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Thought Leadership – The Coming Age and Acceptance for Electric Vehicles

Innovation is nothing more than an idea that turns into reality. It often takes time and must be carried beyond its initial growing pains. Automobiles, for example, have a long history of innovation, and likely an exciting future. One of the very first successful internal combustion engines, developed by Jean J. Lenoir in 1858, was about **4% efficient** (Tietz, 2021).

Common arguments:

“4% efficient... why even bother?”

“Our current steam engines are much more reliable, and we have always done it this way.”

“It sure seems dangerous, doesn't it?”

Although 4% combustion efficiency would be completely unacceptable by today's standards, *Lenoir saw the potential*. The same applies to one of the largest changes to the transportation industry since the Industrial Revolution; something some may call the **Electric Vehicle Revolution**. The transportation industry is shifting from internal combustion engine vehicles (ICEVs) to battery electric vehicles (BEVs).

It is now 2021, and every major car manufacturer offers some type of hybrid or all-electric vehicle option. Ford just announced their 100% electric (BEV) F-150 pickup truck in May 2021, and although excitement ensues with many, there are still a plethora of counterarguments discouraging BEV innovation and development:

Common arguments:

“Those batteries are more damaging for the environment than gasoline could ever be.”

“You must be unaware of where that electricity is coming from... that coal plant right up the road!”

“What happens when your battery suddenly dies and you're 50 miles from the closest charging station?”

Manufacturers and scientific research have worked to solve these issues. Charging stations are not only becoming more readily available and universal, but they are also being integrated directly into GPS trip planning software so drivers can be confident they will make it to the next charging station.

Carbon emissions and source electricity are also important to consider when making the switch from ICEVs to BEVs. [Carbon Counter 2021](#), developed at the [MIT Trancik Lab](#), helps consumers understand lifecycle greenhouse gas (GHG) emissions per mile driven (g CO₂eq / mile). This calculation considers

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the GHGs from cradle-to-grave for all vehicles, including battery and engine production, raw material inputs, disposal/recycling, and electrical grid source emissions per kWh consumed (Miotti et al., 2016). These numbers can also be customized on their website, so drivers can make informed decisions and have an idea of how vehicle, fuel, and maintenance costs compare against other vehicles. This featured news release from the U.S. Department of Energy's National Renewable Energy Laboratory tells the same story:

[News Release: Research Determines Financial Benefit from Driving Electric Vehicles](#)
[Over a 15-Year Life, EVs Can Save Thousands of Dollars in Fuel Costs Compared to Gasoline Vehicles](#)

There are always a plethora of detractors urging us *not to do something*. If they were listened to, there would never be progress. Arguments against the electrification of our transportation sector are sometimes valid and challenging new ideas does make them adapt to be better. However, we must be careful as to not discourage innovation, and instead, take the challenge head on and solve the main concerns to ensure innovation can be achieved.

Joe Maioli, LEED AP, an Energy Engineer at Pathfinder, is a graduate of SUNY College of Environmental Science and Forestry with a Bachelor of Science in Sustainable Energy Management. He and his wife recently completed construction of their new all-electric home which includes a ground source heat pump system, heat pump hot water heater, LED lighting, and energy star appliances throughout. He energy-modeled his house pre-construction and his findings suggest that his projection of 24.4 EUI (kBtu/sf/year) may come in conservatively high, meaning that energy savings could be even better than he originally anticipated.



Joe chose to write about innovation in the electric vehicle sector because he has always been interested in new, modern technology and its application to solve real world challenges. Electric vehicles are the perfect example, and the topic ties nicely into his comprehensive energy work at Pathfinder.

References

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