

**PROTERRA**

# RIDE ZERO™

Zero never added up to so much.



**Panel 3:  
Infrastructure and Fuel  
Challenges & Opportunities**

**Mike Finnern**

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## Proterra Infrastructure: Charger

- On-route fast charge – no deadheading
- Safely charge the bus while customers are loading or unloading
- Bus charging procedure is semi-automated – minimal training required
- 1 charger can support up to 10 buses
- Charge equipment utilizes mature technology (UPS) with built in redundancy and safety



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## Proterra Experience = Tailored Solutions

- Flexibility Key to Successful Installations
- Minimal Footprint Required
  - Footprint reduction of 3x since first generation
  - Design to match local architecture
  - Location surveys lead to optimized installations
- Operation Expertise
  - Computer simulations used to understand expected performance
  - Early teamwork with operations to plan for expected charge time
  - Multiple routes can be served by a single charger properly placed




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## On-Route Charging is Inherently Scalable

- Chargers geographically distributed
  - Easier on the grid
- Load distributed throughout day
- 1 charger supports 10 buses
  - 100 buses = 10 chargers
- Easily support multiple routes
- No impact to bus yard

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## Electricity: The Perfect Fuel Hedge

- Electricity prices are stable
- Significantly cheaper than traditional fuels
- Proterra's approach allows for distribution of power with on-route charging
- Utilities have shown favorable response in support of increased HD EV usage

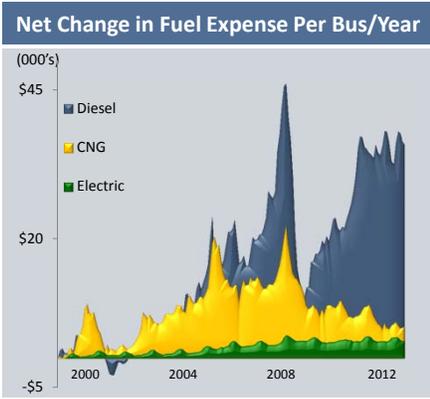
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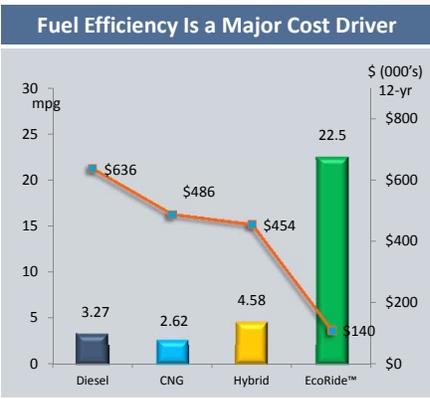
## Very Strong Economic Case for EV Buses

### Net Change in Fuel Expense Per Bus/Year

(000's)



### Fuel Efficiency Is a Major Cost Driver

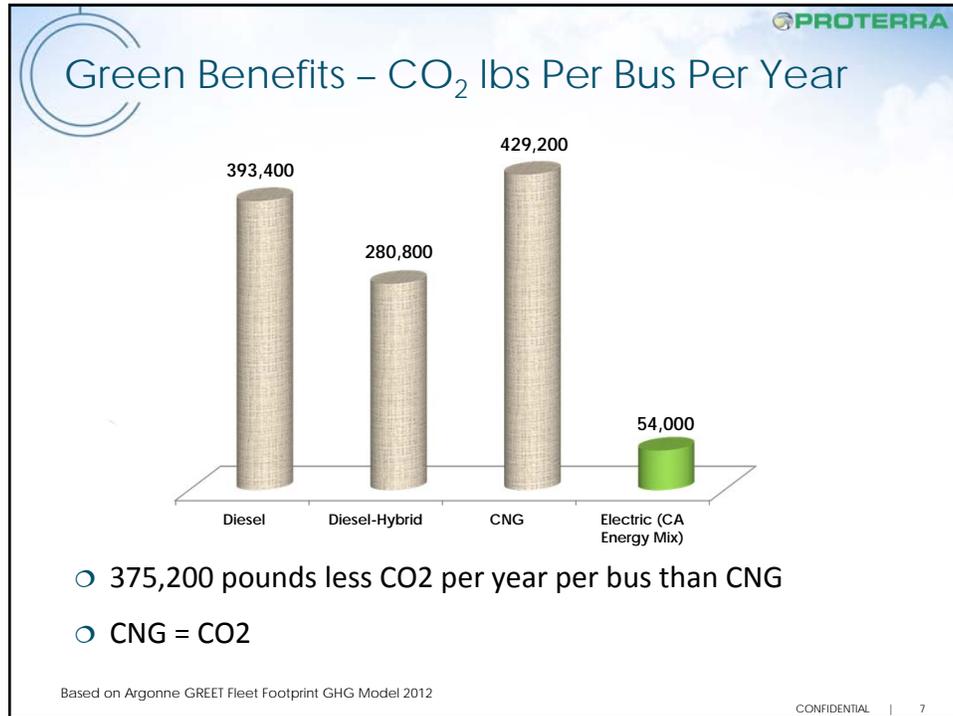


Vehicle Type	Fuel Efficiency (mpg)	12-yr Fuel Expense (\$000's)
Diesel	3.27	\$636
CNG	2.62	\$486
Hybrid	4.58	\$454
EcoRide™	22.5	\$140

- Electricity prices significantly lower volatility than CNG Diesel
- 575% MPGe improvement for Proterra electric solution
- \$ >500K fuel savings over the life of the bus

Total Cost of Ownership (TCO) and Budget Stability Are Compelling

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## Multiple funding sources for CA

- Proterra offers comprehensive financing options through our partner: **KeyBank**
- Federal
  - FTA5307 & FTA5312
  - FTA grants for bus efficiency and ZEVs
- State/Regional
  - \$180M this fiscal year through AB118 and HVIP
  - Air quality district funds (i.e. San Joaquin)
  - Technology Advancement Programs (TAP)
  - HVIP+

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## Summary

- Proterra on-route charging is ready now
  - Safe/Redundant
  - Reliable
  - Easy to use for drivers and service techs
  - Experience with planning and installation important
- Electricity prices are lower and more stable
- Best GHG option
- Numerous funding sources in CA
- Immediate scaling supports improvements

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