from LG Chem
- 75 miles 150 miles range
- 1 or 2 swappable 80kWh batteries
- 19.2 kW on-board charger that uses a J1772 charger
- Available for school transportation purposes
- Will launch in the Summer of 2018









## Range and Energy

## **ellon**



RANGE	ENERGY
75 miles	80 kWh
150 miles	160 kWh

## **ellonm**



RANGE	ENERGY
75 miles	80 kWh
150 miles	160 kWh

### **Charging Times:**

eliony -elionM

• AC /19.2: 4-9 hours

• DC 50kW: 1.6 – 3.2 hours

• DC 100kW: 0.8 – 1.6

hours



## Significant Greenhouse Gas Emissions



HEAVY VEHICLES ARE RESPONSIBLE FOR ABOUT 50% OF ALL ROAD VEHICLES GLOBAL EMISSIONS



# **Specific Benefits to Different Usage**

GARBAGE TRUCK: Eliminating hydraulics saves maintenance but also eliminates hydraulic leaks and related fines

CRANE TRUCK: Significant reduction in consumption when vehicle is stopped

**EMERGENCY VEHICLE:** Electric motorization facilitates the integration of new technologies and improves the performance of the vehicle to reduce the inaction time

REFRIGERATED TRUCK: Quiet vehicle allow for all-day service outside of traditional working hours

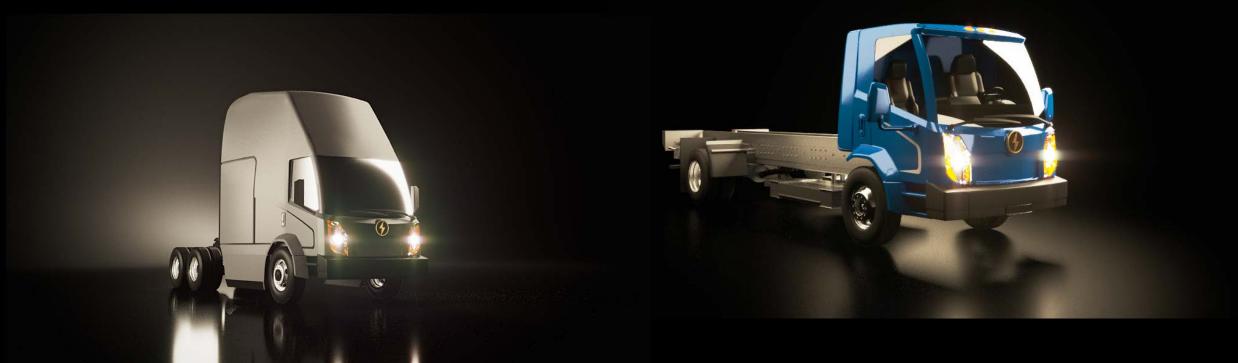
MINING TRUCK: Eliminates the need for expensive ventilation systems inside mines



#### ELECTRIFYING HEAVY DUTY VEHICLES IS INEVITABLE



# CLASS 8 ALL-ELECTRIC VEHICLE AVAILABLE IN THE FALL OF 2018





# LION's Next Steps

#### Sales

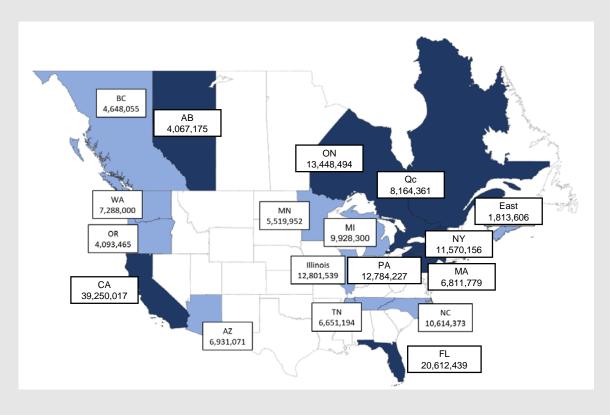
- Lion sold hundreds of Type C buses in North America; more specifically in California, Massachusetts, Minnesota, Quebec, Ontario and Alberta
  - Lion is currently targeting other major markets and is extending its reach to 205 million people in 19 different states and provinces

#### Cities eLIONC

96" width all-electric school buses are now available

#### **Built in the US for the US**

Lion will open a facility in the US by 2019





# Power in Progress

