



10 MINUTE
TRAINING
TOPIC

Electric Vehicles

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SafetyFirst

Electric Vehicles (EV)

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Overview

- Electric vehicle (EV) technology has advanced rapidly since its introduction, and today there are many plug-in hybrid and battery electric vehicle options available on the market.
- EVs are vehicles that are either partially or fully powered on electric power. They have low running costs as they have fewer moving parts for maintaining and are also very environmentally friendly as they use little or no fossil fuels.
- EVs have no tailpipe emission as compared to ICE (internal combustion engine) vehicles. Adopting EVs will help in reducing local air pollution.
- Shifting to EVs will also reduce Greenhouse Gas (GHG) emission that gets emitted from running an ICE vehicle.



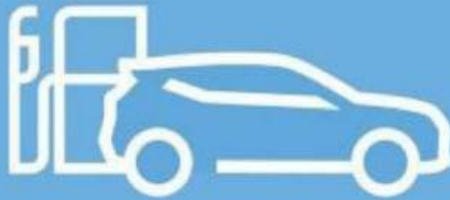
Statistics

- Sales of electric cars topped 2.1 million globally in 2019, surpassing 2018 – already a record year – to boost the stock to 7.2 million electric cars.
- After a decade of rapid growth, there are now over 10 million electric cars on the road, representing ~1% of the global car stock.
- For 2030, the Net Zero Emissions by 2050 Scenario projects 300 million electric cars on the road and they account for over 60% of new car sales, compared with only 4.6% in 2020.
- Around the world, by the year 2025, 20% of all new cars sold globally will be electric, according to the latest forecast by the investment bank UBS. That will leap to 40% by 2030, and by 2040 virtually every new car sold globally will be electric, says UBS.
- According to the US Department of Energy, all-electric vehicles and plug-in hybrid electric vehicles have a typical energy cost of \$50-80/month, compared to the ICE gasoline cost of \$160-200/month.

Non ICE vehicle types

Hybrid

No plug



Range



Features a dual engine, the primary (combustion) and an electric motor. The battery recharges when the vehicle reduces speed.

Plug-in hybrid

Refuel it and plug it in



Range



Combines a combustion engine and an electric motor which is primarily used. The battery charges when the vehicle reduces speed or directly when plugged in.

100% electric

Zero emissions



Range



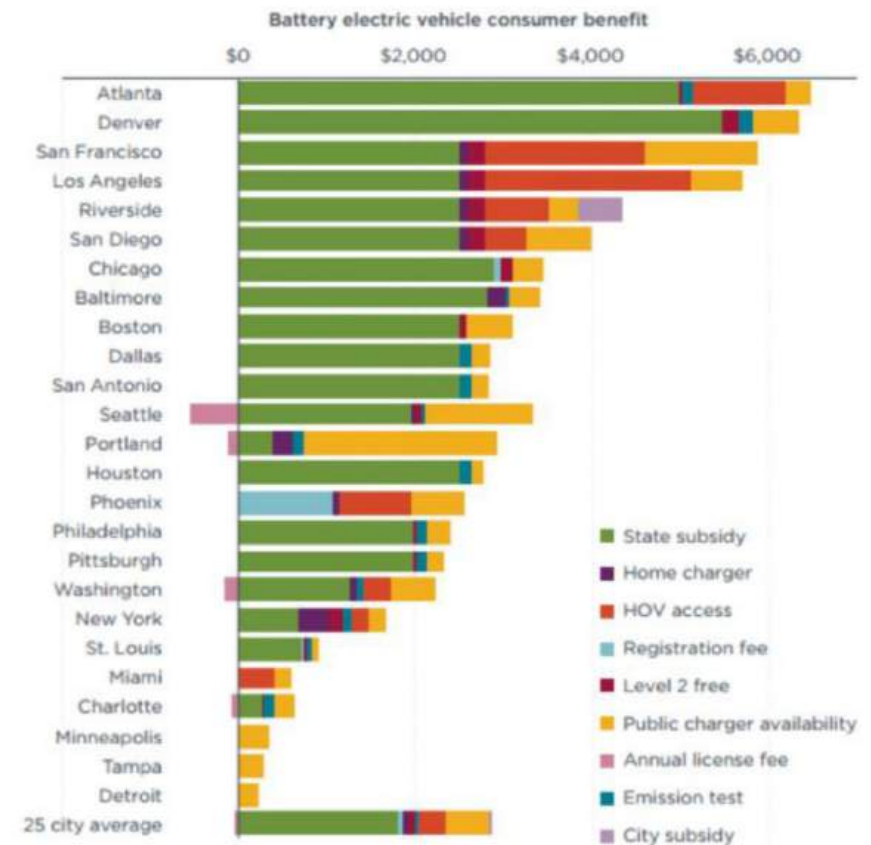
Exclusively electric drive and all its power and range comes from its high capacity rechargeable battery.

Facts which Contribute to the Growth of the EV Market

- **Convenience:** EV charging stations are popping up all over. You can charge at the office, at rest stops, while you're shopping for groceries or eating dinner at a local restaurant.
- **Range:** The average American drives less than 40 miles per day. That means most Americans could drive a battery electric vehicle for days without needing charging.
- **Charging Time:** Battery electric and plug-in hybrid electric cars are like a cell phone, you rarely wait for the battery to be completely depleted before recharging, and most charging is typically done at home while you are sleeping.
- **A Model for Every Lifestyle:** What do a minivan, luxury car and SUV all have in common? Many are available in electric models.
- **Lifetime Cost:** In many cases, electric cars are less expensive to own than gas-powered cars. While initial purchase price tends to be slightly higher, it is important to consider rebates, savings on fuel and maintenance, insurance discounts, and tax incentives.
- **Battery Costs:** Drivers don't typically need to replace the engines or transmissions in their cars. Likewise, electric car drivers don't typically replace their batteries.

Consumer benefits

- Federal tax credits can reduce purchase price of EVs by up to \$7,500.
- State and local purchase incentives can further reduce the purchase price, depending on the state you live in.
 - As an example, New Jersey offers a rebate of up to \$5,000, and New York and Connecticut both offer rebates of up to \$2,000 and \$1,500 respectively for plug-in hybrid and battery electric cars.
- There is access to additional state and local EV incentives.
- Allows the use of High-Occupancy Vehicle (HOV) lanes.



Benefits of Adding EVs to your Vehicle Fleet

- A new generation of fleet management software brings unprecedented visibility into battery charge levels and charging resources.
- Electric and hybrid fleets can now be managed using real-time data, GPS, and other technologies to improve fleet operations and help increase return on investment.
- Aside from the tax credit, there have been advances in battery technology. This is making EVs a more affordable alternative to traditional vehicles.
- There are some challenges and occasional drawbacks such as limited range and charging infrastructure. However, there are other benefits.



Benefits of Adding EVs to your Vehicle Fleet

- By investing in electric vehicles, your fleet can:
 - **Lower upfront costs:** Fleet managers looking to add EVs to their fleets can lower the upfront costs of their investments due to credits and incentives.
 - **Lower operational costs:** Savings on the cost of gasoline.
 - **Have fewer maintenance issues:** With fewer moving parts to maintain, EVs help save owners a lot of money on maintenance costs.
 - **Environmental benefits:** EVs have zero tailpipe emissions, thus making them far better for the environment and they can help improve air quality in cities and municipalities.
- **Vehicle safety:** Electric vehicles have shown to be safer than internal combustion engine vehicles for a few reasons: lithium-ion batteries are less flammable than gasoline, and the vehicles are less likely to roll over in a collision due to their heavier weight. Electric car automakers have begun to strategically place the vehicles' batteries further away from the vehicles' "crumple zones"—or areas that are susceptible to getting smashed in a crash—in order to mitigate risk of fire in the case of a collision.

Summary

- Over the last few years, there has been a big upswing in the use of Electric Vehicles (EV) by both, individual consumers and companies who are adding them to their existing fleets.
- Federal and State incentives are also helping the increase in the demand of EVs all around the globe.
- EVs can now also be found in the luxury car, SUV and minivan categories.
- EV owners receive significant savings in fuel, maintenance and operational costs.
- Electric car owners report spending one third of the cost to maintain their EVs than traditional gas vehicles.
- There is enhanced vehicle safety with EVs since lithium-ion batteries are less flammable than gasoline.
- Companies are using GPS to make their EV fleets more efficient and to enhance their capabilities.