

# EVERYTHING YOU DIDN'T KNOW ABOUT ELECTRIC SCHOOL BUSES!



PRESENTED BY:

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# WHY EV SCHOOL BUSES?

THE HEALTH AND WELFARE OF THE STUDENTS, DRIVERS AND STAFF

STATE AND LOCAL EMISSIONS REQUIREMENTS

POLICY OF THE SCHOOL DISTRICT OR LOCAL GOVERNMENT

REDUCED DEPENDANCE ON FOSSIL FUEL

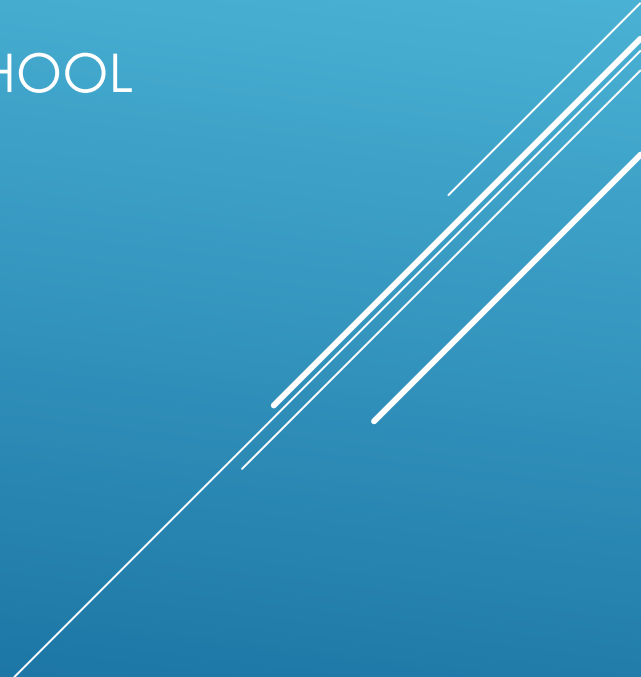
REDUCED OPERATING COSTS




# WHAT ARE THE OPTIONS WHEN CONSIDERING EV BUSES?

- ▶ SIMILAR TO ICE BUSES EV BUSES COME IN VARIOUS CLASSES AND OPTIONS INCLUDING TRADITIONAL OPTIONS, RANGE, ETC.
  - ▶ NEW BUSES RANGING FROM A THRU D CLASS BUSES
  - ▶ RE-POWERED BUSES – EXISTING CHASSIS - USUALLY “A” AND “C” TYPE BUSES

# ARE EV BUSES AVAILABLE NOW?

- ▶ GENERALLY, THE ANSWER IS YES!
  - ▶ THERE ARE ABOUT 7-10 MANUFACTURERS OF “NEW EV SCHOOL BUSES”
  - ▶ THERE ARE ABOUT 2 OR 3 COMPANIES THAT SPECIALIZE IN RE-POWERING EXISTING BUSES
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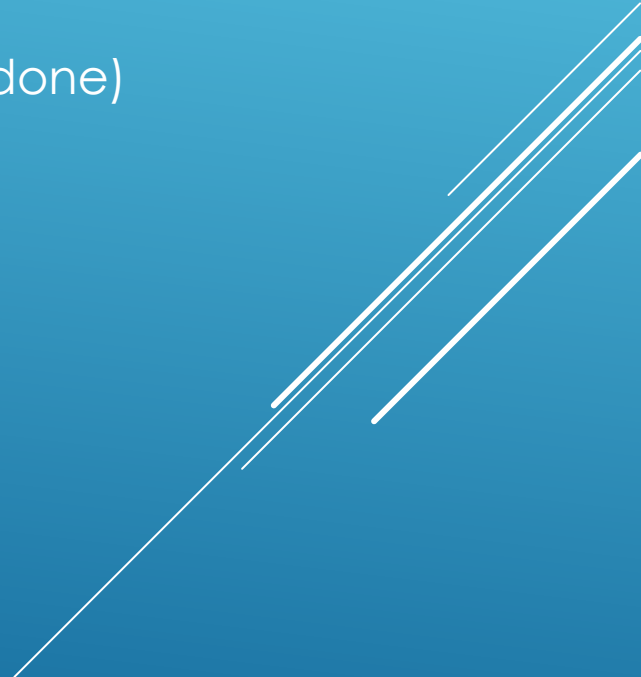
# AREAS OF OPERATIONAL SAVINGS WITH EV FLEETS

- No Engine Oil Changes
  - No Engine Air Filter Change
  - No Smog Check/Testing
  - No Spark or Glow Plug, or Coil Replacements
  - No Transmission Maintenance
  - Brake Pad Change Intervals are Longer
  - Fewer Coolant Changes Needed
  - Electric “fuel” is cheaper per mile and fossil-based fuels
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# HOW DO YOU CHARGE THE FLEET

- ▶ There are basically two ways to charge electric vehicles- you must decide which option(s) supports your driving mission
  - ▶ Level 2 – Charging Stations – slower, usually overnight (6-10 hours )
  - ▶ Level 3 - Chargers – “fast chargers” can fully charge the vehicle in less than two hours

# COST OF INFRASTRUCTURE

- ▶ The following steps are required to build your charge network
    - ▶ Determine the type and number of chargers
    - ▶ Determine availability of grid power ( and if not- what must be done)
    - ▶ Engineering design – mechanical and electrical
    - ▶ Permitting
    - ▶ Equipment order/ installation
    - ▶ Training
    - ▶ Commissioning
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# THE PITFALLS OF CHARGE INFRASTRUCTURE AND HOW TO AVOID THEM

- ▶ Charging is expensive- both to install and operate
- ▶ Electricity is a low-priced fuel commodity but highly volatile
- ▶ You need to employ “smart charging” which monitors electric consumption vs need vs peak load chargers from the grid
- ▶ Dealing with Utility and acquiring grants/rebates is time consuming
- ▶ Consider options for buy, lease or Charging-As-A-Service for your infrastructure and operations
- ▶ Charging Services can provide expertise and take-over the risks, being paid by the mile driven or kWh consumed



# SCHOOL BUS DEPOT CHARGE INFRASTRUCTURE



# RESOURCES FOR YOUR FLEET

- ▶ Depending on the state in which you operate, there can be substantial subsidies and incentives to electrify your fleet-
- ▶ In New York State the lead organization is NYSERDA- NY State Energy Research and Development Authority-
- ▶ They provide a voucher program in excess of \$100k PER VEHICLE for both new and re-powered school buses
- ▶ The program specifies “approved” vendor of vehicles and re-power systems
- ▶ Many states also have the Clean Cities Coalition where you can apply for grants for both vehicles and infrastructure support

# HELPFUL LINKS AND INFORMATION

- ▶ <https://www.nyserda.ny.gov/All%20Programs/Programs/Truck%20Voucher%20Program>
- ▶ <https://thelionelectric.com/en/products/electric>
- ▶ <https://www.blue-bird.com/>
- ▶ Re-Power ( NYS Approved) <https://www.uesmfg.com/electric-school-bus-conversions/>
- ▶ <https://www.icbus.com/electric>
- ▶ Charge Infrastructure ( as a service ) <https://www.amplypower.com>
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