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1.0 Challenges of Electric Vehicles

Electric Vehicles (EVs) has its own challenges which were not much different from those that were faced by the Natural Gas Vehicles (NGVs) industry. Challenges such as: lack of charging infrastructure / stations, limited range of travel (range anxiety) of vehicles, expensive prices of vehicles, and sources of electricity supply, are quite similar to those faced by the NGV industry in one form or another. In the aggressive push towards widespread propagation and usage of EVs (and also FCEVs), governments, organizations, and companies could learned from the experiences of the NGV industry on the best ways to address the challenges before it becomes too big or too late to be adequately addressed which will eventually affects the growth and sustainability of the EVs (and FCEVs) industry.

2.0 Selected News / Articles

2.1 United States of America

What is Electricity and What are its Risks as a Fuel?
By Eleanor Johnstone. Greenbiz.com March 14, 2019

Electricity is an intangible fuel that we are increasingly relying on to power our transportation. Where it comes from, how it's delivered, and where it's stored matters more and more as our vehicles move towards electrification.

Unlike gasoline, electricity is more or less an invisible and intangible fuel. Questions about sourcing, storing, accessing and handling such a fuel are difficult to formulate. As transportation electrifies, however, industry stakeholders, policymakers and the average consumer have a growing need to get the electricity basics under their belt in order to make sophisticated decisions about its use. **In the first installment of this two-part series we will cover what, exactly, is electricity, what are its risks as a fuel?**

Electricity 101

Electricity is a form of energy created when electrons—charged particles generated by wind, the hot sun, or combusting fuels—move at the speed of light under high pressure. Unlike gasoline, quantities of electricity are not typically stored on a fueling site, instead they are delivered upon request when two conductive components connect under the right conditions of pressure (voltage), volume (amperage), and resistance (ohms).

Once components connect, for instance, when an appliance is plugged into an outlet, electricity generated at a wind turbine or solar panel is transmitted as AC power (alternating current) across wires rated at specific pressures (voltage) to the receiving point, such as a hair dryer, a light bulb, or a cell phone. These

requests and responses are made at nearly instantaneous time scales over hundreds of miles of utility cable.

To maintain stability on the electric grid, utilities must ensure that generation supply equals customer demand in every location and at every moment of operation. If this relationship does not stay within a given range of balance, blackouts or equipment failures may result. These events are unusual in the US and cost electrical companies and their customers hundreds to thousands of dollars by the hour.

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A more common outage experience is when we trip a circuit breaker. This happens when too many requests for electricity are placed on a circuit that is too small to safely deliver all of the requested power at once. In this case, a circuit breaker "breaks" the demand signal by shutting off the power, effectively cancelling all requests for electricity. If not for the circuit breaker, then all of that electricity could damage equipment or individuals.

The Electricity EVs Require From the Grid

At a fundamental level, electric vehicles (EVs) interface with the electric grid in the same way as a laptop. Plugging in an EV connects it to the grid to draw electric energy, which is stored in a battery. The battery's energy is then used when the vehicle turns on and begins to do work. Unlike a laptop, the speed with which energy is required to charge an EV's battery raises the equipment and energy cost.

EVs may demand a large amount of electricity in a very short period of time in order to meet the longer ranges that drivers often require. If we remember that electricity is delivered according to the pressure, amperage and resistance specifications of the transmitting components (electrical wires, charger nozzle standards, and on-board converters), we can imagine that a fast charge for a large vehicle, like a truck, requires robust charging infrastructure that can safely handle large power requests—particularly in a fleet charging scenario when multiple vehicles need to refuel quickly.

Similarly, the amount of energy demanded in a fast charge period tends to drive up the cost of that energy because of the sudden pressure it puts on generating units on the other end of the grid. This is very different from gasoline and diesel procurements, for which per gallon costs may even drop for volume purchases.

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The Supply & Demand Challenges that Come with EVs

The proliferation of these standard, fast, and fleet charging scenarios across major transportation corridors in the US is new territory for utilities, and it introduces supply challenges on a scale that they have never faced before. It also introduces risks that neither the utilities nor their consumers have yet been able to fully assess.

The operations of the electric grid are various and complex. Understanding the basic terms under which electricity is created and obtained from the grid can inform our response to the supply and demand challenges introduced by fleet charging scenarios.

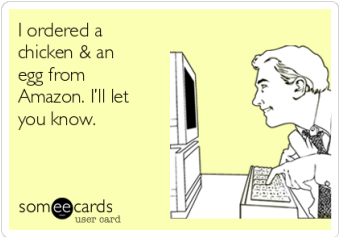
In the second part of this series, we will explore how electricity costs are determined and the challenges and considerations this presents for charging electric vehicles.
https://www.act-news.com/news/what-is-electricity/

2.2 United States of America

Electric truck blues: charging infrastructure & battery cost

by

 Jason Cannon | March 17, 2019



There was a meme on Facebook recently that I found humorous. It said, "I ordered a chicken and an egg from Amazon. I'll let you know" – a spin on determining which came first.

Leave it to trucking and logistics – an industry currently mired in its own chicken and egg struggle – to make that determination.

As of this writing, there are at least six OEMs – Volvo, Peterbilt, Freightliner, Tesla, Thor Trucks and The Lion Electric Company – with sights set on an electric Class 8 tractor.

That doesn't count the likes of Cummins, Fuso, Chanje and a host of others that already have lighter electric solutions tooling around the final mile. Mack is working on an electric refuse truck. Navistar has said it plans to start its electric program in the medium duty segment and companies like Nikola, Kenworth and Toyota are promoting fuel cells as the future.

So with all the promise that electrics hold, what's really holding us back? Is a 300-ish mile range really that large of a hurdle when you consider the promises of reduced maintenance intervals and zero tailpipe emissions?

I don't think so. Range anxiety, as it is commonly called, can easily be overcome with the ability to "top-off" along your route. Therein lies the problem. That's simply not possible.

"Charging has sort of becoming the key barrier to deployment," says Mike Roeth, executive director of the North American Council for Freight Efficiency (NACFE). Roeth says that up until very recently, battery cost was the primary issue.

Michael Berube, the acting deputy assistant secretary of sustainable transportation, energy efficiency and renewable energy for the U.S. Department of Energy says the average cost of a battery pack currently sits at about $197 per kilowatt hour (kWh). He estimates Tesla's costs to be about $10 fewer.

Motiv Power Systems Founder and CEO Jim Castelaz, speaking as part of a panel at Green Truck Summit in Indianapolis last month – and whose company has a number of electric powertrain options in the medium-duty segment, says anything under $200 per kWh represents a savings in the medium duty segment versus a fossil fuel powertrain because fleets spend more money on fuel than they do on the truck itself.

Maybe the cost of the pack isn't the barrier it once was but it will never be cheap enough if they're not simple to fill.

Undaunted, Castelaz calls the "movement of goods and people is a fantastic segment for the electric vehicle."

He's right, but currently those operations have to return to base and that's not an interesting proposition for public re-charging.

The easiest-sounding solution is to simply heap more energy into the battery, but the challenge for a commercial truck is packing on enough battery power to supply an extended range of approximately 600 miles without sacrificing payload.

"3 kWh per mile needs almost 2 megawatt hours of storage," Castelaz says. "It's hard."

Which is why, according to the most recent NACFE report, the initial infrastructure is going to be private. But that's not conducive to wide deployment.

For a large-scale rollout, a national infrastructure has to come first. Even the fleets most willing to embrace electrification aren't going to jump head-first into a truck that is a logistical nightmare to refuel. Not when their option is a diesel unit that can find fuel at nearly every exit along the Interstate.

For all the time and money the Environmental Protection agency spends on implementing new Greenhouse Gas Standards – if this technology is really going to take off – similar resources are going to have to be made available to truck stops willing to install charging terminals.

Depending on battery capacity and how much charge you need, an electric truck could be recharged in about an hour. That's a long time for a carrier to sit at a pump, but if the operating expenses of an electric truck are what they're claimed – between 60 and 80 percent of that of the diesel unit – it still seems like an attractive proposition in a lot of cases.

The lack of electric trucks is holding back infrastructure development just like the lack of infrastructure is holding back deployment of electric trucks.

Someone – the chicken or the egg – has to blink first.
https://www.fleetowner.com/ideaxchange/chicken-and-egg-electric-vehicle-charging

2.3 China

China's Electric Cars Hit Some Potholes

By Adam Minter. March 20, 2019.
Adam Minter is a Bloomberg Opinion columnist. He is the author of "Junkyard Planet: Travels in the Billion-Dollar Trash Trade."

The government is doing everything it can to spur sales of new-energy vehicles. First, it should stop them from spontaneously combusting.

It's hard not to buy electric in Beijing.
Photographer: Greg Baker/AFP/Getty Images

For several days last week, the often distressingly poor quality of China's electric cars was a leading topic across Chinese media. According to one survey ricocheting across the web, nearly 70 percent of respondents said they regretted buying a new-energy vehicle (NEV). Many expected the industry to be targeted in China's wildly popular "Consumer Rights Day" gala television special, which shames corporate giants for service and quality lapses.

While privacy-invading tech companies were harangued instead, the frustration of car owners continues to spill over on both social and traditional Chinese media.

For China, which is hoping to dominate the NEV industry globally, this should be a warning. The government's focus on quantity over quality isn't sustainable. If China wants to win the electric-car race, it needs to refocus on the concerns of drivers.

While Beijing has supported the industry for more than a decade, its efforts took on new momentum with the introduction of the now-notorious "Made in China 2025" industrial strategy in 2015. Since then, the

government has pursued a range of policies to boost electric cars — funneling R&D funding and subsidies to carmakers and battery makers (batteries are the most expensive components of electric cars), imposing tariffs on imported cars, squeezing technology out of foreign joint-venture partners, and issuing incentives and mandates to produce electric cars regardless of demand.

To spur demand, the government has offered a range of subsidies that it's only recently begun to rein in (the price of NEVs in China is lower than the global average) and eliminated the sales tax on NEVs. Importantly, several cities have also restricted the number of license plates issued for traditional cars; in Beijing, less than 1 percent of applicants aiming to get one succeed. That virtually forces drivers there to buy electric.

The results have been predictable. Last year, Chinese manufacturers sold 1.256 million NEVs, mostly electric cars — nearly 62 percent more than 2017, putting the country on track to meet its goal of 2 million NEVs sold in 2020. Currently, China accounts for more than half of all electric-car sales in the world.

But quantity can't obscure what one Chinese energy journal last week referred to as the industry's "Quality-Gate" scandal.

The numbers are damning. In 2018, Chinese manufacturers recalled 135,700 NEVs for a crushing 10.8 percent industry wide recall rate. Already this year, another 23,458 electric vehicles have been recalled.

Batteries are the most common source of problems. Some don't perform as advertised. Others drain unusually fast. Still others run dangerously hot. More than 40 NEVs spontaneously combusted in China in 2018.

Other issues include faulty motors, faulty transmissions, faulty odometers and bad odors (a problem to which Chinese consumers are particularly sensitive). Most notably, according to market research firm J.D. Power, problems are far more common in Chinese NEVs than in traditional Chinese-made cars.

True, as with any new technology, teething problems are to be expected. But China's government-sponsored largesse and highly protected market have clearly exacerbated the problem. By one estimate, there are "as many as 500" NEV startups in China, most of which have little to no experience in making or marketing automobiles.

Often this fuels a race to the bottom, as companies see cutting corners and costs as the only way to stay afloat. Restrictions on imported cars, which might otherwise offer some competition, leave the low-end market to cutthroat Chinese rivals.

The good news is that the government has recently taken steps to eliminate subsidies on the shorter-range NEVs that tend to be sold at the low end, and imposed restrictions on additional manufacturing capacity that should ensure most production takes place in experienced factories.

To restore the confidence of Chinese consumers, however, will require entirely new policies and standards. For example, the most common Chinese complaint about NEVs is that battery performance on the road doesn't meet what's advertised. New standards for certifying, testing and marketing batteries — and new resources devoted to enforcement — would help. Likewise, new industrial standards for key components such as fire-prone wiring harnesses would assuage fears that one's new car might, you know, suddenly burst into flames.

Above all, the government should seek to reduce its role in supporting the industry, allowing carmakers to compete on quality just as they do elsewhere in the world. The best way to get Chinese to buy electric cars is to give them electric cars worth buying.
https://www.bloomberg.com/opinion/articles/2019-03-20/quality-issues-plague-china-s-electric-car-industry

2.4 China

China toughens NEV subsidy policies
Source: Xinhua. March 26, 2019. 22:51:22. Editor: van

BEIJING, March 26 (Xinhua) -- Chinese authorities on Tuesday unveiled tougher policies for subsidizing the purchases of new energy vehicles (NEVs) to push for the sector's high-quality development.

The Ministry of Finance said in a joint statement that the threshold of technological requirements has been "moderately raised" to support producers with advanced technology, reliable product quality and high safety standards.

"[The country] focuses on supporting high-quality products with high technology, while encouraging enterprises to pay attention to safety and consistency of their products," the statement said.

The new measures steadily raise the energy density threshold for the NEV power battery system, moderately raise the energy consumption requirement and raise the mileage threshold for the continuous driving of pure electric passenger vehicles.

Due to factors including economies of scale and cost reduction, the country has reduced the subsidy standards for new energy passenger vehicles, buses and trucks to promote the survival of the fittest and prevent drastic market fluctuations, the statement said.

After a three-month transition period starting Tuesday, local governments should stop subsidizing purchases of NEVs other than new energy buses and fuel cell vehicles and use the funds to improve charging facilities and other supporting services.

If a local government continues the subsidies after June 25, its fiscal subsidies from the central government will cut accordingly, the statement said.

Thanks partly to the government's support policies over the past few years, China has become one of the fastest-growing NEV markets. Last year, NEV sales soared 61.74 percent to 1.26 million units, according to the China Association of Automobile Manufacturers.
http://www.xinhuanet.com/english/2019-03/26/c_137925357.htm

3.0 ANGVA Events

i. 20th China International NGVS and Gas Station Equipment Exhibition 2019 + 2nd China International Natural Gas Vehicle and Ship Development Forum 2019. China International Exhibition Center (New Venue), Beijing, China. 16th – 18th May 2019. For more information, please contact: Ms. Fu Yu, at ngv2018@163.com or visit http://www.ngvchinaqifa.com

ii. ANGVA 2019, The 8th ANGVA International Biennial Conference & Exhibition. Balai Kartini Exhibition & Convention Center, Jakarta, Indonesia. 25th – 27th Nov 2019. For more information please contact angva@angva.org or aznita@angva.org

4.0 End

Any comments and suggestions on the topics and information covered and to be covered in future are most welcome. Please send your comments and suggestions to Lee Giok Seng at email: leegs@angva.org