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Analysis of the Transformation Path and Effectiveness of Build Your Dream Company's Green Development Strategy Driven by Environmental Policies

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Abstract:

In the context of global environmental crises and the shift of environmental policies (e.g., China's dual carbon goals, United States (U.S.) green new deal) to mandatory constraint-and-incentive frameworks, this study focuses on Build Your Dream (BYD), a global leader in the new energy sector. The study methodically elucidates the policy contexts by methodically categorizing environmental policy trends in China, the U.S., and the United Kingdom (UK). The subsequent analysis examines the direct (e.g., BYD's 1.41b yuan three wastes investment, 100% compliance in 2024) and indirect (e.g., 4.27m 2024 New Energy Vehicle (NEV) sales, +41% Year-on-Year Growth Rate (YoY)) driving forces on BYD. The report also examines BYD's strategic initiatives in support of environmental sustainability, including the discontinuation of fuel cell vehicle production in 2022 and the transition to renewable energy sources for its manufacturing operations. A subsequent effectiveness analysis demonstrated positive outcomes in terms of both the economy and the environment. The analysis revealed a 2024 gross/net profit margin of 19%/5.2%, indicating financial prosperity, and a 2.64-million-ton reduction in carbon dioxide (CO_2) emissions due to the adoption of NEVs. The study proffers recommendations for the subsequent transformation of BYD, offering insights into the policy-driven enterprise transformation dual benefits logic.

Keywords: Environmental policies; BYD company; green development strategy transformation.

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1. Introduction

The global environment is confronted with serious problems such as pollution, global warming, ozone depletion, and loss of biodiversity due to unsustainable resource utilization and rapid urbanization [1]. These problems have a substantial impact on public health and necessitate the prompt implementation of effective measures by the relevant authorities to mitigate them. This underscores the imperative for green and low-carbon development as the fundamental consensus for achieving sustainable economic and societal development. The evolution of environmental policies has been marked by a transition from voluntary advocacy to a framework driven by mandatory constraints and incentives. This transition is exemplified by the United Nations Sustainable Development Goals (SDGs), which guide global actions, and targeted national strategies such as China‘s dual carbon goals, the United States‘ Green New Deal, and the United Kingdom (UK) long-term environmental goals after Brexit. These policies have the potential to not only reconfigure the operational boundaries of enterprises but also generate novel market opportunities, compelling industries to undergo transformative adjustments, particularly those sectors that have historically been significant contributors to carbon emissions and resource consumption, such as the automotive and energy sectors [2].

Against the backdrop of a global transformation driven by environmental policies, the automotive industry — a major emitter and consumer of resources — is bound to undergo significant changes. As a leading company in the automotive industry, Build Your Dream (BYD) transformation of its green development strategy in response to environmental policies is a valuable case study [3].

This article selects BYD as its research object because its unique position in the field of environmental policy and green development reflects the logic of ‚policy-driven transformation benefits‘. BYD has become a leader in the global new energy sector and has a fully integrated supply chain. Data on its conversion process is traceable. In 2022, the company ceased production of fuel vehicles due to policies implemented in many countries. Furthermore, the advantages of its transformation are substantial. BYD‘s transformation is based on its multi-dimensional environmental management policies, combined with its strengths in technology research and development, product design, the supply chain, ESG governance, and social responsibility. This approach has enabled BYD to develop a sustainable business model and compete globally in the new energy sector.

The present article first systematically organizes the development trends of environmental policies in major economies (China, the United States, and the United Kingdom) and clarifies the policy context of BYD‘s transformation. Secondly, a thorough analysis of the driving effect of policies on BYD Company is imperative. This analysis should encompass an examination of the company‘s green development transformation and the effectiveness of the transformation.

2. Analysis of the Driving Effect of Environmental Policies on BYD Company

2.1 The Development Trends of Domestic and International Environmental Policies

The environmental challenges confronting various nations exhibit temporal and geographical variability, thereby giving rise to a multitude of distinctive characteristics [4]. The evolution of China‘s environmental policies features distinct phases and a structured implementation framework. At key junctures: in 2005, the State Council issued climate change-focused environmental policies, laying governance foundations; in 2008, the Ministry of Ecology and Environment (formed from the former Ministry of Environmental Protection) strengthened professional functions and enforcement. Guided by the State Council’s policies and implemented by the Ministry, the core initiative is promoting the nature reserve system – building a three-tiered structure (national parks as the top tier, covering existing national parks, new nature reserves and parks) for clear ecological protection. Key concerns address the conflict between short-term economic support and long-term pollution control/environmental protection: economic growth is prioritized while upholding the ecological bottom line. It functions to secure the role of forests, water and soil to stabilize ecosystems; boost effectiveness via the three-tier system and national park protection. For implementation, the central government, competent authorities and local governments collaborate: the State Council designs top-level policies; the Ministry oversees pollution control and ecological protection; local governments support nature reserve development and environmental services, ensuring full policy chain implementation.

The United States‘ environmental policy has no definite single launch time, with its process closely tied to the United Nations (UN) Sustainable Development Goals (SDGs) and advanced around the Green New Deal. Its framework is bound to the SDGs, focusing on responsible production and consumption and affordable clean energy, with an information-driven energy conservation strategy at the core (covering energy measurement, monitoring, etc.). In key areas, efforts focus on improving energy efficiency (the US Energy Conservation Alliance plans to double it by 2030), promoting renewable energy (the Green New Deal aims for 100% supply within 10 years), and implementing energy-saving measures across the

entire chain. For implementation, a multi-party participation pattern exists: the government coordinates SDGs and energy policies; the US Energy Conservation Alliance and others participate in assessment and target-setting; members of Congress promote proposals like the Green New Deal.

The UK's environmental policy has recovered post-Brexit, with the latest Environment Act as its core framework. The Act grants the Minister of State power to set legally binding long-term environmental goals (valid for at least 15 years) and requires the government to set PM2.5 targets. Key areas focus on low-carbon transportation – e.g., Ford and the Welsh government established the Ford Low-Carbon Vehicle Transformation Fund to tackle technical challenges, drive Research and Development (R&D) and boost production capacity. Implementation is government-led: the Minister sets long-term goals, the government takes charge of PM2.5 targets, and policies are advanced via government guidance + enterprise participation.

2.2 The Direct Driving Force of Environmental Policies on BYD

Considering policy constraints, domestic and international environmental regulations (e.g., China's Environmental Protection Law) set unbreakable compliance benchmarks for BYD. In China, pollutant emission policies require up-to-standard discharge of wastewater, waste gas and noise. BYD invested 1.41 billion yuan in three wastes disposal in 2024, with a 100% compliance rate, and cut volatile organic compounds (VOCs) emissions by 84.57% via process upgrades. Hazardous waste is disposed of by qualified institutions per the manifest system, with no annual environmental penalties. To control risks, it has established relevant measures and conducted emergency drills, covering 100% production divisions [5].

In response to the national dual-carbon strategy and in accordance with policy requirements, BYD has set goals to achieve carbon neutrality throughout its entire value chain by 2045 and to reduce operational carbon intensity by 50% by 2030. To this end, BYD Company built a real-time carbon monitoring platform in 2023. Regarding electricity policy, BYD purchased 2.23 million green certificates and 468 million kilowatt-hours of electricity. By 2024, green power will account for 17.3% of the total. Its on-site photovoltaic power station generated 552 million kWh of electricity, reducing its reliance on fossil fuels.

2.3 The Indirect Driving Force of Environmental Policies on BYD

Driven by market demand, national and global policies supporting new energy vehicles (NEVs), energy storage, and photovoltaics (e.g., NEV tax cuts, energy storage subsidies) indirectly boosted BYD's core business demand. In 2024, its NEV sales hit 4.27 million units (up 41% Year-over-Year, topping global rankings, covering over 90 countries/regions. To meet emission reduction policies, BYD increased research and development, developing technologies like nickel-cobalt-free Blade Battery (passing needle-puncture tests), 5th-gen tech (2.9L/100km fuel consumption, 46.06% thermal efficiency), and e-platform 3.0 Evo (20% lower thermal management energy use)—meeting environmental protection rules while enhancing product performance.

3. The Transformation Path of BYD Company's Green Development Strategy Driven by Environmental Policies

3.1 Strategic Transformation of Green Products

Byd's green products are designed to address social and environmental challenges. In regard to environmentally sustainable transportation products, in alignment with the national New Energy Vehicle Industry Development Plan and the global policy on transportation electrification, BYD ceased the production of fuel vehicles in 2022, thereby redirecting its efforts toward the domains of new energy passenger and commercial vehicles. In regard to green energy products, BYD's energy storage business, in response to the national New Energy Storage Development Plan, has a presence in 110 countries and regions. In 2024, the company will launch the Magic Cube MC Cube energy storage system, which has been engineered to function in extreme environments, including sand, desert and famine conditions. For a consecutive period of years, the company has been selected as a Tier 1 module manufacturer by Bloomberg. The 86MW ground-mounted power station in South Africa has been shown to reduce 180,000 tons of CO_2 annually, thereby alleviating the local power shortage.

3.2 Strategic Transformation of Green Production

In regard to environmentally sustainable manufacturing, BYD has transitioned from a reliance on fossil fuels to a renewable energy-based approach. In 2024, BYD voluntarily purchased over 2.23 million green certificates and approximately 468 million kilowatt-hours of green electricity, with the photovoltaic power generation in the park reaching 552 million kilowatt-hours. Distributed photovoltaic projects are currently under construction in locations such as Thailand and Xi'an an. The Shenzhen Global R&D Center employs an integrated photovoltaic building design, with the proportion of green electricity usage gradually approaching the target of 35% by 2025.

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Concurrently, BYD employs water-efficient practices, aligns with the National Water Conservation Action Plan, and has established a system that integrates wastewater recycling, rainwater collection, and reclaimed water reuse. The reuse rate of water resources has been demonstrated to exceed 80%.

4. Analysis of Transformation Effectiveness

4.1 Analysis of Economic Effectiveness

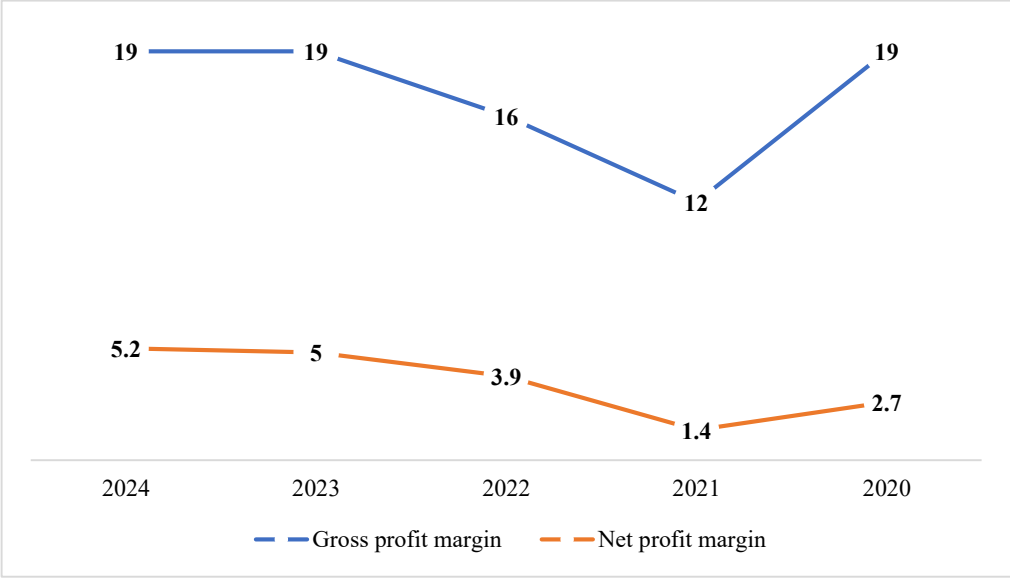

Fig. 1 Short-term financial analysis and comparison of BYD Company (Picture credit: Original)

Figure 1 indicates that there has been an increase in both the gross profit margin and the net profit margin following the transformation. During the 2020-2021 period, BYD was undergoing a pivotal phase of industrial upgrading and technological iteration within the domain of new energy vehicles. The company may have encountered circumstances such as the establishment of new production lines and augmented R&D expenditures, which resulted in elevated initial expenses and a reduction in gross profit margin. In the nascent stage of transformation, apart from the gross profit margin being affected, BYD may also allocate a substantial amount of resources to market expansion, brand building, and the cultivation of new businesses (e.g., the external supply of power batteries). This will result in an increase in period expenses and a decline in net profit margin. From 2021 to 2024, as BYD's new energy vehicle technology gradually matures, such as the advantages of the Blade Battery in terms of safety and energy density becoming more prominent, the competitiveness of its products will increase. Concurrently, the scale effect will commence, and production costs will be effectively controlled, which will gradually restore the gross profit margin and return it to the level prior to the transformation. BYD's sales of new energy vehicles have exhibited a marked increase, accompanied by a concomitant rise in its market share and an expansion of its profit margin.

Byd Company takes advantage of economies of scale to reduce raw material procurement costs and optimize production processes. This helps the company reduce costs and increase profit margins. While the price of lithium soared to 600,000 yuan in 2022, BYD's battery cost remained at 0.6 yuan per watt-hour. During the same period, Contemporary Amperex Technology Co., Limited (CATL's) cost reached 0.85 yuan per watt-hour. BYD's precise supply chain predictions and long-term contract prices have enabled it to lock in costs and gain a significant cost advantage in the material sector. At the Pingshan base in Shenzhen, BYD's power battery workshop and assembly workshop are less than 500 meters apart, and BYD uses the battery assembly upon production model. This layout eliminates the costs of logistics, warehousing, and middleman links. According to the financial report, BYD's self-developed blade battery reduced the cost of battery packs by 30%, saving 12,000 yuan per vehicle.

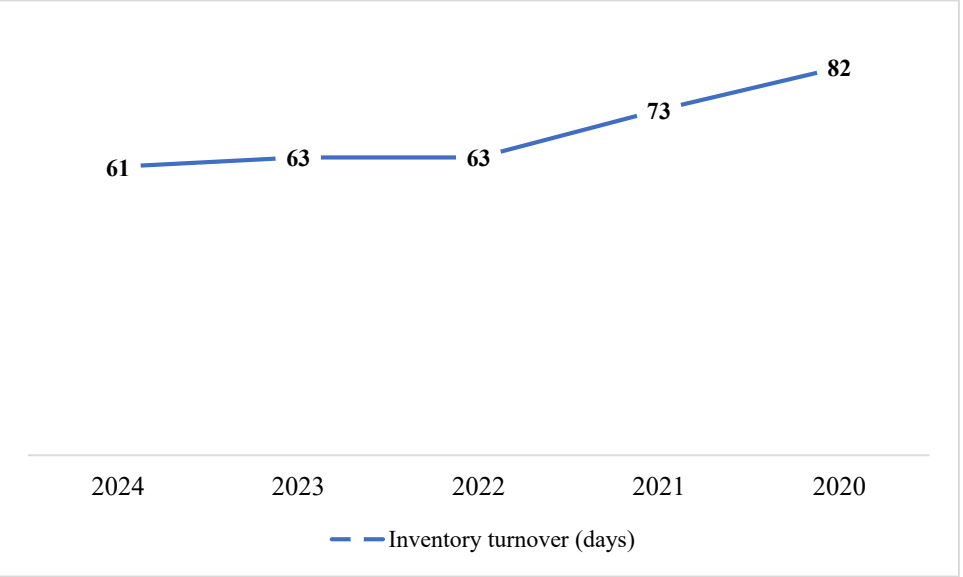

Fig. 2 Long-term financial analysis and comparison of BYD Company (Picture credit: Original)

Figure 2 indicates a decline in inventory turnover days following the implementation of the transformation. This suggests that the efficiency of inventory management and product sales is continuously enhancing, and inventory turnover is accelerating, which is beneficial to the expeditious return of enterprise funds and the enhancement of operational efficiency. This is indicative of the success of the transformation of the BYD Company.

4.2 Analysis of Environmental Effectiveness

BYD has established long-term objectives to achieve carbon neutrality across its entire value chain by 2045, to reduce its own operational carbon emission intensity by 50% by 2030, and to implement 410 energy-saving projects in 2024, with a cumulative carbon reduction of over 210,000 tons of CO_2 equivalent. The proportion of green electricity usage has increased to 17.3%, equivalent to a reduction of 339,000 tons of standard coal consumption. In 2024, BYD reported sales of 4.27 million new energy vehicles, with a cumulative pure electric driving range of approximately 150 billion kilometers. According to the average fuel consumption of 8 liters per 100 kilometers for fuel vehicles, this is equivalent to a reduction in crude oil consumption of 1.2 million tons and a decrease in CO_2 emissions of 2.64 million tons.

5. Conclusion

BYD adapts well to the environmental policies of China, the US, the UK and more. Driven by policies, it shifted to EVs (stopping fuel car production in 2022), expecting to sell 4.27 million new energy vehicles in 2024 and having energy storage in 110 countries. In 2024, it will spend 1.41b yuan for 100% three wastes compliance, cut Volatile Organic Compounds (VOCs) by 84.57%, buy 468m kWh of green power, build a PV station and promote water recycling (reuse rate over 80%). Results include 2024 gross profit margin 19%, net 5.2% (up vs 2021), 61-day inventory turnover, over 210,000 tons CO_2 eq cut and early achievement of 35% of 2030 carbon target.

To boost its green transformation, BYD must invest more in R&D, focusing on next-gen batteries like solid-state ones, accelerate tech breakthroughs and mass production, consolidate battery tech advantages, and address potential tech shocks. It also needs to advance intelligent tech—integrating AI into autonomous driving and vehicle-machine interaction for smarter products. Additionally, it must adopt a green supply chain evaluation system and strictly monitor carbon emissions across raw material procurement, production, and logistics.

This article has certain limitations in its analysis of the transformation path and achievements of BYD's green development strategy, which is driven by environmental policies. Specifically, the article focuses primarily on the impact of environmental policies in China, the United States, and the United Kingdom without incorporating the policy dynamics of other significant markets. The economic effectiveness analysis relies heavily on short-term financial indicators from 2020 to 2024 and lacks long-term tracking research. Additionally, the dynamic adjustment mechanism of potential risks and policy adaptation during the transformation, as well as the challenges of the transformation and response strategies, were not thoroughly examined.

The prospects for a green transformation are encouraging. The corporation's technological portfolio encompasses solid-state batteries and intelligent driving, while its international market expansion is marked by a closed-loop

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supply chain and policy compatibility. Notably, environmental, social, and governance (ESG) considerations have emerged as a competitive advantage. However, it must confront challenges such as cost, brand, and intelligence. The company has articulated a definitive objective for the year 2030.

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