



STOCKTON BALLPARK



Pollutant  
Emission  
Reduction

Market  
Acceleration  
and Job  
Creation

Better Fuel  
Efficiency  
over  
Conventional  
Fuels

Operational/  
Maintenance  
Cost Savings

# BENEFITS OF ZERO EMISSION BUSES

The U.S.-China Race to Zero Emissions (R2ZE) Challenge aims to increase the number of zero emission buses used by fleets in the United States and China. The focus on these specific technologies stems from the proven benefits of these vehicles to the environment, business, and fleet operations.





# BENEFITS OF ZERO EMISSION BUSES

## Pollutant Emission Reduction

In the United States alone, the transportation sector represents 27% of total greenhouse gas (GHG) emissions nationally. Diesel buses are one of the major emitters of GHG within the sector.

Every zero emission bus is able to eliminate 1,690 tons of CO<sub>2</sub> over its 12 year lifespan. This is equivalent to taking 27 cars off the road. These buses also eliminate 10 tons of nitrogen oxides and 350 pounds of diesel particulate matter, improving air quality in the communities that they serve.

## Better Fuel Efficiency over Conventional Fuels

Zero emission buses are more fuel-efficient than diesel buses. Depending on driving conditions, these buses can use the same amount of fuel as a diesel bus and travel for multiple more routes.

A report published by the National Renewable Energy Laboratory in February 2016 concluded that battery-electric buses can be nearly four (4) times more fuel-efficient than comparable compressed natural gas (CNG) buses – battery-electric buses had about 17.48 miles per diesel gallon equivalent while CNG buses only had 4.51 miles per diesel gallon equivalent.

A demonstration of a fuel cell bus by the University of California, Irvine's Anteater Express fleet revealed that fuel cell buses are capable of saving more than 18,000 gallons of fuel per year compared to conventional vehicles.

By using less fuel while traveling the same distance or even greater than diesel fueled buses, fleets using zero emission buses have the opportunity to reduce their overall fuel costs annually.

## Market Acceleration and Job Creation

The advancement and subsequent increased adoption of zero emission buses into fleet operations has worked to continually accelerate the market for these buses. In order to support the development and maintenance required of a growing market, new jobs have been created in response to the increase in volume of zero emission buses. In 2013, BYD, a Chinese automaker, opened two manufacturing plants in Southern California to produce electric buses. In 2015, Proterra, a U.S. manufacturer of advanced technology zero-emission heavy-duty vehicles, also opened two new facilities in California to support its technology development needs and marketing departments.

In addition to greater innovation in bus manufacturing, market growth also positively affects how the large-scale electric drive and energy storage system components develop in the freight truck manufacturing to the extent the technology can be replicated and built upon.

## Operational/Maintenance Cost Savings

Fleets that have deployed zero emission buses have seen a substantial reduction in operational and maintenance costs compared to conventional buses. Electric buses have been observed to log 133,000 miles between maintenance, compared to compressed natural gas buses that logged on average about 45,000 miles between maintenance.

In addition to recorded decreases in equipment maintenance costs, zero emission buses also run quieter than conventional buses, reducing noise pollution in the areas they service.