

The Impact of the Bursting New Energy Vehicle Market on the Traditional Fuel Vehicle Industry

- The Case of Audi

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Abstract: The automotive industry is facing an era of change against the backdrop of escalating environmental concerns and a global shift towards sustainable transportation. This thesis focuses on the impact of the emerging New Energy Vehicle (NEV) market on Audi, a stalwart of the traditional fuel vehicle segment. The purpose of this study is to assess how Audi is responding to this transition, with particular emphasis on its strategy of embracing electrification in the face of increased competition and changing consumer preferences. Through a comprehensive literature review, analysis of Audi's financial reports and sales data, this study provides insights into Audi's investment in electrification, the pace of model launches, and sales of hybrid and all-electric vehicles. The data for this study was obtained from official Audi publications, industry reports, and relevant academic articles. The findings show that Audi has made significant progress in adapting to the new energy vehicle market, as evidenced by significant investment in electric vehicles, an expanding portfolio of electric models, and sales growth in key markets.

Keywords: New Energy Vehicles (NEVs), Automotive Electrification, Sustainable Mobility, Audi Strategy, Market Dynamics

1. Introduction

It has only been a few years since the first new energy vehicle was introduced, and now new energy vehicles have entered the market on a large scale. As one of the culprits of the increasingly serious environmental pollution problem, the carbon emissions generated by traditional fuel vehicles have been the target of worldwide attention and search for solutions. Therefore, as an alternative, the emergence of new energy vehicles is both a proof of technological development and a response to the trend of the times. However, while people are focusing on the gradually expanding market of new energy vehicles, they have overlooked the impact that the traditional fuel vehicle industry is facing. When the market share is almost unchanged, for the whole automobile market, the development and expansion of the new energy vehicle market will definitely take away the share of the traditional fuel vehicle market. Therefore, this paper will mainly study the impact of the new energy vehicle market on the traditional fuel car industry, and take Audi, the representative of traditional fuel car, as the

main research object. This paper will analyze Audi's financial report data in the past three years to analyze Audi's sales in the global market and its response to the globalization of the new energy vehicle market in the years of rapid growth of the new energy vehicle market. Through the research of this paper, it can provide a vision for all traditional fuel car industries to cope with the wave of new energy vehicles and to stand out from the rest.

2. Development of the New Energy Vehicle Market

Over the past decade, the share of new energy vehicles in the Chinese market has increased dramatically. The introduction of government policies is one of the main reasons for the rapid growth of the new energy vehicle industry. As of 2018, the Chinese government has invested more than RMB 390 billion (US\$58.8 billion), or more than 42% of the industry's overall business activity, to boost the supply of new energy vehicles, batteries, and other key components, and to stimulate consumer demand [1]. As a result, electric vehicle (EV) sales in China are expected to grow 36% year-on-year through 2023. China currently holds 33.9% of the global light-duty vehicle market share, and 65% of global EV sales come from China, underscoring its dominance of the new energy vehicle market as both the largest EV sales market and a leading producer [2].

Similarly, worldwide, the new energy vehicle market is gradually expanding. In 2023, global sales of pure electric vehicles (BEVs) and plug-in hybrid electric vehicles (PHEVs) reached 14.2 million units, marking a significant increase of 35% from the previous year. This growth reflects the rapid global adoption of new energy vehicles, driven by strong market demand and a consumer shift towards more sustainable transportation options. The rise was particularly notable in the U.S., Europe, and other regions [2]. New energy vehicles are gaining market share in the global automotive market, with BEVs and PHEVs increasing their share of all light-duty vehicle sales from 13.0% in 2022 to 15.8% in 2023. This growth is attributed to advances in new energy vehicle technology, the expansion of charging infrastructure, and a wide range of fiscal incentives and policy measures designed to promote the adoption of new energy vehicles [3].

Within a limited market share, the expansion of the new energy vehicle market inevitably means that the traditional fuel vehicle industry is taking a hit. The growing new energy vehicle market is gradually taking a larger share of the overall automotive market, which has a direct impact on the demand for Traditional Fuel Vehicles (TFVs). Meanwhile, globally, governments around the world are introducing policies to help the development of the new energy vehicle industry while also restricting the traditional fuel vehicle industry. For instance, in November 2020, the U.K. government announced a policy to ban the sale of new gasoline and diesel cars and vans by 2030 [4]. The plan aims to reduce the UK's carbon emissions and combat climate change by accelerating the transition to electric vehicles (EVs), among other measures. By setting strict deadlines, the government is sending a strong signal to the industry and consumers, prompting a major shift to EVs and leading to a decline in the long-term viability of the traditional fuel vehicle market.

3. Audi Sales in the Chinese Market

3.1. Global New Energy Vehicle Sales and Market Share Dynamics

The global New Energy Vehicles (NEV) market has witnessed an impressive expansion from 2020 to 2022, with a surge in sales and a significant increase in market share. The shift to electric vehicles (EVs), including pure electric vehicles (BEVs) and plug-in hybrid electric vehicles (PHEVs), marks a key shift in the automotive industry's approach to sustainable transportation.

The year 2020 marked a significant turning point for the adoption of new energy vehicles globally. Amidst the challenges posed by the COVID-19 pandemic, there was a notable escalation in consumer interest and sales in the electric vehicle (EV) sector. Despite logistical and economic hurdles, the

market share for electric vehicles began its upward trajectory, reflecting an increasing public awareness and preference for sustainable mobility options [5].

In 2021 the new energy vehicle industry growth exponentially. Global electric vehicle sales surge to 6.5 million units, a 109% increase from 2020. This surge highlights the rapid growth in consumer demand for electric vehicles, driven by technological advances, lower battery costs, and comprehensive policy support from governments around the world. Notably, EVs account for 9% of global passenger car sales in 2021, a significant increase from the previous year, indicating a steady rise in market share in a global automotive market that is growing at a marginal rate of only 4%.

Similarly, the momentum continues with electric vehicle sales breaking new records in 2022. Electric vehicle sales exceed 10 million units, accounting for 14% of global new car sales, up sharply from around 9% in 2021 and less than 5% in 2020 [6].

The large increase in electric vehicle sales and their market share from 2020 to 2022 is not only a temporary spike in consumer interest, but also a sign of a deep and lasting shift in the automotive industry. The increase in market share is particularly indicative of the industry's shift away from combustion-engine vehicles to more sustainable electric alternatives.

3.2. Audi Global Sales and Market Share Changes from 2020 to 2022

2020 was a challenging year for the global automotive industry due to the COVID-19 pandemic. Audi's performance in global markets reflected broader industry trends, with overall sales and market share significantly impacted. Despite these challenges, Audi has demonstrated resilience and strategic adaptability.

In 2020, Audi observed a notable reduction in its global car deliveries, with a decrease of 8.3%, delivering 1,692,773 units as opposed to the 1,845,573 units in 2019. This trend was not isolated to Audi but was reflective of a broader downturn within the automotive industry, which saw a significant decline in total vehicle sales by 15.2%—from 79,852,032 in 2019 to 67,729,526 in 2020. These market conditions were further compounded by a global GDP contraction of -4.0% in 2020, indicating widespread economic challenges [7]. Additionally, Audi reports global deliveries totaling 1,638,638 units in 2022, down slightly by 3.0% from 1,688,978 units in 2021. This adjustment reflects the ongoing impact of the pandemic on the automotive industry as a whole, including supply chain disruptions and the response of consumers to changing preferences for sustainable mobility solutions. Despite the challenges, Audi's financial results highlight its strategic strengths and operational efficiencies. In 2022, Audi achieved revenues of €61,753 million, a significant increase of 16.4% from €53,068 million in 2021. Operating profit also increased significantly, reaching €7.55 billion in 2022, up 37.3% from 2021. The previous year was \$5.498 billion. This financial upturn highlights Audi's successful adaptation strategy, which includes cost control, an enhanced product portfolio, and strategic investments in electrification and digitalization [8-10].

A closer look at Audi's deliveries in the regions reveals a mix of growth and contraction. In Europe, supported by recovery efforts and a strong performance in Germany, deliveries grew modestly, by 1.9% from 619,856 units in 2021 to 631,697 units in 2022, an increase of 19.2%. In China (including Hong Kong), Audi's deliveries decreased by 7.8 percent from 702,224 units in 2021 to 647,221 units in 2022 due to competitive pressures and the region's push for new energy vehicles. The same downsizing also occurs in the U.S. region, where deliveries are down slightly by 2.5 percent. This is not only a continuing effect of the COVID-19 pandemic, but also signals a shift in consumer preferences, as consumers may explore options from other brands that are more aggressively entering the EV market [11].

4. Analysis of Audi's Response to the Globalization of the New Energy Vehicle Market

4.1. Audi's Response to the Globalization of the New Energy Vehicle Market

As the automotive industry is in a critical period of transformation driven by surging demand for sustainable and environmentally friendly mobility, Audi has strategically positioned itself to meet the challenges and opportunities presented by the globalization of the new energy vehicle (NEV) market.

4.1.1. Strategic Vision

Under its ambitious corporate strategy "Vorsprung 2030", Audi aims to redefine its identity as a leader in sustainability, technology and social responsibility by 2030. The strategy underscores Audi's commitment to providing its customers with an unparalleled electric vehicle ecosystem and highlights the brand's proactive approach to electrification and digitalization [9]. This initiative reflects Audi's commitment to maintaining its competitive edge in the global marketplace by transitioning to new energy vehicles, in line with global efforts to combat climate change and reduce its carbon footprint.

4.1.2. Embracing Electrification

Audi's entry into the electric vehicle market was marked by the launch of the e-Tron range, which represents a significant advancement in the brand's electrification goals. The introduction of new models such as the Audi Q8 e-Tron (formerly known as the Audi e-Tron SUV) showcases the brand's innovative efforts to expand its electric vehicle lineup with a 95.0 kWh lithium-ion battery pack and dual electric motors (Car and Driver, n.d.). These developments signal Audi's determination to offer a diverse range of electric models that cater to the evolving preferences of consumers seeking sustainable, premium mobility solutions [9].

4.1.3. Market-Specific Strategies

Understanding the unique dynamics of regional markets is critical to Audi's global strategy. For instance, in China, the world's largest market for new energy vehicles, Audi has tailored its offerings to meet the region's specific needs and comply with local regulatory environments. This localization strategy enables Audi to effectively navigate the competitive forces in the new energy vehicle industry and maintain its leadership among traditional automakers, emerging new energy vehicle companies, and technology giants. Audi's approach includes adapting its product lineup and marketing strategies to align with Chinese consumer preferences and government incentives for new energy vehicles, thereby securing a strong position in this rapidly evolving market [12-13].

4.2. Audi's New Energy Vehicle Investment and Change in Ratio of Total Expenditures to Revenues

The significant increase in Audi's investment in new energy vehicles over the past three years underscores Audi's commitment to electrification and marks a key shift in its business strategy towards sustainability and innovation. This strategic alignment is reflected in Audi's financial allocation to electrification, which impacts its total revenue and operating profit.

In 2020, Audi's revenue was €49,973 million and its operating profit was €2,569 million. The average annual investment in electrification is about €3.4 billion, which is 6.80% of total revenue for the year and 132.35% of operating profit for the year. This ratio underscores the strategic importance Audi attaches to electrification, even in the face of significant operating costs relative to profitability.

In 2021, Audi's revenue increased to €53.068 billion and operating profit rose sharply to €5.498 billion. In that year, electrification investments accounted for 6.41% of total revenues and 61.84% of

operating profit. The decline in investment as a percentage of operating profit from 2020 to 2021 reflects the improvement in Audi's financial performance and in the efficiency of the allocation of investments in new energy vehicles.

By 2022, Audi continued to demonstrate its commitment to sustainability with record revenues of €61.8 billion and operating profit of €7.6 billion. The proportion of electrification investments remains high, underscoring Audi's continued commitment to leading the electric vehicle transition [7-10].

Audi's significant commitment to new energy vehicles is demonstrated by the fact that it has earmarked approximately €17 billion of its total investment plan of €35 billion over the next five years for electrification. This investment represents a significant portion of Audi's future vehicle program, which focuses on networked and sustainable premium mobility [9].

4.3. Analysis of Audi's Hybrid and All-Electric Model Launch Pace and Sales Volume

The Audi e-tron range, which includes the flagship e-tron SUV and the e-tron Sportback, is the core of Audi's entry into the electric vehicle market. 2020 saw a significant increase in global sales of the Audi e-tron and e-tron Sportback, which rose by 79.5% year-on-year to 47,324 units. This is an important milestone that demonstrates the growing interest of consumers in the electric mobility solutions offered by Audi.

In 2022, Audi continued its success in the electric vehicle market, delivering more than 100,000 electric models, including the e-tron range. Of these, a record 16,177 were sold in the U.S. alone, a 47.3 percent increase over the previous year. Notably, Audi e-tron models themselves sold 10,397 units, up 7.2 percent from the previous year. The launch of the Audi Q4 e-tron and Audi Q4 Sportback e-tron further expanded Audi's electric vehicle portfolio and strengthened its position in the market.

5. Conclusion

This thesis focuses on the impact of the booming New Energy Vehicle market on Audi in the traditional fuel automobile industry. A detailed analysis shows that Audi's strategic investments and rapid adaptation to electrification are reshaping its market position and competitive landscape. Despite the significant progress made, the paper did not delve into a comparative analysis of Audi's performance with its major competitors in the NEV industry, nor did it use quantitative research methods to assess consumer reaction to Audi's electric and hybrid models.

Future research could focus on a comprehensive competitive analysis of the NEV market and incorporate consumer behavioral research to understand Audi's EV adoption rate. In addition, exploring the impact of global supply chain challenges on Audi's electrification strategy could provide valuable insights. Investigating these areas will deepen our understanding of Audi's position and potential in a changing automotive market, and help the traditional fuel vehicle industry make strategic decisions as it moves toward sustainable mobility.

References

- [1] Kennedy, S. (2018). *Front Matter. In China's Risky Drive into New-Energy Vehicles (p. I–II). Center for Strategic and International Studies (CSIS).* <http://www.jstor.org/stable/resrep22521.1>
- [2] Tian, Y., & Yan, J. (2023). *A Study on the Factors Influencing the Penetration of the New Energy Vehicle Market in the New Stage of Demand Driven Development: Analysis Based on Consumer Surveys. Green and Low-Carbon Economy.* <https://doi.org/10.47852/bonviewGLCE32021520>
- [3] Mittal, V., & Shah, R. (2024). *Modeling the Market-Driven Composition of the Passenger Vehicle Market during the Transition to Electric Vehicles. Modelling, 5(1), 99–116.* <https://doi.org/10.3390/modelling5010007>
- [4] Hill, G., Heidrich, O., Creutzig, F., & Blythe, P. (2019). *The role of electric vehicles in near-term mitigation pathways and achieving the UK's carbon budget. Applied Energy, 251(251), 113111.* <https://doi.org/10.1016/j.apenergy.2019.04.107>

- [5] M. Gupta, J. Mittal and A. Tomar, "Predictive Performance of EV Charging Behaviour in COVID-19," 2023 IEEE 3rd International Conference on Sustainable Energy and Future Electric Transportation (SEFET), Bhubaneswar, India, 2023, pp. 1-6, doi: 10.1109/SeFeT57834.2023.10245140.
- [6] M. B. Ali and G. Boukettaya, "A Review of Factors Influencing the Adoption of Electric Vehicles in the World," 2022 19th International Multi-Conference on Systems, Signals & Devices (SSD), Sétif, Algeria, 2022, pp. 2139-2144, doi: 10.1109/SSD54932.2022.9955908.
- [7] Chervenkova, T., & Ivanov, D. (2023). Adaptation strategies for building supply chain viability: A case study analysis of the global automotive industry re-purposing during the COVID-19 pandemic. *Transportation Research Part E: Logistics and Transportation Review*, 177(1366-5545), 103249. <https://doi.org/10.1016/j.tre.2023.103249>
- [8] Audi. (2022) Audi Report 2020. Retrieved from https://www.audi.com/content/dam/gbp2/downloads/report/annual-reports/2020/en/audi-report-2020_desktop.pdf
- [9] Audi. (2022) Audi Report 2021. Retrieved from <https://www.audi-mediacycenter.com/en/publications/corporate/audi-report-2021-1139>
- [10] Audi. (2022) Audi Report 2022. Retrieved from <https://www.audi.com/content/dam/gbp2/downloads/report/annual-reports/2022/en/audi-report-2022.pdf>
- [11] Audi. (2022) Fact Pack 2022. Retrieved from <https://www.audi.com/en/sustainability/sustainability-concept/sustainability-reports/report-2022.html>
- [12] Zhao, Z. (2023). Empirical Study on the New Energy Vehicles Market in China —Based on the CAPM Model. *ICEMME*. <https://doi.org/10.4108/eai.18-11-2022.2326786>
- [13] Jiao, Y., Yu, L., Wang, J., Wu, D., & Tang, Y. (2022). Diffusion of new energy vehicles under incentive policies of China: Moderating role of market characteristic. *Journal of Cleaner Production*, 353, 131660.