

How ESG Practices Reshape the Corporate value of Luxury Electric Vehicles - Evidence from Porsche AG

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Abstract. As the global climate change challenge intensifies and electric vehicle technology becomes more sophisticated, the impact of ESG practices on the value of new energy vehicle (EV) companies is in the spotlight. Using Porsche AG as a case study, this study qualitatively analyses how ESG initiatives are reshaping the value of luxury electric vehicle companies through Porsche AG's Annual and Sustainability Report (2022-2024). During the 2022-2024 period, the company augmented its value by investing in sustainable technological innovations, implementing an environmental management system across its supplier network, and issuing green bonds. The findings suggest that ESG practices have a positive effect on Porsche's corporate value, shedding light on the green transformation of luxury automobile companies. It also provides meaningful reference for the government issuing more efficient policies on how to encourage ESG practices.

1 Introduction

Global climate change and the urgent need for energy sustainability are two major issues faced by the post-COVID-19 era [1]. These challenges have kicked off the green energy transition, shifting people's attention to global renewable energy [2]. Luxury electronic vehicle companies have attracted a group of environmentally conscious consumers a certain user base, utilizing high-performance batteries, cutting-edge self-driving technology, and attracting a group of environmentally conscious consumers. The luxury EVs market is predicted to enlarge to 643.9 billion USD in 2030, compared to 239 billion USD in 2024 [3].

ESG (Environmental, Social, Governance) is used to assess the sustainability and ethical impact of companies. Environmental metrics include the use of environmentally friendly materials and greenhouse gas emissions, and are an assessment of a company's environmental performance and environmental risk [4]. Social indicators include diversity and inclusion, employee well-being, customer satisfaction and ethical labour practices. Governance metrics include corporate governance structure, transparency, ethical business practices and shareholder rights. It's widely recognised that ESG goes beyond traditional financial metrics to help investors make decisions that are consistent with their values and long-term goals [5].

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This report selects Porsche AG Group as a case study to deeply explore the company's ESG practices and qualitatively analyze the impact on corporate value, involving financial indicators. Porsche has well-documented ESG practices, evidenced by comprehensive standalone Annual and Sustainability Reports, which provides transparent data on decarbonization roadmaps and social governance programs. In addition, the article cites ESG ratings from the leading organization Sustainalytics to assess companies' ESG practices, noting that Porsche is rated in the highest 19% [6]. This is meaningful to the study of whether traditional luxury goods can offer brand benefits in the era of green development.

2 Theoretical analysis

The automotive industry is currently facing with a number of significant challenges, including intensified competition, more discerning customers, rising raw material costs, and more stringent regulations, such as those regarding to CO₂ emissions [7]. These challenges have led the automotive industry to gradually realize the importance of environmental and social issues, and they have become increasingly concerned about ESG and CSR [8]. Some companies have invested in EVs production, which has become one of the effective ways to increase sustainability and environmental protection in the automotive industry [7].

The relationship between ESG and corporate value is diverse. Some believes that ESG modeling has a significant positive impact on economic performance in general and social and governance performance in particular [9]. However, Shangguan et al. [10] demonstrate that ESG performance exerts a non-linear effect on firm value, exhibiting an inverted U-shape, thereby suggesting that enhancing ESG performance initially augments firm value.

3 ESG practices of Porsche AG

Porsche AG attaches great importance to economic, environmental and social factors as integral components of its sustainability strategy. The company's position that economic success, environmental awareness and social responsibility are interlinked provides a solid foundation for Porsche's future ESG practices (table 1). This paper analyzes Porsche's ESG practices with reference to the relevant disclosures in the Annual and Sustainability Reports of Porsche AG for the years 2022 to 2024.

Table 1. List of Practices

Environment	Social	Government
Produce EVs	'Join the Porsche Ride'	Manage procurement process
Optimize painting process	'Social Partner' strategy	Supplier rating and targeting
Generate electricity by biomethane	Carry out training programs	Involve employees in decision making
Use low-carbon and recyclable materials	Sponsor 'Porsche hilft'	Train employees on the whistleblower system
Introduce systems engineering	Seasonal initiatives	Linking ESG goals with executive compensation

3.1 Environment-related practices

Porsche is committed to becoming a "Zero Impact Factory" and aims to achieve carbon neutrality in the automotive value chain by 2030, with electrification as a key focus. EVs

utilize renewable energy compared to conventional combustion-engine vehicles, and it is notable that more than 80% of Porsche's shipments have already been electrified. Currently, the company has implemented energy-saving measures to shorten the distance between its factories and its high-efficiency hot-spot co-production plants in order to achieve zero CO₂ emissions.

Porsche is improving energy efficiency in waste and renewable energy management. For example, the paint shop in Stuttgart-Zuffenhausen recovers 70% of the paint mist by means of an electrostatic separator and uses biomethane extracted from organic waste as an energy source. Additionally, since 2019, the plant's rooftop photovoltaic system has been generating 250,000 kWh of electricity per year. These initiatives reduce the environmental impact of in-house production by 58% by 2022 and the amount of waste disposed of per vehicle by 75%.

Porsche has also introduced a "systems engineering" approach to development to increase efficiency. The latest generation of the Taycan model has been developed to optimise the distribution of drive forces between the front and rear axles, through speed-dependent body height control and drag minimization. This significantly improves energy recovery efficiency by around 48%.

3.2 Social-related practices

Porsche AG is actively engaged as a socially responsible partner and use a multi-faceted approach to combine financial investments, employee engagement, and targeted initiatives. For instance, Porsche supports youth and vulnerable groups through its "Join the Porsche Ride" program in Brazil, Chile, and China. The company's global commitment is highlighted by its sponsorship of over 150 projects under its "Social Partner" strategy, with a long-term investment exceeding €8 million.

Employee participation is equally prioritized. Through the "Porsche hilft" platform, the company connects employees with volunteer opportunities, resulting in more than 2,500 hours of community service in 2023. Additionally, Porsche has allocated €10 million to training programs focused on sustainability and ethical practices. For example, seasonal initiatives such as fulfilling Christmas wishes for disadvantaged children. These practices have promoted environmental responsibility, improved working conditions and strengthened community cohesion.

3.3 Governance-related practices

Porsche AG has established a sound management framework for the electrification of the supply chain based on the sustainable development goals. Porsche tends to source production materials from direct suppliers with an S-rating of "A". The proportion of such conforming suppliers is expected to reach 90% by 2030. The company's procurement process has established clear management mechanisms and various components have been standardized, reducing risks related to standards, quality and compliance.

Transparency in management has been further strengthened through mechanisms such as joint decision-making. Porsche provides for employee participation in decision-making through the Supervisory Board and the Works Council. Stakeholders are kept informed of operational changes through the Transformation Roadmap. These initiatives have increased transparency in management. The company's commitment to governance standards is further evidenced by the centralized monitoring of ESG data and compliance with the German Supply Chain Due Diligence Act. For instance, Porsche conducts comprehensive audits of all direct suppliers in accordance with sustainability standards. Beginning in 2023, sustainability goals have also been added to executive compensation, aligning leadership incentives with long-term ethical and environmental goals. By balancing supply chain

innovation with managerial responsibility, Porsche ensures resilience, profitability, and ethical compliance across operations.

4 The impact on company value under ESG practices

4.1 Research and development (R&D) innovation

Porsche's strategic investments in R&D have a direct impact on the valuation of intangible assets, particularly in the context of electrification and carbon neutral technologies. Through investments in technical equipment, Porsche may optimize the efficiency of its energy use and reduce operating costs in the long term, indirectly improving profitability. The report indicates that Porsche's R&D development costs, recognised in the income statement for the year 2024, are estimated to be €2,033 million, representing a 18.8% increase compared to the year 2023. This increase is primarily attributed to expenditures related to electrification and digitalisation. The electrification R&D is directly linked to the company's carbon emission targets, driving continued growth in intangible assets in 2022-2024 (figure 1).

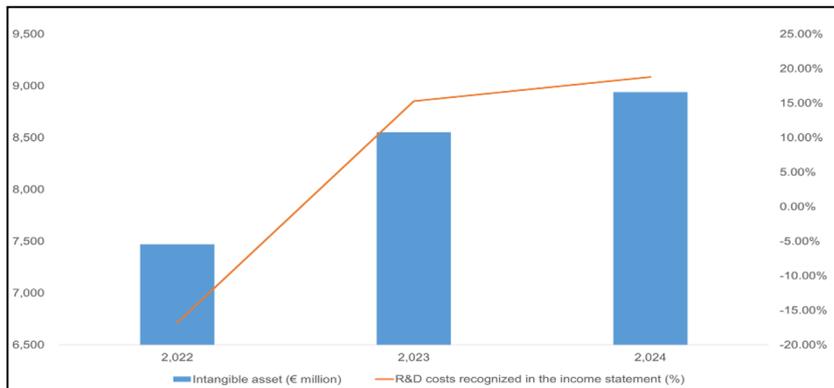


Fig. 1. Intangible asset and R&D costs during 2022-2024

4.2 Supplier efficiency

With the electrification of its automotive portfolio, Porsche AG's supply chain is becoming increasingly complex. The number of direct suppliers of production materials, as well as the demand for raw materials that may pose potential risks, especially those required for the production of high-voltage batteries, is increasing. Simultaneously, the German Supply Chain Responsibility Act has expanded the scope of legal requirements. Consequently, the Porsche AG Group recognises the mounting significance of supply chain management that is characterised by responsibility, adherence to human rights, and an ecological orientation. In the reporting year, over 50% of Porsche AG's direct suppliers of production materials and a number of its direct suppliers of non-production materials established environmental management systems. A detailed analysis of the available data reveals that the company has consistently demonstrated an upward trend in sales profit and inventory turnover ratios over the 2022-2024 period, with figures exceeding 4 (figure 2). This indicates that the company is operating within favourable conditions, exhibiting commendable performance in inventory management and experiencing robust market demand for its products.

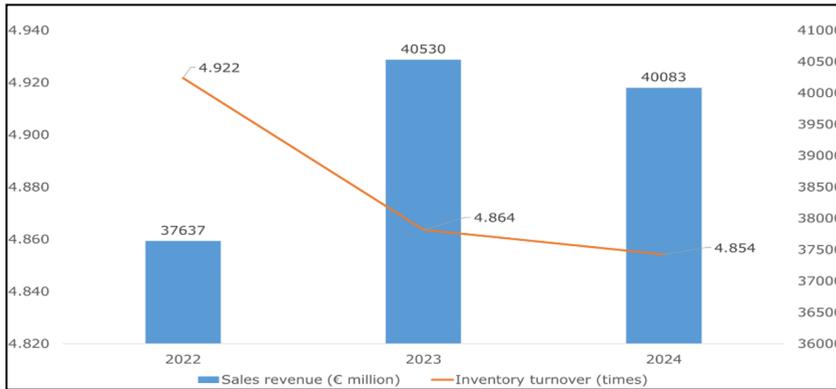


Fig. 2. Sales revenue and inventory turnover during 2022-2024

4.3 Green schuldschein

Green bonds are an emerging fixed-income instrument designed to raise funds for environmentally friendly projects. Porsche issued €1 billion in 2019 and is having a profound impact on the value of the company, with around 55 per cent of the proceeds being used to finance the construction of energy-efficient and resource-saving production facilities [11]. Research has shown that the issuance of green bonds has a positive impact on corporate value growth [12]. Wang's empirical analysis shows that green bond issuance announcements are associated with a positive stock price reaction, consistent with the theory of maximising stakeholder value [13]. In addition, investors may react positively to issuance announcements, with first-time issuers and third-party certified bonds showing stronger reactions [14]. After issuing its green bond, Porsche's environmental performance continued to improve and attracted new investors, including more than 100 banks, pension funds and insurance companies [11].

5 Conclusion

This study first enumerates the ESG practices of Porsche and then analyses their impacts on company value. During the 2022-2024 period, the company augmented its value by investing in sustainable technological innovations, implementing an environmental management system across its supplier network, and issuing green bonds. Despite these advances, the quantitative impact of each initiative on specific financial indicators has not been fully analysed and requires further research and data support.

Future research should investigate the critical thresholds of ESG factors across industries, quantify the long-term effects of rating differences on human capital mobility, and develop AI-driven dynamic scoring models to capture real-time sustainable innovation. This multifaceted approach bridges the gap between ESG implementation and assessment frameworks, offering actionable insights for insurance manufacturers in their sustainable transformation.

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