

An Overview on Current Sustainable Practices in the Tire Industry. Focus on Environmental Orientations

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Please cite this paper as:

Sava, S., Bux, C., Ntouros, V. and Grosu, R.M., 2025. An Overview on Current Sustainable Practices in the Tire Industry. Focus on Environmental Orientations. In: C. Vasiliu, D.C. Dabija, A. Tziner, D. Pleșea, V. Dinu eds. 2025. *11th BASIQ International Conference on New Trends in Sustainable Business and Consumption*. Oradea, Romania, 26-28 June 2025. Bucharest: Editura ASE, pp. 293-300

DOI: 10.24818/BASIQ/2025/11/025

Abstract

The tire industry is responsible for significant environmental and health risks across its entire lifecycle, by consuming high amounts of fossil fuels, water and other natural resources, and by releasing volatile organic compounds and radioactive byproducts. Based on desk research, this paper investigates corporate sustainability reports, integrated annual reports and environment, social, and governance disclosures published by Michelin, Bridgestone, Goodyear, Continental, and Pirelli, which are among the most important players in the global tire market. The purpose of this paper is to identify current sustainable practices, environmental-oriented, in the tire industry, where sustainability is neither a destination nor a checkbox but a relentless, uneven journey. Michelin and Pirelli emerge as frontrunners, leveraging systemic governance and biodiversity stewardship to align innovation with planetary boundaries, while their reliance on premium pricing and fragmented carbon emissions (Scope 3) accountability exposes vulnerabilities in scaling solutions. Contrastingly, while advancing fleet-centric innovations and compliance-driven reporting, Goodyear and Continental grapple with cost barriers and blurred circular economy metrics. Bridgestone's ambiguous stance, which balances futuristic research and development with vague disclosures, exemplifies the sector's struggle to reconcile legacy practices with emergent sustainability imperatives. Across all firms, material bottlenecks (e.g., 10% sustainable rubber adoption) and stalled recycling rates (30% global average) underscore systemic inertia, despite incremental bio-material breakthroughs. Legislative pressures are accelerating standardization, while increasing disparities in transparency. At the same time, consumer and investor demands for a clearer accountability system are reshaping priorities. The analysis over the sustainable paths taken by the five companies outlines important information aimed at redefining the ecological legacy of the tire industry.

Keywords

Sustainability, "green" practices, circular economy, tire industry, environment, entrepreneurship

DOI: 10.24818/BASIQ/2025/11/025

Introduction

Sustainability has emerged as a cornerstone of global governance and corporate strategy, driven by escalating regulatory frameworks and societal demands. In 2025, the European Union's (EU) Corporate Sustainability Reporting Directive (CSRD) mandates rigorous environmental, social, and governance (ESG) disclosures, compelling companies to align operations with climate mitigation goals, such as limiting global warming to 1.5°C, compared to pre-industrial levels (Davies and Huber, 2025). In such a context, ESG reporting is not a trend anymore, but it becomes an integral part of firms' economic activity (Belas et al., 2024; Sichigea et al., 2025). However, there are still different contradictory debates on the compliance with all the sustainability-related requirements in current business practice (The Economist, 2025). In

addition, various challenges like greenwashing practices or fluctuating political support have led different companies to not consider sustainability a priority anymore. On the contrary, other companies became more aware of their actions and switched to circular economy models (Institute of Sustainability Studies, 2025). Of topical importance, circular economy principles are redefining the way entrepreneurs committed to the environment are doing business leading to a strong orientation towards the implementation of “green” practices (Amicarelli et al., 2021; Grosu, 2024).

The tire industry, a fundamental component of global transportation systems, poses substantial environmental and public health risks throughout its lifecycle. For decades, tire industry’s growth was tethered to resource-intensive practices – synthetic rubber production, fossil fuel-dependent logistics, and linear material flows (Araujo-Morera et al., 2021; Bowles and Fowler, 2022). Furthermore, post-consumer tire disposal intensifies environmental concerns; 75% of used tires are deposited in landfills, where they leach toxic substances into the environment (Mayer et al., 2024).

However, the tire industry is navigating an era of unprecedented transformation, and, in current society, the paradigm is shifting. Important players on the market are orienting themselves towards the implementation of more sustainable practices. Starting from this practical issue, an important question arises: What sustainable practices are companies active in the tire industry implementing, with a particular focus on environment-related orientations? The present paper aims to provide coherent answers to this question by investigating current sustainable practices implemented by Michelin, Bridgestone, Goodyear, Continental, and Pirelli, which are among the most important players in the global tire market (Chicu, Prioteasa and Deaconu, 2020; Tyre Industry Publications Ltd., 2024). This research investigates corporate sustainability reports, integrated annual reports and ESG disclosures published by these five companies. In such a context, the paper is structured in five main sections, introduction included. Section 1 of the paper briefly outlines a review of the literature related to sustainability in the tire industry, whereas Section 2 includes the presentation of the research methodology. Section 3 presents the main research results and discussions. The paper ends with a series of final considerations, systematically presented in the conclusions section.

1. A brief outline of the scientific literature on sustainability in the tire industry

Nowadays, the tire industry is considered an important polluter, and scholars’ concerns for its environmental sustainability has sharply increased in the last decade. It can be observed that many studies belong to more technical areas and mainly focus on materials’ investigation from sustainable-related perspectives (Das et al., 2021; Shoul et al., 2022; Deng et al., 2023). Approaches are diverse, ranging from broad outlines, like in the cases of Das et al. (2021) or Deng et al. (2023) who investigate the sustainability of tire materials, to more specific analyses like in the case of Shoul et al. (2022), that focus on the use of green silica in the green tire industry. Waste tires recycling technologies or end-of-life tire management, along with their potential for valorisation, especially through byproducts development, are also frequently studied in the scientific literature (Dabic-Miletic, Simic and Karagoz, 2021; Formela, 2021; Martinez, 2021; Abdullah, 2024; Hu et al., 2024). In these cases, approaches vary from being mainly technical to being more interdisciplinary, especially in connection to various aspects related to the circular economy (Symeonides, Loizia and Zorpas, 2019; Araujo-Morera et al., 2021). Furthermore, from a more business-oriented approach, sustainability in the tire industry is tackled in the scientific literature, in studies that focus on its assessment (Dewi, Febrianti and Utama, 2023), on its relationship with supply chains (Mavi et al., 2023), or on the green productivity (Marimin et al., 2018) and the twin transition, approaching the link between companies’ digitalization and environmental orientation (Tota et al., 2024).

This paper aims at bringing a novel approach in the scientific literature on the sustainability of the tire industry, especially in terms of its business-related perspectives. Thus, following the research methodology adopted by Amicarelli et al. (2021) or Grosu (2024), this paper aims at analysing the sustainability of the most important players in the industry, by focusing on their environment-oriented practices as outlined in their official documents (i.e., corporate sustainability reports, integrated annual reports and ESG disclosures). This way, this paper adds an extra step to the scientific literature, by offering interesting insights over sustainable practices in the tire industry, analysed from a different perspective, at the same time providing useful information for practitioners active in the industry.

2. Research methodology

Starting from a practical problem, of societal importance, this paper addresses a topical research question: What sustainable practices are companies active in the tire industry implementing, with a particular focus on environment-related orientations? Targeting a coherent answer to the research question, the paper aims

at investigating current sustainable practices implemented by Michelin, Bridgestone, Goodyear, Continental, and Pirelli, world's largest tiremakers, according to their 2023 sales (Tyre Industry Publications Ltd., 2024). To do this in a clear way, desk research was carried out in the second half of April 2025, by systematically analysing the most recent corporate sustainability reports, integrated annual reports and ESG disclosures of these five companies. The official website of each company was accessed to collect information for the study. The analysed documents are outlined in table no. 1.

Table no. 1. The investigated companies and their associated data sources

Name of the company/ Country, Continent	2023 sales (mil. Euro) / tire value and share *	Accessed website, focusing on sustainability-related information	Mainly analysed document
Michelin / France, Europe	28,343 / 26,727 - 94.3%	https://www.michelin.com/ https://www.michelin.com/en/sustainability/company (Accessed 21 April 2025)	2024 Sustainability Statement
Bridgestone / Japan, Asia	27,594.2 / 25,690.2 - 93.1%	https://www.bridgestone.com/regional/europe_cis/ https://www.bridgestone.com/responsibilities/ (Accessed 21 April 2025)	Bridgestone 3.0 Journey Report (2024 Integrated Report)
Goodyear / The United States of America (U.S.A./U.S.), America	18,159.3 / 18,159.3 – 100%	https://www.goodyear.com/ https://corporate.goodyear.com/us/en/commitments/reports-and-policies.html# (Accessed 21 April 2025)	2023 Corporate Responsibility Report
Continental / Germany, Europe	41,420.5 / 13,958 – 33.7%	https://www.continental.com/en/ https://www.continental.com/en/sustainability/ (Accessed 21 April 2025)	2024 Sustainability Report
Pirelli / Italy, Europe	6,650.1 / 6,650.1 – 100%	https://www.pirelli.com/global/en-www/homepage/ https://corporate.pirelli.com/corporate/en-www/sustainability/sustainability (Accessed 21 April 2025)	2023 Annual Report

Notes: * according to Tyre Industry Publications Ltd., 2024

Source: developed by the authors

The reports were manually checked for sustainability-related information, with a focus on environmental metrics (especially, Scope 1–3 emissions and renewable energy adoption) and circular economy claims, framed in the governance structure. According to McKinsey & Company (2024), Scope 1, Scope 2 and Scope 3 emissions categorise the greenhouse gases that are released across an organization's entire value chain. Scope 1 refers to direct emissions from sources that are owned or directly controlled by the organization, while Scope 2 encompasses indirect emissions resulting from purchasing energy, including electricity, heating, and cooling. Scope 3 is the most extensive and complex category of emissions, encompassing all indirect greenhouse gas emissions that arise beyond an organization's immediate operational boundaries, both up and downstream. Content analysis was performed over the collected information, mainly focusing on quantitative key performance indicators (KPIs) (e.g., emissions reductions, renewable energy adoption) and qualitative claims (e.g., circular economy pledges). The main outcomes of the analysis are put forward, in a concise way, by the next section of the paper. Their presentation reflects the specificities of each company, followed by general aspects related to their joint approach, broadly outlining strengths, weaknesses, opportunities and challenges.

3. Results and discussions

Michelin, Pirelli, Goodyear, Continental, and Bridgestone are redefining their roles in a world where sustainability is no longer optional but existential. Their strategies, as revealed in their latest reports and initiatives, reflect a complex interplay of innovation, regulation, and market pragmatism. Yet beneath the glossy sustainability pledges lie stark contrasts in vision, execution, and transparency – a tapestry of ambition and compromise that reveals as much about the industry's future as its past.

Michelin's approach is the most audacious. The company has long positioned itself as a sustainability vanguard, and its 2024 strategy strengthens this identity. Central to its ethos is the concept of systemic circularity, articulated through the "4Rs" framework: Reduce, Reuse, Recycle, Renew. This is not mere rhetoric. Michelin's innovations – such as the VISION concept tire with biodegradable tread and Movin'On, a global coalition of over 300 stakeholders – aim to decouple growth from resource depletion. Michelin's governance framework, which includes cross-functional corporate social responsibility (CSR) committees and a dedicated ethics board, integrates sustainability considerations throughout its decision-making processes. Financially, the company capitalizes on its premium market positioning to support these sustainability initiatives; despite a global decline in tire volumes, its operating income increased to 3.4 billion euros in 2024, driven by high-margin offerings such as energy-efficient truck tires. However, this premium-oriented strategy presents a potential drawback. While it facilitates substantial investment in research and development (R&D), it may also limit accessibility in price-sensitive markets, particularly in developing countries where lower-cost, less sustainable tire alternatives remain prevalent.

Unlike Michelin, Pirelli differentiates itself through a strong emphasis on biodiversity conservation and innovative financial mechanisms. The company's implementation of the TNFD LEAP framework – a comprehensive approach to evaluating nature-related risks (TNFD, 2025) – positions it as a leader in ecological accountability. This commitment is exemplified by its Hutan Harapan rainforest conservation initiative, carried out in collaboration with BMW and BirdLife International, which addresses deforestation in Sumatra while securing sustainable rubber sourcing. Financially, Pirelli's issuance of a 600-million-euro sustainability-linked bond in 2024 – the first of its kind in the industry – demonstrates the integration of environmental targets with investor interests. Even more, the company's reliance on Forest Stewardship Council (FSC)-certified natural rubber and rice husk silica (10% of total usage) signals material innovation. Yet, these remain incremental steps in a sector demanding systemic overhauls. In addition, Pirelli's sustainability trajectory remains uneven. Although it has achieved a 51% reduction in Scope 1 and 2 emissions since 2015 – outpacing industry peers – its lack of disclosure regarding Scope 3 emissions, which comprise approximately 70% of its total carbon footprint, reveals a significant shortcoming.

Goodyear's strategy is defined by its attempt to reconcile sustainability with market accessibility. The company's 2024 Sustainable Reality Survey, which polled over 1,000 fleet operators, reveals a paradox: while 93% prioritize sustainability, 63% view costs as prohibitive. Goodyear's response is the EQMAX tire line, which blends 55% sustainable materials (soybean oil, rice husk ash) with a 20% mileage improvement. This 'better performance, lower cost' pitch targets fleet operators seeking to balance ESG mandates with profitability. Yet Goodyear's broader trajectory is less assured. Its Scope 1-2 emissions reductions lag at 21.9% (vs. a 2019 baseline), and its Scope 3 reporting lacks the granularity of Michelin or Pirelli. Partnerships like Tree-Nation, which planted over 7,000 trees since 2020, feel symbolic against the scale of decarbonization required. The company's "Better Future" framework, aiming for 100% sustainable materials by 2030, hinges on scaling niche innovations – a gamble in an industry where bio-material costs remain volatile.

Continental's journey is marked by 'compliance-driven pragmatism'. The German manufacturer's 2024 Sustainability Report, structured around the EU's CSRD, prioritizes transparency in gender diversity (27% female executives) and workplace safety (1.69 accidents per million hours). These metrics, while laudable, skirt deeper environmental challenges. Continental's circular economy strategy, for instance, lacks the specificity of Michelin's 4Rs, offering vague commitments to "reduce waste" without quantifiable targets. The company's recent spin-off of its Automotive division aims to sharpen focus on tire innovation, particularly in electric mobility – a sector where it holds over 500 electric vehicles (EV)-specific tire approvals. However, this strategic shift is not without risks. Continental's "glocal" production approach – marked by the expansion of manufacturing sites in locations such as Hefei, China – enhances supply chain efficiency and supports market responsiveness, yet introduces complexity in emissions monitoring. The carbon footprint of decentralized production, while advantageous for circumventing tariffs and achieving geographic proximity to key markets, may jeopardize the company's commitment to its net-zero emissions target.

Bridgestone's sustainability-related strategic direction remains among the opaquest, amid the analysed companies. Bridgestone's "E8 Commitment" – encompassing Energy, Ecology, Efficiency, Extension, Economy, Emotion, Ease, and Empowerment – reveals an ambitious future, including innovations such as airless tires and collaborative lunar rover projects with the National Aeronautics and Space Administration (NASA). Yet, its 2024 sustainability disclosures lack substantive detail, offering generalized assertions about "sustainable solutions" while omitting specific metrics. The firm's mid-term strategy (2024–2026) sets a modest target of using 40% recycled and renewable materials in its tires – a figure already exceeded by competitors, such as Goodyear's EcoReady line, which incorporates recycled and renewable materials

in proportion of 70%. Bridgestone's "glocal" approach, which balances regional product adaptation with centralized R&D, affords operational agility but complicates transparency and accountability. For example, its Ecopia line, marketed as environmentally friendly, continues to utilize conventional synthetic rubber compounds in emerging markets.

An illustrative summary of all the above-mentioned information about sustainable practices, focused on environmental orientations, specific to all five investigated companies is depicted in figure no. 1.

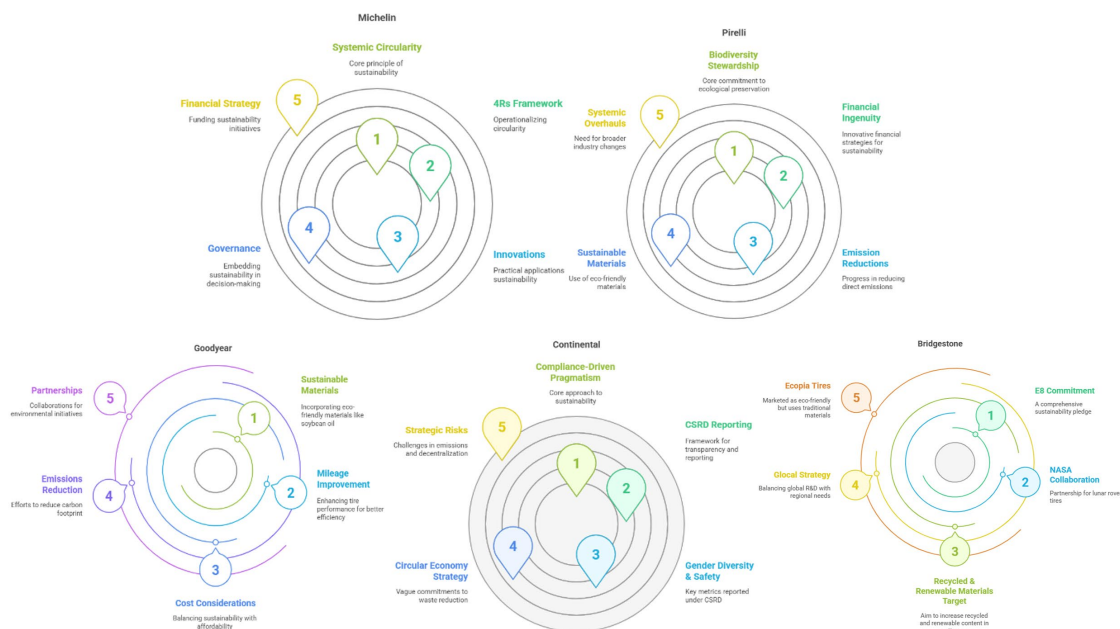


Figure no. 1. Current sustainability orientations, environmental focused, outlined by the analysed companies

Source: developed by the authors based on figures generated with Napkin AI, 2025

Jointly approaching the investigated companies, it can be observed that, beneath the divergent strategies specific to each of them lie common threads. All five companies have pledged net-zero emissions by 2050, with Michelin and Pirelli leading renewable energy adoption (80-100% in key regions). Material innovation unites them: Michelin's bio-sourced polymers, Pirelli's FSC rubber, Goodyear's soybean oil composites, and Bridgestone's guayule experiments all target the same goal – breaking free from fossil-derived materials. Collaborative governance, too, is a hallmark. Michelin's Movin'On, Pirelli's BMW partnership, and the cross-industry Tire Industry Project (TIP) reflect a recognition that systemic challenges – tire wear particles, supply chain deforestation – demand collective action.

Yet the cracks in this unity are revealing. Transparency varies wildly. Michelin and Pirelli publish detailed emissions breakdowns and third-party audits. Continental and Bridgestone obscure key metrics behind broad declarations. Legislative pressures amplify these disparities. The EU's CSRD, which mandates granular ESG disclosures, has forced Continental to overhaul its reporting – a move yet to be mirrored by Bridgestone. In the U.S.A., the U.S. Tire Manufacturers Association (USTMA) advocates for circular infrastructure, pushing members like Goodyear to invest in retreading technologies. However, the absence of federal mandates akin to the CSRD creates a regulatory patchwork, allowing laggards to hide behind voluntary initiatives.

Material costs complicate the landscape. Sustainable alternatives like silica from rice husks or rubber from dandelions remain 2-3 times costlier than conventional inputs. Michelin and Pirelli, with their premium market positions, absorb these costs through higher pricing – a luxury Goodyear and Bridgestone, competing in mass markets, cannot afford. This economic imbalance threatens to split the tire industry into two distinct segments: a premium segment capable of advancing sustainability through innovation, and a mass-market segment hindered by cost constraints.

The most striking divergence between the analysed tire manufacturers lies in the treatment of Scope 3 emissions. Michelin and Pirelli have acknowledged Scope 3 emissions as their most significant challenge. Michelin is investing in pyrolysis technologies to recycle end-of-life tires, while Pirelli is auditing natural rubber supply chains to address deforestation. In contrast, Goodyear and Continental continue to focus primarily on Scope 1 and 2 emissions, prioritizing internal operational efficiencies over broader lifecycle

impacts. In what regards Bridgestone, although its E8 Commitment refers to “energy-efficient logistics,” it lacks specific Scope 3 reduction targets.

This inconsistency is reinforced by regulatory disparities. For example, the EU’s CSRD mandates Scope 3 disclosures, whereas the U.S. currently imposes no comparable requirements. As a result, corporate sustainability narratives often centre on incremental achievements – such as renewable energy adoption in factories, recycled water usage, etc. – while neglecting the dominant contributor to tire-related emissions: approximately 80% of a tire’s environmental impact occurs during its use and post-consumer disposal.

The push toward sustainable tires has produced both genuine innovation and superficial branding. Michelin’s VISION tire, which features a 3D-printed, biodegradable tread, represents a substantive leap forward. Similarly, Pirelli’s Cyber Tire integrates digital sensors to enhance pressure control and reduce tread wear, connecting sustainability with digitalization. Conversely, many products marketed as “eco-friendly” merely repurpose existing technologies. Bridgestone’s Ecopia line, for example, still relies on silica-based compounds introduced in the 1990s, while Continental’s EcoContact series relies on minor tread design tweaks.

This dichotomy underscores a deeper tension: R&D cycles in the tire industry span decades, clashing with the urgency of climate deadlines. However, collaborations might offer a partial solution. Michelin’s partnership with Swedish startup Enviro to scale pyrolysis-based recycling exemplifies open innovation. Goodyear’s joint venture with BP to produce bio-isoprene – a synthetic rubber alternative – aims to disrupt supply chains. Yet, such alliances are fragile. The collapse of Bridgestone’s guayule rubber project with Yulex in 2023, citing scalability issues, highlights the risks of dependency on nascent technologies.

As the industry marches toward 2030 – a critical checkpoint for many net-zero pledges – its trajectory will hinge on three factors: (i) legislative coercion; (ii) consumer demand; and (iii) material scalability. The EU’s CSRD and U.S. Inflation Reduction Act incentives are already reshaping priorities, pushing firms to quantify once-nebulous goals. Consumer sentiment, particularly in Europe and North America, increasingly ties brand loyalty to sustainability credentials – a shift Michelin and Pirelli exploit through aggressive “green” marketing.

Yet material bottlenecks persist. Sustainable rubber covers less than 10% of global demand, and recycling rates for end-of-life tires stagnate at 30% in most regions (World Business Council for Sustainable Development (WBCSD), 2023). Bridgestone’s experiments with recycled carbon black and Michelin’s biobutadiene projects hint at solutions, but commercialization remains distant.

In this fractured landscape, the tire giants are not just competing for market share but for the very soul of their industry. Michelin and Pirelli, with their holistic visions and financial agility, are charting a course toward systemic sustainability. Goodyear and Continental, tethered to cost realities, walk a tightrope between innovation and imitation. Bridgestone, meanwhile, straddles past and future – a titan struggling to shed its skin.

Conclusions

The tire industry’s sustainability efforts reveal a landscape of asymmetrical progress, marked by stark contrasts between aspirational pledges and operational realities. Michelin and Pirelli emerge as frontrunners, leveraging systemic governance (e.g., Michelin’s ‘4Rs’ framework) and biodiversity stewardship (e.g., Pirelli’s TNFD LEAP adoption) to align innovation with planetary boundaries. However, their reliance on premium pricing and fragmented Scope 3 accountability exposes vulnerabilities in scaling solutions. Goodyear and Continental, while advancing fleet-centric innovations (e.g., EQMAX tires) and compliance-driven reporting, grapple with cost barriers and opaque circular economy metrics. Bridgestone’s ambiguous stance – balancing futuristic R&D (e.g., airless tires) with vague disclosures – epitomizes the sector’s struggle to reconcile legacy practices with emergent sustainability imperatives. Across all firms, material bottlenecks (e.g., 10% sustainable rubber adoption) and stalled recycling rates (30% global average) underscore systemic inertia, despite incremental bio-material breakthroughs.

Legislative pressures, particularly the EU’s CSRD and U.S. state-level mandates, are accelerating standardization but also increasing disparities in transparency. While Michelin and Pirelli exploit green financing (e.g., sustainability-linked bonds) to fund decarbonization, laggards like Bridgestone risk alienating ESG-focused investors through opaque reporting. Consumers’ and investors’ demand for clearer accountability standards are reshaping priorities, yet geopolitical fragmentation – such as the EU’s stringent regulations versus U.S. federal inaction – creates a compliance maze. The industry’s collective failure to address Scope 3 emissions (70–80% of total footprints) remains its most critical hotspot, with even leaders

like Pirelli delaying concrete roadmaps for supply chain decarbonization. Ultimately, the tire industry's sustainability journey is less a linear path than a contested evolution. Michelin and Pirelli's holistic strategies set benchmarks but rely on unsustainable market privileges (e.g., premium pricing). Conversely, Goodyear and Continental's pragmatic, cost-conscious approaches highlight the tension between innovation and accessibility. Bridgestone's duality – futurism anchored to convention – mirrors the sector's broader identity crisis. As climate deadlines loom, the industry's ecological legacy will hinge on bridging this divide: scaling affordable, circular solutions while dismantling the regulatory and economic barriers that perpetuate fossil-fuel dependency. Sustainability is not a fixed goal but a dynamic reckoning – one demanding radical collaboration, equitable policies, and a reimagining of mobility itself.

Albeit the analysis put forward in this paper outlines diverse perspectives on sustainable practices implemented by top tire manufacturers, with a particular focus on environmental orientations, its limitations might lead to different biases. These might refer to briefly analysing environmental-related data only from the most recent available reports specific to the leading five tire manufacturers. To get a more detailed overview of the tire industry's sustainability and circularity more in-depth research is necessary on a longer period and on more manufactures. However, the present paper sets its premises.

References

- Abdullah, Z.T., 2024. Remanufactured waste tire by-product valorization: Quantitative–qualitative sustainability-based assessment. *Results in Engineering*, [e-journal], 22, article no. 102229. <https://doi.org/10.1016/j.rineng.2024.102229>.
- Amicarelli, V., Lagioia, G., Patruno, A., Grosu, R.M. and Bux, C., 2021. Enhancing the Sustainability of the Aviation Industry: Airlines' Commitment to "Green" Practices. *Amfiteatru Economic*, [e-journal] 23(Special Issue No. 15), pp.934-947. DOI: 10.24818/EA/2021/S15/934.
- Araujo-Morera, J., Verdejo, R., López-Manchado, M.A. and Hernández Santana, M., 2021. Sustainable mobility: The route of tires through the circular economy model. *Waste Management*, [e-journal] 126, pp.309-322. <https://doi.org/10.1016/j.wasman.2021.03.025>.
- Belas, J., Balcerzak, A.P., Dvorsky, J. and Streimikis, J., 2024. Influencing ESG Perception in SMEs through CSR, Business Ethics, and HRM: An Empirical Study in V4 Countries. *Amfiteatru Economic*, [e-journal] 26(66), pp. 532-549. <https://doi.org/10.24818/EA/2024/66/532>.
- Bowles, A.J. and Fowler, G.D., 2022. Assessing the impacts of feedstock and process control on pyrolysis outputs for tyre recycling. *Resources, Conservation and Recycling*, [e-journal] 182, article no. 106277. <https://doi.org/10.1016/j.resconrec.2022.106277>.
- Chicu, N., Prioteasa, A.L., Deaconu, A., 2020. Current trends and perspectives in tyre industry. *Studia Universitatis "Vasile Goldis" Arad. Economics Series*, [e-journal] 30(Special Issue 2/2020), pp.36-56. DOI: 10.2478/sues-2020-0011.
- Dabic-Miletic, S., Simic, V. and Karagoz, S., 2021. End-of-life tire management: a critical review. *Environmental Science and Pollution Research*, [e-journal] 28, pp.68053-68070. <https://doi.org/10.1007/s11356-021-16263-6>.
- Das, S., Satpathi, H., Roopa, S., Das Gupta, S., 2021. Sustainability of the Tire Industry: Through a Material Approach. In: N. Kanwar Rawat, T.G. Volova and A.K. Haghi, eds. 2021. *Applied Biopolymer Technology and Bioplastics*. New York.: Apple Academic Press. ch.4.
- Davies, P. and Huber, B., 2025. *ESG and Sustainability Insights: 10 Things That Should Be Top of Mind in 2025*. [online] Available at: <<https://corpgov.law.harvard.edu/2025/01/18/esg-and-sustainability-insights-10-things-that-should-be-top-of-mind-in-2025/>> [Accessed 27 April 2025].
- Deng, S., Chen, R., Duan, S., Jia, Q., Hao, X. and Zhang, L., 2023. Research progress on sustainability of key tire materials. *SusMat*, [e-journal] 3(5), pp.581-608. <https://doi.org/10.1002/sus2.159>.
- Dewi, S.K., Febrianti, R. and Utama, D.M., 2023. An Integrated method for manufacturing Sustainability assessment in tire industry: a case study in Indonesian. *International Journal of Sustainable Engineering*, [e-journal] 16(1), pp.1–12. <https://doi.org/10.1080/19397038.2023.2276936>.
- European Commission, Directorate-General for Financial Stability, Financial Services and Capital Markets Union, n.d. *Corporate sustainability reporting*. [online] Available at: <https://finance.ec.europa.eu/capital-markets-union-and-financial-markets/company-reporting-and-auditing/company-reporting/corporate-sustainability-reporting_en> [Accessed 17 April 2025].

- Formela, K., 2021. Sustainable development of waste tires recycling technologies – recent advances, challenges and future trends. *Advanced Industrial and Engineering Polymer Research*, [e-journal] 4(3), pp.209-222. <https://doi.org/10.1016/j.aiepr.2021.06.004>.
- Grosu, R.M., 2024. “Green” practices in the food retail sector: evidence from the Romanian market. *British Food Journal*, [e-journal] 126(1), pp.173-190. <https://doi.org/10.1108/BFJ-12-2022-1119>.
- Hu, Y., Yu, X., Ren, J., Zeng, Z. and Qian, Q., 2024. Waste tire valorization: Advanced technologies, process simulation, system optimization, and sustainability. *Science of The Total Environment*, [e-journal], 942, article no. 173561. <https://doi.org/10.1016/j.scitotenv.2024.173561>.
- Institute of Sustainability Studies, 2025. *Sustainability trends 2025 shaping the future of business*. [online] Available at: <<https://instituteofsustainabilitystudies.com/insights/lexicon/sustainability-trends-2025-shaping-the-future-of-business/>> [Accessed 25 April 2025].
- Marimin, Darmawan, M.A., Widhiarti, R.P. and Teniwut, Y.K., 2018. Green productivity improvement and sustainability assessment of the motorcycle tire production process: A case study. *Journal of Cleaner Production*, [e-journal], 191, pp.273-282. <https://doi.org/10.1016/j.jclepro.2018.04.228>.
- Martinez, J.D., 2021. An overview of the end-of-life tires status in some Latin American countries: Proposing pyrolysis for a circular economy. *Renewable and Sustainable Energy Reviews*, [e-journal] 144, article no. 111032. <https://doi.org/10.1016/j.rser.2021.111032>.
- Mavi, R.K., Shekarabi, S.A.H., Mavi, N.K., Arisian, S. and Moghdani, R., 2023. Multi-objective optimisation of sustainable closed-loop supply chain networks in the tire industry. *Engineering Applications of Artificial Intelligence*, [e-journal] 126, Part D, article no. 107116. <https://doi.org/10.1016/j.engappai.2023.107116>.
- Mayer, P., Moran, K., Miller, E., Brander, S., Harper, S., Garcia-Jaramillo, M., Carrasco-Navarro, V., Ho, K., Burgess, R., Thornton Hampton, L., Granek, E., McCauley, M., McIntyre, J., Kolodziej, E., Hu, X., Williams, A., Beckingham, B., Jackson, M., Smith, R., Fender, C., King, G., Bollman, M., Kaushal, S., Cunningham, B., Hutton, S., Lang, J., Goss, H., Siddiqui, S., Sutton, R., Lin, D. and Mendez, M., 2024. Where the Rubber Meets the Road: Emerging Environmental Impacts of Tire Wear Particles and Their Chemical Cocktails. *Science of The Total Environment*, [e-journal] 927, article no. 171153. <https://doi.org/10.1016/j.scitotenv.2024.171153>.
- McKinsey & Company, 2024. *What are Scope 1, 2, and 3 emissions?*. [online] Available at: <<https://www.mckinsey.com/featured-insights/mckinsey-explainers/what-are-scope-1-2-and-3-emissions>> [Accessed 24 April 2025].
- Napkin AI, 2025. *Napkin AI*. [online] Available at: <<https://www.napkin.ai/>> [Accessed 26 April 2025].
- Shoul, B., Marfavi, Y., Sadeghi, B., Kowsari, E., Sadeghi, P. and Ramakrishna, S., 2022. Investigating the potential of sustainable use of green silica in the green tire industry: a review. *Environmental Science and Pollution Research*, [e-journal] 29, pp.51298-51317. <https://doi.org/10.1007/s11356-022-20894-8>.
- Sichigea, M., Vasilescu, L., Mihai, L. and Sitnikov, C., 2025. Modelling ESG Relationships with the Employability-Operational Growth-Profitability Trilogy in the European Food System. *Amfiteatru Economic*, [e-journal] 27(69), pp.329-350. <https://doi.org/10.24818/EA/2025/69/329>.
- Symeonides, D., Loizia, P. and Zorpas, A.A., 2019. Tire waste management system in Cyprus in the framework of circular economy strategy. *Environmental Science and Pollution Research*, [e-journal] 26, pp.35445-35460. <https://doi.org/10.1007/s11356-019-05131-z>.
- The Economist, 2025. *Legislation and circularity will make business greener*. [online] Available at: <<https://impact.economist.com/sustainability/net-zero-and-energy/sustainability-trends-for-2025>> [Accessed 25 April 2025].
- TNFD, 2025. *Guidance on the identification and assessment of nature-related issues: the LEAP approach*. [online] Available at: <<https://tnfd.global/publication/additional-guidance-on-assessment-of-nature-related-issues-the-leap-approach/>> [Accessed 25 April 2025].
- Tota, R., Facchini, F., Pio Iavagnilio, R., Mossa, G. and Sassanelli, C., 2024. Digital twin supporting environmental performance evaluation according to ISO certification: an application case in the tire industry. *Production & Manufacturing Research*, [e-journal] 12(1), article no. 2351839. <https://doi.org/10.1080/21693277.2024.2351839>.
- Tyre Industry Publications Ltd., 2024. *The world's largest tyre makers by sales*. [online] Available at: <<https://www.tyrepress.com/leading-tyre-manufacturers/>> [Accessed 3 May 2025].
- World Business Council for Sustainable Development (WBCSD), 2023. *Tire Industry CEOs commit to ambitious sustainability workplan*. [online] Available at: <<https://www.wbcd.org/news/tire-industry-ceos-commit-to-ambitious-sustainability-workplan/>> [Accessed 29 April 2025].