

Why are China's SUVs and EVs cheaper?

May 10, 2024

Dongfeng Group is selling its SUV - MHero1 – at about €155,000 in Switzerland. The electric vehicle, designed like the US Army's Humvee, may also find customers among the armies of the Global South. Th SUV has an associated drone package, costing €13,000. The drone can be voice-controlled by the driver in the SUV for filming the movement of the SUV in a rugged terrain.

(Reference: <https://tinyurl.com/3pbh57ks>) – Report by DPA (the German news agency - Deutsche Presse-Agentur GmbH - at <https://www.dpa.com/en/international-news>)



Reference: <http://www.dongfeng-global.com/>

The manufacturing of automobiles has been automated, with a large use of robots, so that the component of cost of labor has been minimized. (China is, by far, the biggest user of robots in the manufacturing industries.)

www.DiGiNews360.com asks the following two questions:

1. Why is the huge automobile industry of Europe and USA not able to put forward a similar product in the market?
2. If the labor cost be the issue, China's 'per capita GDP' is 5 times that of India. Why **Mahindras** or **Tatas** cannot compete with Chinese manufacturers like **Dongfeng Group** and **BYD**.

In 2021, China was home to 44% of the world's electric vehicles (more than 4.5 million vehicles), which was almost triple the number of electric vehicles in the US. Today, BYD of China is such a big name in EVs, the rumours of BYD establishing a factory in Europe pulled down the stock prices of auto-manufacturers in Europe.

TECHNOLOGIES for EVs: If a country wants to develop an industry to manufacture EVs, it requires the following:

1. Availability of component manufacturers, who are willing to modify their products for use with the EVs.
2. Availability of efficient and easy to use infrastructure.
3. Availability of a business model to leverage the cost of batteries.

In most of the countries, including China, electric power generation is heavily dependent on thermal power plants that employ fossil fuels. But India and many other countries have solar energy available all through the year. So, these countries have to develop their own business model, which may cost much less.

There are four types of batteries vying to be the standard for the EVs industry:

- i. LAB (lead acid);
- ii. Li-Ion (lithium-Ion);
- iii. NiMH (nickel metal hydride) and
- iv. sodium, also known as ZEBRA, Zero-Emission Battery Research Activity, which is fully recyclable and which tends to be cheaper than lithium-based batteries.

BYD of China has a proprietary **iron phosphate battery**.

BYD claims about its **iron phosphate battery**:

It is environmentally friendly, safe, reliable and fully recyclable. It still retains over 70% capacity after 10,000 charging cycles, and goes through extremely harsh tests – flames, short circuit, prodding, striking, extreme heat, extrusion and overcharge. It will not burn or explode even when put into the fire.

GOVERNMENT SUBSIDIES: In France, government incentives HAVE BEEN DEVELOPED in coordination with PREDIT – **National Program of Research and Innovation in Transportation**. Cooperative research projects have been developed

involving car manufacturers, major suppliers, industrial firms from other sectors (oil sector) and public institutions (the French Oil Institute).

RESEARCH at UNIVERSITIES: Every University has to develop research programs both for technologies as well as for implementation of the eco system for EVs. For example: BYD of China has sponsored research to find out what it takes to have a wide-spread use of EVs in a city in Sweden. This type of research will enable decision-making when BYD wants to develop the European market for its EVs.

----A BACKGROUNDER on BYD----

BYD is the largest manufacturer of pure electric vehicles worldwide. It manufactures plug-in electric vehicles (PHEV) and is also producing its second generation of dual hybrid vehicles, known as Dual Mode.

The company is based in the city of Shenzhen, Guangdong Province, but it also has factories in Beijing, Xi'an, Shanghai and Changsha. In total, BYD currently has 20 factories producing from IT to EV components, 14 in China and 6 around the world: Russia, Syria, Egypt, Sudan, USA and Brazil. In Brazil, BYD has built a CKD bus assembly facility in the region of Campinas – São Paulo – and its buses have been tested in the Brazilian cities of Curitiba, Rio de Janeiro, Salvador, Brasília and Joinville. According to a BYD executive at Headquarters, this early international expansion is due to the fact that "... our technology is mature enough, but the EV market is not. We must explore BYD's advantage by being the first to start operating in the largest consumer markets (BYD, 2015a, 2015b)."

According to the company, the battery packs powering vehicles will also be made in Brazil.

BYD Company Limited has devised what they denominate as a "7+4 strategy", also known as Green Mobility Strategy, which consists of electrifying all transportation currently dependent on fossil fuels. The 7 refers to on-road transportation (urban transit, taxis, private cars, tourism and commuting coaches, garbage trucks, urban goods logistics and urban construction logistics) and the 4 refers to off-road environments (harbor, warehouse, mining and airport).

Along with the production of EVs, BYD also provides different charging solutions, like the BYD AC Power-Interface, Bi-Directional Charge/Discharge Technology, Elevated Charging Facility, Vertical Charging Carrousel, Dual Overhead Bus Charging Facility and EV Charging Tower Facility. These charging solutions, allied with the 7+4 strategy, embody one of BYD's "three green dreams". The other two are mass Solar Power Generation with its high-tech solar panels and efficient Energy Storage Solutions. According to BYD, the idea is to create a Zero-Emission Energy Ecosystem that is self-sufficient and sustainable, relying on complete vertical integration to guarantee clean energy from efficient energy generation and storage to its final use.

In the solar power sector, the BYD "dream" consists of adding quality to Grid Parity by developing its Dual Glass PV Module 2.0 with an advanced solar cell technology that achieves an average efficiency of 18.0%. The BYD New Energy Total Solution comprises PV Module+Tracking System+Inverter+Energy Storage. Its solar panels have received prominent certifications such as UL, CE, TUV, IEC and PV Cycle, and the company also offers the key part of the reverse and the Insulated Gate Bipolar Transistor (IGBT).

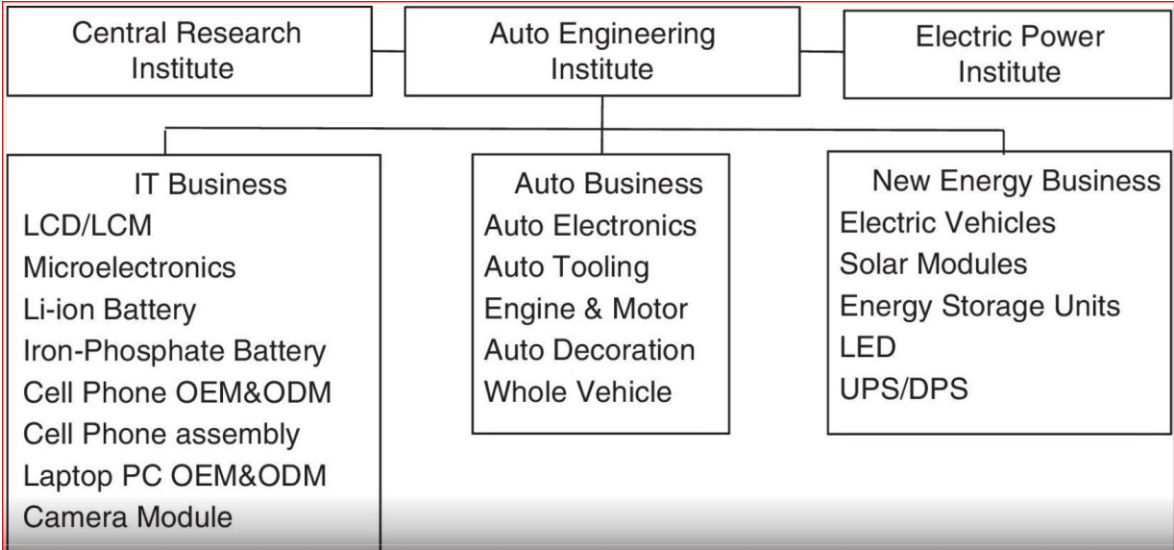
The company's next "green dream" is streamlined energy storage for grid operations and renewable balancing. For grid operations, the company is working toward building smarter grids, discharging them during high power demand and charging during lower power demand with a shorter response time of just 4ms (which improves the transmission line and the equipment lifetime). China State Grid's 6MW/36MWH Project (energy storage station) and Chevron 4MWH Project in San Francisco (mobile energy storage station) are representative of the company's efforts to build this new platform, as well as providing home energy storage systems as an additional component.

Research on the internationalization strategies in the emergent EVs industry being pursued by fast movers like BYD deserves to be further investigated. Future research should be directed at more in-depth case studies analyzing the company's performance in local and foreign markets. Specifically, further research is needed to understand if the vertical integrated structure of production of EVs that has driven the company's expansion in the Chinese market is able to continue as government subsidies are reduced. In foreign markets, case studies of BYD's

investments could help to identify which factors (the gains from local production, the reduction of costs for batteries, the expansion of infrastructure, etc.) are most critical for the consolidation of the EVs segment. Beyond BYD, further research is also needed on what other Chinese companies as well as global automakers are doing to leverage the development of the EVs industry. These questions are a promising research agenda that should be pursued in the near future.

Reference: ‘Electric vehicles in China: BYD strategies and government subsidies’ by *Gilmar Masiero*, *Mario Henrique Ogasavarab*, *Ailton Conde Jussanic* and *Marcelo Luiz Rissod* in **Elsevier** at <https://tinyurl.com/ym9ssbmn>

In 1995, BYD Company Limited started operations with 20 employees and US\$ 300,000 in initial investment. Since then, the company has grown at an average of 70% per year. Today, the Chinese company has a staff of 190,000 employees worldwide and around US\$ 9.1 billion in sales. The company started its activities making mobile phone batteries and quickly moved on to making OEM handsets for the information technology industry. In 2003, it entered the auto and renewable energy sectors. The company's diversification is represented in Fig. 1.



Note: Please read “China controls production of Batteries for Electric Vehicles” dated 28 January 2023 at <https://diginews360.com/china-controls-production-of-ev-batteries/>