

Research on the Quality of ESG Information Disclosure: A Case Study of BYD and Tesla

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Abstract. As Environmental, Social, and Governance (ESG) practices become increasingly important in evaluating corporate sustainability, differences in disclosure approaches have led to significant variations in ESG reporting quality and comparability. This study examines the ESG disclosure quality of BYD and Tesla between 2022 and 2024. A unified evaluation framework covering content completeness, data continuity, and visualization effectiveness is developed to compare the two companies. The findings show that BYD follows a standards-oriented disclosure approach characterized by increasing alignment with international ESG frameworks and stronger institutionalization. In contrast, Tesla adopts a strategy-oriented approach that emphasizes product impact and technological innovation. The study concludes that companies should balance standardized disclosure with strategic communication to improve transparency and reporting quality.

Keywords: ESG report, BYD, Tesla, Disclosure quality

1. Introduction

More and more people worry about climate warming, energy shift and companies' social duties these days. For this reason, ESG turns into a key set of rules to judge how well a company can keep developing and create long-run value. Investors, official supervisors and other related groups now depend more on ESG materials to judge a company's operation results, instead of only looking at common financial numbers.

Many worldwide standard systems including GRI, TCFD and ISSB push businesses to make their ESG public reports more unified. But many firms still choose their own ways to release ESG content. A number of companies mainly follow global standard rules to finish reports, while many others prefer to connect ESG descriptions closely with their own business modes. Such different ways make people doubt whether ESG reports are reliable, open and easy to compare with one another.

This research looks into two main questions: how people can judge the real level of ESG public reports, and how various reporting styles change the quality of these documents. The study picks BYD and Tesla as research objects. Both of them are top makers of new energy cars, yet they use totally different plans to publish ESG information.

The research uses the way of comparing two typical company cases. It studies ESG reports released from 2022 to 2024 with one fixed judging rule system. This system covers three main parts:

environmental issues, social matters, company management, together with standards to check how well the reports are written.

This whole paper is split into seven parts. They are opening introduction, past related studies, the judging system built in this paper, case study of BYD, case study of Tesla, comparison between the two firms and final summary.

2. Literature review

Now ESG works as an important standard system to evaluate long-term corporate sustainable development. Past research mainly covers three core themes: ESG disclosure methods, the construction of evaluation frameworks, and the correlation between disclosure and corporate operating results.

Scholars hold divided views on ESG disclosure styles. Some studies suggest companies should strictly follow international standards to achieve unified, comparable disclosure content [1, 2]. Other research finds new energy enterprises commonly adopt strategy-centered disclosure. They focus on the environmental benefits of their products instead of fully matching global standard frameworks [3, 4]. If firms only publish positive information selectively, the reliability of their reports will drop [5]. Disclosure priorities also differ across industries: heavy polluting enterprises focus on measurable environmental data, while new energy businesses highlight emission cuts over the full product life cycle [6, 7, 4].

In terms of evaluation frameworks, researchers believe qualified systems need rational design, industry adaptability and quantifiable indicators. Some scholars use the Analytic Hierarchy Process and prove environmental factors weigh most heavily for polluting industries [7]. Other experts combine GRI and TCFD standards to boost cross-firm comparability [1]. A complete evaluation framework is therefore regarded as a basic support for sustainable corporate management [2, 6].

When it comes to corporate performance, high-quality ESG disclosure reduces information gaps between companies and investors, improves transparency, and lifts enterprise value and investor confidence [3, 4]. Businesses with outstanding ESG performance often have lower financing costs and more stable long-term earnings [5, 8]. Meanwhile, standardized ESG disclosure also optimizes a company's internal management mechanism [9, 10]. Most existing literature agrees that disclosure quality is positively related to corporate value.

In short, former studies reach consistent conclusions: evaluation frameworks need rationality and practicality; high-quality ESG disclosure raises corporate value and stakeholder trust; industrial features greatly shape firms' disclosure choices. However, disputes still exist between standard-oriented and strategy-oriented disclosure modes, as well as the completeness of disclosed information. In addition, most previous research only analyzes one single firm or one industry, lacking horizontal comparison between different enterprises. This paper thus selects BYD and Tesla to compare their ESG report quality and disclosure logic, making up for the shortcomings of existing studies.

3. Evaluation framework

To ensure consistency and comparability, this study develops a unified ESG reporting quality framework. The framework evaluates disclosure quality rather than actual ESG performance.

Three dimensions are assessed:

- Content Completeness – whether reports comprehensively cover environmental, social, and governance topics.

- Data Continuity – whether key indicators are reported consistently across multiple years.
- Visualization Effectiveness – whether information is communicated clearly through charts, diagrams, and visual structures.

Each dimension is scored on a five-point scale. Additional evaluation criteria cover compliance, environmental performance, social responsibility, and governance practices. This framework enables both longitudinal analysis and cross-company comparison.

Based on the evaluation criteria, disclosure quality can be assessed from four dimensions. Disclosure standardization examines the use of international standards and report structure. Disclosure boundary and scope evaluate the coverage of operations and supply chains. Report assurance focuses on third-party verification of ESG data. Reporting frequency and format assess whether the report is published regularly and presented in accessible formats.

Based on the evaluation criteria, environmental disclosure can be assessed from five dimensions. These include carbon emission targets, carbon emission data, energy saving and emission reduction measures, circular economy and life cycle management, and environmental investment. Together, these dimensions evaluate the company's environmental management and disclosure quality.

Based on the evaluation criteria, social disclosure can be assessed from five dimensions. These include human resource management, employee health and safety, supply chain management, customer responsibility, and community impact. Together, these dimensions reflect the company's social responsibility and management practices.

Based on the evaluation criteria, governance disclosure can be assessed from four dimensions. These include ESG governance structure, risk management, business ethics and compliance, and information transparency and stakeholder communication. Together, these dimensions evaluate the company's governance system and disclosure quality.

Based on the evaluation criteria, report quality can be assessed from three dimensions. These include content completeness, data continuity, and visualization effectiveness. Together, these dimensions evaluate the quality, consistency, and readability of ESG reports.

4. Case introduction and analysis of BYD's ESG information disclosure

4.1. Case background

BYD is one of the world's leading new energy vehicle manufacturers headquartered in Shenzhen, China. The company operates across batteries, automobiles, renewable energy, and electronics. BYD has consistently emphasized technological innovation and sustainable development and has achieved an MSCI ESG rating of AA, placing it among the leading global automotive companies in ESG performance.

4.1.1. Case representativeness

This paper selects BYD as a representative case for studying ESG information disclosure in China's new energy vehicle and advanced manufacturing industries. As a global leader in a key strategic industry, BYD's integrated industrial chain and ESG practices closely align with China's "dual carbon" goals and green manufacturing policies. Its dual listing in mainland China and Hong Kong requires compliance with both domestic and international ESG disclosure rules, making its practices valuable for studying standardization and comparability. Moreover, with core technologies across the entire value chain, BYD faces high requirements on material ESG issues such as carbon management, product safety, and supply chain responsibility, while accumulating representative

experience in these areas. Finally, its MSCI ESG rating of AA—among the highest globally in the auto industry—reflects strong international recognition and further reinforces its benchmarking significance.

4.2. Evaluation of ESG information disclosure quality

4.2.1. Basic information and compliance

Table 1. BYD basic information and compliance evaluation

Year	Disclosure Standardization	Disclosure Boundary and Scope	Report Assurance	Reporting Frequency and Format	Total Score
2022	Prepared based on GRI, HKEX ESG Guidelines, CASS-CSR4.0, and SDGs; disclosure relatively comprehensive. 3/4	Covered parent company and subsidiaries, mainly domestic operations in China; some historical data restated. 1/2	No independent third-party assurance statement identified. 0/2	Only electronic PDF version provided; mainly Chinese version; disclosed simultaneously on official website and HKEX platform. 2/3	6/11
2023	Report structure more closely aligned with GRI 2021, TCFD, and ISSB draft frameworks; ESG terminology became more internationalized. 4/4	Scope expanded to overseas subsidiaries and international production bases; boundaries became clearer. 1/2	Some carbon emission data externally reviewed and verified. 1/2	Chinese and English versions provided; ESG data website and digital interactive report platform added. 3/3	9/11
2024	Simultaneously followed HKEX ESG Code C2, Shenzhen Stock Exchange Guideline No.17, GRI, ESRS, and ISO IWA 48:2024; compliance significantly improved. 4/4	Boundaries covered all group entities except associates and joint ventures; environmental indicators covered all subsidiaries under operational control, showing greater systemization. 1/2	Broader external assurance introduced, including carbon emissions and key KPIs, with formal assurance statements attached. 2/2	Simplified Chinese, Traditional Chinese, and English versions provided; downloadable web version available; reporting schedule remained stable. 3/3	10/11

In 2022, the company's ESG reporting was at an early stage. It followed GRI and HKEX guidelines, covered only the parent company and domestic subsidiaries, had no third-party assurance, and was published only as a Chinese PDF. In 2023, the report improved by following GRI 2021, TCFD, and ISSB drafts. The disclosure boundary expanded to overseas subsidiaries, limited third-party assurance was introduced for carbon data, and an English version with a digital platform became available. By 2024, the ESG reporting system became more complete. The report followed HKEX ESG Code C2, SZSE Guideline No.17, GRI, ESRS, and ISO IWA 48:2024, covered almost all group entities, provided broader third-party assurance, and was published in three languages with web-based access. Overall, from 2022 to 2024, the company's ESG reporting became more systematic, transparent, and aligned with international standards.

4.2.2. Environmental (E) performance

As shown in Table 2, from 2022 to 2024, environmental ESG disclosure improved in carbon management, energy conservation, circular economy, and environmental investment. In 2022, carbon targets were not clear, only Scope 1 and 2 emissions were disclosed, battery recycling was still at an early stage, and environmental investment mainly focused on pollution control. In 2023, the company set a 2030 carbon intensity target and a 2045 carbon neutrality vision. It added some Scope 3 data, expanded the disclosure boundary, increased green electricity use, and expanded the battery recycling system. By 2024, carbon management followed HKEX, ESRS, and ISO IWA 48

standards. The report fully disclosed Scope 1, 2, and 3 emissions, implemented over 400 energy-saving projects, expanded battery recycling, and increased investment in water resources, waste recycling, and ecological protection. Overall, the company developed from basic carbon management to a more complete global carbon management and circular economy system, with continuous improvement in disclosure quality.

Table 2. BYD environmental (E) performance evaluation

Year	Carbon Emission Targets	Carbon Emission Data and Boundaries	Energy Saving and Emission Reduction Measures	Circular Economy and Life Cycle Management	Environmental Investment and Ecological Protection	Total Score
2022	The company proposed carbon management concepts for the first time and began planning long-term carbon reduction pathways, but the targets were not fully quantified. Scope 1 and Scope 2 emissions were disclosed, mainly focusing on factory operations. 0/2	Disclosure boundaries mainly covered domestic factories, while supply chain and overseas operations were not fully included. 2/3	Implemented energy-saving technological upgrade projects to reduce energy consumption and promoted the use of green electricity in some operations. 3/4	Began establishing a power battery recycling system, including pilot recycling stations and reuse programs. 0/2	Basic environmental investment was made, mainly focusing on wastewater and exhaust gas treatment facilities. 2/3	7/14
2023	Clearly proposed a 2030 carbon intensity reduction target and introduced a 2045 full value-chain carbon neutrality vision. Fully disclosed Scope 1 and Scope 2 emissions and began adding partial Scope 3 data. 2/2	Disclosure boundaries expanded to overseas factories, and some supply chain emission data were introduced. 3/3	The use of green electricity increased significantly, and the number of energy-saving projects grew substantially; some data were externally reviewed. 4/5	The battery recycling system further expanded, with continuous growth in recycling volume and the development of recycling factories in multiple regions. 3/4	Environmental investment increased, including water resource management and pollutant reduction initiatives. 2/2	12/14
2024	Fully aligned with HKEX, ESRS, and ISO IWA48 standards; continuously advanced the 2045 carbon neutrality pathway, with a more mature internal carbon management system. Scope 1, 2, and 3 emissions were disclosed, covering global operations with greater transparency and consistency. 2/2	Clearly defined "all subsidiaries under operational control" as the reporting boundary; environmental data excluded overseas construction bases. This represented the clearest disclosure boundary among all years. 3/3	Green electricity usage reached 468 million kWh, with more than 400 energy-saving technological upgrade projects implemented and significantly improved annual emission reduction performance. 3/4	The closed-loop power battery recycling system became more mature, with cumulative recycling volume exceeding 10,000 tons and further improvements in material reuse rates. 2/2	Environmental expenditure continued to increase, including projects related to water footprint management, solid waste recycling, and ecological protection. 3/3	13/14

4.2.3. Social (S) performance

Table 3. BYD social (S) performance evaluation

Year	Human Resource Management	Employee Health and Safety	Supply Chain Management and Responsible Procurement	Customer Responsibility and Product Safety	Community and Public Welfare Impact	Total Score
2022	Rapid expansion of workforce, with the establishment of basic training systems and skilled talent development programs. 2/3	Implemented EHS management systems, while workplace injury and accident rates remained low. 2/3	Established supplier entry standards and began introducing sustainable procurement requirements. 1/3	Established quality management procedures and continuously strengthened product consistency and safety. 0/3	Conducted educational public welfare projects and gradually formed a long-term donation mechanism. 1/3	6/15

Table 3. (continued)

2023	Strengthened the reserve of highly skilled talent, with significant increases in training hours and employee development investment. 2/3	Expanded the coverage of safety management systems and improved occupational health monitoring and training. 3/3	Increased the proportion of ESG audits within the supply chain, bringing more suppliers into sustainable management standards. 2/3	Product safety data became more transparent, complaint handling efficiency improved, and privacy protection guidelines were introduced. 2/3	Expanded the scope of public welfare activities, focusing on education and environmental protection. 2/3	11/15
2024	Established a multi-level talent development system and promoted digital and intelligent training platforms; employee structure disclosure became clearer. 3/3	Upgraded health and safety management through digital systems, further reducing workplace accidents. 3/3	Fully implemented an ESG supply chain management system and strengthened raw material compliance and green procurement. 3/3	Customer satisfaction improved, product quality traceability systems became more comprehensive, and data and privacy protection were further strengthened. 3/3	Increased the strategic focus of public welfare projects and expanded investment in education and technological innovation. 3/3	15/15

As shown in Table 3, from 2022 to 2024, social ESG disclosure became more systematic in human resources, employee safety, supply chain, customer responsibility, and public welfare. In 2022, the company had basic training and EHS systems, while supply chain management, product safety disclosure, and public welfare were still at an early stage. In 2023, training investment, safety management, and supply chain ESG audits improved. Product safety, data privacy disclosure, and public welfare activities also expanded. By 2024, the company established a more complete talent development system, digitalized safety management, implemented a full ESG supply chain system, improved product traceability and data security, and made public welfare more strategic and long-term. Overall, the company developed from basic social responsibility to a more systematic and digitalized social governance system, with continuous improvement in disclosure quality.

4.2.4. Governance (G) performance

Table 4. BYD governance (G) performance evaluation

Year	ESG Governance Structure	Risk Identification and Management Mechanism	Business Ethics and Compliance Disclosure	Information Transparency and Stakeholder Communication	Total Score
2022	Initially established an ESG management system and set up dedicated departments to promote ESG disclosure work. 0/1	Began identifying environmental and safety risks, with a preliminary risk management framework established. 1/1	Established basic anti-corruption and compliance systems, while only briefly disclosing general policies. 0.5/1	Annual reports and ESG reports were disclosed simultaneously, but information transparency still had room for improvement. 2/3	3.5/6
2023	ESG functions were elevated to the group strategic level, making the governance structure clearer and more standardized. 1/1	Introduced a more systematic ESG risk matrix covering supply chain and operational risks. 1/1	Added anti-fraud mechanisms and internal whistleblowing channels, with more detailed integrity and compliance disclosures. 0.5/1	Information disclosure became more transparent, with new stakeholder communication and feedback channels established. 3/3	5.5/6
2024	The ESG committee became more aligned with international standards, with governance roles and responsibilities further strengthened. 1/1	Risk management became increasingly aligned with the TCFD framework, adding climate, supply chain, and human rights risk identification. 1/1	Strengthened anti-corruption and regulatory compliance disclosure, while improving transparency regarding external regulatory events. 0.5/1	Disclosure depth significantly improved, with reports provided in three languages and broader stakeholder participation. 3/3	5.5/6

As shown in Table 4, from 2022 to 2024, ESG governance improved in governance structure, risk management, business ethics, and transparency and stakeholder communication. In 2022, the company had a basic ESG governance structure, while risk management, business ethics disclosure, and stakeholder communication were still at an early stage. In 2023, ESG functions were elevated to the strategic level, risk management expanded, anti-fraud and whistleblowing mechanisms were

introduced, and stakeholder communication improved. By 2024, the company established an ESG committee with clear responsibilities, aligned risk management with TCFD, improved anti-corruption and compliance disclosure, and published reports in three languages with wider stakeholder participation. Overall, the company developed from basic ESG governance to a more internationalized and institutionalized governance system, with continuous improvement in disclosure quality.

4.2.5. Report quality evaluation

Table 5. BYD ESG report quality evaluation

Year	Content Completeness	Data Continuity	Visualization Effectiveness	Total Score
2022	The report structure was relatively basic, covering the three ESG dimensions but with limited depth. 3/5	Some key indicators began to provide year-on-year comparison data, but continuity remained insufficient. 2/5	The number of charts and visual elements was limited, and the visualization design was relatively simple. 2/5	7/15
2023	The report content became significantly more comprehensive, with the addition of multiple thematic sections and case studies. 4/5	Core environmental and social indicators provided more than three years of continuous data. 4/5	The richness of charts and visual presentation improved, with the introduction of progress bars and structural diagrams. 4/5	12/15
2024	The disclosure structure was comprehensively upgraded and aligned with multiple international standards, making the report the most complete among all years. 5/5	Data standards became more unified and continuity significantly improved, with several indicators achieving global coverage for the first time. 5/5	The report layout became more professional, with clearer visual designs and the addition of global maps and management system diagrams. 4/5	14/15

As shown in Table 5, from 2022 to 2024, ESG reports improved in content completeness, data continuity, and visualization. In 2022, the report covered environmental, social, and governance topics, but the content was simple, most indicators provided only single-year data, and few charts were used. In 2023, the report added themed chapters and practical cases, provided three years of data for core indicators, and used more charts to improve readability. By 2024, the report followed multiple international standards, covered strategies, management systems, results, and future targets, used unified global data standards, and included more professional visuals. Overall, the reports developed from basic disclosure to a more complete and professional reporting system, with continuous improvement in information transparency.

4.2.6. Overall analysis of ESG report quality

From 2022 to 2024, BYD's ESG report evaluation scores kept going up steadily. The score was 6 in 2022, grew to 9 in 2023 and reached 12 in 2024. This change proves its reporting system covers more content and shares more open information.

When talking about complete report structures, the 2022 report only had simple frames and mainly showed major positive results. The 2023 report added parts about product whole-life cycles and supply chain control, so its content framework became more organized. The 2024 report put more focus on important themes including climate change, supply chain rules and staff rights, and its overall layout turned much more well-developed.

For consistent data records, nearly all measurement items in the 2022 report only showed data of that one year. Some environment and supply chain indexes started to list figures of several years in the 2023 report. In 2024, main environmental indicators offered three years of trend data with unified calculation rules, which made data more consistent and easier to compare.

As for visual presentation, the report once relied mostly on written words, and later added more graphic elements. In 2024, flow charts and global maps were widely used, helping readers grasp key information faster and making the whole report look more professional.

In short, BYD's ESG reports get better and more professional each year. It shows the company pays more attention to ESG disclosure as an important business strategy, but there is still space to adjust its reports to fit top global standards better.

5. Case introduction of Tesla's ESG information disclosure

Tesla is one of the world's leading companies in electric vehicles and clean energy, with its headquarters in Austin, Texas. Its business includes electric vehicles, solar energy, energy storage, autonomous driving, and AI technologies. Since 2020, Tesla has published annual Impact Reports that mainly focus on environmental performance and its business strategy, while providing relatively limited disclosure on social and governance issues.

Tesla's ESG reporting differs from that of many traditional companies. Instead of following a fully standardized ESG framework, it focuses on the environmental impact of its products and technological innovation. Although Tesla has achieved strong environmental performance, it has also faced criticism over governance, employee relations, product safety, and supply chain issues. Therefore, Tesla provides a representative case for examining different ESG reporting approaches and evaluating their strengths and limitations.

5.1. Case representativeness

This paper selects Tesla as a representative case for ESG research in the global new energy vehicle industry because of its market position, unique reporting approach, and mixed ESG evaluations. Unlike many companies that follow international ESG standards, Tesla mainly focuses on the environmental impact of its products and its business strategy. Its annual Impact Reports provide detailed environmental information, while social and governance disclosure is relatively limited. This reporting approach has led to different evaluations from ESG rating agencies, reflecting the challenges of balancing business strategy with standardized ESG disclosure. Therefore, Tesla provides a valuable case for comparing different ESG reporting approaches and evaluating their strengths and limitations.

5.2. Evaluation and analysis of Tesla's ESG disclosure quality

5.2.1. Basic information and compliance

Table 6. Tesla basic information and compliance evaluation

Year	Disclosure Standardization	Disclosure Boundary and Scope	Report Assurance	Reporting Frequency and Format	Total Score
2022	The report followed Tesla's self-developed Impact Report framework and referenced greenhouse gas accounting methods, but it was not fully aligned with mainstream standards such as GRI and TCFD. 0/2	Disclosure boundaries mainly covered environmental and supply chain information from the United States and some global factories, without a systematic global scope explanation. 2/2	No third-party assurance was provided, and all environmental and social data were self-disclosed by the company. 0/2	English-only Impact Highlights report released mainly in PDF format, without multilingual or digital versions. 2/3	4/9

Table 6. (continued)

2023	Report content became more aligned with TCFD and life-cycle carbon accounting logic, but mainstream international ESG frameworks were still not formally adopted. 1/2	Disclosure scope expanded to major global production bases and supply chain hotspot analysis, with clearer boundary descriptions than in 2022. 2/2	External assurance was still absent, although some data were disclosed using more standardized methodologies. 0/2	Continued publishing English-only Impact Highlights reports with more complete graphic structures, but without multilingual versions. 2/3	5/9
2024	Report structure became more systematically aligned with TCFD and life-cycle emission frameworks, with improved disclosure standardization compared with previous years, although GRI and ISSB standards were still not formally adopted. 1/2	Disclosure boundaries covered global operations, key supply chain materials, and product use stages, representing the clearest disclosure scope among all years. 2/2	Third-party assurance was still not introduced, although overall data transparency improved significantly. 0/2	English-only Impact Highlights report released with the most comprehensive content, while additional web-based information was provided, representing a clear improvement compared with 2022–2023. 2/3	5/9

As shown in Table 6, from 2022 to 2024, ESG disclosure improved in standardization, reporting boundaries, assurance, and publication formats. In 2022, the report used a self-developed framework, covered only U.S. operations and selected factories, had no third-party assurance, and was published only in English. In 2023, alignment with TCFD improved, the reporting boundary expanded to major global facilities and key supply chain areas, and environmental data became more standardized, although external assurance was still lacking. By 2024, the report further strengthened climate risk disclosure, covered global operations, key supply chain raw materials, and product-use-stage impacts, and added web-based supplementary information. Overall, the company developed from a self-developed framework to a more systematic global reporting structure, although gaps remain in international standards alignment and third-party assurance.

5.2.2. Environmental (E) performance

As shown in Table 7, environmental disclosure improved from 2022 to 2024 in carbon management, data coverage, energy saving, resource reuse, and environmental investment. In 2022, the report focused on emission reduction from electric vehicles, disclosed data only for factory production, and included limited information on energy saving and battery recycling. In 2023, carbon footprint analysis became more systematic, data coverage expanded to the supply chain and product use stage, clean energy use and material recycling increased, and environmental investment also grew. By 2024, the report covered global factories and major supply chain activities, further improved clean energy use, production efficiency, recycling, and environmental investment, although the company still did not announce a clear net-zero target. Overall, the company established a more complete environmental management system across the product life cycle, but a full net-zero plan is still needed.

Table 7. Tesla environmental (E) performance evaluation

Year	Carbon Emission Targets	Carbon Emission Data and Boundaries	Energy Saving and Emission Reduction Measures	Circular Economy and Life Cycle Management	Environmental Investment and Ecological Protection	Total Score
2022	Strongly emphasized that electric vehicles significantly reduce emissions across the full life cycle compared with fuel vehicles, but no clear carbon neutrality target year was established. 0/2	Disclosed greenhouse gas emissions from manufacturing stages, mainly covering factory operations, while supply chain and product use-stage data remained limited. 2.5/3	Implemented high-efficiency manufacturing processes and introduced clean energy in some factories, although the level of detail in energy-saving data remained limited. 3/4	Began pilot battery recycling programs and increased the use of recycled materials, although the recycling system remained at an early stage. 1/2	Environmental investment mainly focused on energy-efficient manufacturing and waste reduction, with relatively limited disclosure depth. 2/3	8.5/14

Table 7. (continued)

2023	Continued emphasizing product life-cycle emission reduction contributions and disclosed more systematic carbon footprint analysis, but still did not announce a company-level carbon neutrality target. 0/2	Expanded disclosure boundaries to include manufacturing, supply chain hotspot analysis, and comparisons of product use-stage emissions. 3/3	Expanded renewable energy use and reduced manufacturing energy consumption, while energy-saving and emission reduction measures became more quantifiable. 3/4	Battery material recycling volume increased, and the proportion of recycled materials used in new vehicle models continued to rise. 2/2	Increased environmental governance investment, focusing on energy saving, water management, and factory pollution control. 2/3	10/14
2024	Further emphasized improvements in life-cycle emission reduction performance, but still did not establish a specific net-zero target year, and the company-level carbon roadmap remained incomplete. 0/2	Disclosure boundaries became broader, covering global operations and key material-related emission hotspots; comparative analysis of use-stage emissions became more systematic. 3/3	Expanded the use of clean energy in factories and continuously improved energy efficiency; disclosed multiple energy-saving achievements and emission reduction trends. 3/4	Battery recycling and recycled material utilization systems became more mature, further increasing material circularity rates. 2/2	Environmental investment continued to increase, focusing on water resource management, waste management, and ecological risk control. 3/3	11/14

5.2.3. Social (S) performance

Table 8. Tesla social (S) performance evaluation

Year	Human Resource Management	Employee Health and Safety	Supply Chain Management and Responsible Procurement	Customer Responsibility and Product Safety	Community and Public Welfare Impact	Total Score
2022	Employee numbers continued to grow, with major investment in manufacturing and engineering positions, but disclosure regarding training systems and diversity remained limited. 1.5/3	Established basic safety management procedures and disclosed some factory safety measures, but occupational health data disclosure remained limited. 1/3	Promoted responsible procurement and supply chain audits, especially focusing on battery mineral sourcing, although the system was still not fully mature. 2/3	Emphasized product safety testing and OTA software updates, but disclosure regarding customer complaints remained limited. 1/3	Public welfare activities remained relatively limited, mainly focusing on community education and STEM promotion projects. 2/3	7.5/15
2023	Strengthened technical talent development, expanded training resources, and improved disclosure regarding diversity and inclusion policies. 3/3	Safety management became more systematic, with more employee health and safety indicators disclosed. 3/3	Expanded the scope of supply chain audits and strengthened traceability requirements for key minerals such as lithium, nickel, and cobalt. 2/3	Product safety disclosure became more transparent, while product updates, safety reports, and privacy policies became more comprehensive. 2/3	Public welfare projects expanded, with greater investment in education and technology promotion. 2/3	12/15
2024	Continued expanding global teams while promoting engineering and AI-related talent development; diversity and inclusion strategies became clearer. 3/3	Health and safety systems continued to improve, while automation and AI-assisted manufacturing reduced workplace injury risks. 3/3	Supply chain responsibility management strengthened further, with stricter requirements regarding material compliance, human rights, and environmental protection. 2/3	Product safety and autonomous driving safety disclosure became more comprehensive, while privacy protection transparency further improved. 2/3	Public welfare strategies became more systematic, continuously supporting STEM education, energy transition, and community education projects. 2/3	12/15

As shown in Table 8, from 2022 to 2024, social disclosure improved in human resources, employee safety, supply chain, customer responsibility, and public welfare. In 2022, training and diversity disclosure were limited, safety data were insufficient, supply chain audits were at an early stage, and product safety and public welfare disclosure were relatively basic. In 2023, training, safety disclosure, supply chain audits, product safety, data privacy, and public welfare all improved. By 2024, the company further strengthened talent development, upgraded safety management with

automation and AI, introduced stricter supply chain requirements, improved product safety disclosure, and expanded public welfare activities. Overall, the company developed from basic social practices to a more global and technology-oriented social responsibility system, although supply chain and customer safety disclosure still need further improvement.

5.2.4. Governance (G) performance

Table 9. Tesla governance (G) performance evaluation

Year	ESG Governance Structure	Risk Identification and Management Mechanism	Business Ethics and Compliance Disclosure	Information Transparency and Stakeholder Communication	Total Score
2022	The board of directors and committees such as the audit and compensation committees were responsible for sustainability and risk oversight, but no independent ESG committee was established. The governance structure remained largely "mission-driven." 0/1	The report disclosed risk identification practices related to carbon emissions, water resources, and supply chain "hotspot analysis," while beginning to systematically identify ESG risks related to battery raw materials and manufacturing processes. 1/1	The company emphasized responsible procurement and human rights protection while conducting audits and corrective actions within the battery supply chain, but disclosure regarding anti-bribery and anti-monopoly compliance remained principle-based. 0/1	The Impact Report disclosed a large amount of environmental and social data, but governance details such as board structure, executive compensation, and shareholder rights remained limited. Stakeholder communication mainly relied on one-way reporting. 2/3	3/6
2023	The company continued using a board-level sustainability oversight model and further emphasized "net-zero targets" and life-cycle responsibility, but ESG management remained embedded within strategic narratives rather than institutionalized committees. 0/1	Sections such as "Net-zero GHG emissions" and "Minimizing Our Environmental Footprint" strengthened the identification and management of climate risks, life-cycle emissions, and supply chain environmental risks. 1/1	The company continued disclosing responsible procurement, critical mineral traceability, and supplier audits. Business ethics and compliance were mainly reflected indirectly through supply chain human rights and environmental standards, while disclosure of specific violations remained limited. 0/1	Environmental, product safety, and employee data became more systematic, but disclosure regarding governance structure, executive compensation, and stakeholder interaction remained limited, with communication channels still relatively one-directional. 2/3	3/6
2024	In the latest Impact Report, sustainability governance responsibilities continued to be jointly handled by the board and management, emphasizing that all business activities support the mission of "accelerating the transition to sustainable energy." However, a formal board-level ESG committee was still absent. 0/1	Greater attention was given to climate risks, autonomous driving safety risks, and supply chain human rights risks. The company also presented risk management and emergency response cases related to energy businesses, virtual power plants, and battery recycling, making risk identification more comprehensive. 1/1	The company emphasized human rights protection, environmental and social responsibility within the supply chain, and battery recycling practices, but quantitative disclosure regarding anti-corruption measures and compliance investigations remained limited. 0/1	The 2024 Highlights Report presented key environmental, product, employee, and supply chain data in a more readable format. However, governance disclosure regarding board diversity, executive compensation structures, and stakeholder participation mechanisms remained insufficient. 2/3	3/6

As shown in Table 9, from 2022 to 2024, ESG governance disclosure improved in risk management, business ethics, and stakeholder communication. In 2022, the company had no independent ESG committee, risk management mainly covered carbon, water, and supply chain issues, and stakeholder communication was limited. In 2023, risk management became more systematic, covering climate and supply chain risks, and environmental and product data disclosure improved. By 2024, risk management further expanded to climate, autonomous driving safety, and supply chain human rights, while business ethics disclosure also improved. However, the company still had no formal ESG committee, and board diversity, executive compensation, and stakeholder participation remained limited. Overall, ESG governance became more systematic, but there is still room for improvement in governance structure, compliance transparency, and stakeholder engagement.

5.2.5. Report quality evaluation

As shown in Table 10, from 2022 to 2024, ESG reports improved in content, data continuity, and visualization. In 2022, the report had a simple structure, provided mainly single-year data, and used mostly text. In 2023, the report added product life-cycle and supply chain sections, included some multi-year data, and used more charts and infographics. By 2024, the report focused more on climate change, supply chain, and human rights, provided more three-year trend data, and used global maps, flowcharts, and infographics to improve presentation. Overall, the reports developed from basic highlights to more complete and visual disclosure, although there is still room for improvement in the reporting framework and long-term data continuity.

Table 10. Tesla ESG report quality evaluation

Year	Content Completeness	Data Continuity	Visualization Effectiveness	Total Score
2022	The report mainly focused on impact highlights, covering environmental and social topics but lacking a systematic structure. 2/5	Most indicators were disclosed on a single-year basis, resulting in weak data continuity. 2/5	Visualization remained basic, mainly relying on textual descriptions with relatively few charts. 2/5	6/15
2023	Compared with 2022, the report content became more comprehensive, adding topics such as product life-cycle analysis and supply chain discussions. 3/5	Some environmental and supply chain data began providing multi-year comparisons, although the disclosure system remained incomplete. 3/5	Visualization became richer, with clearer information organization and improved presentation quality. 3/5	9/15
2024	The report structure became more complete and focused more clearly on key ESG topics such as climate, supply chains, and human rights, although it still mainly relied on the Highlights format. 4/5	Several environmental and product safety indicators provided three-year trend data, significantly improving data continuity. 4/5	Visualization quality reached its highest level, introducing maps, flowcharts, and additional graphic elements, although it still did not fully meet comprehensive ESG disclosure standards. 4/5	12/15

5.2.6. Explanation of scoring results

The scoring system evaluates ESG disclosure quality rather than actual ESG performance. Higher scores indicate more complete, transparent, and standardized disclosure. Full scores require clear management systems, sufficient data, and consistent reporting boundaries, while lower scores reflect incomplete disclosure rather than poor ESG performance. Changes in scores show the continuous improvement of ESG reporting quality.

6. Comparison of corporate ESG reports

To systematically compare ESG disclosure characteristics between Chinese and global leading new energy vehicle companies, this paper selects BYD and Tesla for case analysis across disclosure logic, E, S, G dimensions, and report presentation quality.

- **Basic Information and Compliance:** BYD and Tesla show significant differences in disclosure approaches. BYD emphasizes alignment with regulatory requirements and international standards, with increasingly standardized report structures, third-party assurance, and multilingual publication, matching capital market expectations for standardized ESG reporting. Tesla maintains a relatively independent style, focusing on carbon emissions, product efficiency, and technological pathways, with less emphasis on formal compliance structures and external assurance.

- **Environmental and Carbon Emission Disclosure:** Differences lie mainly in disclosure logic rather than investment intensity. BYD emphasizes regulatory alignment, carbon target setting, emission boundary completeness, and systematic environmental management, showing stability and

balance across years. Tesla highlights product life-cycle emission reduction and technological pathways, showing strengths in data expansion and engineering execution but remaining conservative on corporate-level carbon neutrality timelines.

- **Social Responsibility Management:** BYD emphasizes institutional development and management completeness, with strong integration across employee management, health and safety, supply chain, customer responsibility, and public welfare, showing steady and systematic development. Tesla focuses social responsibility more closely around core business, performing strongly in technical talent, critical mineral supply chain risk, and product safety, but with a more concentrated and less systemized disclosure structure

- **Governance Dimension:** BYD emphasizes governance structure clarity and institutionalized management through committees, risk matrices, and multi-level systems, aligning with standardized development trends. Tesla adopts a mission-driven model, embedding ESG into corporate strategy, with strengths in identifying climate, supply chain, and product safety risks, but remaining conservative on institutionalized governance structures and transparency. These two models reflect the contrast between structure-oriented and strategy-oriented governance.

- **Report Quality and Presentation:** BYD emphasizes systemization and completeness, with structure, data continuity, and information organization moving toward comprehensive ESG frameworks, showing professionalism and standardization. Tesla focuses on highlighting key issues and core impacts through concise content and strong visuals, improving readability. Its style is more "highlight-oriented" than fully comprehensive, reflecting different disclosure strategies.

Overall, BYD and Tesla represent two distinct ESG disclosure models: a "standard-oriented" model emphasizing compliance, completeness, and comparability, and a "strategy-oriented" model emphasizing materiality, impact, and strategic consistency. Both demonstrate rationality under different institutional environments and corporate strategic backgrounds, providing useful references for understanding the diversified development of ESG disclosure practices in the global new energy vehicle industry.

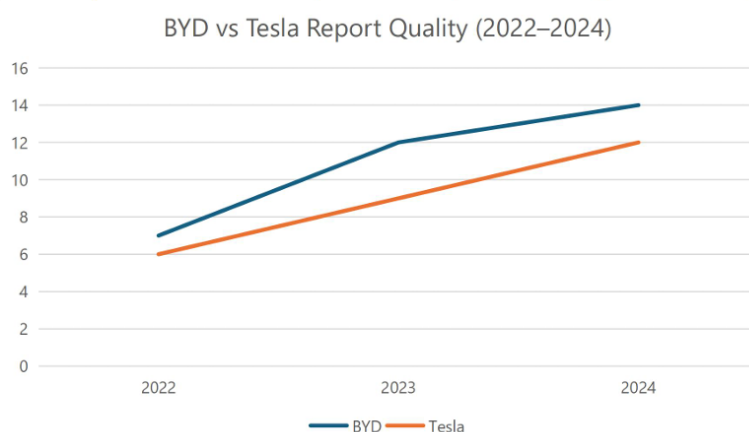


Figure 1. Total ESG disclosure score trends of BYD and Tesla, 2022–2024

7. Conclusion

This paper compared the ESG reports of BYD and Tesla from 2022 to 2024 by using a unified evaluation framework covering basic information and compliance, environmental, social, governance, and overall report quality. The results show that the two companies use different ESG reporting approaches. BYD follows international ESG standards and has continuously improved its

reporting structure, data quality, transparency, and third-party assurance. In contrast, Tesla focuses more on its business strategy and environmental performance. Its reports provide strong environmental and technology disclosure, but governance, social disclosure, and third-party assurance remain relatively limited.

The comparison shows that there is no single reporting model suitable for all companies. A standard-based approach improves comparability, transparency, and reporting quality, while a strategy-based approach better reflects a company's business characteristics and long-term development goals. Both approaches have their own advantages, but companies should balance international reporting standards with their own strategic priorities.

Overall, ESG reporting in the new energy vehicle industry is becoming more comprehensive and strategy-oriented. In the future, companies should improve data continuity, information transparency, governance systems, and the connection between ESG reporting and long-term business strategy. These improvements can enhance report quality and strengthen stakeholder trust. This study also provides a useful reference for future research on ESG reporting quality in the new energy vehicle industry.

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