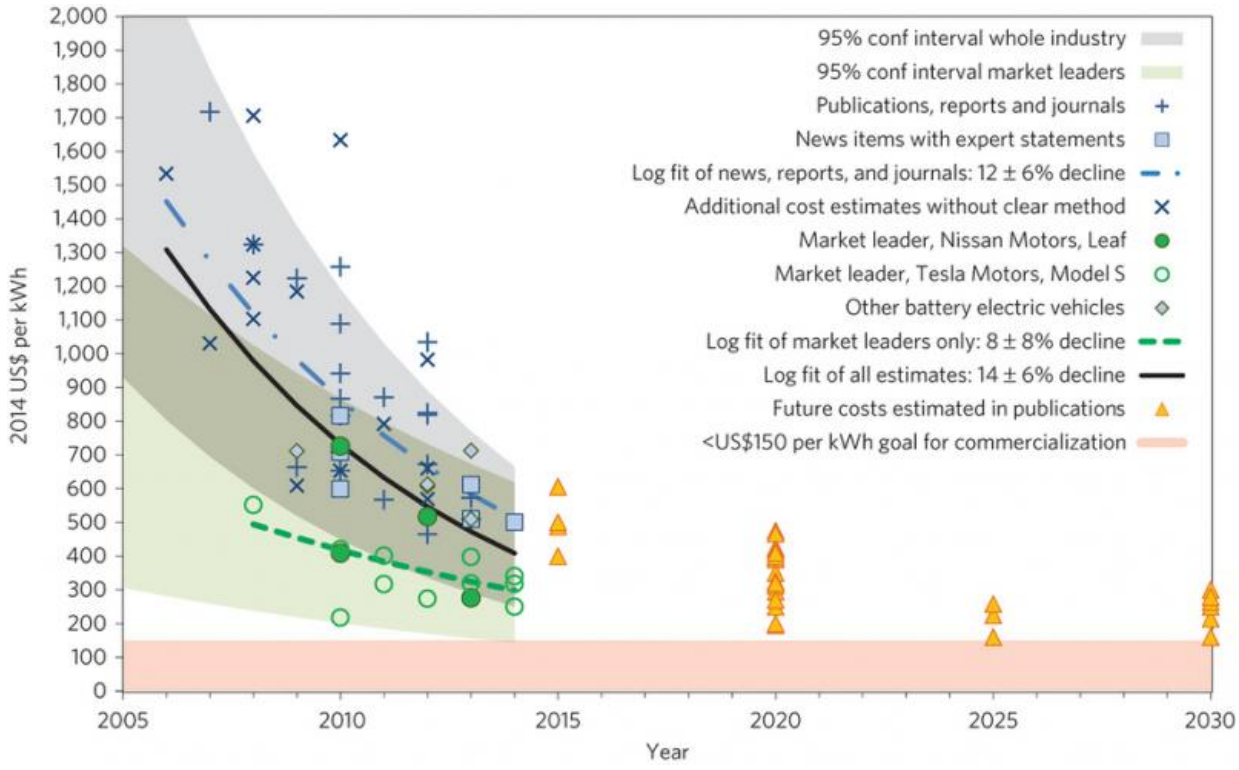
Falling prices for battery packs may cause a surge in electric car sales

April 6 2015, by Bob Yirka



Data are from multiple types of sources and trace both reported cost for the industry and costs for market-leading manufactures. If costs reach US$150 per kWh this is commonly considered as the point of commercialization of BEV. Credit: Björn Nykvist & Måns Nilsson, *Nature Climate Change* 5, 329–332 (2015) doi:10.1038/nclimate2564

A pair of researchers affiliated with the Stockholm Environment

Institute has found that prices for battery packs in electric cars have been falling more than has been reported. In their paper published in *Nature Climate Change,* Björn Nykvist and Måns Nilsson describe a study they carried out to determine the cost of battery packs for EV's and what they learned by doing so.

As Nykvist and Nilsson point out, sales of cars with electric motors have not been able to compete with those based on gasoline engines—the high price of the battery pack has relegated such vehicles to elite status, which only the well-off can afford. But, they claim, after conducting a study which involved garnering price information from 80 different sources (the majority of electric car makers do not divulge the cost of the battery pack), they found that average cost estimates for lithium-ion batteries was US$1000 per kWh back in 2007. But their latest figures show that the cost has dropped to just US$300 per kWh, which they say, is approaching the cost of running a gasoline powered vehicle. They suggest that if prices continue to fall at the same rate (about 8 percent per year), they could reach US$150 per kWh over the next decade, which they say would make such cars cost competitive (depending on oil prices, of course)—and that they add, could have a major impact on the climate.

The report by Nykvist and Nilsson shows prices for battery packs below what industry analysts have been predicting—with current prices at levels many have suggested would not be seen until 2020. They also note that some makers such as Tesla, and Nissan have been ramping up production which could lead to economies of scale, further reducing costs. That will leave EV makers with two options—lower the price on their vehicles, or add more distance to their cars. Of course, some makers could choose to split the difference, offering intermediate buyers an attractive option.

In their study the research pair detailed how they used price estimates

from a variety of sources to come up with their averages; from statements made public be EV makers, to news reports, research papers and other documents published by governments, academics and businesses. They believe it all means that EVs will become cost competitive far sooner than many have predicted.

More information: Rapidly falling costs of battery packs for electric vehicles, *Nature Climate Change* 5, 329–332 (2015) DOI: 10.1038/nclimate2564

Abstract

To properly evaluate the prospects for commercially competitive battery electric vehicles (BEV) one must have accurate information on current and predicted cost of battery packs. The literature reveals that costs are coming down, but with large uncertainties on past, current and future costs of the dominating Li-ion technology. This paper presents an original systematic review, analysing over 80 different estimates reported 2007–2014 to systematically trace the costs of Li-ion battery packs for BEV manufacturers. We show that industry-wide cost estimates declined by approximately 14% annually between 2007 and 2014, from above US$1,000 per kWh to around US$410 per kWh, and that the cost of battery packs used by market-leading BEV manufacturers are even lower, at US$300 per kWh, and has declined by 8% annually. Learning rate, the cost reduction following a cumulative doubling of production, is found to be between 6 and 9%, in line with earlier studies on vehicle battery technology. We reveal that the costs of Li-ion battery packs continue to decline and that the costs among market leaders are much lower than previously reported. This has significant implications for the assumptions used when modelling future energy and transport systems and permits an optimistic outlook for BEVs contributing to low-carbon transport.