ICCT Blogs

Cleaning the Air: Understanding the EV Advantage

Summary by the NJDEP

EV fire risk is different from, not higher than gasoline vehicles

- ☐ EV battery fires run the risk of thermal runaway, requiring approximately 2,500 gallons of water to stop.
  - In comparison, ICEVs require 500-1,000 gallons.
- ☐ NMC (nickel manganese cobalt oxide) Lithium-ion batteries have higher fire risk than other chemistries
  - The industry is shifting towards solid state and LFP (lithium iron phosphate) chemistries, which have high thermal stability. [ICCT]
- ☐ Tesla reported one vehicle fire per 130 million miles travelled. Across all vehicle types, the National Fire Protection Association estimated one vehicle fire per 18 million miles; approximately 7x higher.
  - Data from Sweden showed gasoline and diesel vehicles were 29x more likely to catch fire than EVs.

EVs continue to perform in cold weather

- ☐ Both ICEVs and EVs are less efficient in cold temperatures. [US DOE]
- ☐ In freezing temperatures, ICEVs may be completely unable to start, but this is not the case for EVs.
- ☐ Using seat warmers and steering wheel warmers instead of cabin heaters can save energy. When the cabin heater isn't used, the fuel economy of EVs drops by about 8% and range drops by about 12%.
  - With less-than-optimal engine temperatures, ICEVs can have 15-25% lower fuel economy. [US DOE]
- ☐ A survey of EV drivers in cold regions of the US found that 60% of those who initially had concerns about driving their EVs in the cold reported little to no worry after having experienced these conditions.

EVs can provide benefits to the electric grid

- ☐ Many utilities use time of use (TOU) rates to incentivize EV drivers to charge off-peak.
  - Off-peak charging can generate more revenue for electric utilities than costs, potentially reducing utility rates for all utility customers. [Synapse Energy Economics]
  - EVs contributed an estimated $85 million more to utilities than their associated costs in New Jersey.
- ☐ Managed and bi-directional charging can help reduce grid stress, avoid grid upgrades, and reduce electricity costs during peak demand [ICCT]. At least 27 models of EVs offer bi-directional charging.
- ☐ More than $30 billion in federal investments are being used to expand and improve the grid.

EVs have lower environmental impacts than ICEVs

- ☐ Extracting and combusting fossil fuels throughout a vehicle's life is far more environmentally damaging than mining the small amount of critical minerals needed for battery construction. [ICCT]
- ☐ When accounting for battery recycling, only around 30 kg of metals are lost for each EV.
  - Recycling requires an estimated 60% less water, energy, and GHGs than newly mined materials.
  - While battery recycling rates are currently low, they are expected to increase significantly by 2050.
- ☐ In 2024, New Jersey became the first state to require extended EV battery producer responsibility.

EVs provide benefits to drivers

- ☐ In 2023, light-duty plug-in EVs made up more than 9% of all new light-duty vehicles sold.
- ☐ EV sales continue to increase year over year despite reports of the EV market stalling.
- ☐ EV models cover the full range of price classes and cost less to drive and maintain than ICEVs. [NRDC]

To learn more, see: Clearing the Air- Understanding the EV Advantage, by the ICCT