

Sustainability Driven:

Accelerating Impact with the Tire Sector SDG Roadmap



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Foreword



Foreword

The Sustainable Development Goals (SDGs) lay out a global agenda to tackle the world's most pressing social, environmental and economic challenges by 2030.

It is well-accepted that business leadership and action are key to realizing this ambitious agenda. Companies that take an active role in leading this transformation and position the SDGs at the heart of operational decisions will ultimately be better equipped to harness market opportunities and manage risks. The Business and Sustainable Development Commission's Better Business, Better World¹ report makes a compelling case for companies to align with the SDGs. The report outlines that sustainable business models could unlock more than USD \$12 trillion in new market value and create up to 380 million jobs by 2030. Furthermore, the report emphasizes the critical role of sectoral partnerships to drive

industry transformation on the road to 2030 and beyond.

Formed in 2005, the World Business Council for Sustainable Development's (WBCSD) Tire Industry Project (TIP) is the primary global forum for the tire industry on sustainability issues. TIP's mission is to proactively identify and study the potential human health and environmental impacts associated with the life cycle impacts of tires to contribute to a more sustainable future. With a membership of leading tire manufacturers that represent more than 60% of global tire manufacturing capacity, TIP is well-positioned to develop this Roadmap as a resource that the sector-at-large can use.

As business leaders, we want to work together with sector peers and other stakeholders to help the tire sector navigate the sustainability challenges that lie ahead, and ensure

that our industry continues to grow. We want to demonstrate leadership, apply our creativity, share our knowledge and provide innovative solutions to achieve a sustainable, resilient and inclusive future.

With this Roadmap, TIP offers a framework for action that outlines impactful pathways for the entire sector to contribute to the ambitions of the SDGs. The Roadmap aims to guide, inform and support decision-making along the value chain, encourage stakeholder dialogue and inspire action-oriented initiatives among industry peers and beyond.



Shu Ishibashi
Global CEO and Representative
Executive Officer
Bridgestone Corporation

Christian Kötz
Member of the Executive
Board Continental AG
Head of Continental Tires

Brad Hughes
President & CEO
Cooper Tire & Rubber Company

Richard Kramer
Chairman, CEO & President
The Goodyear Tire & Rubber Company

Lee, So Il
President & CEO
Hankook Tire & Technology Co., Ltd.

Il-Taik Jung
CEO, Kumho Tire

Florent Menegaux
CEO, Michelin

Marco Tronchetti Provera
Pirelli Executive
Vice Chairman & CEO

Satoru Yamamoto
President and CEO,
Representative Director
Sumitomo Rubber Industries, Ltd.

Takashi Shimizu
President & CEO
Toyo Tire Corporation

Masataka Yamaishi
Yokohama President, Chairman
of the Board

The Roadmap translates the industry's vision for sustainable mobility into action, leveraging TIP's 15 years of success to identify key opportunities to positively impact people and society as a whole. The tire industry and its stakeholders have high expectations for the Roadmap and the future that – together – it will help us create.

Shu Ishibashi

Global CEO and Representative Executive Officer, Bridgestone Corporation

TIP members value the opinions of stakeholders. The Roadmap reflects this, with actions shaped through consultation with industry, non-governmental organizations, international organizations and other groups that have roles to play in improving the sustainability of the tire value chain.

Richard Kramer

Chairman, Chief Executive Officer and President, Goodyear

The Roadmap aims to become a key reference for any tire-value-chain stakeholder that aspires to sustainable business. For people and planet, the Roadmap offers inspirational actions and case studies toward a future of sustainable mobility.

Florent Menegaux

Chief Executive Officer, Michelin



KUMHO TIRE



TOYO TIRES®



① Executive summary



① Executive summary

Since their launch in 2015, the 17 Sustainable Development Goals (SDGs) and the 169 time-bound targets underpinning them have provided all stakeholders – the private sector included – with a lens through which to translate global needs and ambitions into business solutions. Companies and sectors that apply their creativity and innovation to develop these solutions will be in a position to better manage risks, anticipate consumer demand, capture growth markets and strengthen supply chains in line with the sustainability needs outlined by the SDGs.

PURPOSE

In an effort to drive the transformation needed to achieve the SDGs, the 11 member companies of the Tire Industry Project (TIP), which operates under the umbrella of World Business Council for the Sustainable Development (WBCSD), came together to develop *Sustainability Driven: Accelerating Impact with a Tire Sector SDG Roadmap*. The Roadmap presents a series of ambitious impact pathways outlining how the sector can contribute to the 2030 Agenda. The Roadmap is intended to be an inspirational tool that the sector can use to build a unified response to sustainability challenges, while navigating

the transition to a low-carbon, resilient and resource-efficient economy, in line with the SDGs.

APPROACH

TIP followed the three-step process outlined in WBCSD's *SDG Sector Roadmap Guidelines* to explore, articulate and realize a shared vision for the sector to contribute to the SDGs. This process brought member companies together to identify how the tire sector interacts with the SDGs across the value chain; areas where the sector can have the most significant impact; and key actions to scale and accelerate contributions to the SDGs. We consulted a range of global stakeholders from industry associations, non-profits and subject matter experts throughout the development process.

PRIORITY SDGs

The tire sector interacts with all 17 SDGs; however, this Roadmap focuses on areas where the sector has the greatest potential to lead, influence and accelerate action to make progress on the 2030 Agenda. As such, we identified eight SDGs as priorities and where the sector can have the highest impact through multi-stakeholder action - with SDG 8 (decent work and economic growth) and 12 (responsible consumption and

production) mapping against the Roadmap actions most frequently (Figure 1).

IMPACT PATHWAYS

We identified seven opportunities to maximize positive impact and minimize negative impact across three main themes: supply chain, operations, and products and services (Table 1). We developed impact pathways for each opportunity with a series of actions.

ROAD TO 2030

Achieving the SDGs is beyond the reach of any one company and TIP members recognize the integral role they have in driving forward the actions in this Roadmap. TIP's own work program will have the Roadmap at its core, including a commitment to develop additional indicators to measure progress by 2023 and to produce a progress report by 2026 to reflect advancements and optimize delivery. We encourage all members of the sector (including those who are not members of TIP), along with customers, consumers, suppliers, governments, academia and NGOs, to engage with the Roadmap. In addition, we encourage interested parties to contact TIP with questions and ideas on how to initiate projects or strengthen partnerships to accelerate SDG impact.

Figure 1: SDG impact - We identified eight SDGs as priorities and where the sector can have the highest impacts; we identified SDG 8 and 12 the most frequently.



Table 1: Impact opportunities - Identifying pathways for action

THEME	IMPACT OPPORTUNITY
Supply chain	1. Accelerate and scale activities to achieve a fair, equitable and environmentally sound natural rubber value chain – including ensuring decent work and upholding human rights.
	2. Implement sustainable procurement practices and establish environmental, social and governance (ESG) responsibilities throughout the supply chain, including the promotion of transparency and traceability.
Operations	3. Develop pathways to decarbonize operations, reduce emissions and ensure the sustainable use of natural resources.
	4. Ensure safe and inclusive working environments and equal opportunities for all employees.
Products and services	5. Further leverage multi-stakeholder efforts to achieve evidence-based solutions that address tire and road wear particles (TRWP).
	6. Accelerate the sustainable mobility transition by raising awareness of the impact of user behavior, designing connected and intelligent tires, and providing innovative digital solutions.
	7. Advance innovation in product, service and business model design to enhance low-carbon and circular solutions while ensuring sustainable management of end-of-life tires (ELT) around the world.



② The SDGs and the tire sector



② The SDGs and the tire sector

2.1 INTRODUCTION

Adopted unanimously by the United Nations (UN) in 2015, the 17 SDGs provide a blueprint to ensure peace and prosperity for people and the planet, now and into the future.

In recognition of the need for an extraordinary leap forward to realize the ambitious SDG targets, the UN called for a “Decade of Action” in 2020. Achieving the 169 targets by 2030 will require stakeholders to work together to transform economic and social systems that can respond to the ever-changing landscape of megatrends and global challenges, including those like the COVID-19 pandemic.

The SDGs provide a ready-made, universal framework that all stakeholders – the private sector included – can use to renew and focus their efforts to achieve social and environmental progress. As an engine of economic growth and employment, a source of finance and a driver of technology and innovation, business has a

critical role to play in realizing SDG-related opportunities that overcome obstacles and scale solutions.

Against this background, it is crucial that companies identify ways in which they can innovate and drive meaningful action in their own operations and value chains. In its *Better Business, Better World*¹ report, the Business and Sustainable Development Commission recommends that players in all industries produce detailed roadmaps – to further guide sectors and companies toward sustainability in line with the SDGs.

The 11 TIP member companies have joined efforts to develop this Roadmap, to explore, articulate and ultimately realize the potential of the sector to drive innovation that will significantly contribute to the SDG agenda.

The Roadmap identifies areas where the sector can have the most impact on the SDGs by maximizing those that are positive and minimizing negative impacts and explores key ways to accelerate and

optimize impact by 2030. The Roadmap aims to guide focused action and provides a means to communicate relevant sustainability activities and initiatives to key stakeholders.

The 2020 UN *Sustainable Development Goals Report*² highlights the progress made in a number of areas since the launch of the SDGs in 2015. In particular, it highlights progress such as expanding access to electricity (SDG 7) and increasing women’s representation in government (SDG 5). However, overall progress has not advanced at the speed or scale required to achieve the SDGs by 2030 – and in some areas there has been regression. For instance, global economic growth has slowed (SDG 8), income equality is falling in some countries (SDG 10) and the global material footprint has increased (SDG 12).



2.2 THE TIRE SECTOR VALUE CHAIN

Tires keep the world moving. The tire sector and its value chain have a vital role in creating a future with environmentally friendly, safe, efficient and accessible mobility for all. The sector continues to research and develop products and services that contribute to improved safety and environmental performance, including increased wet grip, improved tread wear, and reduced rolling resistance.

Mobility innovations such as clean, connected and autonomous vehicles have transformed transport systems; and the rise of fleets, shared mobility and mass transit will lead to further business model transformation across the value chain.

These mobility trends present new opportunities for the tire sector to develop products and services that minimize negative impacts, protect the environment, promote social progress, and support economic growth.

For the purposes of this Roadmap, “the tire sector” refers to all companies worldwide that are engaged directly in manufacturing tires or related products and services, including tire installation, maintenance and repair, retreading and fleet monitoring.

These companies operate in different ways across the full range of the value chain, from raw material production and sourcing, through design and manufacturing, to customer use and end-of-life options (Figure 2).

Figure 2: The tire sector value chain and its stages

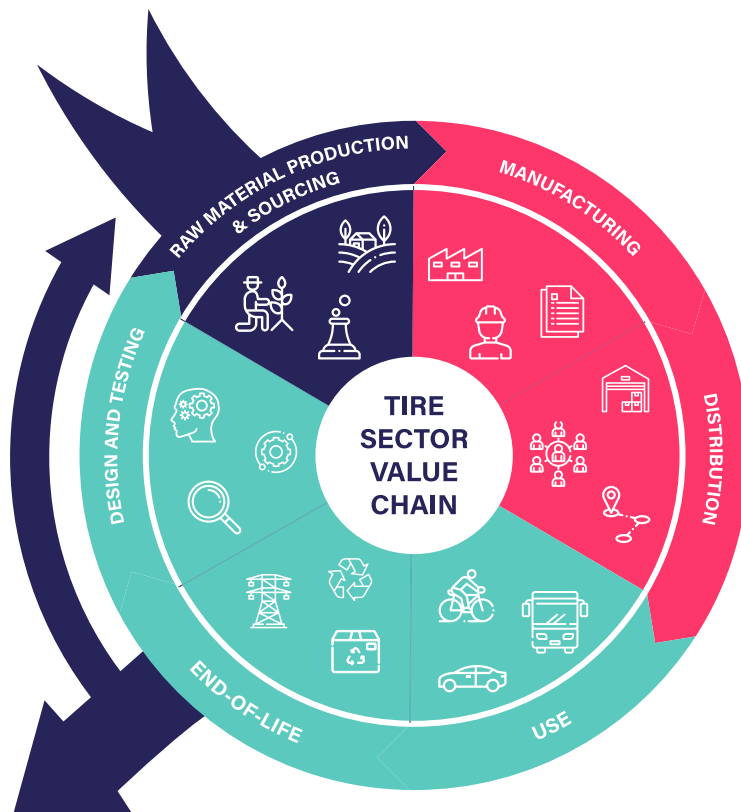
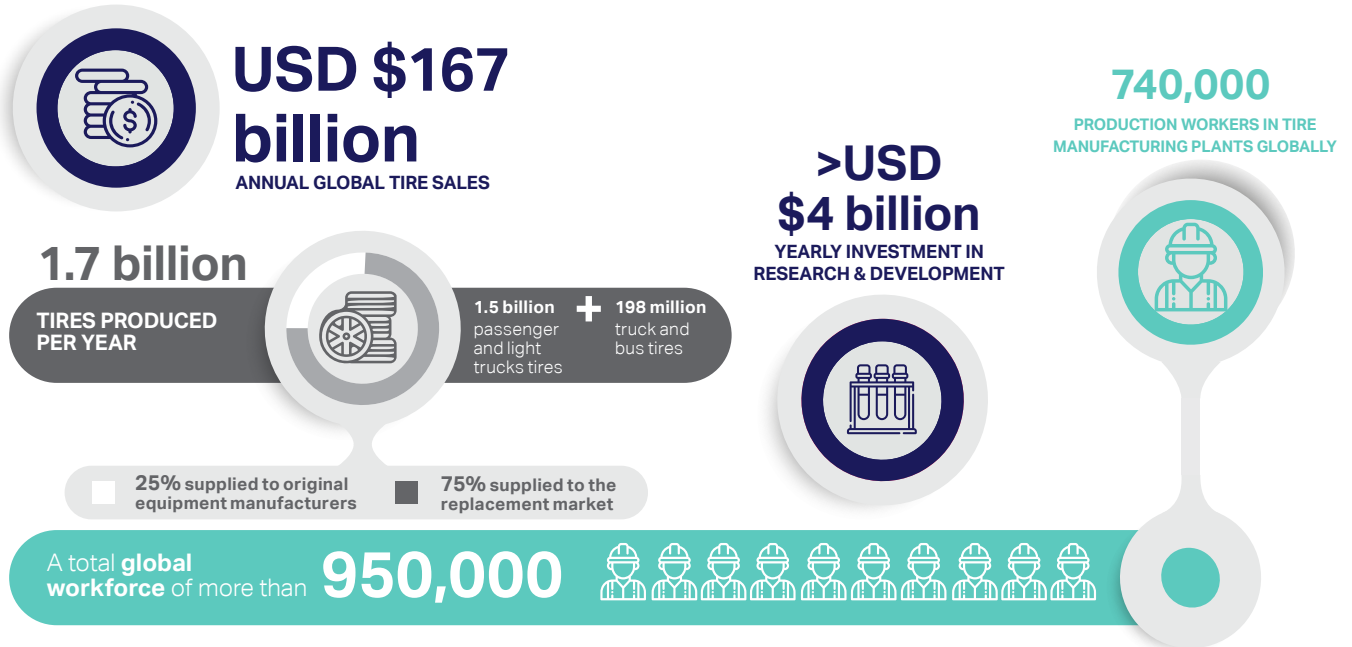
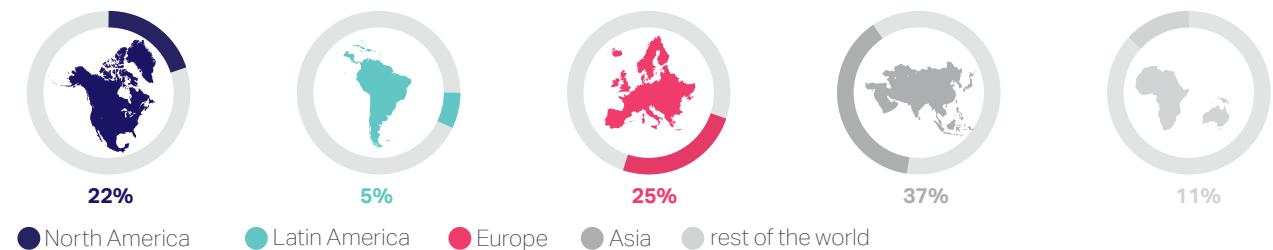


Figure 3 provides an overview of key industry statistics, and Figures 4 and 5 reveal the composition and internal structure of tires typically used for passenger vehicles or light trucks.

Figure 3: The global tire industry at-a-glance (approximate figures, 2019)

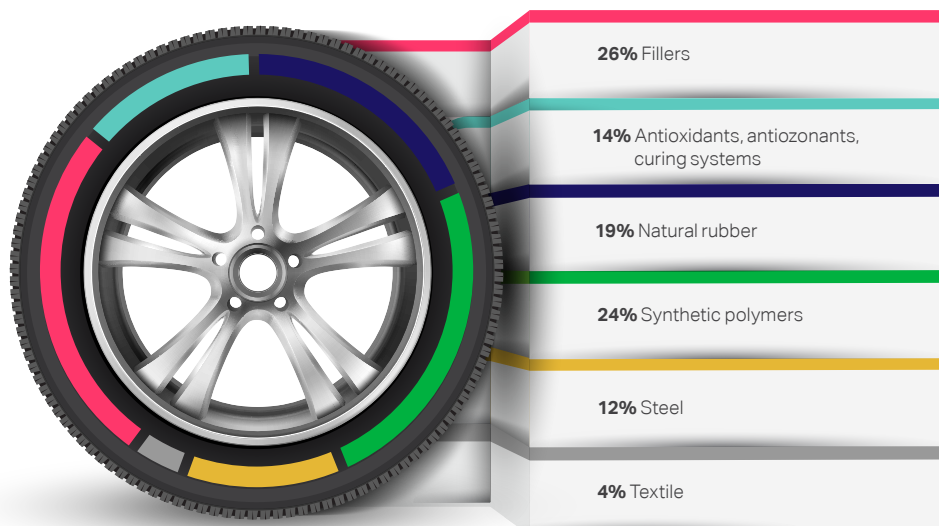


REGIONAL TIRE SALES SPLIT (BASED ON NUMBERS OF UNITS)



Source: Tire sales in USD, number of employees, R&D investment - Tire Business, 2020; Tires produced, regional sales - LMC, 2020

Figure 4: Tire composition - A representation of the material composition of a typical passenger vehicle or light truck tire. The composition of tires differs according to tire type and tire application.



Adapted from U.S. Tire Manufacturers Association (USTMA)

Figure 5: Tire structure - A representation of the structural composition of a typical passenger vehicle or light truck tire. The structural composition of tires differs according to tire type and tire application.



Tread

Tread rubber compound and tread pattern provide grip for traction and abrasion resistance against treadwear.

Belts

Belts with steel cords laid at opposing angles provide stability to the tread area of the tire and contributes to managing wear, handling and traction performance.

Body ply

Body plies are typically comprised of polyester, rayon or nylon cords within a rubber layer. Body plies contribute to giving structure to the tire and provide strength to contain inflation pressure.

Inner liner

A rubber compound used to retain the inflation pressure inside the tire.

Bead

Tire bead bundles are usually strands of wire and work to secure the tire to the wheel.

Sidewall

A rubber compound used to cover the body plies on the sides of the tire that provides abrasion, scuff and weathering resistance.

Bead filler

A rubber compound wrapped around the bead to tune ride and handling characteristics.

Adapted from U.S. Tire Manufacturers Association (USTMA)

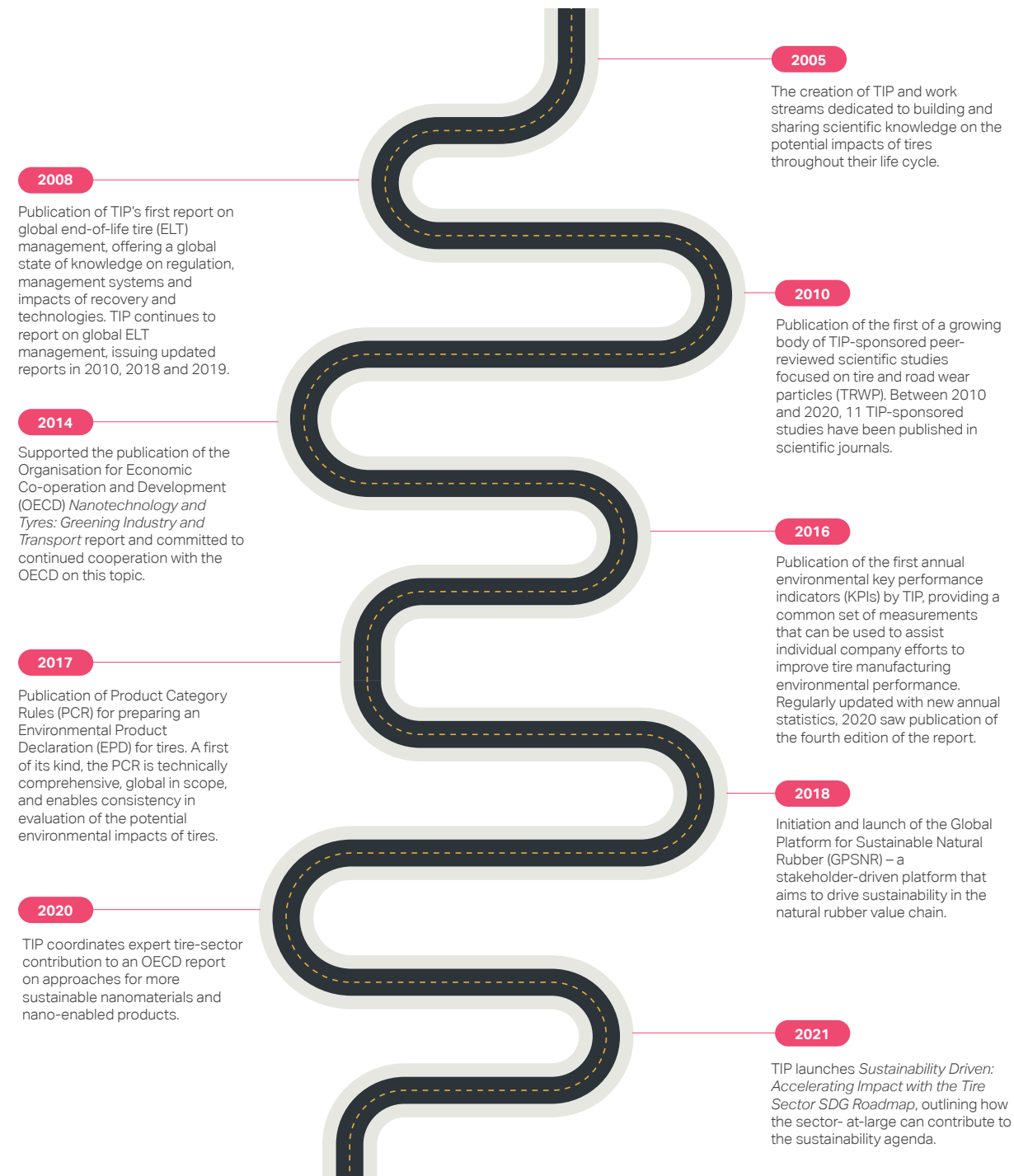
2.3 SUSTAINABILITY MILESTONES AND MEGATRENDS

TIP has been operating for more than 15 years. Prior to the SDGs, several key milestones influenced

sustainable development progress within the industry. TIP's work to improve understanding of potential human health and environmental impacts of tires throughout their life cycle is an example of the sector's approach

to sustainability. Here are some TIP examples that indicate how members of the sector have worked to understand and address potential life cycle impacts of tires (*Figure 6*).

Figure 6: TIP sustainability milestones



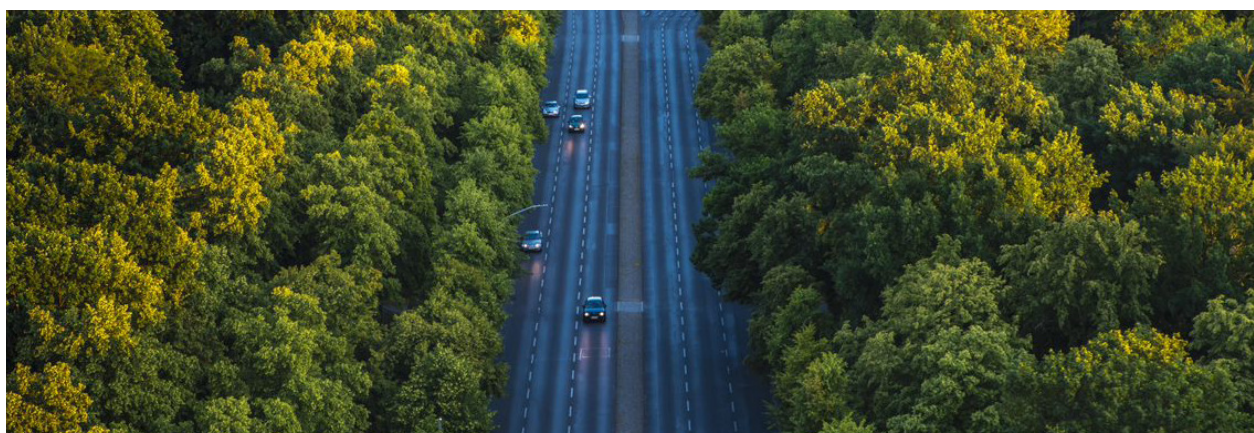
Despite continued sustainability progress, megatrends (trends that have an effect on a global scale) encompassing significant environmental, social, economic or technological changes have the potential to disrupt business and society as a whole and will likely continue to do so for decades to come. Of the key megatrends presenting significant challenges for the

business community, four are particularly relevant to the tire sector within the wider context of sustainable development. These megatrends are drawn from expert stakeholder interviews, research and workshops that took place during the Roadmap's development and were used to inform the development of the Roadmap's impact pathways.

This Roadmap is a tool that the sector can use to build a unified response to these megatrends while navigating the transition to a low-carbon, resilient and resource-efficient economy in line with the SDGs. *Table 2* summarizes the megatrends most integral to the sustainability context for the sector.

Table 2: Sustainability megatrends and their potential impact on the tire sector

MEGATREND	IMPACT ON THE SECTOR
 <p>Circular innovation to tackle resource scarcity</p>	<p>Burgeoning populations in emerging markets and increased urbanization globally are encouraging a rise in mobility. The resource challenges that can result from growing demand present the opportunity for the emergence of new business models such as those based on the circular economy.</p>
 <p>Climate and nature crises to accelerate the low-carbon energy transition</p>	<p>Progress to reduce greenhouse gas (GHG) emissions, adapting to the physical impacts of climate change and halting biodiversity loss remains slow and insufficient. However, new regulations, investor pressure and citizen power have created momentum to which the business community must respond.</p>
 <p>Industry 4.0 to allow systems transformation</p>	<p>Rapid digitalization and automation across industries is driving improved productivity, efficiency and safety – but could lead to widespread and disruptive implications for employment and workforce skills if not appropriately managed. Technologies, including artificial intelligence, internet of things and 5G, alongside autonomous, connected and electric vehicles, offer significant opportunities to organizations ready to embrace them. The adoption of such technologies must come with efforts to address rising cybersecurity and data privacy concerns and to manage the potential environmental impacts from material and energy consumption.</p>
 <p>Human rights, safety, well-being and equal opportunities – across the value chain – are essential to building resilience</p>	<p>Rising inequality is driving continued dissatisfaction with current political and economic models and global civil protests on issues relating to diversity and inclusion. Companies are increasingly expected to take strong positions on human rights and other social issues – including protecting employee well-being, promoting workplace safety and improving supply chain due diligence and transparency – to ensure long-term business resilience.</p>



2.4 THE ROADMAP DEVELOPMENT PROCESS

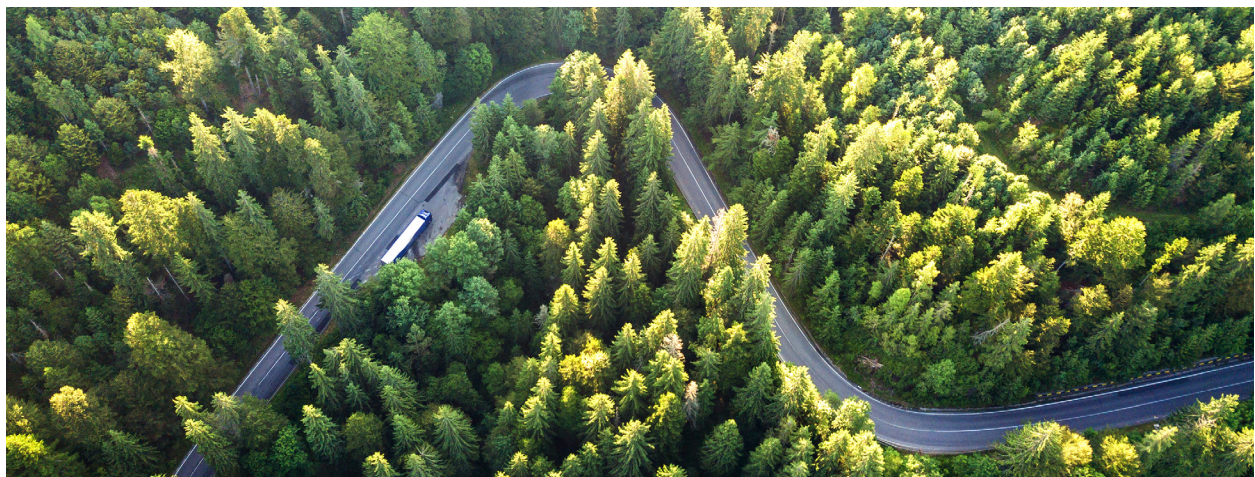
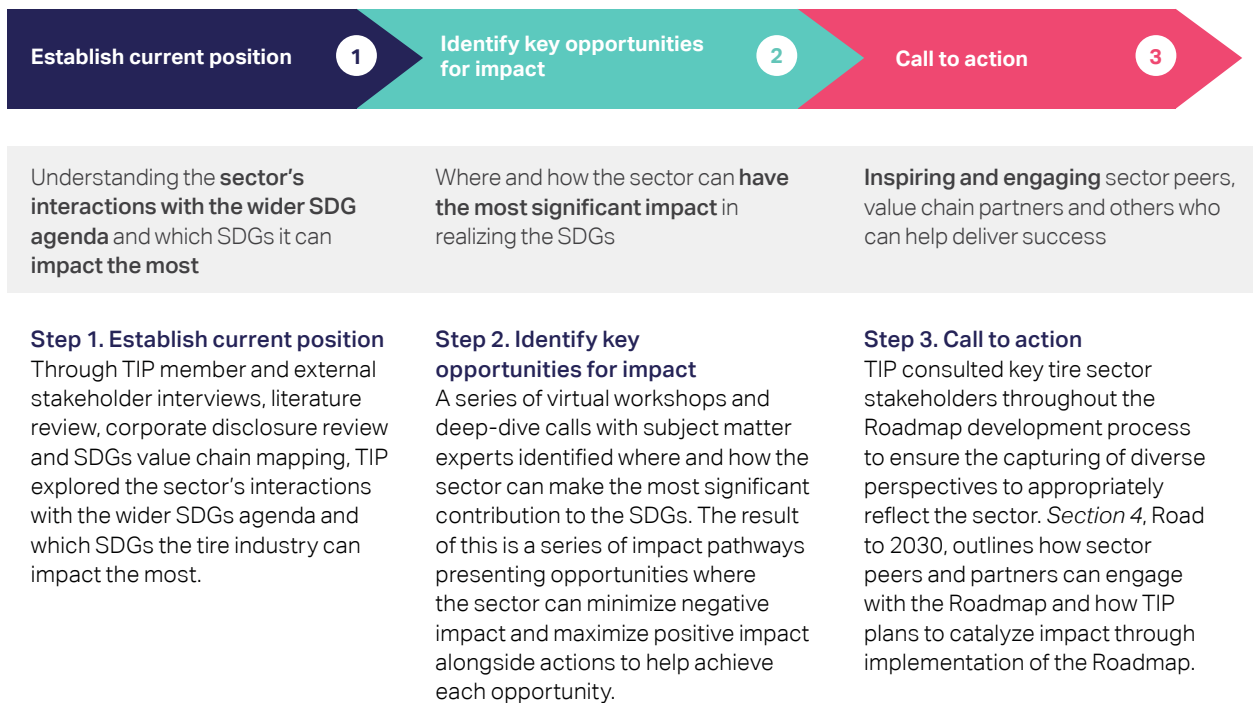
The tire sector, as a sustainable mobility actor, has a unique role in enabling sustainable transport solutions that are essential to achieving the 17 SDGs. TIP members have developed this Roadmap for the tire sector and its stakeholders in view of the challenges and opportunities presented by sustainable development.

Acknowledging that all SDGs are important and interconnected, this Roadmap aims to focus on where it can maximize impact by identifying the areas where the sector has the greatest ability to lead, influence and accelerate actions.

TIP applied the WBCSD's *SDG Sector Roadmap Guidelines*,³ a framework that leads companies from the same sector through a systematic process to explore,

articulate and realize a shared vision for their industry to contribute to the SDGs. The 12-month development process for this Roadmap brought together industry experts and diverse stakeholders to develop impact pathways through the three main steps outlined in *Figure 7*.

Figure 7: Roadmap development process



Based on this three-step process, TIP identified 8 SDGs as those where the sector has the potential to have the highest

impact through collective multi-stakeholder action. SDG 8 (decent work and economic growth) and 12 (responsible

consumption and production) map against the Roadmap actions most frequently (Figure 8).

Figure 8: Priority SDGs for the tire sector



The impact pathways also support the achievement of other SDGs, most notably SDG 11 (sustainable cities and communities) and SDG 15 (life on land). In addition, while SDG 17 (partnerships for the goals) was not specifically identified as a priority goal for the sector, it is a recurring theme throughout this Roadmap.

All impact opportunities and actions need inclusive partnerships and collaborations to succeed; and the importance of scaling action in developing countries is also recognized.

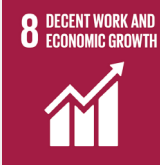
The impact pathways described in Section 3 map each action against the SDG targets where there is the greatest potential to contribute.

The SDG targets with the most direct links are highlighted to help further focus SDG prioritization but this does not indicate that this SDG target has the most opportunity for impact. Figure 9 presents a summary of the targets against the eight priority SDGs.



Figure 9: Identified priority SDGs and targets with the greatest potential for tire sector contributions





8.4

Improve progressively through 2030 global resource efficiency in consumption and production, and endeavor to decouple economic growth from environmental degradation in accordance with the 10-year framework of programs on sustainable consumption and production with developed countries taking the lead.



9.4

9.5

By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, all countries taking action in accordance with their respective capabilities.

Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and substantially increasing the number of research and development workers per 1 million people and public and private research and development spending.



10.3

10.4

Ensure equal opportunity and reduce inequalities of outcome, including through eliminating discriminatory laws, policies and practices and promoting appropriate legislation, policies and actions in this regard.

Adopt policies especially fiscal, wage, and social protection policies and progressively achieve greater equality.



12 RESPONSIBLE CONSUMPTION AND PRODUCTION



12.2 12.4 12.5 12.6 12.8

By 2030, achieve the sustainable management and efficient use of natural resources.

By 2030, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment.

By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse.

Encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle.

By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature.



③ Impact pathways



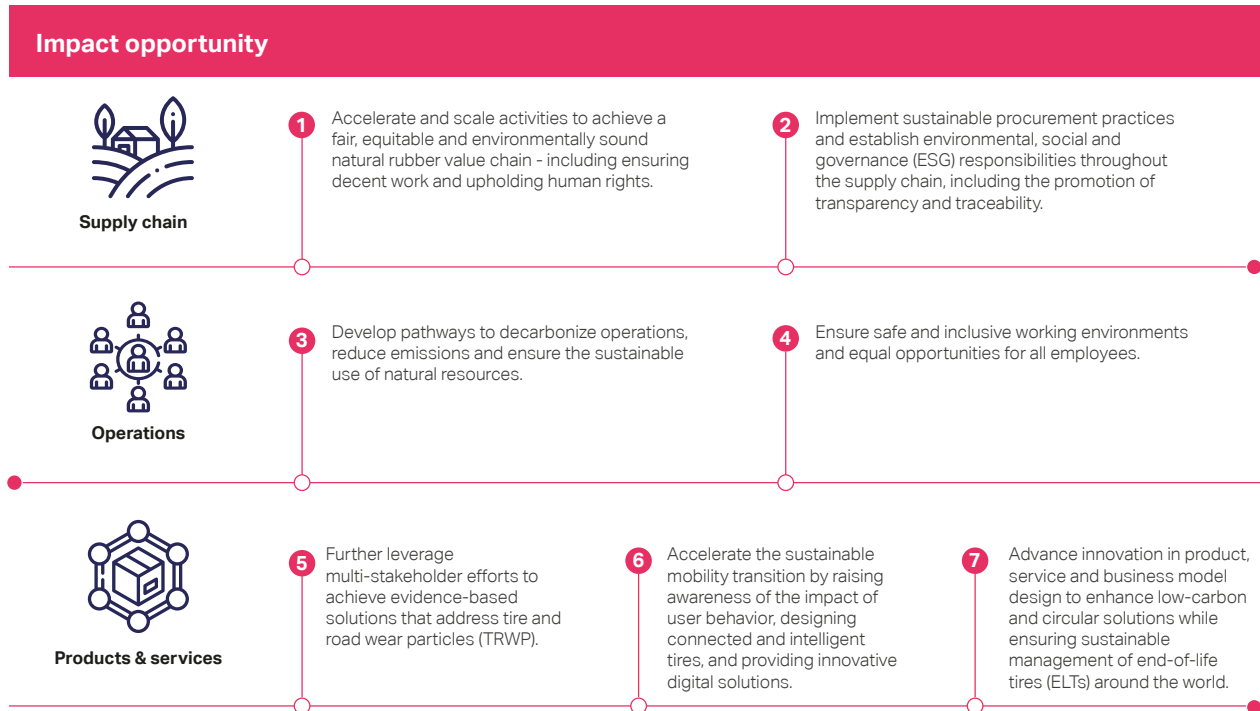
③ Impact pathways

TIP identified seven opportunities where the tire sector can have transformative

impact and contribute to the SDGs across three main themes: supply chain, operations, and

products and services (Figure 10).

Figure 10: Impact opportunities for the tire sector



To realize these opportunities, TIP developed impact pathways comprising a series of tangible actions mapped against several variables (*Table 3*).

Table 3: Impact pathways and their actions

Level of potential impact	Time frame	Level of contribution and control	SDG target	Stakeholders
Level of potential impact that each action can have on the SDGs	Time frame by which the action will begin to show expected outcomes	Level of contribution and control the tire sector has to progress the action	Links with SDG targets	Stakeholders
<p>L Low The action will have a small, but necessary, role in contributing to the identified SDGs</p> <p>M Medium The action will have a significant role in contributing to the identified SDGs</p> <p>H High The action will have a pivotal role in contributing to the SDGs</p>	<p>S Short-term 1 to 3 years</p> <p>M Medium-term 4 to 6 years</p> <p>L Long-term 7 or more years</p>	<p>Lead The sector has a high degree of control and can make a significant contribution</p> <p>Accelerate The sector has medium control and can directly contribute and/or accelerate current actions</p> <p>Influence The sector has little control and can mainly contribute by influencing the action</p>	<p>Each action is mapped against the SDG targets where there is greatest potential for contribution</p> <p>The SDG targets with the most direct links are highlighted to help further focus SDG prioritization but this does not indicate that this SDG target has the most opportunity for impact</p>	The partners and stakeholders who must be involved to achieve high impact

The seven impact pathways are laid out in tables across the following pages alongside illustrative examples from TIP members that provide insights on concrete actions that are already underway to deliver on the ambitions at the heart of the SDGs.



IMPACT PATHWAY 1: Supply Chain - Accelerate and scale activities to achieve a fair, equitable and environmentally sound natural rubber value chain – including ensuring decent work and upholding human rights.

Natural rubber, primarily sourced from the rubber tree (*Hevea brasiliensis*), is an important raw material for the manufacturing of tires. Over 70% of natural rubber is used by the tire sector⁴ globally and 85% of the global natural rubber is produced by more than 6 million smallholders.⁵ With increasing global demand for natural rubber, this is a commodity where without proper controls and standards, there can be negative impacts in the supply chain both socially and environmentally.

In 2017, TIP CEOs committed to improving the sustainability of the natural rubber value chain. In 2018, TIP members initiated the Global Platform for Sustainable

Natural Rubber (GPSNR). GPSNR works to achieve its vision of a fair, equitable and environmentally sound natural rubber value chain and in doing so actively contributes to the fulfillment of the SDGs. The first 18 months of GPSNR operations saw the platform welcome over 90 members, including natural rubber producers (including smallholders from Brazil, Côte d'Ivoire, Ghana, Indonesia, Myanmar, Thailand and Vietnam), processors and traders, tire makers, other rubber makers and buyers, car makers, other downstream users, and financial institutions and civil society organizations.

In addition to supporting and leveraging GPSNR activities, the tire sector has an opportunity to further scale and accelerate efforts to tackle complex environmental and socio-economic issues in the natural rubber value chain, such as access to education and sustainable livelihoods for the millions of smallholder producers on which it depends (*Table 4*).



Table 4: An overview of the actions identified under impact pathway 1



Actions	Level of impact on SDGs	Time frame	Tire sector contribution	SDG target contribution
1.1 Enhance efforts to ensure sustained, inclusive and sustainable economic growth of the natural rubber value chain through alignment and commitment to the Global Platform for Sustainable Natural Rubber (GPSNR) policy framework (refer to the business example that follows for more detail on components of the policy framework).	H	S	Accelerate	8.4 8.8 10.1 12.2 13.3 15.1 15.2 15.5
1.2 Take a risk-based approach to continually improve the sustainability of natural rubber and align to the GPSNR Implementation Guidance (under development), which will outline policy implementation actions for players at different supply chain stages.	H	M	Accelerate	8.4 12.2 13.3 15.1 15.2 15.3 15.5
1.3 Improve access to and quality of all levels of education and vocational training for women, youth and vulnerable groups across the natural rubber value chain. Supporting the equitable inclusion of women across natural rubber operations.	H	M	Accelerate	4.5 8.6
1.4 Enable smallholders to access advanced farming techniques and knowledge on best practices to increase rubber yields, halt biodiversity loss, preserve future soil health and secure income.	H	L	Accelerate	2.3 2.4 4.7 8.2 8.4 10.1 12.8 15.1 15.2 15.3 15.5

Low (L) Medium (M) High (H) Short (S) Medium (M) Long (L)

STAKEHOLDERS

The following stakeholders will need to be involved to ensure the success of the actions outlined in this pathway: GPSNR; companies worldwide that use

natural rubber; suppliers; industry associations; governments of key producing countries; Chinese stakeholders; global and local NGOs; customers and original equipment

manufacturers; smallholder farmers; plantation owners and operators; and related associations.

BUSINESS EXAMPLES

The initiation of a global platform to achieve a sustainable natural rubber value chain

GPSNR is committed to promoting the uptake of sustainable natural rubber globally by addressing forest and other ecosystem conversion, biodiversity loss, human and labor rights violations and inequality in the natural rubber supply chain.

In September 2020, GPSNR published a policy framework that outlines a series of policy components that company members are required - as part of their commitments as members - to include in their sustainable production and purchasing policies and other documents.

The policy components are spread across eight themes with commitments to:

1. Legal compliance;
2. Healthy, functioning ecosystems;
3. Respecting all human rights;
4. Community livelihoods;
5. Increased production efficiency;

6. Systems and processes to drive effective implementation of policy components;
7. Supply chain assessment, traceability, and management
8. Monitoring and reporting on progress on, and conformance with policy components.

As part of membership requirements, members are required to adopt a policy or other documents that include the GPSNR policy components adapted to the particular context and supply chain position in 2021. The components are aligned with the principles and guidelines laid out in the UN Global Compact, the UN Guiding Principles for Business and Human Rights, the International Bill on Human Rights, and the International Labour Organization Fundamental Conventions.

Securing smallholder representation was a platform priority. A series of outreach activities, including workshops

in Asia, Latin America and West Africa, culminated in the creation of a GPSNR membership category for smallholder producers, with over 40 members and three representatives at executive committee-level, providing smallholders with equal representation and a role in platform decision-making. Smallholders and small natural rubber growers (i.e., natural rubber plantations of no more than 50 hectares) and small trader members are not required to develop and implement a formal policy, although they are required to adhere to buyers' policies, and if they are members, they are required to sign the GPSNR Founding Members statement that includes the 12 GPSNR principles.

More information on GPSNR, the policy components and implementation guidance can be found at <https://sustainablenaturalrubber.org/>.

Traceability and sustainability in the rubber supply chain: A Continental and GIZ project in West Kalimantan

Since 2018, **Continental** has worked with the German development agency, **Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)**, to provide tailored training programs for local natural rubber farmers in the Indonesian province of West Kalimantan, Borneo. The project delivers training on sustainable cultivation practices and has helped improve the quality of the natural rubber produced, allowing local producers to increase their revenue on average by 10-15%.

The supply chain is documented with a digital traceability system where the production areas are mapped by GPS. The app-based system documents raw rubber deliveries and sale prices upon delivery, which helps to prevent rubber from entering the supply chain from non-registered areas, such as illegally deforested areas, by indicating if the quantity received exceeds the expected production volume.

In cases of significant oversupply, the app notifies field agents who proceed to clarify the gap between

the expected and actual volumes of natural rubber and engage in dialogue with farmers.

This approach facilitates sustainable rubber cultivation and directly supports improvements in small-scale producer productivity and incomes, resource efficiency, and protection of biodiversity and natural habitats.

www.giz.de/en/html/index.html
www.youtube.be/uVsd3oOTDCU




IMPACT PATHWAY 2: Supply Chain - Implement sustainable procurement practices and establish environmental, social and governance (ESG) responsibilities throughout the supply chain, including the promotion of transparency and traceability.

Tires can contain more than 100 different materials, including natural and synthetic rubbers, carbon black and silica, metal cables and textile reinforcements, and specific chemical ingredients – all of which give tires their necessary

performance characteristics.⁶ The tire sector has a significant opportunity to scale impact far beyond the boundaries of its own operations by implementing sustainable procurement practices that identify and tackle material

issues. Sustainable supply chain programs should be developed inclusively with suppliers and relevant stakeholders and build on existing initiatives to maximize reach and impact (*Table 5*).

Table 5: An overview of the actions identified under impact pathway 2

SDG impact	 <small>TARGET 8-4</small> <small>8 DECENT WORK AND ECONOMIC GROWTH</small> <small>IMPROVE RESOURCE EFFICIENCY IN CONSUMPTION AND PRODUCTION</small>	 <small>TARGET 12-2</small> <small>12 RESPONSIBLE CONSUMPTION AND PRODUCTION</small> <small>SUSTAINABLE MANAGEMENT AND USE OF NATURAL RESOURCES</small>	 <small>TARGET 12-6</small> <small>12 RESPONSIBLE CONSUMPTION AND PRODUCTION</small> <small>ENCOURAGE COMPANIES TO ADOPT SUSTAINABLE PRACTICES AND SUSTAINABILITY REPORTING</small>			
Actions	Level of impact on SDGs	Time frame	Tire sector contribution	SDG target contribution		
2.1 Develop and drive effective implementation of corporate sustainable sourcing policies and practices, including: environmental and social/human rights due diligence, effective governance, transparency and disclosure standards.	(M)	(S)	Lead	8.7 8.8 12.6		
2.2 Improve transparency, traceability and sustainable production of materials in the sector's supply chain through identification, prioritization and management of risks and opportunities.	(H)	(M)	Accelerate	8.4 8.7 8.8 12.2		
2.3 Advance supplier performance through engagement and participation in multi-stakeholder efforts to sustainably manage the use of natural resources and reduce operational impacts on the environment, including suppliers' own GHG emissions.	(H)	(M)	Lead	7.2 7.3 8.4 12.2 12.4 12.5 15.1		

STAKEHOLDERS

The following stakeholders will need to be involved to ensure the success of the actions outlined in this pathway: responsible supply chain and materials associations;

trade associations; regional institutions and governments; suppliers; research institutions and academia; NGOs, customers and original equipment manufacturers,

and peer companies from other sectors that have similar supply chain materials or issues.

BUSINESS EXAMPLES

Reducing supply chain GHG emissions

Recognizing the opportunity that the supply chain presents to reduce GHG emissions, TIP members engage suppliers to drive climate action.

Michelin has GHG reduction targets approved by the Science Based Targets initiative (SBTi) and has also encouraged its main raw material suppliers to set science-based targets for GHG emissions reductions, with the objective that, by 2024, suppliers responsible for 70% scope 3 emissions related to purchased goods and services will have set targets.

Pirelli has SBTi-approved GHG reduction targets that have been set in line with maintaining climate warming well below 2°C.

This includes cutting the absolute CO₂ emissions linked to the acquisition of raw materials by 2025 by 9% compared to 2018. Pirelli is working with its suppliers to reduce their carbon footprints using mechanisms that consider potential impacts and opportunities, including material life cycle assessments and direct engagement.

Michelin, Pirelli and Yokohama Rubber use the Carbon Disclosure Project (CDP) Supply Chain Program

to engage their leading raw materials suppliers, pinpoint risks and identify emissions reductions opportunities. This process has played an important role in driving effective action across the supply chain by encouraging the deployment of best practices to reduce GHG emissions. Additionally, the CDP Supplier Engagement Rating Leaderboard highlights **Bridgestone, Continental and Michelin** as they play a crucial role in the transition to the net-zero sustainable economy by engaging their suppliers on climate change.

www.cdp.net/en/supply-chain

Improved assessment of the potential environmental impacts of tires: Raw materials

A Product Category Rule (PCR) is an agreed-to, industry-specific guideline used to determine the environmental impacts of a product. It allows manufacturers to develop Environmental Product Declarations (EPDs), which are an internationally recognized way to verify the potential environmental impacts of a product, including the establishment of product life cycle assessments (LCAs).

TIP developed a PCR for tires in an important proactive step in developing internationally useful guidelines to measure the environmental impacts of tires.

The standardized approach taken by a PCR can give consumers confidence in the information disclosed by the tire industry on the environmental impacts of its tire products.

By improving awareness of potential environmental impacts, the PCR for tires contributes to industry efforts to improve the sustainable performance of tire products.

In 2020, TIP initiated an update of the PCR with the intent to incorporate guidelines to calculate the environmental impacts linked

to the manufacturing of the raw materials used in tire production. These new guidelines will strengthen the PCR by providing increased consistency and contribute to dialogues between supply-chain actors on the sustainable sourcing and use of raw materials.

IMPACT PATHWAY 3: Operations - Develop pathways to decarbonize operations, reduce emissions and ensure the sustainable use of natural resources.

The World Economic Forum *Global Risk Report* highlights environmental concerns as the top issues for the first time in history, including risks such as extreme weather, climate action failure, natural disasters, biodiversity loss, and human-made environmental disasters. Despite at least 177 companies,⁷ 67 countries

and 8 US states⁸ having made net-zero pledges, more urgent action and ambition is needed to keep global warming below 1.5°C and to ensure a stable, inhabitable planet for everyone. Increasing demands from investors, consumers and civil society to use science-based approaches, optimize energy

efficiency and protect nature present an opportunity for all industrial sectors, including the tire sector, to demonstrate leadership through continuous improvement and implementing practices to scale innovations that will improve environmental performance (*Table 6*).

Table 6: An overview of the actions identified under impact pathway 3

SDG impact	TARGET 6-4 INCREASE WATER USE EFFICIENCY AND ENSURE FRESHWATER SUPPLIES 6 CLEAN WATER AND SANITATION	TARGET 9-4 UPGRADE ALL INDUSTRIES AND INFRASTRUCTURES FOR SUSTAINABILITY 9 INDUSTRY, INNOVATION AND INFRASTRUCTURE	TARGET 12-2 SUSTAINABLE MANAGEMENT AND USE OF NATURAL RESOURCES 12 RESPONSIBLE CONSUMPTION AND PRODUCTION	TARGET 12-5 SUBSTANTIALLY REDUCE WASTE GENERATION 12 RESPONSIBLE CONSUMPTION AND PRODUCTION
Actions	Level of impact on SDGs	Time frame	Tire sector contribution	SDG target contribution
3.1 Expand the use of low-carbon energy sources and optimization practices to mitigate emissions and move towards net-zero emissions for scope 1 and 2 by 2050. Note: The scope 3 categories that are most material to the sector are addressed in the supply chain (IP2.3) and product (IP7.5) impact pathways.	M	L	Lead	7.2 7.3 9.4 12.2 13.3
3.2 Accelerate and scale best practices to optimize distribution and logistics operations by using alternative fuels and implementing technologies that improve fuel efficiency, load optimization and routes (and cascade these best practices to suppliers if they manage logistics).	M	M	Accelerate	12.2 13.3
3.3 Upgrade and retrofit infrastructure to increase resource-use efficiency and greater adoption of sustainable technologies and industrial processes, including building capability and incentivizing the sharing of best practices.	M	L	Lead	8.4 9.4 13.3
3.4 Apply risk management concepts to drive water stewardship efficiency and address physical, regulatory and operational risks.	L	M	Lead	6.4 12.2
3.5 Reduce operational waste and emissions to air, water and soil, with a particular focus on volatile organic compounds (VOCs) and chemicals of potential concern.	H	L	Lead	9.4 11.6 12.4 12.5 14.1

STAKEHOLDERS

To ensure the success of each action outlined in this pathway, the following groups of stakeholders will need to be involved. For Action 3.1, suppliers and electric utilities. For Action 3.2, suppliers; distribution and logistics providers; customers;

and other sectors operating in the same locations. For Action 3.3, communities; governments and municipalities; other sectors with the same challenges. For Action 3.4, companies, organizations and sectors linked to a specific watershed.

For Action 3.5: governments; trade associations; NGOs; Global New Car Assessment Programs; original equipment manufacturers; vendors; customers; suppliers.

BUSINESS EXAMPLES

Decarbonizing operations

As described in the 2020 TIP's *Environmental Key Performance Indicators for Tire Manufacturing 2009-2019* report, the weighted average CO₂ intensity (CO₂ per ton of production) for TIP members decreased by 6% between 2015 and 2019. The implementation of decarbonization measures and the adoption of an energy mix with a greater share of renewable sources drove this reduction.

To limit energy loss and optimize the efficiency of their plant facilities, **Kumho Tire** and **Toyo Tires** have conducted regular audits to detect and prevent air and

heat loss. Similarly, **Goodyear** commissioned third-party audits at 18 manufacturing plants, resulting in the identification of more than 500 projects with potential savings of approximately USD \$15 million, including the installation of energy-saving solutions such as efficient air compressors, heat pumps and LED lightings.

TIP members such as **Kumho Tire**, **Yokohama Rubber** and **Hankook** are targeting a switch to renewable energy and have installed photovoltaic solar panels at plant facilities. TIP members are also transitioning from the use of heavy fuel for heat generation to natural gas, low-carbon steam, including thermal energy from biomass,

and the use of absorption chilling. For example, the **Hankook** plant in Daejeon, South Korea, made the switch to low-carbon steam, reducing GHG emissions by approximately 25,000 tCO₂-eq per year. Several TIP members have joined international global initiatives to reinforce their efforts to decarbonize. For example, **Pirelli** has committed to achieving group carbon neutrality by 2030, a commitment underpinned by the company's goal to use 100% renewable electrical energy by 2025.

Complementing decarbonization with offsetting

Carbon offsetting has been employed to complement industry efforts to achieve the decarbonization of operations. Contributions to the development of carbon sinks and the financing of sequestration projects remain practical means to drive action to achieve net-zero.

Kumho Tire initiated the Carbon Offset Forestation Project in 2015 in collaboration with the Seoul Municipal Government. The project saw the planting of 20,000 trees in the northern part of Seoul, which are expected to absorb approximately 1,380 tons of carbon dioxide over the next 30 years.

Yokohama Rubber planted more than 900,000 trees through its Forever Forest project. In addition to carbon offsetting, the trees are expected to contribute to disaster prevention and the promotion of biodiversity through the provision of new habitats. Yokohama Rubber aims to plant 1.3 million trees in 17 countries by 2030.

Mitigating risk in water-stressed areas

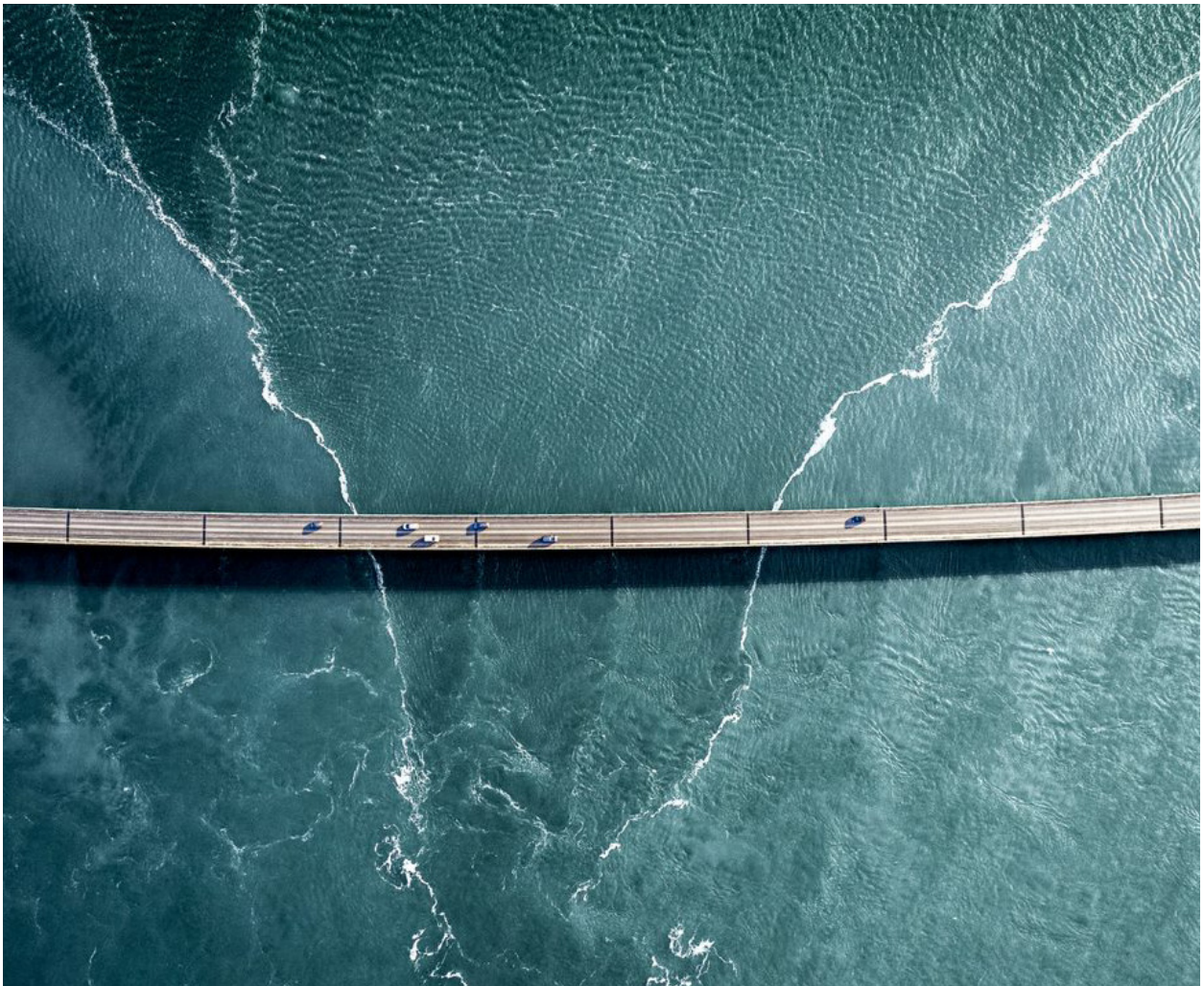
Water optimization projects led by TIP members help reduce water consumption and mitigate risk in water-stressed areas. All TIP members have set targets for their manufacturing sites to reduce water withdrawal and use and to increase water recycling volumes. Leak prevention and water reuse and recycling are common features of strategies to reduce abstraction.

Cooper Tire completes water stress studies globally at manufacturing locations on a regular basis using Aquastat, the World Resources Institute (WRI) Aqueduct Risk Assessment tool and the Growing Blue Tool.

The company contributes to relieving local water stress at its facility in El Salto, Mexico, by treating industrial and sanitary wastewater that is then used for irrigation.

Sumitomo Rubber aims to achieve a wastewater recycling rate of 100% at all of its 26 factories by 2050. In 2018, Sumitomo implemented water recycling measures at its manufacturing plant in Cankiri, Turkey, which is located in a region of high water stress. By the end of 2019, the factory was able to recycle 100% of its wastewater for use in applications including the watering of trees located on factory grounds. By 2021, Sumitomo Rubber aims

to replicate this success at its factory in Changshu, China. By 2019, Sumitomo had achieved a year-on-year 2.5% reduction in global water usage. The Sumitomo group makes use of the WBCSD Global Water Tool and the WRI Aqueduct Risk Assessment tool, and will continue to implement recycling technologies across its manufacturing sites to achieve its long-term wastewater recycling rate objective.



IMPACT PATHWAY 4: Operations - Ensure safe and inclusive working environments and equal opportunities for all employees.

Significant growth, productivity and performance improvements are available to companies that commit to improving all aspects of diversity and inclusion in policies and practices⁹ - and evidence suggests that diverse organizations are more attractive to prospective employees¹⁰ and better at

responding to customers. TIP members acknowledge that companies have a responsibility to ensure decent work and to respect and remedy human rights – including ensuring safe working conditions, acceptable job quality¹¹ and that employee health and well-being is paramount. By establishing progressive practices that

consider local cultural context, the tire sector has the opportunity to contribute to increased diversity in technical schools and functions, recruit and retain top talent, and establish a pipeline of future candidates with diverse skills, opinions and backgrounds (Table 7).

Table 7: An overview of the actions identified under impact pathway 4

SDG impact	TARGET 5-5 ENSURE FULL PARTICIPATION IN LEADERSHIP AND DECISION-MAKING	TARGET 10-3 ENSURE EQUAL OPPORTUNITIES AND END DISCRIMINATION	TARGET 10-4 ADOPT FISCAL AND SOCIAL POLICIES THAT PROMOTE EQUALITY			
Actions	Level of impact on SDGs	Time frame	Tire sector contribution	SDG target contribution		
4.1 Adopt policies, especially employee well-being, occupational health, fiscal, wage and social protection policies, and progressively achieve greater diversity, inclusion and equality.	(H)	(S)	Lead	8.5 8.8 10.3 10.4		
4.2 Ensure women's full and effective participation and equal opportunities for leadership at all levels.	(H)	(M)	Accelerate	4.5 5.5 10.3		
4.3 Build capabilities to increase diversity and inclusion of all into the talent pool for the sector, including driving access to higher education institutions.	(M)	(M)	Accelerate	4.4 4.5 10.2 10.3		

STAKEHOLDERS

To ensure the success of each action outlined in this pathway, the following stakeholders will need to be involved: other sectors and peers with similar challenges, trade associations, local communities, governments and research institutes, and academia for the Action 4.3.

BUSINESS EXAMPLES

Closing the gender gap

The tire industry has significant opportunities to increase the representation of women within the workforce and corporate leadership. Recognizing this, TIP members have set targets to increase the number of women leaders within their companies. **Sumitomo Rubber**

doubled the number of women in management positions between 2014 and 2020. **Yokohama Rubber** established a taskforce to support the advancement of women's careers, through training, flexible working arrangements, and job-return and rehire policies. In 2019, the taskforce's scope

was expanded to a "Diversity Promotion Taskforce" to promote diverse workstyles that will enable not only women, but also foreign employees, employees with disabilities or LGBTQ employees to have equal opportunities within the company.

Social inclusion

Through participation in the French Government's urban renewal initiative – *Pacte Avec les Quartiers pour Toutes les Entreprises (PAQTE)* – **Michelin** France demonstrated its commitment to social inclusion through a series of actions delivered through purchasing, recruitment and training practices. Actions included the hosting of groups of students and young school-leavers for a week of immersion in the company. The program also saw 14 refugees complete 16 months of training to become factory-maintenance agents and the hiring of 20 young people from deprived neighborhoods. Additionally, Michelin uses a simulation-based process to recruit

operators that is designed to assess the agility and potential of candidates rather than their experience. Michelin also supports inclusive procurement and spent EUR €1.5 million in 2020 on the products and services of companies that the French Government recognizes as active and specialized recruiters of people with disabilities. Learn more: www.paqte.fr/entreprise/michelin/

Hankook established Hankook Donggeurami Partners in 2015 to provide opportunities to the underprivileged and contribute to the growth and development of local communities. The company is a service provider for Hankook Tire & Technology's welfare business operations and administrative support areas. In 2019, a total of 159 people with disabilities

were hired, with diversity fully respected in the recruitment process. In April 2019, the company was honored with the Prime Minister's Citation at the 2019 Inclusive Employment Awards in recognition of its efforts to promote stable and desirable employment opportunities for people with disabilities. It will continue to expand the program.





IMPACT PATHWAY 5: Products and Services - Further leverage multi-stakeholder efforts to achieve evidence-based solutions that address tire and road wear particles (TRWP).

An important focus of TIP’s research is to contribute to a better scientific understanding of any potential human health and environmental impacts of the particles generated

during the normal use of tires. Stakeholder interest in topics sometimes associated with TRWP – such as microplastics and air quality – present opportunities for the sector to

engage with a diverse group of stakeholders and experts to contribute to evidence-based solutions (Table 8).

Table 8: An overview of the actions identified under impact pathway 5

SDG impact	 TARGET 12-4 RESPONSIBLE MANAGEMENT OF CHEMICALS AND WASTE	 TARGET 12-6 ENCOURAGE COMPANIES TO ADOPT SUSTAINABLE PRACTICES AND SUSTAINABILITY REPORTING			
Actions	Level of impact on SDGs	Time frame	Tire sector contribution	SDG target contribution	
5.1 Develop standardized methodologies and definitions – that stakeholders widely adopt – for the identification and quantification of TRWP, including transparency and disclosure requirements.	(H)	(M)	Lead	12.6 12.8	
5.2 Continue research and dissemination of results to understand potential pathways and human health and environmental impacts of TRWP and tire tread materials.	(M)	(M)	Lead	12.4 12.6 14.1 15.1	
5.3 Engage with stakeholders and other sectors to identify and assess mitigation options (e.g., product innovation, user behavior, road characteristics, street sweeping and maintenance, road run-off management, water treatment systems).	(H)	(M)	Accelerate	9.5 12.4 14.1 15.1	

STAKEHOLDERS

The following stakeholders will need to be engaged to ensure the success of the actions outlined in this pathway: trade associations;	European TRWP platform; governments and municipalities; research institutes; academia; OECD (Organisation for Economic Co-	operation and Development); other sectors, including asphalt, road and original equipment manufacturers; and NGOs.
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BUSINESS EXAMPLES

Contributing to a scientific understanding of TRWP

It is common knowledge that tires wear during normal use but questions remain about the characteristics of tire wear particles, what happens to the particles once generated, and if the particles pose potential risks to human health and the environment.

TIP has been working since 2005 to support scientific research and method development to help improve scientific understanding of the physical and chemical characteristics of TRWP and

has conducted risk assessments that have contributed to a better understanding of the potential impacts of TRWP on human health and the environment.

TRWP are a mixture of tire tread and road pavement material produced by the friction between tires and the road surface. Research has found that most TRWP are expected to be deposited on roadside soil and that TRWP are unlikely to negatively impact human health and the environment; however, this is a relatively new field of research and TIP is engaged in continued

studies in collaboration with multiple institutions to improve scientific understanding of the environmental fate and potential risks associated with TRWP.

Understanding the potential health and environmental impacts of TRWP remains a TIP priority. A full list of TIP sponsored peer reviewed studies is available via www.wbcasd.org/tip.

Addressing TRWP: A multi-stakeholder approach

TRWP mitigation requires the engagement of multiple stakeholders to consider relevant factors such as driving behavior, road and vehicle characteristics, tire design, transport infrastructure design and the presence or capacity of wastewater treatment plants.

The European Tyre and Rubber Manufacturers' Association (**ETRMA**) – with the facilitation of CSR Europe – launched a multi-stakeholder TRWP initiative in 2018: the European TRWP Platform. The platform brings together representatives from governments, academia, non-governmental

organizations and different industries for open dialogue. It aims to share scientific knowledge of the potential effects of particles generated during normal tire use and wear and co-design TRWP mitigation solutions.

www.tyreandroadwear.com



IMPACT PATHWAY 6: Products and Services - Accelerate the sustainable mobility transition by raising awareness of the impact of user behavior, designing connected and intelligent tires, and providing innovative digital solutions.

The performance of tires, including their safety, has long been a focus for continuous improvement by TIP member companies and the tire sector more broadly. As the transition to sustainable mobility progresses, driven by innovation and the rapid digitalization, automation and adoption of new technologies (such as artificial intelligence,

internet of things, 5G and more), the sector will continue to play an indispensable role in ensuring safe mobility. Users also have important influence over the safety and environmental performance of tires and various modes of transport through actions including driving behavior and tire maintenance.

With autonomous, electric and connected vehicles, mass transit and micro-mobility all becoming more commonplace, the tire sector has a tremendous opportunity to design and manufacture new tire solutions and engage stakeholders to drive sustainability progress (Table 9).

Table 9: An overview of the actions identified under impact pathway 6

SDG impact	TARGET 3-6 REDUCE ROAD INJURIES AND DEATHS	TARGET 9-5 ENHANCE RESEARCH AND UPGRADE INDUSTRIAL TECHNOLOGIES	TARGET 11-2 AFFORDABLE AND SUSTAINABLE TRANSPORT SYSTEMS	TARGET 12-2 SUSTAINABLE MANAGEMENT AND USE OF NATURAL RESOURCES	TARGET 12-8 PROMOTE UNIVERSAL UNDERSTANDING OF SUSTAINABLE LIFESTYLES
Actions	Level of impact on SDGs	Time frame	Tire sector contribution	SDG target contribution	
6.1 Promote safe mobility and contribute to reducing global deaths and injuries from road traffic accidents through engagement with stakeholders to raise awareness for behavior change.	H	M	Lead	3.6* 11.2	
6.2 Develop vendor and user awareness campaigns to improve understanding of tire life cycle impacts and opportunities, and uptake of measures to reduce environmental impacts.	H	S	Accelerate	3.6 4.7 11.2 12.8 13.3	
6.3 Create and promote standards and governance to accelerate data-sharing capacity among mobility actors and with public authorities to improve tire safety and efficiency (resource use) continuously.	H	M	Accelerate	3.6 11.2 12.2	
6.4 Research the impacts (risks or benefits) of emerging digital solutions and sustainable mobility trends on the incumbent industry business models to outline the opportunities and required shifts towards sustainability.	M	M	Lead	3.6 9.5 11.2	
6.5 Contribute to building new strategic frameworks for improved modes of sustainable transport through strong engagement with cross-sectoral and multi stakeholder groups.	H	L	Influence	11.2	

*By the end of 2020, it was intended that 21 of the 169 Sustainable Development Goal targets were to have been realized, including SDG 3.6. In 2020, given the outlook that the target was unlikely to be met by the end of the year, the UN proclaimed the period of 2021-2030 as the second Decade of Action for Road Safety and revised the target date for Target 3.6 to 2030.

STAKEHOLDERS

The following stakeholders will need to be involved to ensure the success of the actions outlined in this pathway: governments; trade associations and customers.

In addition, achieving Action 6.1 will require the involvement of these stakeholders: NGOs; Global New Car Assessment Programme; original equipment manufacturers; vendors.

Achieving Actions 6.2, 6.3 and 6.4 will require the involvement of these stakeholders: sustainable mobility actors; digital solutions and/or data management providers.

BUSINESS EXAMPLES

Digital and smart solutions for safer and more sustainable mobility

Leading tire manufacturers are developing smart solutions that bring opportunities and benefits for mobility stakeholders, including increased safety, new services and better management of the tire life cycle.

With embedded sensors, chips or tags, intelligent and connected tires can transmit real-time information to the vehicle or surrounding mobility devices to help enable safe and sustainable mobility.

Toyo Tires is developing tire sensing technology that enables the real-time visualization of tire performance. This technology monitors tire and road conditions while driving, allowing for the real-time display of tire performance which supports safer driving.

Sumitomo Rubber worked with Kansai University in Japan to develop technology that harnesses the rotational movement of tires to generate electricity as a potential source of power for digital devices.

Goodyear has partnered with several companies to test connected tires, gathering more than 3 million miles of driving data. Tires embedded with sensors measure characteristics of the tire, such as tire wear, load, inflation and temperature, along with road surface conditions, leading to potential enhanced vehicle performance and safety. Initial studies have shown that connected tires can improve a vehicle's stopping distance by as much as 30%.

As the world transitions to electric and autonomous vehicles, intelligent tires can increase electric vehicle range and provide valuable information about road conditions to autonomous vehicles.

Michelin has developed technology that enables farmers to change tire pressure from the tractor cabin when they go from the field to the road and vice-versa, helping them protect the soil, improve operational safety and optimize the use of their vehicles and tires.

With integrated technologies, tire makers can provide products and services that go beyond tires, including fully integrated fleet management solutions. **Bridgestone** offers a fleet optimization service that more than 900,000 vehicle owners have adopted. By managing data related to overall vehicle performance (fuel efficiency, navigation, maintenance) the service enables real-time adjustments to operations to contribute to improvements in fleet safety, efficiency and productivity and has helped customers achieve 10-25% reductions in fuel consumption and carbon emissions.

Road safety education

SDG 3.6 specifically focuses on the urgent need to address road traffic safety. In August 2020, the UN General Assembly adopted a resolution to improve global road safety, proclaiming a new Decade of Action for Road Safety 2021-2030. The Plan of Action will align with the Stockholm Declaration, which emphasizes the importance of a holistic approach to road safety and calls for continued improvements in the design of roads and vehicles; the enhancement of laws and law enforcement on behavioral risks such as speeding and drinking and driving; and the provision of timely, life-saving emergency care for the injured.^{12, 13, 14}

Because tires are important to road safety, regional tire manufacturers' associations have worked with partners and stakeholders to target tire dealers, authorities and consumers with awareness-raising campaigns on best practices and procedures on tire maintenance, storage and service life. Programs include **ETRMA's** Tire Aware, **USTMA's** National Tire Safety Week, and **JATMA's** Tire Safety Campaign.

TIP members have also run their own awareness programs, including **Cooper's** satellite media tour during US National Safety Week, **Hankook's** Road Safety for Children program, **Kumho Tire's** General Public on Highway

Campaign, or **Toyo Tires'** Tire Safety Awareness Campaign using a driving simulator. These programs have reached millions of drivers worldwide, passing on essential know-how for the proper care and maintenance, and safer use of tires.

www.tyreaware.org/



IMPACT PATHWAY 7: Products and Services - Advance innovation in product, service and business model design to enhance low-carbon and circular solutions while ensuring sustainable management of end-of-life tires (ELT) around the world.

Whether through product, service or business model innovation, major opportunities exist for tire companies to improve business value – cost savings, access to new markets and more – by moving from linear to more circular value chains. A systematic life cycle approach must be taken to achieve a circular economy, which can result in better environmental performance and improved security of supply of raw materials. Indeed, tire companies are already exploring beneficial

uses for ELT and emerging technologies to recover raw materials from ELT. The sector also continues to invest significant effort in the research and development of new products and services, seeking to optimize the balance between related and/or interacting performance characteristics such as wet grip and rolling resistance to allow improved fuel efficiency, longevity and other sustainability outcomes. The design and manufacture of new tire solutions is a core

area of competition between tire companies that seek to innovate new and proprietary performance attributes for their customers. This Roadmap identifies a number of opportunities for legally permissible collaborations among stakeholders and also identifies opportunities that individual companies can choose to pursue within their own value chains to differentiate themselves in comparison to others (Table 10).

Table 10: An overview of the actions identified under impact pathway 7

SDG impact	TARGET 8-4 IMPROVE RESOURCE EFFICIENCY IN CONSUMPTION AND PRODUCTION	TARGET 12-2 SUSTAINABLE MANAGEMENT AND USE OF NATURAL RESOURCES	TARGET 12-5 SUBSTANTIALLY REDUCE WASTE GENERATION		
Actions	Level of impact on SDGs	Time frame	Tire sector contribution	SDG target contribution	
7.1 Develop standards to assess life cycle impacts of critical materials and business models, for use by individual companies.	M	S	Lead	8.4 12.2 12.5 12.8 13.3	
7.2 Establish cross-sectoral engagement supporting and enabling individual companies and their value chains to advance circularity and the development of alternative materials to reduce potential impacts on human health or the environment.	H	L	Accelerate	8.4 12.2 12.5 12.8	
7.3 Develop a standardized definition and methodology for circularity to allow improved tracking and understanding of individual company circularity performance. Promote innovation and eco-design principles to underpin individual company efforts across value chains to extend tire life, promote sustainable outcomes and transform end-of-life management options.	H	S	Lead	8.4 12.2 12.5 12.8 13.3	
7.4 Develop solutions to track and trace the flow of ELTs.	M	M	Accelerate	12.2 12.5 12.8	

7.5 Develop standards and scalable solutions that individual companies can use to advance product design to achieve more sustainable, low-carbon / circular outcomes, including but not limited to: promoting the appropriate reuse retreading of tires, optimizing tread wear, and reducing rolling resistance.	(H)	(L)	Accelerate	8.4 12.2 12.5 12.8 13.3
7.6 Foster new or improved ELT markets, management systems and recycling technologies that advance circularity.	(M)	(M)	Accelerate	8.4 12.2 12.5 12.8
7.7 Identify barriers, develop tools, exchange best practice, improve access to information and monitor progress on ELT collection and recycling – and use this information to engage stakeholders (including end-users and regulators in countries where ELT infrastructure is less developed) to promote circularity.	(M)	(S)	Lead	4.7 8.4 12.2 12.5 12.8

STAKEHOLDERS

Trade associations will be key to the success of all the actions outlined in this pathway. Actions 7.1, 7.2, 7.3 and 7.5 will also require involvement from: individual company value chains including suppliers; original equipment manufacturers; and customers; as well as research institutes and academia. NGOs; extended producer responsibility schemes; governments; recyclers and

collectors; original equipment manufacturers and downstream users will be vital to achieving Action 7.4. Action 7.5 will require the involvement of final users; governments; NGOs; Global New Car Assessment Programme (Global NCAP); and vendors. Suppliers; research institutes and academia; original equipment manufacturers and final users will be crucial to realizing Action 7.6.

In addition to trade associations, achieving Action 7.7 will require input from or interaction with: governments; individual company value chains including suppliers, original equipment manufacturers, and customers; end-users; NGOs; stakeholders in countries with the highest potential by volume of ELT generated (e.g., China) or low collection rates.



BUSINESS EXAMPLES

Bio-based materials

TIP members are investing in R&D to develop alternatives to natural rubber and petroleum-based products, for example:

Continental's Taraxagum project generates natural rubber from dandelions, opening up an alternative source of raw material that was used to develop Continental's first production-line bicycle tire made from dandelion-sourced natural rubber. The dandelions are cultivated, extracted and processed in Germany, near the tire production plant. Local production and extraction of raw materials provides an alternative to the long transport routes associated with natural rubber sourced from rubber trees, CO₂ emissions reductions and the conservation of resources. Continental's vision is to industrialize in 5-8 years and replace 10% of natural rubber by around 2035.

www.taraxagum.com

Manufacturers, including **Bridgestone** and **Cooper**, have invested in the development of Guayule, a rubber-producing plant indigenous to the hot and dry environments of the Southwestern United States and North-Central Mexico, as an alternative to natural rubber sourced from rubber trees.

Goodyear has replaced petroleum-based components with soybean oil in some tread compounds. Soybean oil can enhance tire performance and is sourced from a renewable, bio-based material. Additionally, the use of soybean oil promotes resource efficiency; only 65% of soybean oil produced in the US is used in food applications, so a significant surplus is available for other applications. Goodyear has successfully achieved its goal of increasing soybean oil consumption by 25% by 2020 vs. 2018 from suppliers focused on sustainable sourcing and continues to work to fully replace petroleum-derived oils by 2040.

Pirelli aims to use at least 40% renewable materials in selected consumer tires by 2025 while reducing fossil-derived materials to less than 40% and enhancing the potential of secondary materials in other processes, for example, developing lignin and deriving high-performance silica from rice husk. Lignin is a natural material sourced from paper pulp with antioxidant properties that can be used as a substitute for fossil-derived products to improve the performance of tires, a use for which Pirelli has already obtained a trademark. Rice husk is the main waste product of rice production and a source of silica that Pirelli has industrialized for tire production. Where fossil fuels are used to power manufacturing, the life cycle carbon footprint of rice-husk silica results in a reduction of one-and-a-half times the amount of CO₂ emitted per kilogram of silica compared to the conventional approach to manufacturing that uses quartz-sand silica.

Circular solutions: Recovered carbon black

Carbon black is the component that facilitates the vulcanization (hardening) process in tire production and gives tires their distinct black color.

Bridgestone has been an equity partner of Delta-Energy Group, LLC since 2014 and, in 2019, announced that a product of this partnership was the tire market's first at-scale use of recovered carbon black (rCB).

This marked a significant milestone in Bridgestone Group's long-term environmental vision of achieving 100% sustainable materials by 2050. The Delta-Energy Group process to extract materials produces 81% less CO₂ per ton compared to the use of virgin carbon black. By the end of 2020, Bridgestone planned to increase the use of rCB to 6,800 metric tons, equivalent to about 2 million ELTs

and a reduction of about 11,000 metric tons of carbon emissions – equivalent to the emissions resulting from powering 2,000 homes or more than 2,300 passenger vehicles for an entire year. Every year, through the partnership with Delta-Energy, Bridgestone will give material from millions of ELTs new life by using them in newly manufactured products.

Supporting global capacity building for improved end-of-life tire (ELT) management

Around 1 billion tires reach the end of their useful life as tires every year. Recovering ELTs reduces waste and provides a fuel and material resource that can replace other resource-intensive materials.

The majority of tires are recovered and reused. In fact, tires are one of the most heavily recycled consumer products. The global recovery rate is estimated to be between 70% and 90%, with rates exceeding 90% in well developed markets.

Tire trade associations have been working with regional stakeholders for several decades to incentivize existing markets and uses for ELTs, to identify and develop new

uses and markets, and to advance regulations that foster sustainable ELT markets.

An understanding of the status of global ELT management and best practices can help inform regional-level actions aimed at improved ELT management. Since 2008, **TIP** has initiated and supported extensive research on ELT management systems globally and is continually evaluating best practices, innovative methods, and recovery rates. This research is compiled in a series of reports, highlighting that cooperation between tire manufacturers, retailers and governments is essential if ELT are to be managed sustainably. The 2019 TIP report on *Global ELT Management: A global*

state of knowledge on regulation, management systems, impacts of recovery and technologies provides an overview of ELT data collected from 51 countries and an analysis of the recovery routes and most effective ELT management methods.

TIP's work on ELTs continues and includes a series of targeted stakeholder dialogue events worldwide, including the US, Europe and China, that aim to further sustainable ELT management through an action-oriented exchange of knowledge and good practices between stakeholders in the ELT value chain.

④ The road to 2030



④ The road to 2030

This Roadmap presents a shared vision for how the tire sector can drive progress to achieve the SDGs while creating business value. It demonstrates how the sector interacts with the SDGs and presents tangible actions that individual companies and the sector together can use to maximize positive impacts and minimize negative impacts.

TIP members have an important role to play in leading the implementation of the Roadmap – both collectively and individually – and are aware that achieving the SDGs will require collaboration among all stakeholders in accordance with competition laws. Therefore, all members of the sector (including those who are not members of TIP), alongside customers, consumers,

suppliers, governments, academia and NGOs, are encouraged to engage with the Roadmap in support of the 2030 Agenda. TIP encourages interested parties to contact TIP with questions and ideas on how to support projects or strengthen partnerships to accelerate SDG impact.

4.1 MEMBER ENGAGEMENT AT THE FOREFRONT

As a leading group of tire manufacturers, TIP members understand that they have a responsibility to drive progress on the SDGs within the industry. They also have a central role to play in engaging stakeholders and advocating for sector-wide progress across the Roadmap's impact pathways.

TIP members publicly report on their sustainability performance in accordance with internationally recognized reporting practices and standards, thereby demonstrating leadership and commitment to advancing sustainability.

As members of WBCSD, TIP members have also committed to working to achieve ambitious new WBCSD membership conditions for climate, nature, human rights, diversity and transparency by 2023.



Further, TIP members will:

- Engage individually with members of their value chain and other stakeholders to help advance the Roadmap;
- Leverage existing associations (e.g., regional trade associations), organizations and platforms, including the Global Platform for Sustainable Natural Rubber (GPSNR), and projects, such as TIP, to engage other actors on research, tools and frameworks that can contribute to the advancement of opportunities described in this Roadmap; and
- Explore new, legally permissible ways of working with their peers and value chain partners and stakeholders to further enhance dialogue and advance and leverage the Roadmap to drive change.

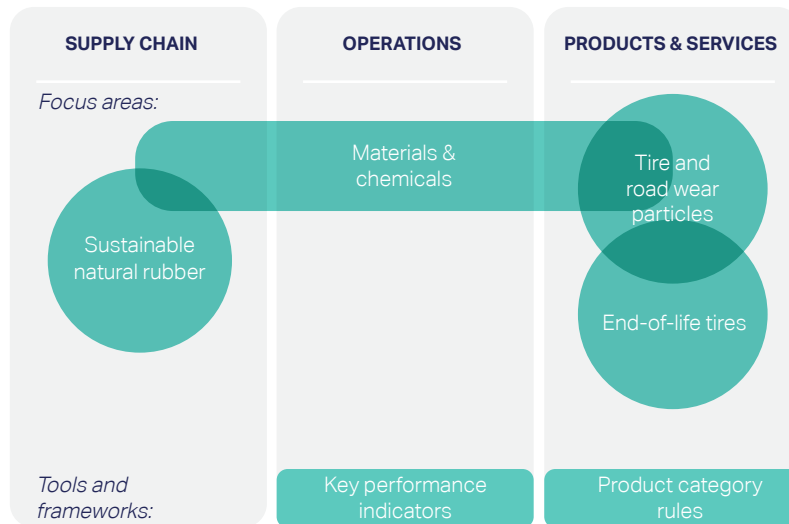
4.2 DRIVING EVIDENCE-BASED PROGRESS THROUGH TIP'S WORK PROGRAM

TIP facilitated the creation of this Roadmap to provide an inspirational tool for the tire

sector. In delivering its mission to anticipate, study and determine key potential environmental and human health issues associated with the tire life cycle, TIP's work program will also contribute to advancing the Roadmap. TIP focuses on key areas of the tire

life cycle, spanning the supply chain, operations, and products and services. It is also active in the development of tools and frameworks that help various members of the sector evaluate and improve environmental performance (Figure 11).

Figure 11: TIP work program



The TIP work program will contribute to actions identified in the Roadmap, including:

- Delivering new research on tire materials and TRWP, contributing to the actions of impact pathway 5;
- Increasing global knowledge of ELT management and engaging stakeholders to advance sustainable ELT management practices, contributing to impact pathway 7; and
- And updating and developing new tools and frameworks that contribute to better understanding the potential impact of tires throughout their life cycle and driving improved sustainability performance, contributing to impact pathways 2, 3, 6 and 7.

TIP will also continue to monitor and be supportive of GPSNR's progress, contributing to impact pathway 1.

TIP delivers its work program against a backdrop of potentially relevant WBCSD and other industry and stakeholder-driven programs and projects, with which it can explore value-added engagement.

4.3 ANTICIPATING FUTURE DEVELOPMENTS AND COMMUNICATING PROGRESS

TIP acknowledges that monitoring the progress of companies and the sector in their implementation of this Roadmap will be important to ensuring that the sector remains focused on optimizing its contributions to the SDGs. With current environmental KPIs¹⁵ for tire manufacturing in place, TIP will develop any additional indicators to measure progress by 2023.

To ensure the sector's contributions to the SDG agenda remain relevant and partnerships continue to focus on the areas where action is most needed, implementation of the Roadmap will require monitoring of emerging trends and developments that may ultimately influence the priorities outlined in this Roadmap.

TIP will produce a progress report by 2026 that will include reflections on important global developments and recommendations for actions

to ensure delivery on the SDGs remains optimal.

Get the latest information on the progress of Roadmap delivery at www.sustainabilitydriven.info; discover more about TIP at www.wbcsd.org/tip.

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CONTRIBUTORS

Members of TIP (in alphabetical order): Bridgestone, Continental, Cooper Tire, Goodyear, Hankook, Kumho Tire, Michelin, Pirelli, Sumitomo Rubber, Toyo Tires, and Yokohama Rubber.

COORDINATION

WBCSD: Anne-Cecile Remont, Gavin Whitmore, James Gomme, Uta Jungermann, Florian Micco, Elisa Pesce, Sheryne Hafez

ERM: Bryan Hartlin, Rosie Powell-Tuck

TIP SDG Working Group Co-Chairs: Ana Arce (Bridgestone), Maureen DeSanzo (Goodyear), Romain Bentz (Michelin)

CONTRIBUTING STAKEHOLDERS

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DISCLAIMER

This publication has been developed in the name of WBCSD. Like other WBCSD publications, it is the result of a collaborative effort by members of the secretariat and senior executives from member companies. A wide range of members reviewed drafts, thereby ensuring that the document broadly represents the perspective of the WBCSD membership. Input and feedback from stakeholders listed above was incorporated in a balanced way. This does not mean, however, that every member company or stakeholder agrees with every word.

ABOUT THE TIRE INDUSTRY PROJECT (TIP)

TIP - currently comprised of 11 leading tire companies - is the primary global forum for the tire industry on sustainability issues. Formed in 2005, TIP serves as a global, voluntary, CEO-led initiative representing more than 60% of the world's tire manufacturing capacity. Its aim is to proactively identify and study the potential human health and environmental impacts associated with the life cycle impacts of tires to proactively contribute to a more sustainable future.

Discover more about TIP: www.wbcسد.org/tip

Follow the latest Roadmap developments: www.sustainabilitydriven.info

ABOUT THE WORLD BUSINESS COUNCIL FOR SUSTAINABLE DEVELOPMENT (WBCSD)

WBCSD is a global, CEO-led organization of over 200 leading businesses working together to accelerate the transition to a sustainable world. We help make our member companies more successful and sustainable by focusing on the maximum positive impact for shareholders, the environment and societies.

Our member companies come from all business sectors and all major economies, representing a combined revenue of more than USD \$8.5 trillion and 19 million employees. Our global network of almost 70 national business councils gives our members unparalleled reach across the globe. Since 1995, WBCSD has been uniquely positioned to work with member companies along and across value chains to deliver impactful business solutions to the most challenging sustainability issues.

Together, we are the leading voice of business for sustainability: united by our vision of a world where more than 9 billion people are all living well and within planetary boundaries, by 2050.

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