

MUSINGS FROM THE OIL PATCH

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Note: *Musings from the Oil Patch* reflects an eclectic collection of stories and analyses dealing with issues and developments within the energy industry that I feel have potentially significant implications for executives operating and planning for the future. The newsletter is published every two weeks, but periodically events and travel may alter that schedule. As always, I welcome your comments and observations. Allen Brooks

Is There Trouble, With A Capital “T”, In EV City?

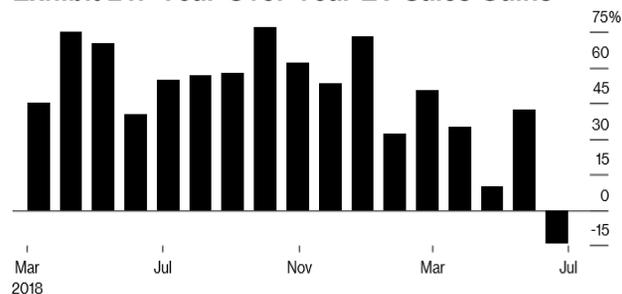
Global electric vehicle (EV) sales fell 14% in July

Bloomberg reports about a research report from investment firm Sanford C. Bernstein that global electric vehicle (EV) sales fell 14% in July, as China’s revamped car subsidies hurt purchases. The news is noteworthy because it marks the first monthly sales decline

The report says that sales fell in both China and North America, while rising in Europe

in the history of EVs. According to the report, there were only about 128,000 EVs sold worldwide during July, based on the investment firm’s assessment of sales by the leading EV manufacturers. The news, if correct, shows just how sensitive EV sales are to tax subsidies, as well as how important the China market is for the future of EVs. The report says that sales fell in both China and North America, while rising in Europe.

Exhibit 21. Year-Over-Year EV Sales Gains



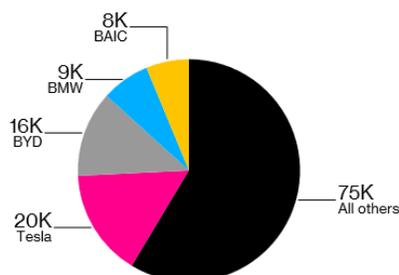
Source: *Bloomberg*

For the first seven months, Bernstein says sales increased by 35%

The report contained the chart in Exhibit 21 showing the year-over-year increase in global EV sales. Even with the surprising July sales decline, Bernstein anticipates global sales to increase between 23% and 48% to 2.4 to 2.9 million units for all of 2019. For the first seven months, Bernstein says sales increased by 35%. While we don’t

know the actual source of Bernstein's estimates, there was another chart showing EV sales by major automaker.

Exhibit 22. Who Is Building The World's EVs



Source: *Bloomberg*

A different data service that tracks EV sales, *insideevs.com*, has yet to report July's global sales figure, although they have posted domestic EV sales for the month. Based on their July 2018 sales data and the Bernstein estimate for this July, the year-over-year decline would be 11.7%. The year-to-date figures for the respective years translate into a 37.4% increase. Unless there are further monthly declines during the balance of this year, the *insideevs.com* seven-month gain, if extended for the full year, is well within Bernstein's projections for all of 2019.

The July sales decline comes as U.S. carmakers are leaning on Washington politicians from leading auto manufacturing states for a new EV subsidy

The July sales decline comes as U.S. carmakers are leaning on Washington politicians from leading auto manufacturing states for a new EV subsidy. The current subsidy was part of the federal government's stimulus plan from the financial crisis in 2008. It offers an EV buyer a tax credit of up to \$7,500 per vehicle in the year the car is purchased. The full tax credit is offered for the first 200,000 units sold by a carmaker, after which the tax subsidy is cut in half for six months, before being cut in half again for the following six months, and then ended. Starting this year, both Tesla, Inc. (TSLA-Nasdaq) and General Motors (GM-NYSE) are having their subsidies reduced after having crossed the 200,000-unit threshold last year. Tesla's sales so far this year have produced mixed results, possibly reflecting the impact of the reduced tax subsidy, which seemed to boost sales in late 2018 prior to the ending of the full credit.

An Ernst & Young study estimates the credit expansion would cost taxpayers nearly \$16 billion over the next decade

The auto manufacturers now want to extend a \$7,000 buyer tax credit for another 400,000 units once the 200,000-limit has been reached. An Ernst & Young study estimates the credit expansion would cost taxpayers nearly \$16 billion over the next decade. This is consistent with estimates that the current tax subsidy program will cost about \$7.5 billion over 2018-2022, or about \$1.5 billion per year. This tax subsidy is viewed as critical to the success of the EV industry, as most manufacturers are losing money on every EV built and they are forced to sell these cars in states like California at a loss due to government mandates.

Nearly 80% of the credits were claimed by households with adjusted gross income of more than \$100,000

There are numerous projections for when EVs and internal combustion engine (ICE) cars will reach price parity, but the key to it happening is the assumption of continuing reductions in EV battery costs. Scale is what the EV proponents suggest is needed to reach the price parity, so therefore they lean on politicians to mandate EVs to address climate change, as well as banning ICE cars. Tax subsidies become the grease necessary to make this all work.

One of the major criticisms of the tax subsidies is their disproportionate help for financially well-off EV buyers. According to a recent Congressional Research Service study, nearly 80% of the credits were claimed by households with adjusted gross income of more than \$100,000. There is a simple reason. Those are the households that will have sufficient federal income tax liabilities to utilize the tax credit.

What is quite interesting is a National Bureau of Economic Research working paper examining the impact of federal tax credits. The researchers found that the tax credits induce EV sales, but that the majority of the credits went to households that would have purchased an EV without any tax incentive. The study examined the 2010-2014 government household survey data, which included information on households' car purchases, as well as the other vehicles the household considered buying, to create a counterfactual scenario without EV tax incentives.

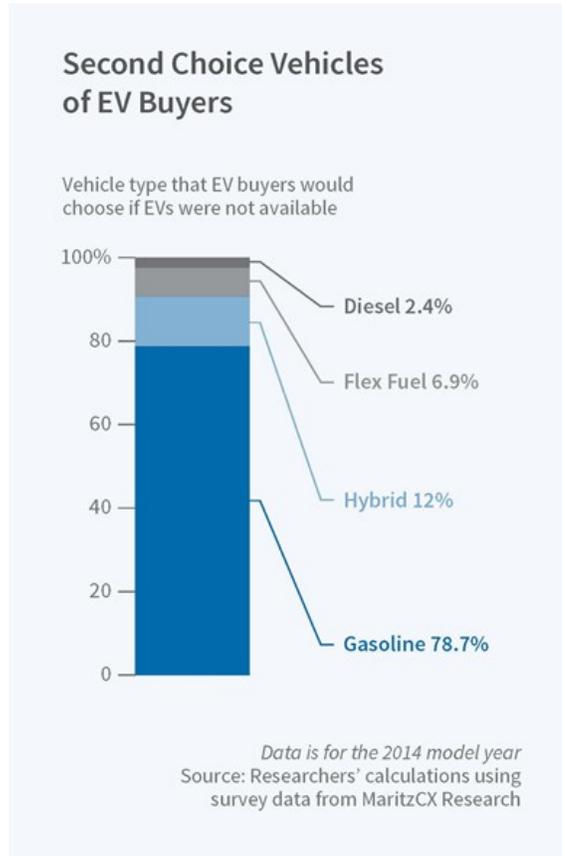
Exhibit 23. EV Buyers Have Many Other Choices

Without the tax subsidies, the researchers found that EV purchases would have fallen by about 29%

EVs will reduce energy-related U.S. carbon emissions by less than 1% by 2050

Now, Mr. Musk has joined the other EV manufacturers urging the tax credit extension

“Various power sources offer various results in charging times for the Niro: A regular household outlet might mean a weekend for a full charge, while a 240-volt charger will do the job in less than 10 hours”



Source: NBER

Without the tax subsidies, the researchers found that EV purchases would have fallen by about 29%. Additionally, they found that high-income households were more likely to reap the benefits of the tax subsidy, but also were more likely to buy EVs in the absence of an incentive, relative to lower-income households. The study also estimated that a modified subsidy program that provided a larger tax incentive for low-income vehicle buyers, who are more price-sensitive than their high-income counterparts, could have induced the same increase in overall EV purchases at a smaller cost to taxpayers.

A key issue is that the EV subsidies are needed to boost sales of vehicles “critical to lowering our emissions and limiting climate change.” However, researchers at the Manhattan Institute found that EVs will reduce energy-related U.S. carbon emissions by less than 1% by 2050. They also found that the spread of EVs would actually increase other harmful pollutants like sulfur dioxide and

nitrogen oxides. Their conclusions were supported by calculations by the International Energy Agency (IEA) and other independent analysts. Even if the number of EVs in the U.S. grew substantially

How is the 45 minutes to 10 hours of charging time factored into an EV's ownership cost, compared to the 5-minute refueling stops for ICE vehicles?

faster than current projections, their cumulative impact on climate trends would amount to a rounding error.

As the *Wall Street Journal* pointed out in its editorial about the tax credit extension, Elon Musk, CEO of Tesla, said that while his competitors want the subsidies, his company didn't need them. That was until the tax credit phase-out began to impact Tesla's sales. Now, Mr. Musk has joined the other EV manufacturers urging the tax credit extension. This may be another example of why subsidies, once begun, are impossible to end.

What no one considers when promoting EVs is the cost of recharging them, especially on long trips. We are not talking about the price of the electricity, but rather the value of the time when the car is parked and plugged in. We were amused to read the comment under a picture of the 2019 Kia Niro EV, which received a very positive review in the "Cars" section of the *Providence Journal*. The commentary stated: "Various power sources offer various results in charging times for the Niro: A regular household outlet might mean a weekend for a full charge, while a 240-volt charger will do the job in less than 10 hours."

Further to the charging issue, we were told of a Tesla owner who drove from Houston to Dallas and had to recharge partly there. It cost the driver 45 minutes. He also had to find a high-speed charger located on the second floor of a parking garage. How much was his time worth?

We have read articles by drivers who have driven their EVs across America to prove that such a trip can be done. The narrative points out that advance planning is needed in order to locate the proper charging stations (more of them are being built at highway service plazas) and to time the recharges to coincide with lunch, dinner or a shopping expedition, to offset the idle time. The drivers also needed to find hotels with charging stations to fill-up overnight. We recently stopped at a hotel where there was no EV charger, so an EV was parked near the lobby door with an extension cord extending inside to a wall outlet. Maybe the joy of driving an EV is worth the hassle of planning recharging stops. How is the 45 minutes to 10 hours of charging time factored into an EV's ownership cost, compared to the 5-minute refueling stops for ICE vehicles? Plus, there likely is a gasoline station close by.

There definitely is a market for EVs in urban areas and for use by people who can control their recharging needs. We find it hard to believe that countries are going to go totally electric for vehicle transportation in the timeframe the EV cheerleaders project, without

major technological breakthroughs in battery technology. Until then, remain skeptical of the explosive EV growth scenarios, and their corresponding view that there is no future for the oil industry.

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