

FLASH – ALTERNATIVE ENERGY

May 3, 2014

Electric Vehicles (EVs): New Energy Car Market Prospects for 2014

Key Points:

- Product variety: rechargeable battery vehicles known as *plug-in electric vehicles (PEV)*; rechargeable hybrid electric vehicles known as *plug-in electric hybrid vehicles (PHEV)* or non PHEVs
- Return of investors' confidence in EVs in 2013: Tesla Motors gains +344%
- Governments now offer great support to EVs, especially in China
- Consequent price decline since 2010, companies make efforts to ease consumer transition towards EVs
- US, Japan, Europe and China remain the most promising markets
- Development of infrastructure

The entire production chain should benefit from the development of electric vehicles. The battery cell manufacturers (Samsung SDI, LG Chem, SK Innovation) have our preference.

Return of investors' confidence in 2013

The electric vehicles (EVS) market – covering all models - strongly increased in 2013. Investors' sentiment has indeed become more favorable with respect to this segment, which has long struggled to take off.

The share price of U.S. Tesla Motors, the only « pure player » in this sector, reflects this evolution. If it is true that 2013 was greatly favorable to U.S. equities (+31.7%), in the meantime, Tesla share prices increased by over +344%. Its rise continued until March 2014, before experiencing a correction, in the month of April.

Price Evolution – Tesla Motors VS S&P 500
(since 31/12/2012)



Source: Bloomberg, BBGI Group S.A

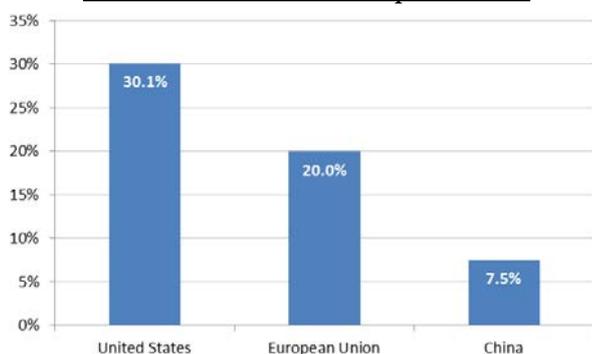
EVs first came into existence in the mid-19th century, based on a production model, however, the segment was not as convincing for investors in the years to come. For several years, governments were quite skeptic towards this new technology and did not promote these models. This lack of state support, coupled with high purchasing price and the lack of infrastructure, has long hampered consumer acceptance of the technology.

Today, however, EVs have enjoyed a rapid growth on each of the abovementioned barriers, on one hand with the help of government grants, on the other hand, concerning purchase price or as regards to the now ancillary infrastructure.

Progressive involvement of authorities in 2014

During the last few decades, given the runaway global warming pollution in major cities, governments had few alternatives: cutback on emissions of greenhouse gases and all other particles. However, the transport of persons and goods today accounts for 20% of CO2 emissions in Europe, 30.1% in the United States and 7.5% in China. For the latter the fleet of different vehicles is still relatively limited.

CO2 Emissions from Transport / Total



Source: World Bank, European Commission, BBGI Group SA

In this context, we are today witnessing in several regions a more aggressive government support in the EVs technology.

China is increasing the initiatives in this sector given the worsening air pollution, which has become the country's major challenge, but also by the severe oil shortage, which threatens the country's economic growth.

Since late 2013, several important actions were taken by the authorities, beginning with the development of an action plan to reduce air pollution (*Air pollution Prevention and Control Action Plan*), setting quotas for PM10 and PM2.5. Four ministries and the *National Development and Reform Commission (NDRC)* published two notices in September 2013 and February 2014 to promote the use of EVs to back the alternative energy sector. Regarding subsidies, a mechanism is provided by the national government, and will be implemented until the end of 2015 at least. At local government level, major cities including Beijing, Shanghai and Tianjin have gradually introduced their own local subsidy policies. Finally, in some cities, there are car purchase restrictions, while there are special quotes only for EV purchases, which is much easier to obtain than general quotes.

Unfortunately, at the moment, China's related market growth has been slow compared to that of the U.S. and Japan. In 2013, the U.S. EV sales reached 7,500 units per million vehicles, 5 times the size of EV sales in the Chinese market. **China could significantly fill-in the gap in the years to come within the region.**

In Europe, there are numerous government-backed projects and initiatives which are promoting electric vehicles. The British Deputy Prime Minister, Nick Clegg, recently announced an initiative to boost the use and development of electric and hybrid vehicles.

The government will spend £500 million, and EV drivers will benefit from free parking and are also eligible for a maximum grant of £5,000 per vehicle along with investments on further R&D.

In the United States, the federal government provides subsidies on purchases off full electric vehicles which can reach a maximum of \$7,500. Moreover, tax credits are restricted to specific models and individual state and regional programs.

Price decline in 2014?

The most significant technological challenge currently facing electric-drive vehicles is the cost which poses a great brake to further R&D investments, despite the huge savings on fuel consumption.

The greater flexibility actually lies in battery price, they constitute 50% to 60% of the vehicle price. Of course, a reduction in their cost of production significantly reduces the vehicle purchase price, and thereby, facilitates consumer transition.

In this area, the changes could still be significant in the coming years. According to the DOE¹, research helped the cost of plug-in electric vehicle batteries fall by -50% over the last four years to \$325 a kilowatt an hour. This was done by reducing both the size and the weight by -60%. The *US Advanced Battery Consortium*, a partner of the department, set a goal to reach \$125 per kWh battery cost by 2022.

Regarding the market for lithium ion rechargeable batteries (which power EVs) and are the preferred choice for electric vehicles, the production is rather limited, and may be in short supply in the case of a market uprise. This is even more true as competition is fierce within the sector, and is led by the South Korean companies Samsung SDI, LG Chem and SK Innovation, and Japan's Sony.

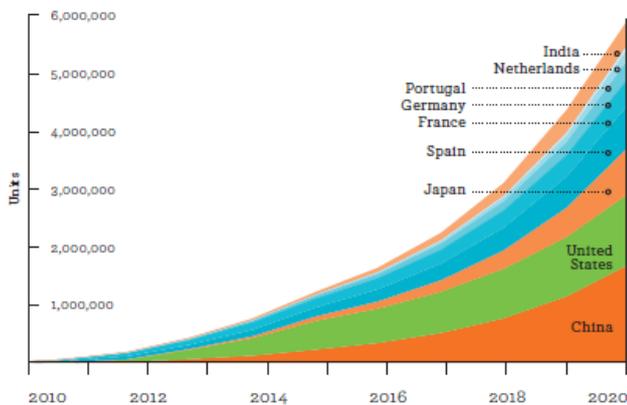
In this context, Tesla Motors, has announced plans to secure its own battery supply, and is planning to build an integrated lithium battery plant in the United States. The company's goal is to exceed by 2020 the world production of 2013. According to the company's estimates, this should cut battery production costs by -30% (per kWh) and reaching significant savings in logistics costs. This is a good sign for the contraction of the EVs' sale prices.

¹ US Department of Energy

Increased demand in established EV markets and in China

According to the IEA², the United States were home to around 38% of the global electric vehicle market in 2012, Japan 24% and Europe 11%. In these countries, the automotive market is well developed, and remains particularly attractive for electric vehicles which are gradually earning an extra piece of the annual market share. Alternative power vehicles volume in the United States increased +22.3% between 2012 and 2013, while there was only +7.5% growth for all passenger vehicles³.

EV Sales Targets by countries⁴



Source: *The Electric Vehicle Initiative, International Energy Agency*

If we turn to China, the country already accounted for 6.2% of the global market in 2012. It should be among those with the strongest growth in 2020, with respect to estimates conducted by the IEA. The agency marks the increased number of purchases for 2014-2015, as illustrated in the above graph.

In China, the market for electric vehicles has increased by +38% between 2012 and 2013, against +13.9% for traditional vehicles.

Although now largely in favor of Chinese manufacturers, the EVs' market is gradually opening towards foreign companies. Furthermore, Tesla recently announced plans for a Chinese factory, to avoid the country's import tariff. The company could offer its vehicles at lower prices, closer to the U.S. standards.

Many EV makers are targeting China and trying to place themselves on this market. Most of the models which were presented at the Beijing Motor Show were reportedly green cars (hybrid or 100% electric). Even luxury carmaker Bentley showcased a plug-in EV

(PHEV), corresponding to its version of the Mulsanne.

Further infrastructure and consumer transition

We have already seen that in all regions, demand is still largely linked to government support and the variety of manufactured models. But it is also a growing investment as the development of recharging stations becomes more and more substantial.

Massive investment in this sector will have to be deployed to move to a 100% electric vehicle sales, as consumer desire shows that hybrid vehicles currently have more market momentum. Sectoral research is also moving the chains, with several new battery infrastructure projects, either to improve the speed or their consumer use. The Wireless Power Transmitter (WPT) receivers, could ultimately impact electric vehicle wireless power transfer systems. The Department of Energy (DOE) is now trying to install charging equipment in workplace parking lots too.

In this regard, the trend among manufacturers of luxury cars could further improve the image of electric vehicles and the trust placed in them. In this sense, Bentley's CEO recently announced that 90% of its vehicles will be offered as hybrid in the next 5-6 years.

Which sectors and companies will mostly benefit from the EVs market development?

Sector analysis agree to place the battery cell manufacturers among those companies that will greatly benefit in the future from the development of electric vehicles.

In this area, there are mainly companies listed on the South Korean market. The following securities are consequently exposed to investors sentiment in this market, which is strongly linked to confidence in emerging markets.

The materials suppliers (anode materials and electrolyte) display an interesting outlook, as is the case for Soulbrain. Other companies also seem attractive, but are often not transparent and not properly covered by analysts, and liquidity can sometimes be insufficient.

² International Energy Agency (Global EV Outlook 2013)

³ Bloomberg Industries, Automobile OEM

⁴ A 20% compound annual growth rate is assumed for countries without a specific sales target.

We are more conservative as regard to EV manufacturers, although we believe that **Tesla Motors** could in the future benefit once again from investors' interest. The Chinese company **BYD** could however take advantage of its privileged position on the Chinese market. In this case, investors might want to take advantage of the recent price correction to take a long term investment view.

Samsung SDI (KRW)	CB : USD 6,656 mn
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Samsung is the top pick for numerous analysts. The market's leading player has a stable production of rechargeable batteries, including the 100% electric BMW i3. Mid/long-term growth potential 12M: 19%ⁱ. GDR available.

LG Chem (KRW)	CB : USD 16,863 mn
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LG Chem is also among the analysts recommendations, for similar reasons to those listed for the Samsung SDI. Growth potential 12M: 29%ⁱ.

SK Innovation (KRW)	CB : USD 10,578 mn
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The company, which is active in the production of battery components is also in the spotlight by analysts in the region. However, the security follows a slightly downward trend since last October. Speculative buying. 12M Yield potential: 32%ⁱ.

Soulbrain (KRW)	CB : USD 646 mn
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Soulbrain is among other things a provider of electrolyte, necessary to produce batteries. 12M Yield potential: 30%ⁱ.

ⁱ Measured by the aggregation of the target price given by analysts.

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