



TAKEAWAYS FROM CHINESE EV DEVELOPMENT



Background

In the automotive world, the “Race” to EV Dominance is heating up and getting more intense than ever. However, the big names are slightly falling behind. (Link to A&M newsletter July) The big names as traditional manufactures have noticed the market trend but have focused on plug in hybrid electric vehicles rather than battery electric vehicles in the past. Reasons is the lower cost of smaller batteries and the legacy of keeping the utilization of their IC related production units. The market is now leaning toward to full battery electric vehicles, which impacts the development and performance of classical OEMs compared with new EV giants like Tesla and BYD.

China accounts for more than half of global EV sales and a similar share of exports, 36.6% of German OEM produced cars are sold in China; and China has surpassed both Japan and German by 2023 Q1 to become the world’s largest auto exporter in units, with EV contributes to more than 20%. Despite EU is intending to impose additional tariffs on Chinese electric vehicles entering Europe. Chinese EV with the good quality and cost performance as well as the innovative design have been attracting the consumers, especially the young drivers. Therefore, to German automotive industry China is critical important both as major market and competitor.

FIGURES AND FACTS

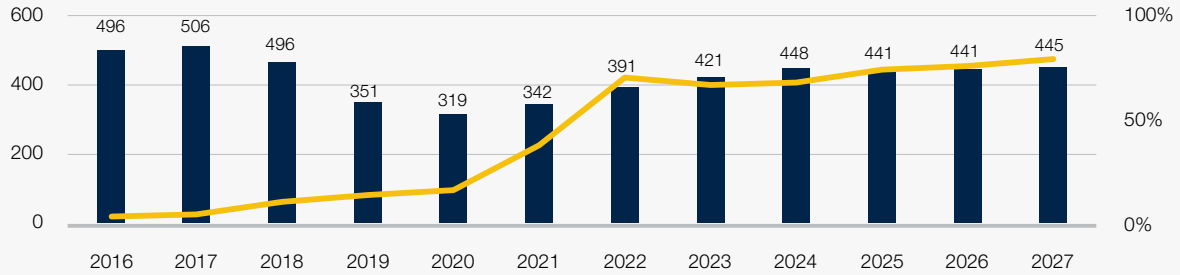
The rapid growth of electric vehicles (EVs) poses a serious challenge to the German automotive industry, which faces two major threats: losing market share in China, the world’s largest car market, and competing with Chinese EV makers, who are expanding their global presence. China is not only a key market for German car makers, but also a leader in EV innovation and production. Below are some facts elaborating the situation of China as market and competitors.



PART 1: CHINA MARKET

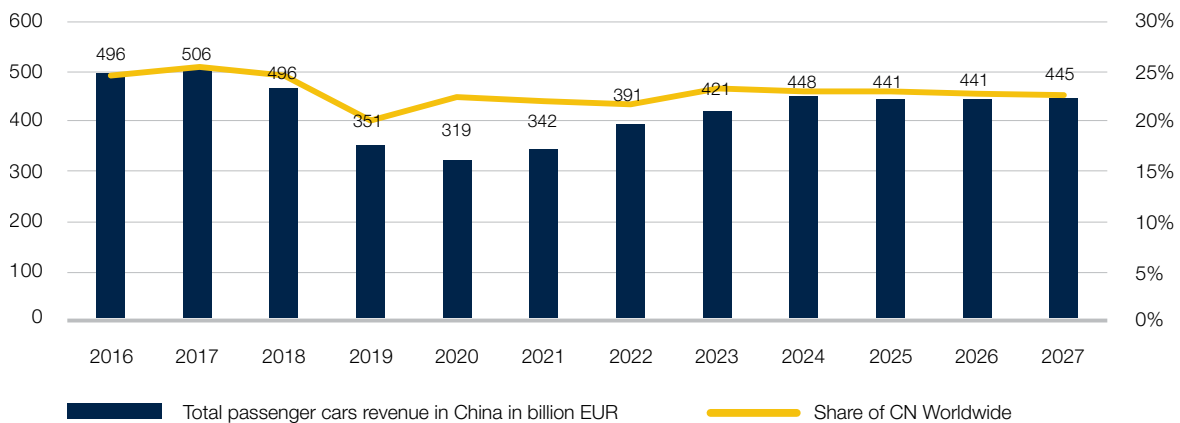
1. China remains as important market for passenger cars, ~ 23% of global market share now and as forecast by 2027.
2. German OEMs are losing the market share in China, 5% market share loss within in 2 years from 2020 to 2022.
3. The market share of EV to passenger car in China has been increasing, especially since 2022 60% of revenue is generated by EV.
4. Chinese local brand is dominating China's EV market, only two car markers with foreign ownership made the TOP 15 suppliers.

Development of EV share in China



Source: Statista 2023 Passenger Cars Worldwide

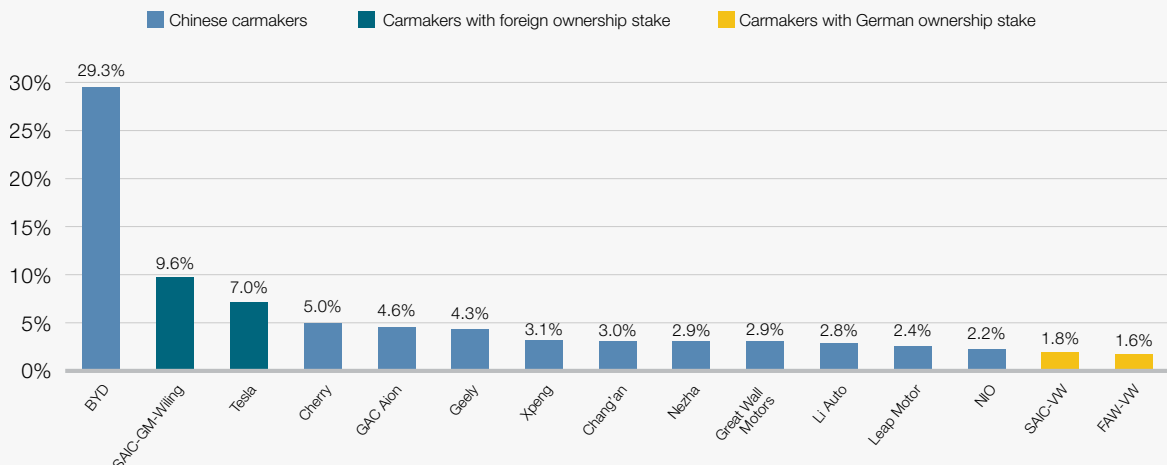
Passenger car market share China 2014-2027



Source: Statista 2023 Passenger Cars Worldwide

Chinese producers dominate China's EV market

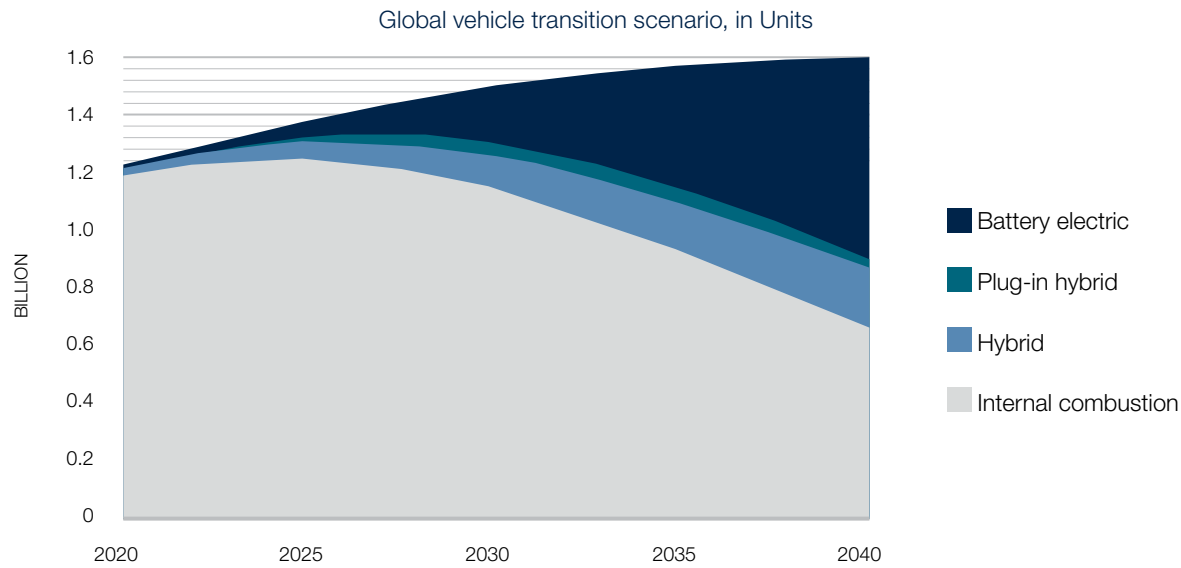
Top 15 EV producers in China by market share in terms of units sold (January - August 2022)



Source: Merics China Monitor 2023

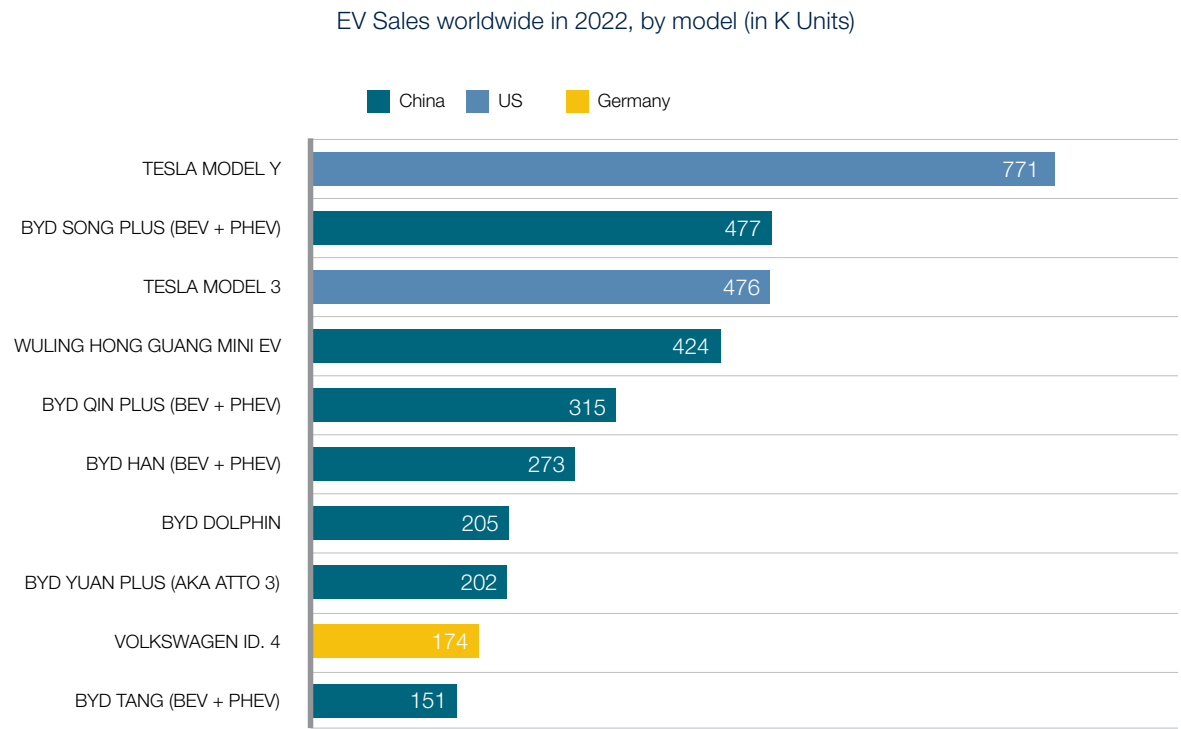
PART 2: CHINA AS TECHNOLOGICAL COMPETITORS

By 2040, battery electric vehicles, along with plug-in hybrids and hybrids, will overtake conventional engine vehicles and become the leading vehicle type in the market.



Source: Bloomberg NEF Long-Term Electrical Outlook 2023

While Tesla has been considered the uncontested market leader, other automakers have entered the race. In 2022, China’s BYD retired its ICE product lines to focus on EVs, which comprised most of the brand’s sales. There is only one Germany model made the Top 10 EV list.



Source: Statista Industries & Markets: Electric vehicle A global overview

Is there some takeaway for Germany?

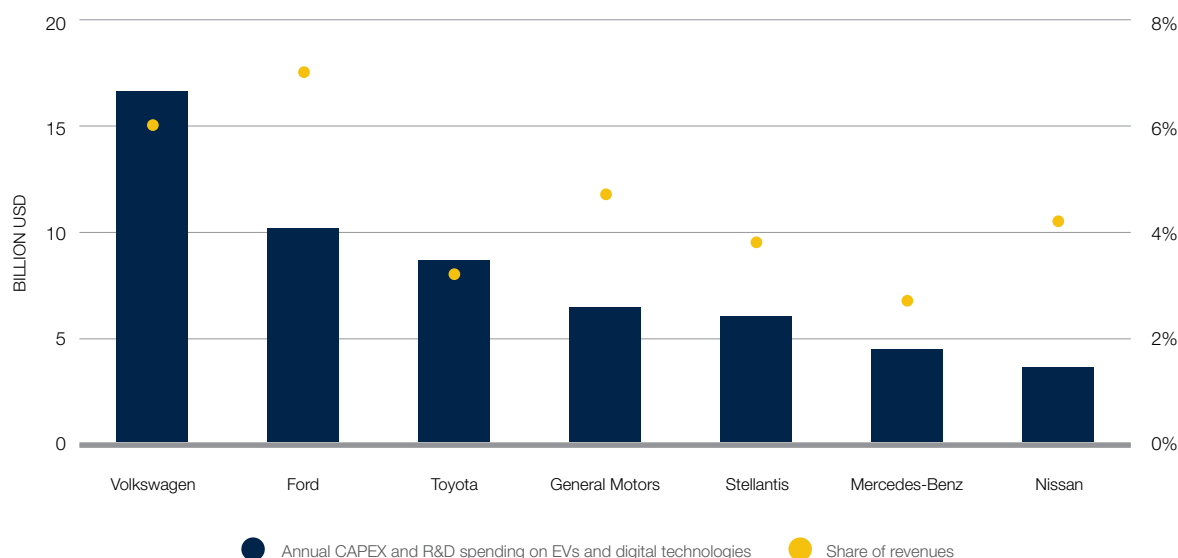
As known the situation is urgent, the major German car makers are lagging their competitors in China and the US, who are leading the EV innovation and production. The German car industry has a long and proud history, but it also has a complex and rigid structure that hinders its transition to EVs. Meanwhile, new, and agile companies are emerging in the EV market, offering cheaper and better alternatives to consumers. The German government and the car industry are aware of the need to accelerate their efforts in EVs and have launched various initiatives and investments to catch up. However, the question remains: will they be fast enough to keep up with the changing trends and demands in the global car market? Even be aware of the urgency, the German government has still decided to cut the purchase premiums for electric cars, which demotivate the EV purchase again as consequences.

The development of EV in China has always been through difficult phase to achieve the current state. There are four main takeaways from China's EV transition.

Takeaway 1 Focus limited R&D resources on selected projects

Germany OEMs has increased CAPEX and R&D spending commitments on EVs and digital technology. Since 2019 Volkswagen has an annual Capex and R&D spend of 17 billion USD and Mercedes-Benz of 4 billion USD on EVs and digital technologies, which is far above BYD 2.78 billion USD and Tesla 3.1 billion USD in 2022.

Annual CAPEX and R&D spending commitment on EVs and digital technologies by selected automakers, 2019-2022



BYD has been in the EV industry since the beginning and master the core technology of power battery, electric motor and electronic control system, the core components of electric vehicles. Over the years it has built a systematic closed loop on the research and development of new energy technology, thus promoting continuous growth and the new generation of products. According to statistics, BYD has more than 40,000 R&D personnel. It has launched new battery technology, which leads to cost advantages. R&D is heavily focusing on increase the product mix and introducing more models to the market. Differs to BYD which has more focus on developing more models with large price range to cover more consumers, Tesla focus more on premium clients and technology development, in the areas of safety, speed, and technology integration.

While EV OEMs only focus on EV technology and already have a well-established system and supply chain, Germany traditional OEMs are sticking to multiple drive technologies which limited the focus and resources for EV development. Between 2023 and 2027 VW has planned to invest up to 15 Billion Euros in batteries and raw materials to cut the cost. The challenge is still to balance the conflict between the new development of EV and the continuing competitiveness of existing motors. USP and R&D focus and strategy needs to be solid planned and crystal clear to be able to succeed.

Takeaway 2 Battery industry development

Battery is the most important component of an electric vehicle as it is the energy source. The performance, quality and safety of the battery includes speed to charge, driving range and stability can even determine the success of an EV. Therefore, close access to qualified batteries is important for EV development.

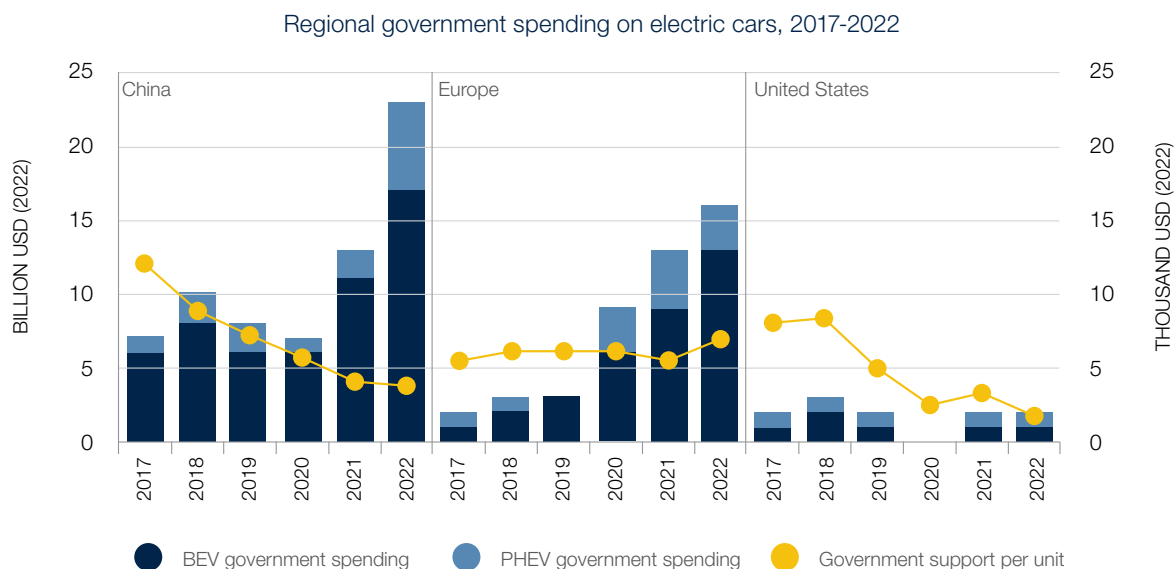
Currently all top 10 battery manufacture are allocated either in China, Japan or South Korea. BYD even has its own capabilities of battery manufacturing which support supply chain independence. The effects of the growing trend toward electromobility are not only challenging German automakers but are also battery producers. The numerous investments by the country and companies will ensure positive development in the coming years for German and European battery industry. Germany OEMs has long history of operating in China and working together with Chinese automotive industry, the cooperation goes into almost all levels and areas of the industry. Recently VW's Partner Jac introduced the first EV with lithium-free sodium-ion battery, where VW owns 50% of the company. A good mix of self-owned technology knowhow and capability build-up with constructive collaboration with partners which has leading technology would boost the development in best speed.

Takeaway 3 Governmental support to boost demand

Government policies can drive industry and people's purchasing behavior. On August 16, 2022, President Biden signed the Inflation Reduction Act into law, offering funding, programs, and incentives to accelerate the transition to a clean energy economy and will likely drive significant deployment of new clean electricity resources. This act is forcing Europe to revise its subsidy system to strengthen the competitiveness of European companies.

Government support as subsidies, tax deduction, procurement contracts, and other policies such as bonuses related to weight, CO2 emissions or range, is one of the most effective ways to promote EV.

Globally since 2017, with the EV spending went up, the ratio of government spend has dropped from ~20% to 10%. The is more recognizable in China. In 2022 China has significantly reduced the subsidies to 1127 USD per unit, as it is not one of the main purchase drivers anymore. But at the beginning, the subsidies have largely promoted EV sales. Germany is still at the beginning of EV journey, but subsidies for purely electric cars costing less than 40,000 euros has fallen from the 6,000 euros to 4,500 euros per car since beginning of 2024, which would lead to a fall back in the journey of EV adaptation.



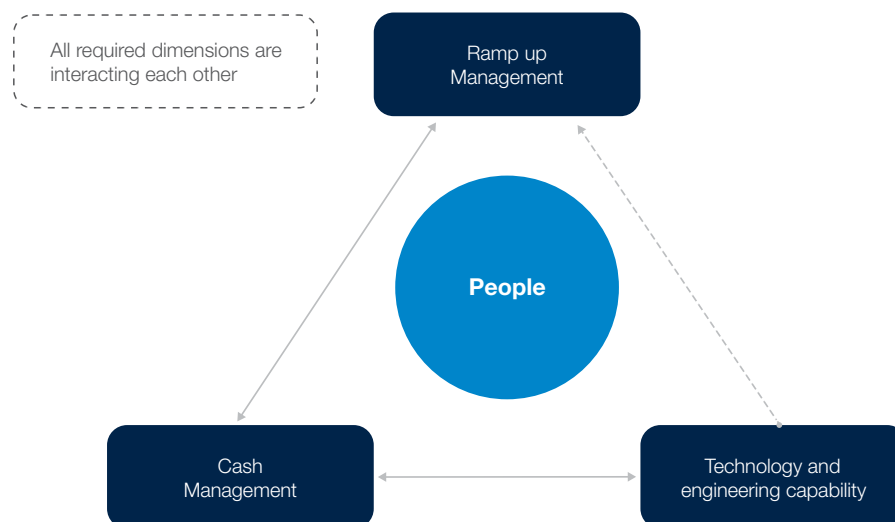
Another government initiative to promote e-vehicle is policy, such as development of zero-emission-zone. Such as all-electric taxi and bus fleet in some cities to reduce carbon emission or targeted motor vehicle ban by year 2030 in Hainan province. Germany has gone similar path to force auto produce to reduce carbon emission, as BMW Group, Mercedes-Benz, and VW Group – have joined the Science-Based Targets initiative, which defines a common framework and path to reduce emissions in line with the Paris Agreement, but the measures are not directly link to the development of electric-vehicles.

Takeaway 4 Infrastructure support

Longer driving ranges can boost EV sales, but range anxiety is the second-most common concern of consumers. According to the announcement of China Electric Vehicle Charging Infrastructure Promotion Alliance (EVCIPA), as of the end of August 2023, the cumulative number of charging infrastructures (public and private) nationwide was 7,208,000, of which 2,272,000 were public charging piles, and 4,936,000 were private charging piles that were built with the vehicles. The number of pure electric vehicles are 12,594,000 which leads a ratio of 1:1.74; in comparison Germany has 53,978 charging station for 1,300,000 electrical vehicles with a ratio of 1:24. The easily accessible charging station makes charging as simple as traditional with petrol and diesel and compensates for the shortage of short driving distance.

Based on these four takeaways the German industry needs to reinvent itself in multiple dimensions.

1. **Ramp up management:** The physical capabilities of the organizations have been adjusted over the years for a certain number of new product launches and certain way of working has been established to handle this level of complexity. With strong push for electrification the manufacturing resources need to be adjusted to this new reality which would mean a high burden for all related organizational units
2. **Technology & Engineering capabilities:** The companies are now handling products which are quite new for their organizations starting from engineering till production. The whole value chain needs to be more agile and should be able to handle multiple new products and services. The engineering resources are highly impacted by this.
3. **Cash management:** This whole change needs to be financed. Both ramp-up management and engineering capabilities are also a function of right and successful cash management. To be able to achieve this without jeopardising the health of the organization, tight cash management and other preventive measures are required. One major measure could be working capital improvements through integrated inventory management and other supply chain related measures.
4. **Talent management and people:** To be able to achieve this massive transformation organizations should have the right people with right skillset on board. This can only be achieved through joint effort by recruitment and qualification resources. Considering aging population and limited study spaces in western Europe the challenge of finding right people will become even more important in upcoming years.



Source:

1. Auto Verkaufszahlen weltweit 2023 | Statista
2. Electric vehicles A global overview_Statista_2023
3. Electric Vehicles Worldwide_Statista_2023
4. Passenger Cars Worldwide_Statista_2023
5. Electric Vehicles market data & analysis_Statista_2023
6. Global revenue for electric vehicles between 2016 and 2022 with a forecast through 2028_Statista_2023
7. State of China's Auto Market - May 2023 - Automobility
8. THE BUMPY ROAD AHEAD IN CHINA FOR GERMANY'S CARMAKERS October 27, 2022
9. Corporate strategy – Global EV Outlook 2023 – Analysis - IEA
10. Technology and Products Driven, BYD Enters a New Upward Cycle | EqualOcean
11. Bloomberg NEF Long-Term Electrical Outlook 2023



Conclusion

To regain the leading position in the EV market, four key areas should be addressed by German car makers: demand, supply, policy, and infrastructure. However, given that German car makers rely heavily on exports, enhancing their competitiveness in the supply side seems to be more crucial. This would require innovation, cost control, and technology breakthroughs in both EV and battery development. To achieve this, they need to undertake various structural changes which will require an operational re-thinking of their current setup. The above recommended dimensions to cluster the required actions and measures will help to define a new strategy to initiate or proceed with required transformation.

The upcoming challenges need to be embraced by all stakeholders especially by the teams because the upcoming change is not a straight line, it will be like a rollercoaster ride with unexpected twists and turns.

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