REVOLUTIONIZING URBAN TRANSIT

PROTERRA

Ryan Popple (@rcpopple)
CEO of Proterra (@Proterra_Inc)

Innovations in Transportation

California Transportation Commission
October 21, 2015

Cincinnati Transit Frequency Map

Doesn't include rush-hour lines

Transit use is growing

- Americans took **10.7 billion trips** on mass transit last year—the most in **six decades**.
- Young people 16 to 34 drove 23% fewer miles in 2009 than in 2001
- Millennials will soon form the largest % of the workforce
- GDP and LDV VMT correlation weakening

Transit has never been more important.

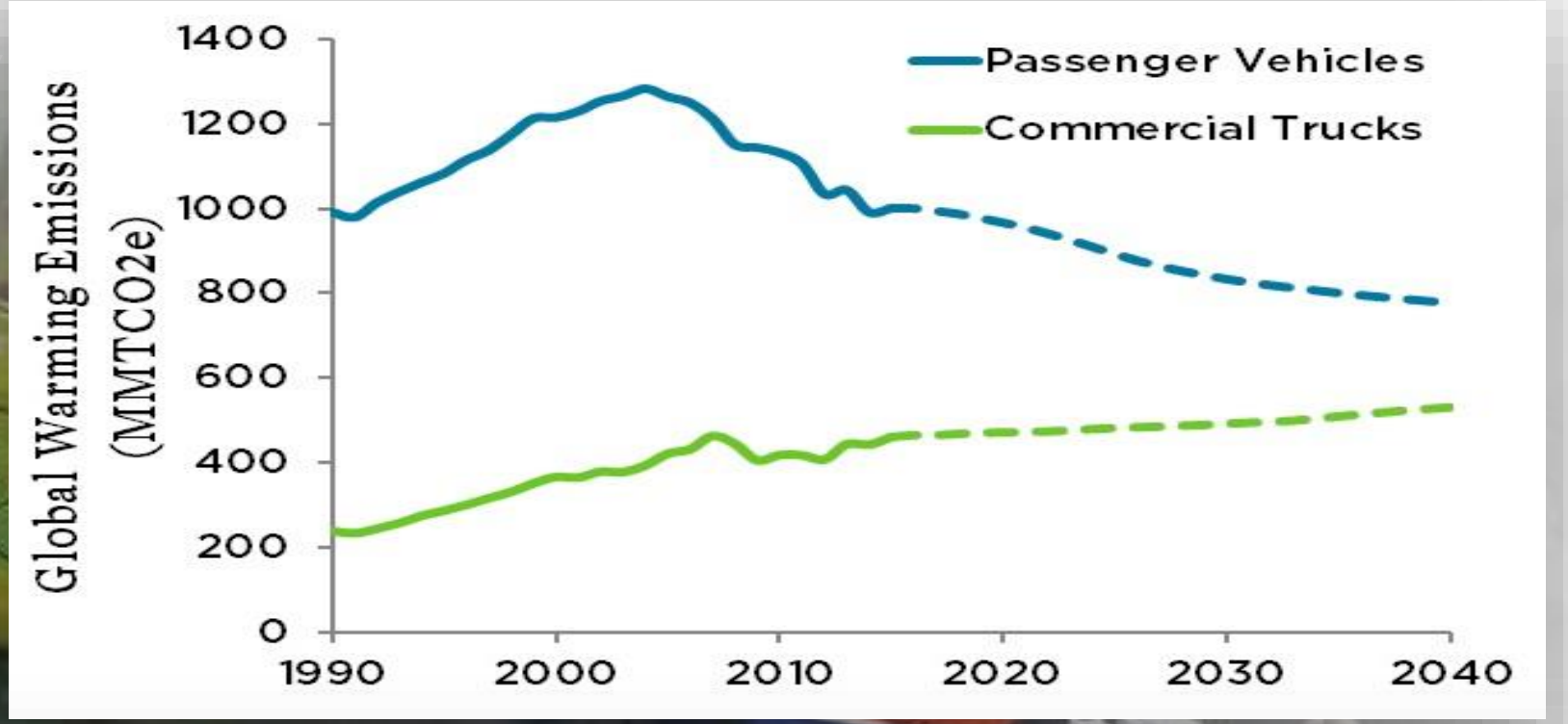
Total fuel consumed by buses per year:

- Diesel fuel: 389,600,000 gallons
- CNG fuel: 150,000,000 gallons

Total GHG per year:

- From diesel buses: 12,500,000,000 lbs
- From CNG buses: 4,600,000,000 lbs
- From hybrid buses: 832,600,000 lbs

More urbanization = more transit.
More transit = more pollution?

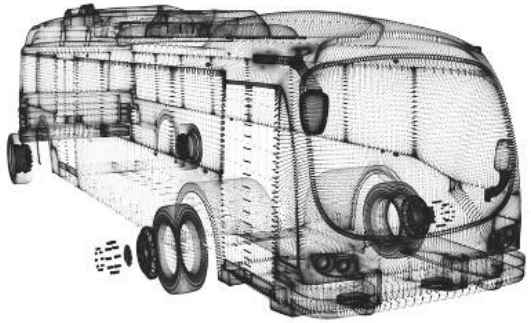


"The biggest reason for the continued increase in emissions from the Heavy-Duty Sector is the simple fact that efficiency has remained stuck in the 1970s at about 6 miles per gallon"

(1990-2011 data from EPA; 2012-2040 data from EIA)

TIME TO REIMAGINE

BUS TRANSIT



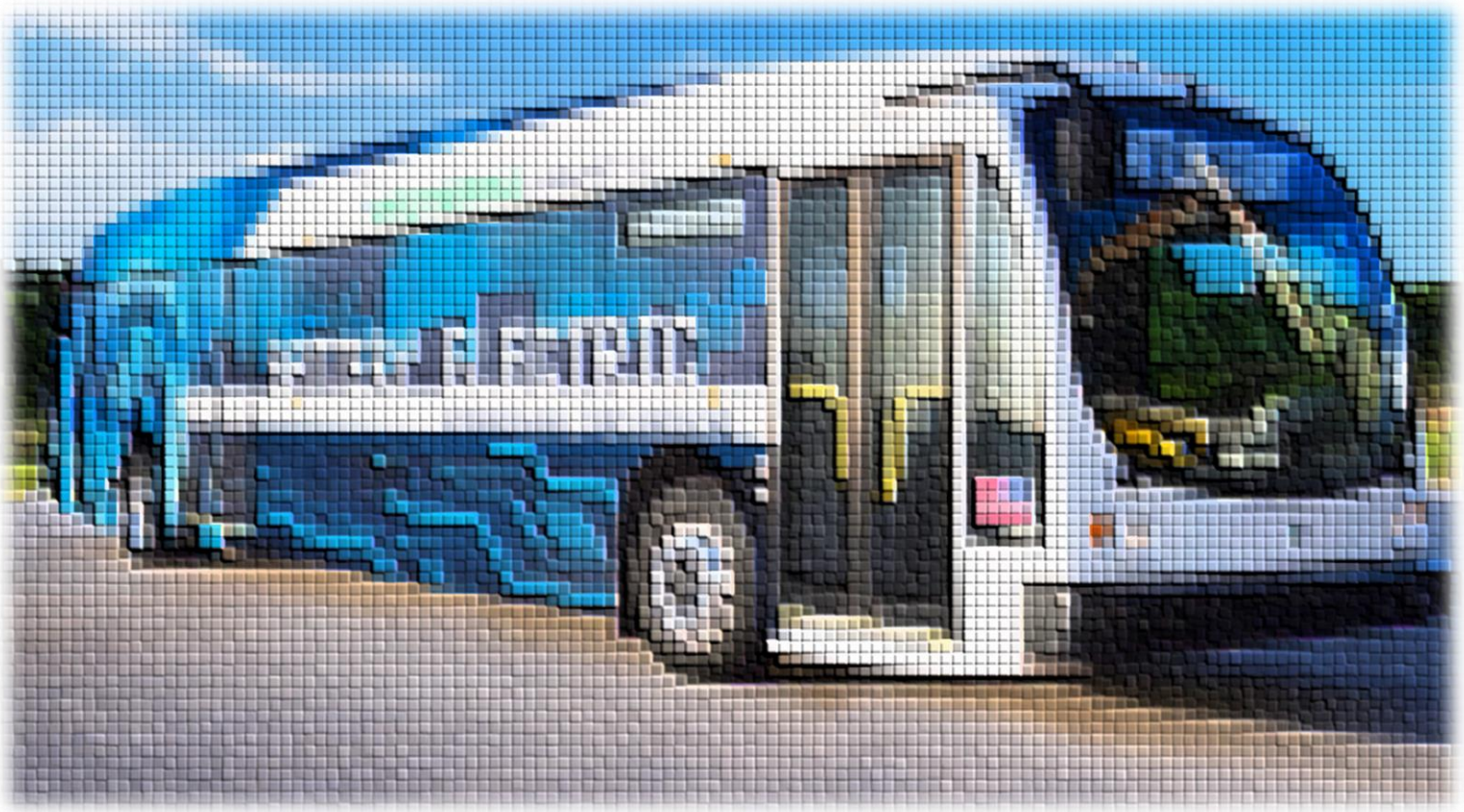
INNOVATE TO ZERO

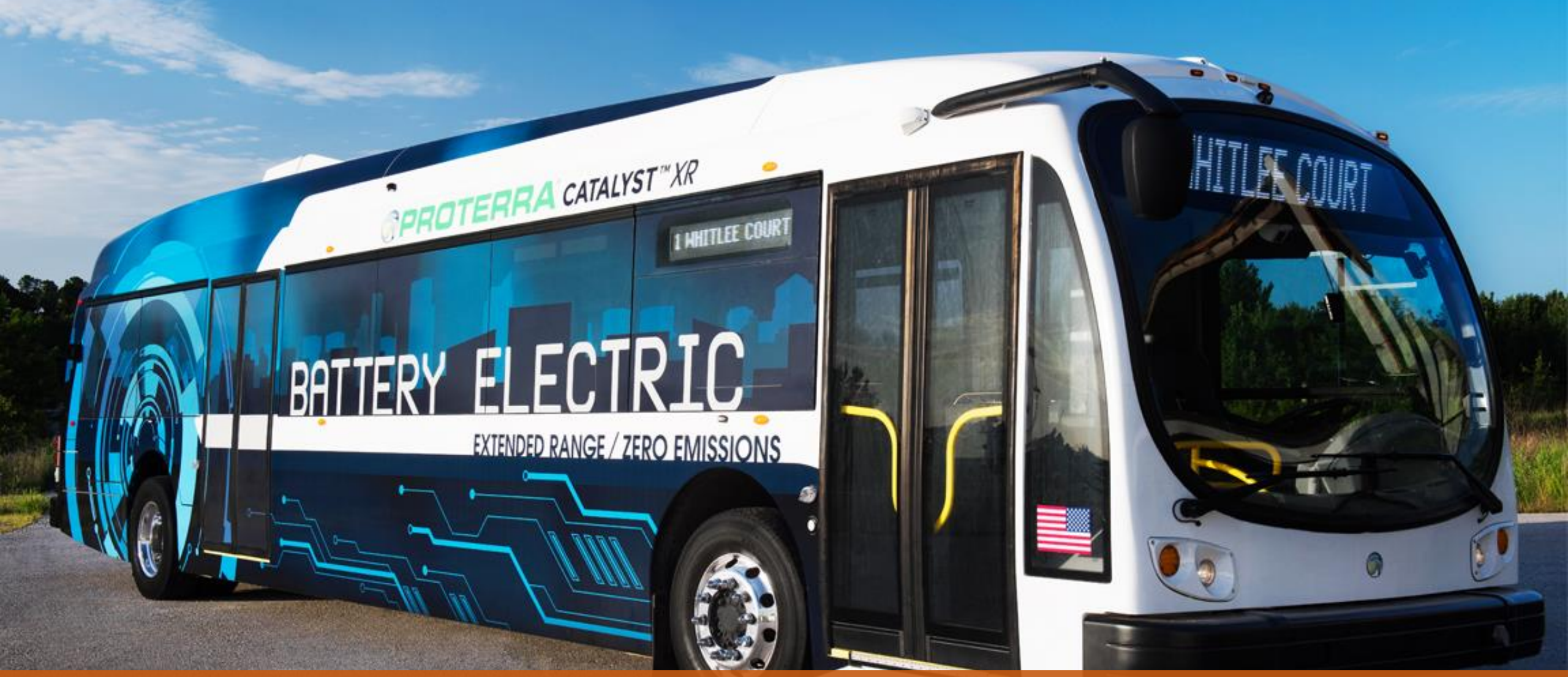
QUIET

LIGHT WEIGHT

DIGITAL RELIABILITY

HIGH PERFORMANCE





Proterra® EV Transit Bus
Record Breaking (Accel, Climb, Efficiency, Weight)

THIS IS ABOUT PERFORMANCE

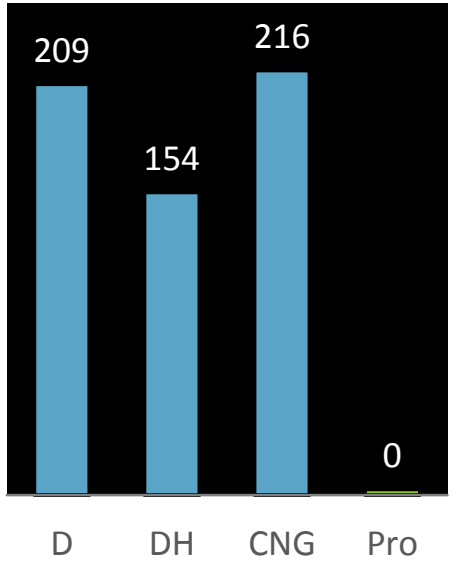
PROTERRA

CLEAN

100+%

Tailpipe Emissions

Annual lbs CO_2

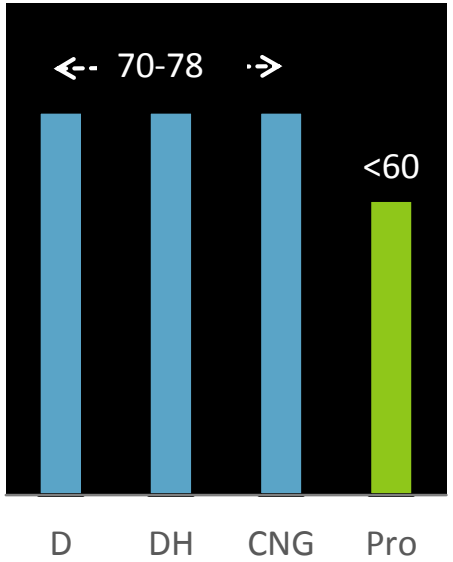


QUIET

50+%

Noise

dB

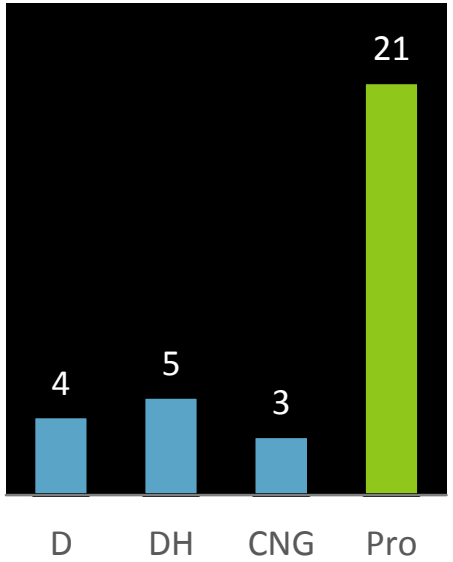


EFFICIENT

400+%

Fuel Economy

MPGe

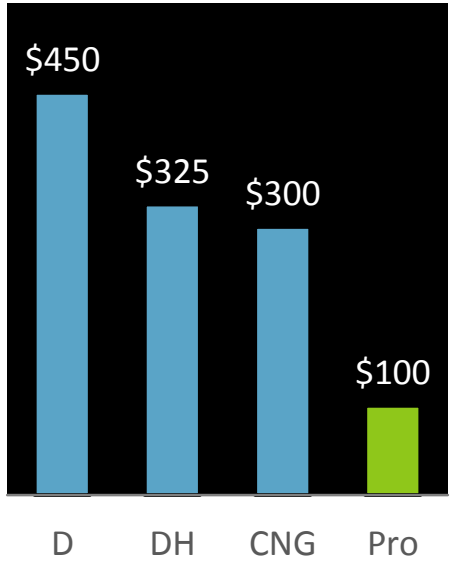


AFFORDABLE

78+%

Lifetime Fuel Costs

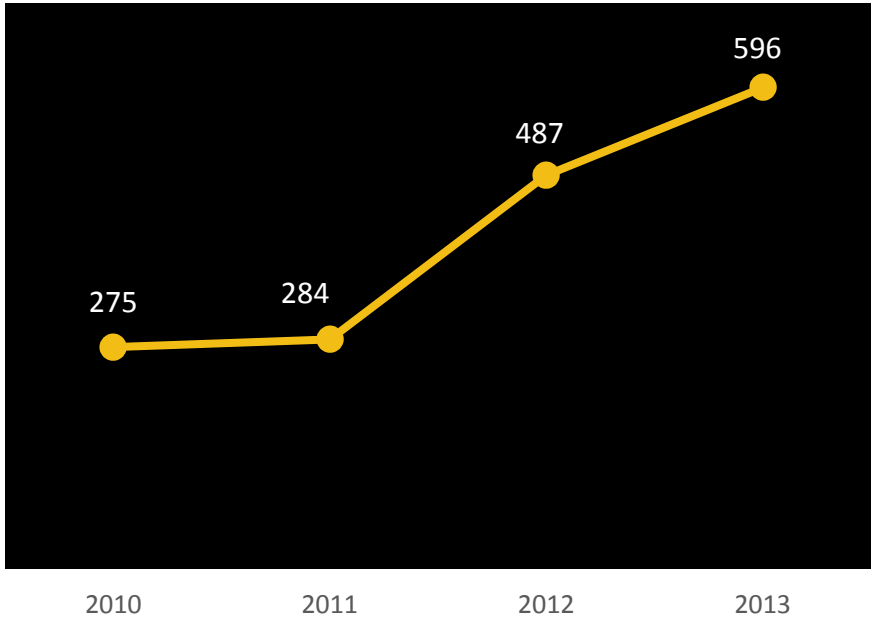
000s



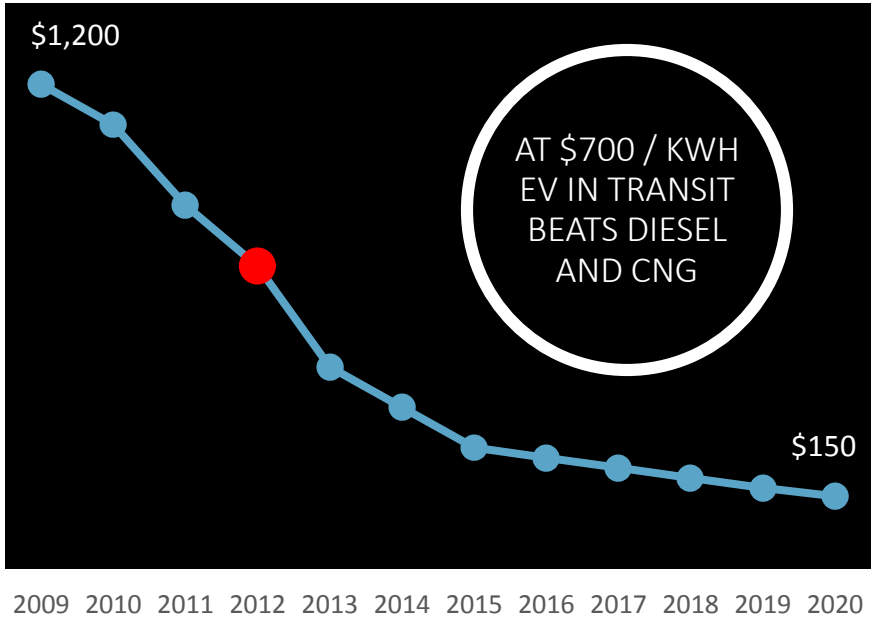
D=Diesel, DH=Diesel Hybrid, CNG= Compressed Natural Gas, Pro=Proterra EV

EV MARKET PROVIDED THE COST REDUCTIONS

U.S. HYBRID & EV SALES (000s Units)

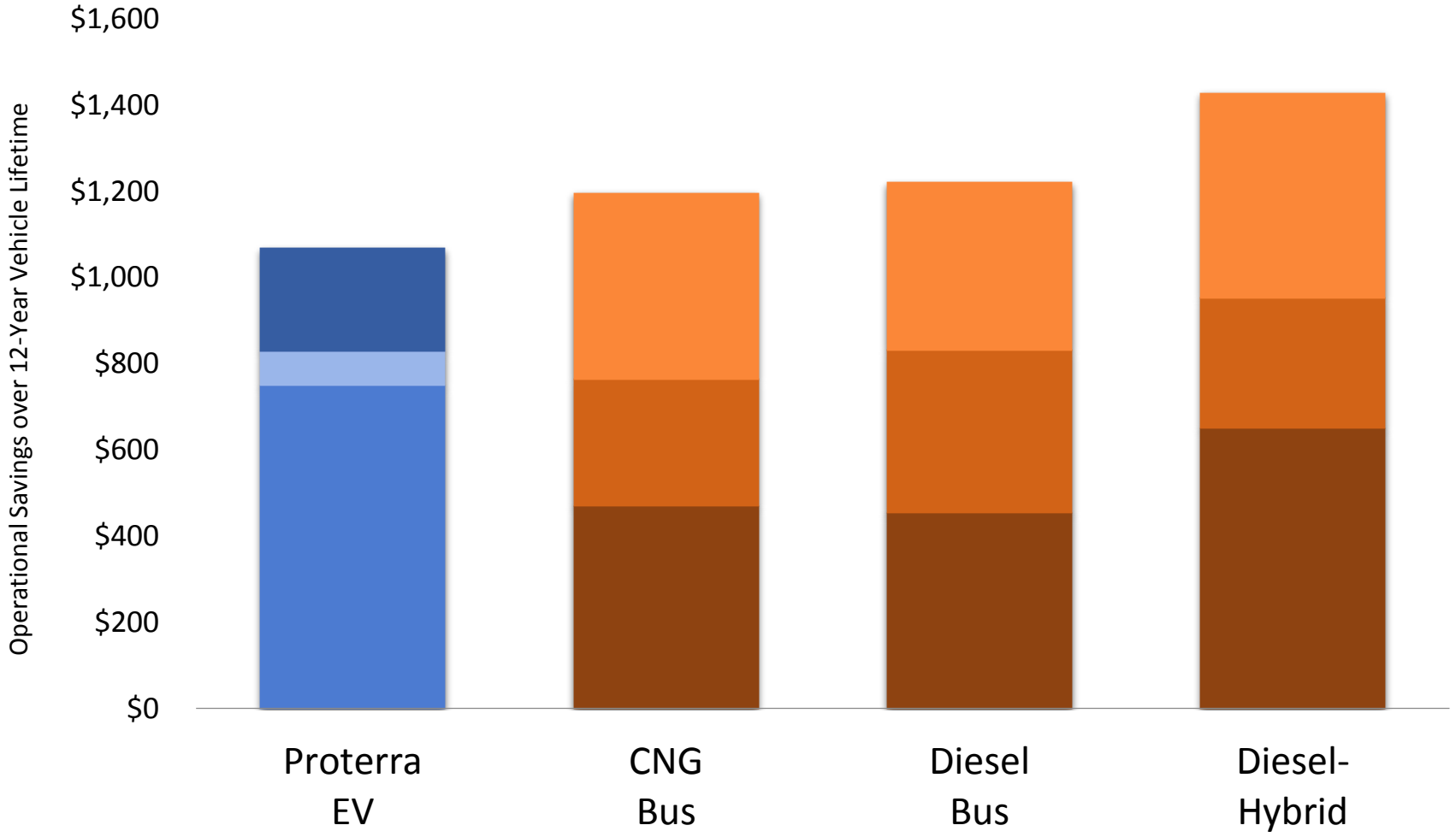


BATTERY PACK COST ($/kWh)



ADVANCED BATTERY TECHNOLOGY HAS DECLINED IN COST TO THE POINT OF DISRUPTION IN THE TRANSIT MARKET

Sources: Navigant Research, green.autoblog.com, Electric Drive Transportation Association. xEV = PHEV, HEV, EREV and BEV.

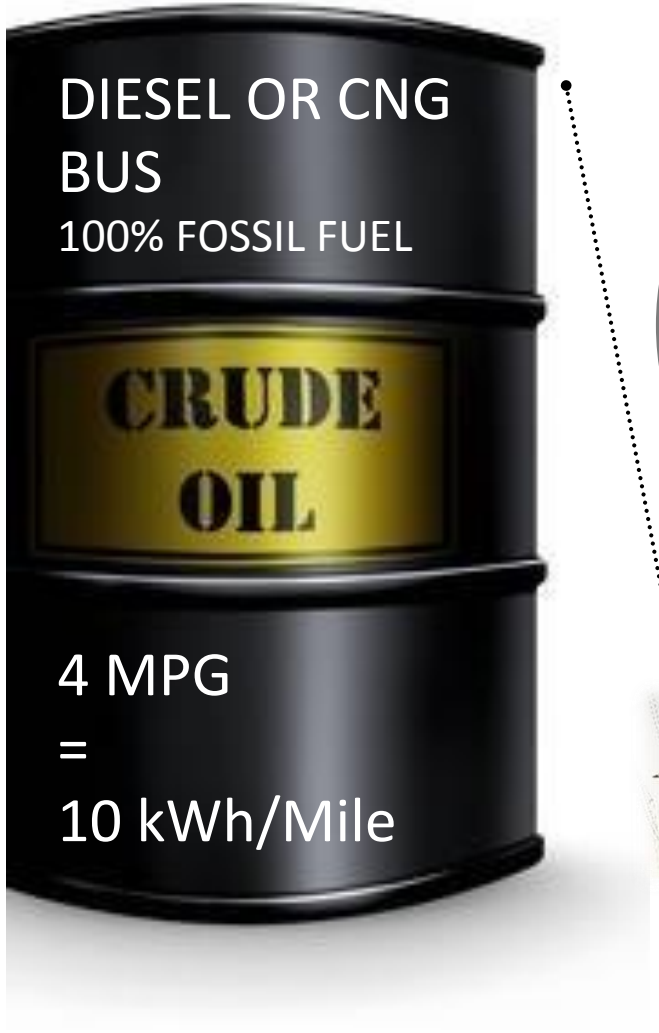


12-yr Operational Savings per Bus:

$448k vs. Diesel
$459k vs. Hybrid
$408k vs. CNG

Proterra vehicles can save customers $450,000 over a 12-year lifetime.

ENERGY EFFICIENCY GAINS AND CLIMATE BENEFITS

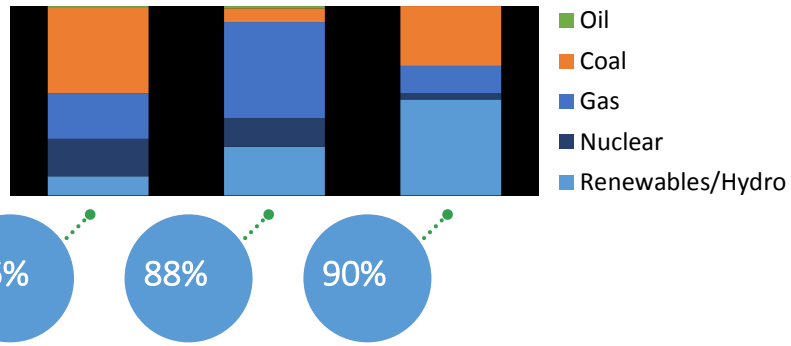


80%

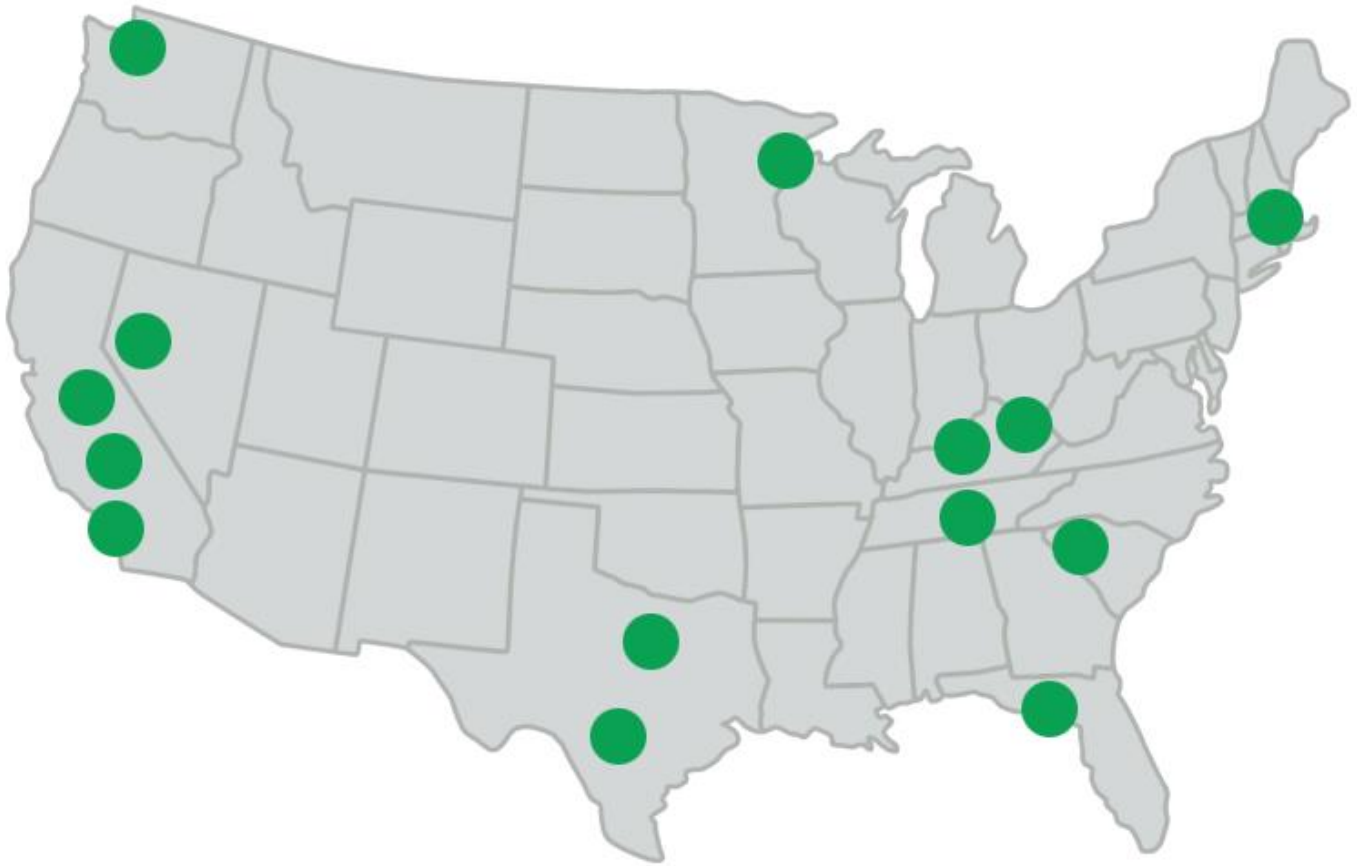
ENERGY SAVINGS
PER MILE

ELECTRIC BUS
(2 kWh/Mile)

ELECTRICITY MIX



Our Customers Today



This is Happening.

- **14 customers | 108 orders | 316 contracted options**
- **60 vehicles delivered | > 1,500,000 service miles**
- **>5,000,000 pounds of C02 emissions avoided**