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Introduction
Introduction

The Tire Industry Project (TIP) – currently comprised of 10 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.

Operating under the umbrella of the World Business Council for Sustainable Development (WBCSD), TIP’s aim is to proactively identify and address the potential human health and environmental impacts associated with the life-cycle impacts of tires to contribute to a more sustainable future. TIP members recognize that there are both opportunities and challenges associated with tire manufacturing and sustainable development.

In 2017, TIP published its first report on members’ environmental key performance indicators (KPIs).

Regularly updated, this fourth edition of the report presents data collected for the 2020 operating year. The report offers a view on the evolution of the environmental performance of TIP members’ tire manufacturing operations through the annual absolute and intensity KPIs, for the period 2009-2020.

The KPIs measure operational impacts of the tire industry related to manufacturing operations (energy consumption, CO₂ emissions, water intake and ISO 14001 certification) and the resulting report provides a common set of measurements – for year-over-year comparison – to assist and inspire individual company efforts to improve the environmental performance of tire manufacturing.

Deloitte, an independent third party, has collected the statistics in this report using a common methodological framework for the compilation of the data sourced through interviews with TIP members. For more information on the kinds of data collected, consult the Methodological note in the appendix (page 28).

* In 2021 the Cooper Tire & Rubber Company was acquired by The Goodyear Tire & Rubber Company, reducing TIP membership from 11 to ten members. The Cooper Tire & Rubber Company features in this report because they were a member of TIP during the reporting year, 2020.
The overall improvements in environmental performance captured in this report are the direct result of purposeful changes that TIP members have made to their production lines. This report includes an inexhaustive account of business examples that illustrate the types of measures that TIP members have put in place to improve the environmental performance of their manufacturing operations. For more complete coverage of the measures that companies have put in place, please consult publicly available company reports.

**THE SUSTAINABLE DEVELOPMENT GOALS**

At the time of compiling data for this report, TIP launched Sustainability Driven: Accelerating Impact with the Tire Sector SDG Roadmap. The Roadmap offers a framework for action that outlines impactful pathways for the tire sector to contribute to the ambitions of the United Nations Sustainable Development Goals (SDGs), which themselves lay out a global agenda to tackle the world’s most pressing social, environmental and economic challenges by 2030.

TIP’s KPI reporting is central to the Roadmap, which 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.

Indeed, TIP acknowledges that monitoring the progress of companies and the sector in their implementation of the Roadmap will be important to ensuring that the sector remains focused on optimizing its contributions to the SDGs. TIP’s ongoing work to track and report sector environmental KPIs will play a central role in that monitoring.

**COVID-19**

The transport sector did not escape the destabilizing social and economic impacts of COVID-19. This is evident in 2020 KPI values that do not follow the steady year-on-year improvements that preceded the pandemic.
State of play: Policies, strategies and targets
State of play: Policies, strategies and targets

Based on publicly available data and information provided to Deloitte by each member company, all TIP member companies have taken steps to reduce the environmental impact of their manufacturing operations.

POLICIES

All TIP companies reported that they consider environmental issues at a high level across all operations, with varying degrees of implementation and integration. As such, two types of policies emerge:

1. Global policies that are generally concerned with both environmental and safety issues and tend to describe overarching principles but do not include quantitative insights into corporate strategy. These policies are mostly part of broader company-level strategies based on the SDGs as a basis for international sustainability guidelines. These strategies can encompass broader operations, including supply chain management, sourcing of natural rubber, and a product’s end of life.

2. Independent policies that target specific environmental topics (i.e., water, waste, greenhouse gas (GHG) emissions, energy) with more detailed roadmaps.

TARGETS

Companies recognize quantitative targets as leading factors of improvement and external stakeholders expect such targets even if they do not require them. Most TIP companies have set targets for energy, carbon and water.

While these targets vary in scope, TIP members fixed them previously for an average period of 10 years and the majority ran them until 2020. As this period came to an end and provided encouraging results, most TIP member companies set new targets (see targets for each topic in the different sections below). The establishment and delivery of specific roadmaps are important for the companies to achieve these targets and for the continued improvement of performance indicators in the coming years.

Despite the COVID pandemic, in general and where possible, TIP companies maintained environmental management programs and operational investments to improve environmental performance.
2 Key performance indicators
3.1 SUMMARY OF ABSOLUTE KPIs

This graph illustrates the evolution of absolute environmental KPIs for tire manufacturing. The production level strongly increased at the beginning of the period and peaked in 2011. A slight decrease in production levels between 2018 and 2019 followed a period of sustained growth that started in 2012. Globally, the absolute KPIs followed the same trends as the production level through 2013; this is particularly visible in 2019 and especially in 2020, where a decrease of all absolute indicators is noticeable. However, from 2014, while energy consumption followed production variations, CO₂ emissions began to decrease slightly, and water intake decreased significantly.

The sector’s CO₂ emissions are strongly correlated with its energy consumption until 2014, showing the absence of any major change in terms of energy sources used or carbon mix over the period studied. From 2014 onwards, TIP members began to dissociate CO₂ emissions from energy consumption. Increased recourse to renewable energy will continue to drive this trend. This result is due to an improvement (decrease) in countries’ emission factors where the companies operate and to a change in TIP companies’ energy mix.

The performance of absolute-value KPIs decreased quite sharply compared to the intensity KPIs in 2020. This decline correlates with a sharp COVID-19 pandemic-linked decrease in production and affected all other KPIs.

Figure 1: Absolute environmental indicators: Manufacturing (2009 value = 100%)
3.2 SUMMARY OF INTENSITY KPIs

The analysis of intensity KPIs (ratio of the absolute indicator by unit of production) enables the comparison of performance without the interference possibly caused by important production variations.

Production levels decreased by 0.5% from 2018 to 2019 for the first time since 2012, despite the increasing number of sites in the reporting scope. The impact of the COVID-19 pandemic is visible on the whole sector, which showed a 16% drop in production vs 2019 performance.

The number of sites covered by this reporting is the highest observed over the period studied. There were 210 sites in the reporting scope in 2010 compared to 242 in 2020.

All intensity* indicators decreased during the 2009-2017 reporting period. It is interesting to note that energy and CO₂ KPIs slightly increased between 2017 and 2019 after a continuous decrease over the preceding 5 years. In 2020, energy intensity increased while total production decreased. This is because some energy-intensive manufacturing systems continued to run despite a slowdown in production. However, the CO₂ intensity KPI decreased due to a major shift from fossil fuel consumption to renewable energy sourcing by some TIP members. At the same time, the water intensity KPI decreased, driven by just two companies that partially or completely paused operations at very water-intensive sites during the pandemic.

Figure 2: Environmental intensity indicators:* Manufacturing (2009 value = 100%)

*Unit of energy, water withdrawal or CO₂ emissions per unit of production
3.3 ENERGY

Total energy consumption on manufacturing sites increased significantly between 2009 and 2010 (+11%) and was largely stable until 2018. The total amount of energy consumed remained constant in 2019 compared to 2018 levels, and above the levels of previous years. Between 2019 and 2020, due to the COVID-19 pandemic, the total amount of energy consumed followed production levels and dropped by almost 12%.

Energy intensity significantly decreased between 2009 and 2010, benefiting from the capacity optimization effect related to production increases. From 2013 to 2017, global energy intensity continuously decreased, only to slightly increase again in 2018 and 2019, remaining around 3% below 2010 levels.

Between 2019 and 2020 (linked to the pandemic) energy intensity increased by 5% and exceeded 2010 levels. This increase in intensity can be explained by a smaller decrease in energy consumption than in production: some production lines continued to operate despite the reduction in activity, while some machinery was always running, such as heating equipment.

With the exception of 2020, it is important to note that intensity does not increase as much as absolute energy consumption. This reflects TIP members’ efforts to improve resource efficiency in their manufacturing operations.

Figure 3: Weighted average energy intensity: Total energy consumption for 11 TIP members / total production volume
3.4 ENERGY POLICIES AND OUTSTANDING PROJECTS

MANAGEMENT AND STRATEGY

TIP companies implemented efficiency programs with a focus on energy. To reduce their impact and shift to a more sustainable mode of manufacturing, TIP members focused on reducing energy consumption at their manufacturing sites, increasing the energy efficiency of their equipment and developing renewable energies.

Companies have programs that include employees in their process-improvement strategies, using cross-functional teams to work on energy efficiency and training their employees to identify opportunities for improvement.

Energy strategies mostly rely on increasing the part of renewable energy, notably by buying renewable electricity certificates.

TARGETS

A few TIP members have set specific long-term energy intensity goals (typically longer than 10 years). The deadline for these targets set during previous years are 2020 and 2023. Several companies set yearly targets at the corporate level while the challenges to achieve them are at the regional or site-specific level; each business location is responsible for implementing measures for group targets.

EXAMPLES OF ENERGY-RELATED PROJECTS

Involving staff members to reduce energy losses

In order to increase the efficiency of their operations, TIP members conducted assessments of energy uses in all areas of the manufacturing facility (steam use, utility costs, heating, cooling and electric use efficiency, etc.) and identified areas for improvement. To do so, some companies involved staff members by developing their ability to recognize and implement energy-saving opportunities and to share best practices between sites. They also conducted third-party audits resulting in the identification of multiple projects with potential savings.

Investing in energy-efficiency projects

Many companies set optimization projects, including:

- Online monitoring for leak detection and rapid reaction
- Installation of new equipment (e.g., heat pumps) with higher efficiency rates
- Lighting optimization programs such as LED lighting equipment installation
Developing energy planning strategies

Michelin has a two-pronged strategy that aims to reduce energy use and shift to a less carbon-intensive energy mix. It is pursuing the first objective through an energy efficiency process led by its manufacturing department, while it is meeting the second by upgrading energy supply infrastructure to use less carbon-intensive energies and by purchasing less carbon-intensive energies. Developments over the next decade will see the electrification of processes, the installation of heat pumps, and new production-line efficiencies relevant to curing equipment, the production of steam and compressed air, and for cooling.

Yokohama Rubber is taking steps to realize sustainable, appropriate energy use and reduce energy consumption throughout the value chain, starting from the design and manufacturing stage, by developing and adopting technologies with sustainability in mind and by working closely with the providers of related products and services.

Kumho Tire has an energy plan for each manufacturing site and a set of indicators used to monitor and measure performance. When it identifies opportunities for improvement in a manufacturing site’s performance, it uses the indicators to establish recommendations for new measures. For example, it has used LEDs to replace less-efficient sources of light.

By 2025, Pirelli aims to reduce its specific energy consumption by 10% compared to 2019 values. To support this target, Pirelli has defined an efficiency plan with actions aimed at improving energy management systems and smart grids, and optimizing the procurement of energy resources. Among the activities implemented in recent years, Pirelli paid attention to the efficiency of the transformation of thermal energy and the recovery of thermal waste to heat premises. There were also projects to improve the efficiency of both compressed air generation, using high-efficiency compressors, and energy flows, with a focus on cold management.

Tracking energy losses and upgrading infrastructure

To improve energy efficiency, Goodyear conducts an annual energy loss assessment that aims to identify inefficiencies that can occur in all areas of the manufacturing process, including steam use, utility costs, heating, cooling and electricity use. To support this, Goodyear is developing a “zero-loss” culture by involving staff members in initiatives to identify opportunities to save energy and in the creation of a global energy project catalog to share best practices between sites.

Kumho Tire and Toyo Tires both systematically evaluate and update their key utility systems to minimize energy waste. This includes programs to issues such as steam and air leaks, condensate return, and compressed air.

Cooper Tires is upgrading its infrastructure to replace cooling towers and air compressors with more efficient alternatives. Likewise, Hankook has introduced non-purge air compressor equipment to minimize energy losses and optimize steam pressure in the curing process.
3.5 ENERGY – FOCUS ON THE ENERGY MIX

Analysis of the energy mix for the sector shows a voluntary change from more carbon-intensive energy, mainly fuel oil and coal, to less carbon-intensive sources of energy, such as electricity and natural gas, from 2009 to 2020, and particularly since 2015. The inclusion and augmentation of renewable electricity in total purchased electricity is clearly visible, as well as the decrease in the consumption of fossil fuels such as fuel oil.

The share of renewable electricity consumption grew to 9%, driven by renewable electricity certificate purchases by several companies in the sector. Many of the companies also installed solar panels or other renewable energy generating sources on their sites and consumed the electricity produced directly on site (partly included in the renewable electricity consumption). However, in 2020, self-generated electricity and that was consumed on-site represented less than 1% of total renewable electricity consumed. This low rate is partly due to the fact that these companies did not consume the electricity generated on-site but connected their equipment to the grid, making the efforts and investments of TIP members invisible on the graph.

Over the reporting period, TIP members usually replaced high-carbon energy with more low-carbon power sources and renewable energy through local action plans. The change in energy sources included harnessing steam power from renewable fuels, increasing natural gas consumption and shifting to electric devices, such as forklifts.

Between 2019 and 2020, the share of renewable electricity sharply increased due to some TIP members’ commitments to shift to renewable electricity sourcing.

Figure 4: Evolution of the energy mix

*Diesel, propane, petrol, other
3.6 CO₂ EMISSIONS

TIP members’ CO₂ emissions are directly related to their energy consumption. CO₂ intensity levels decreased by 6% between 2015 and 2019. Three key factors drove this decrease:

- An evolution in the energy mix: over this period, the sector switched from coal and fuel oil to natural gas and purchased electricity (see page 14 on energy mix).
- Lower Scope 2* emissions factors with regards to purchased electricity: most of the countries where companies operate have changed their own energy mix over the years, with positive impact on the sector’s overall performance.
- Implementation of decarbonization measures (examples on page 16), for which the results are visible when dividing total CO₂ emissions by the total energy consumption of the sector: this shows an 8% decrease in the average emissions factor (in tons of CO₂ per GJ) between 2010 and 2019.

Between 2019 and 2020, absolute CO₂ emissions decreased by 18% because of the COVID-19 pandemic. The CO₂ intensity decrease can be explained by the fact that the switch to renewable energy sourcing by some members offset the increase observed in energy intensity.

Figure 5: Weighted average CO₂ intensity: Total CO₂ emissions for 11 TIP members / total production volume

*Scope 2 emissions are indirect emissions from the generation of acquired and consumed electricity, steam, heat or cooling. Scope 1 emissions are direct emissions from owned or controlled sources.
3.7 CARBON POLICIES AND OUTSTANDING PROJECTS

MANAGEMENT

Climate change is an important topic for the industry. TIP members have policies in place to address the impacts related to manufacturing, emissions emitted during the sourcing of raw materials, and the product use phase. CO₂ policies on industrial sites are mostly linked to energy strategies.

Most TIP members have implemented programs to shift to a less carbon-intensive energy mix, either by producing renewable energy or by changing the source of the energy they consume.

TARGETS

Most TIP members have set mid-term or long-term GHG emissions reduction targets. Target setting covers scopes 1, 2 and 3.

Companies have also engaged in carbon footprint reduction initiatives in 2020 or early 2021. The objectives associated with these initiatives include work on scenario analysis and support for the Paris Agreement (2°C or 1.5°C) through their internal production chains.

EXAMPLES OF CARBON-RELATED PROJECTS

Impactful global initiatives

Several members joined global initiatives to reinforce their engagement, for example:

• Submitting science-based targets (SBTs) for climate action were submitted to the Science Based Targets initiative (SBTi) for verification. SBTs provide companies with targets to achieve carbon neutrality across their manufacturing bases by 2050. One example saw a TIP member set an internal carbon price to spur further progress and analyze the return on investment in capital projects.

• Joining international initiatives (RE100 or Paris Agreement) to commit to the promotion of renewable energy sources and to be more involved in their development.

• Participating in national policy design by setting long-term targets with their environment ministry.

Developing renewable energy instead of fossil fuels

Companies use renewable energy at their manufacturing sites, such as solar panels or biomass, as part of a switch from fossil fuels to a less carbon-intensive energy mix:

• Manufacturing-site level policies targeting a shift to 100% renewable energy: many companies identified switching to renewable electricity in their plant management, usually at site level.

• Change from traditional sources of steam to low-carbon source steam, including thermal energy and biomass.

• Most companies have installed photovoltaic panels. The companies either directly consumed the electricity generated or sold it back to the grid.
In 2019, Continental updated its environmental strategy to include a commitment to the Paris Agreement on climate by aiming for climate neutrality at the latest by 2050. This whole-value-chain objective will see low-carbon and renewable energy sourcing through EACs (Energy Attribute Certificates), production sites switching to green electricity (through membership in the global RE100 initiative), and carbon-neutral production at the latest by 2040. The company foresees the offsetting of the potential carbon impacts of raw material procurement, product use and end-of-life by these carbon neutrality actions.

Bridgestone aims for carbon neutrality by 2050. A central pillar of its strategy is to source 100% renewable electricity: for example, 100% renewable electricity powers 10 manufacturing sites in Europe since 2021. The approach includes investments in on-site generation of renewable electricity. For example, plants in Wuxi (China) and Pune (India) began using electricity generated by large-scale solar power in 2019, with panels installed on facilities’ roofs and it installed a 2MW solar power set up at its Aiken Plant (United States) in December 2020.

By 2025, Pirelli aims to source all its electricity from renewable sources and to achieve carbon neutrality by 2030. Pirelli’s current Sustainability Plan envisages a 25% reduction in the group’s absolute CO₂ emissions (both scope 1 and scope 2) by 2025 compared to 2015 values and, by 2025, an 8.6% reduction – versus 2018 numbers – in absolute CO₂ emissions related to the purchase of raw materials (scope 3). Pirelli has defined a “Carbon Action Plan” with the aim of increasing renewable energy sources through specific projects. For example, in Campinas and Gravataí (Brazil), Pirelli is using waste wood from local supply chains as biomass for the generation of steam; and sites in Silao (Mexico), Slatina (Romania), and Carlisle (UK), procure electrical energy from renewable sources.

Michelin aims to achieve net-zero emissions for its entire production base (scopes 1 and 2) by 2050, with an intermediate target of reducing production plant emissions by 50% between 2010 and 2030. In 2021, to catalyze progress and analyze return on investment, Michelin increased the internal carbon price from EUR €50 to EUR €100 per ton. The Environment and Prevention Management System, which is based on the international ISO 14001 and OHSAS 18001 standards, applies company policies. The company applies the approach in every facility to embed best practices that bring benefits across the organization by driving consistent and continuous improvement.

Sumitomo has established the long-term “Driving our future challenge 2050” sustainability policy. It reflects the strong commitment of Sumitomo to contribute to creating a more sustainable society throughout its business activities. Sumitomo’s sustainability policy aims for scope 1 and scope 2 carbon neutrality by 2050 and a 50% reduction in CO₂ emissions between 2017 and 2030. Measures for these targets include the use of hydrogen as a heat source.

Kumho Tire has been installing photovoltaic power generation systems on the rooftops of its domestic facilities since 2013. It continues to roll out the installation of solar power systems and currently generates around 170,000 kWh of renewable energy each year.

Yokohama aims to reduce its total value-chain CO₂ emissions by at least 50% by 2050. To achieve this, it has installed solar panels at plants in India and the Philippines and constructed a biogas plant in India to generate gas from food waste.

Transitioning from the use of natural gas for heat generation, Hankook has sourced external low-carbon steam produced by co-generation at its plant in Daejeon (South Korea), reducing GHG emissions by approximately 25,000 tCO₂-eq per year. Hankook aims to reduce its GHG emissions by 50% between 2018 and 2050.
3.6 WATER INTAKE

Total water intake decreased significantly over the reporting period, although overall production in 2019 was 12% higher than in 2010. Between 2019 and 2020, due to the pandemic, total water intake dropped by 20% whereas production decreased by 16%. Two companies drove this phenomenon; they saw their water consumption drop sharply due to the closure of some water-intensive sites at the time of the pandemic. This can explain the 4.9% decrease in weighted average water intensity in 2020. The other companies also saw decreased water intake, but to a lesser extent, as facilities continued to operate but at lower capacity.

With the exception of 2020, most TIP members managed to enhance their performance over the reporting period by implementing efficiency improvement projects at their production facilities. They largely implemented water optimization practices, reducing resource consumption and mitigating risk in water-stressed areas.

Water reuse and recycling are key objectives for the industry and TIP members consider water-scarcity risks when they set targets. Companies are achieving good results driven by their commitment to water/ resource savings and reducing impacts on local communities.

Figure 6: Weighted average water intensity: Total CO₂ emissions for 11 TIP members / total production volume
3.9 WATER POLICIES AND OUTSTANDING PROJECTS

MANAGEMENT

The tire production process requires cooling water and steam and companies use water at the site level for sanitary purposes. Efforts to improve the sustainable management of water include preventing, detecting and repairing water leakage, improving water reuse and recycling, and focusing efforts on water-stressed locations. Companies build new plants with the highest standards in terms of water efficiency. They analyze individual results at the company level in frequent performance reviews. Despite the pandemic, they observed major individual reductions, contributing toward long-term targets.

TARGETS

All companies have set targets for water use reduction. Targets commonly address:

• The ability to reduce water withdrawal in the coming years
• The global amount of water used, or
• Water recycling on manufacturing sites

Members pay special attention to manufacturing sites located in areas where water stress is high. For example, two members track water use and water withdrawal data at their facilities and use the World Resources Institute (WRI) Aqueduct Tool to make annual assessments of water stress at water basin level.

EXAMPLES OF WATER-RELATED PROJECTS

<table>
<thead>
<tr>
<th>Systematic implementation of measures to prevent, detect and repair water leakage</th>
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<tbody>
<tr>
<td>Many TIP members improved the measurement of water extraction and usage:</td>
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<tr>
<td>• Installing smart meters that improve the ability to track key water-use parameters</td>
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<tr>
<td>• Measuring and tracking usage regularly through online monitoring</td>
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<table>
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<tr>
<th>Reducing water withdrawals through water reuse and recycling</th>
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<tbody>
<tr>
<td>Many TIP members identified ways to reuse water:</td>
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<tr>
<td>• Ensuring closed-loop circuits for cooling systems and change of heat pumps to reduce water loss through evaporation</td>
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<tr>
<td>• Retreating wastewater at the facilities, enabling the plant to reuse it as sanitary and cleansing water</td>
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<tr>
<td>• Recovering, treating and using rainwater</td>
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<th>Focusing on at-risks plants</th>
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<tr>
<td>Several companies conducted water risk assessments to identify the plants with the highest water scarcity risks and adapt the action plans to perfectly fit the local situation.</td>
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</table>
Implementing water-saving actions

Goodyear has implemented closed-loop and evaporative cooling systems and installed on-site wastewater treatment facilities. The company now has three “zero discharge facilities” (Pulandian, China; Americana, Brazil; and San Luis Potosi, Mexico) that ensure the treatment and return of all water used on-site to the manufacturing process. In 2020, Goodyear reassessed which water projects are going to lead to the goal of a global water reduction of 10% by 2030. The company also reduced global water usage by 55% from a 2010 baseline, significantly exceeding the original water reduction target of 33% over the 2010 baseline.

Michelin aims to reduce water withdrawals per ton of finished and semi-finished product – weighted for water stress – by 33% in 2030 compared to 2019. To achieve this the company will deploy innovative digitization and reuse and recycling programs, while continuing to roll out best practices across the organization to improve water efficiency. Examples include Shenyang (China), where a heat pump installed upstream from cooling towers reduces the amount of water lost to evaporation. In Spartanburg, SC (United States), a project to recycle boiler and cooling tower purge water using reverse osmosis will reduce the plant’s water withdrawals by 6% a year. And in Cholet (France), the company expects a switch to new control-valve technology to improve the management of back-up cooling water to reduce the plant’s water consumption by around 3.8% over the course of a year.

In Japan, Toyo Tires installed flow meters on underground water pipes to quickly identify leaks and conduct repairs without delay. And, water purification devices have allowed the company’s Japanese sites to increase the amount of water recycled, thereby reducing water intake. In China, Toyo Tires has successfully reduced water intake through the recovery of water from steam used during the curing process.

Mitigating risk in water-stressed areas

Sumitomo Rubber aims to recycle 100% of its wastewater at all its factories by 2050. In 2018, it implemented water recycling measures at its manufacturing plant in Cankiri (Turkey), which is 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, the company aims to replicate this success at its factory in Changshu (China).

Cooper Tire completes regular global water stress studies at manufacturing locations using tools including Aquastat (Food and Agriculture Organization of the United Nations), the Aqueduct Water Risk Atlas (WRI), and the Growing Blue Tool (Growing Blue). The company contributes to relieving local water stress at its facility in El Salto, Mexico, by treating industrial and sanitary wastewater for local irrigation.
3.10 ISO 14001 COMPLIANCE

The percentage of ISO 14001-certified sites among the total number of sites slightly decreased, after a period of growth between 2015 and 2019 (weighted average).

Covering 242 industrial sites, this report assesses the highest number of sites since the beginning of our collection of aggregated environmental data. The ISO 14001 certification rate was higher in 2019 because the newly acquired sites first reported on in this report had not yet been certified.

Certification rates confirm that most TIP members have developed or are developing environmental management systems (EMS) and policies.

TIP companies are aware of the importance of certification, as demonstrated both internally through their processes, and externally through communication and reporting. Certifications are a well established and recognized way for companies to demonstrate their commitment to improved environmental performance to customers and other stakeholders.

Several companies have included a 100% certification rate target in their overall environmental policy; which is rolled-out on a site-by-site basis.

Figure 7: Weighted average certification rate: Number of ISO 14001-certified sites for 11 TIP members / total number of sites for these companies included in the scope
3.11 ENVIRONMENTAL MANAGEMENT

ENVIRONMENTAL MANAGEMENT SYSTEMS

TIP member companies have set up Environmental Management Systems (EMS) at almost all of their manufacturing facilities. These systems ensure the sufficient monitoring of environmental data in an effort to foster continuous improvements.

The benefit of rolling out EMS across an ever-growing number of plants is that companies may test best practices more easily and monitor their results in real time. The whole sector may derive major improvements from such practices, as they allow companies to pilot innovative techniques faster and improve implementation of low-intensity processes.

EXAMPLES OF ENVIRONMENTAL MANAGEMENT ACTIONS

Certifying plants according to ISO 14001

Many companies have set up goals or policies to achieve certification of all manufacturing sites:

- By certifying all in-scope plants
- By only acquiring certified sites

Training and education campaigns are a key requirement of EMS standards, and are employed to reinforce the positive impacts of certification.

Implementing broader management system

Many TIP members have also devised their own management system in order to monitor and drive their performance at the corporate level including premises and operations outside of the scope of this report. These policies often refer to ISO 14001 certification, which remains an important reference.

Defining internal policies and plans

Bridgestone adopted a proprietary factory production qualification system, based on the ISO 14001 standard, to rapidly identify and minimize environmental risks at new factories and production lines. It is a four-stage system for checking and certifying environmental management systems at new factories. It includes the creation of an environmental plan, and of preliminary environmental reviews when building new factories or production lines, and the preparation of environmental policies. It also ensures legal compliance and the delivery of environmental training programs.

Toyo Tires operates ISO 14001-based environmental management systems at all production sites. To respond to organizational environmental issues and to work on the continuous improvement of environmental performance in business activities, Toyo Tires conducts an annual audit of ISO 14001 compliance.

Pirelli launched a new Industrial Plan in 2021, including sustainability targets for 2025-2030. It designed the targets to address economic, social and environmental material impacts, while pursuing the UN Sustainable Development Goals and improving corporate preparedness for risk mitigation. The Industrial Plan is based on Pirelli’s “Eco & Safety” approach, which aims to maximize environmental performance while ensuring people’s safety and promoting a circular-economy approach, in particular by reducing resource use, especially in the case of non-renewables.
Hankook is dedicated to mitigating its environmental impact in product manufacturing and across the entire life cycle, from product development to use and disposal. In particular, the company recognizes the importance of research and development (R&D). The R&D department receives life-cycle evaluations of raw materials, which are taken into account when developing new products.

As part of its unique Taraxagum research project, Continental is working with partners from the Fraunhofer Institute for Molecular Biology and Applied Ecology IME and the University of Münster to generate natural rubber from dandelions, which are an alternative source of this important raw material. Continental has developed the first production bicycle tire using Taraxagum cultivated, extracted and processed in Germany. Local raw material extraction, as an alternative to natural rubber made from rubber trees, avoids long transport routes, reduces CO₂ emissions and conserves valuable resources.

Together with its partner and supplier OTIZ, Continental has developed a special technology to recycle polyethylene terephthalate (PET) bottles without the previously necessary intermediate chemical steps required to make polyester yarn suitable for the high performance requirements of tire casings. The use of recycled PET helps avoid waste at the end of the product’s life through reprocessing and recycling. As of 2022, Continental will enable the use of reprocessed PET obtained from recycled plastic bottles in its tire production.

Sumitomo’s former Global Environmental Committee – which reported on Sumitomo Group’s overall environmental goals and achievements – came together twice a year under the guidance of the managing director. The Sustainability Promotion Committee replaced the Global Environmental Committee in 2021. This new environmental, social and governance (ESG)-focused committee oversees issues relevant to society and governance in addition to the existing focus on environmental topics. The Sustainability Promotion Committee has adopted a more diverse membership to manage the wider range of topics. As a sign of company commitment to ESG, the CEO has been invited to join its sessions. Carbon neutrality, sustainable products and gender equality are some of the first topics that the committee will work on.

Yokohama holds a Corporate Social Responsibility (CSR) Council twice a year as part of an organizational framework set up to discuss and develop plans to address the social responsibility issues faced by the group. Yokohama will establish subcommittees for energy savings under the supervision of the Global Warming Countermeasures Committee and will promote energy reduction activities.
3.12 HOW HAVE TIP MEMBERS IMPROVED THEIR KPI PERFORMANCE?

This section summarizes the examples of measures taken by TIP member companies that have directly contributed to improvements in the environmental performance of tire manufacturing operations as measured through the aggregated data set presented in this report. For additional information on TIP members’ individual contributions to sustainable development, visit the links provided on page 27.

METHODS FOR IMPROVED ENERGY EFFICIENCY AND CO₂ FOOTPRINT REDUCTION

Energy savings - energy efficiency:

• Completion of energy surveys to identify energy loss and potential savings
• Installation of energy-efficient machinery to reduce energy loss
• Reduction of energy use through zero-loss thinking
• Establishment of an energy-saving technology committee
• Movement to high-efficiency equipment (mixers, pumps, motors, air compressors, heat pumps, etc.)
• Lighting optimization with LED lighting equipment installation
• Implementation of systems for air, steam and nitrogen leak detection and repair
• Implementation of online steam trap monitoring to improve boiler efficiency
• Installation of heat pumps on evaporative cooling towers to enable the repurposing of waste heat, notably in heating systems

Management systems:

• Expansion of metering at plants to enable more robust, real-time monitoring of energy performance in a centralized energy management system
• Sharing of best practices between sites through the creation of a global energy project catalog
• Introduction of data management for detailed tracking of energy and water
• Implementation of an internal carbon price

Changes in the energy mix:

• Reducing CO₂ emissions by switching fuels from heavy oil, coal and used tires to natural gas
• Installation of solar or photovoltaic panels
• Conversion to wind and hydroelectric energy sources
• Studies to assess the feasibility of replacing coal with natural gas, biomass or other primary energy sources
• Conversion from diesel to LPG fuel sources for boiler energy
• Using heat recovery technology to use factories’ waste heat for air conditioning
• Joining the RE100 initiative to promote renewable energy sources
• Energy generation from biomass sources including food waste and vegetable oil

METHODS FOR IMPROVED EFFICIENCY IN WATER USE

• Systematic implementation of measures to detect, repair and prevent water leakage
• Implementation of closed-loop water management systems, including water recycling and rainwater collection (used as cooling water and for restrooms)
• Implementation of evaporative cooling to capture process water and steam condensate to reuse water and reduce its use
• Promotion of the improvement of equipment for measuring the volume of discharges in order to improve their accuracy
• Installation of water treatment facilities at all production bases to prevent deterioration in the quality of wastewater
• Assessment of water stresses within manufacturing plant catchments to enable smart water management practices, using the WRI Aqueduct Tool
Conclusion
From the implementation of energy-efficient management systems and machinery and the adoption of renewable and low-carbon energy mixes, to systems to improve water-use efficiency, TIP members continue to draw on new methods and technologies to improve the environmental performance of their manufacturing operations.

WBCSD’s vision is that by 2050, resource use is optimized to meet society’s needs while allowing the regeneration of the systems that provide resources. Toward this vision – and aligned with the SDG Roadmap for the tire sector we will continue to report on the environmental performance of the manufacturing operations of our TIP members and will include any additional KPIs by 2023.

The tire sector interacts with all 17 SDGs; however, the SDG Roadmap for the tire sector focuses on areas where the sector has the greatest potential to lead, influence and accelerate action to make progress on the 2030 Agenda. Our Sustainability Driven: Accelerating Impact with the Tire Sector SDG Roadmap identifies eight SDGs as priorities and where the sector can have the highest impact through multi-stakeholder action. Data on the environmental performance of tire manufacturing operations will continue to be an important part of reporting on TIP member contributions to the SDGs.

Discover the Roadmap and more examples of TIP member contributions to the SDGs at www.sustainabilitydriven.info
Discover more about TIP members’ contributions to sustainable development

Bridgestone Corporation
https://www.bridgestone.com/responsibilities

Continental AG

Cooper Tire & Rubber Company
http://coopertire.com/corporate-responsibility

The Goodyear Tire & Rubber Company

Hankook Tire & Technology Co., Ltd.
https://www.hankooktire.com/global/sustainability.html

Kumho Tire Company Inc.
http://www.kumhotire.com/eng/company/ManagementPolicy_061.asp (Korean)

Manufacture Française des Pneumatiques Michelin

Pirelli Tyre S.p.A.

Sumitomo Rubber Industries, Ltd.
https://www.srigroup.co.jp/english/sustainability/index.html

Toyo Tire Corporation
https://www.toyotires-global.com/csr/

The Yokohama Rubber Co. Ltd.
https://www.y-yokohama.com/global/csr/

Discover more about Tire Industry Project contributions to sustainable development at www.sustainabilitydriven.info
Methodological note

ENTITIES AND REPORTING SCOPE

Deloitte collected the data presented in this report, on behalf of TIP. The reporting scope includes all sites under TIP members' operational control. The data are consolidated at 100% for all entities under operational control (regardless of the financial consolidation rate). The following premises and activities are included in the reporting scope: tire manufacturing sites and all related on-site activities (canteen, R&D, mixing, bladder production, reused tire processing, etc.) and stand-alone sites with mixing activities. Other stand-alone sites (bladder production, steel cord, textile facilities, retread tire processing, HQ, offices, etc.) are excluded.

Please note that due to new acquisitions, greenfield sites or shutdowns over the years, the reporting scope and the number of sites participating in the reporting is not constant.

The qualitative information reported is not exhaustive and the implementation of measures can vary both between and within companies.

INDICATOR DEFINITIONS

All indicators were calculated using the Common Methodology. The Common Methodology is a reporting protocol that defines the indicators, scope and calculation methodology. The Common Methodology was set up and agreed upon by TIP members and is summarized below:

Energy consumption: The energy consumption is consolidated in net calorific value (NCV). The electricity and steam sold to external third parties are deducted. Fuel consumption related to off-site transportation (employees, products) is excluded.

CO₂ emissions: This includes CO₂ emissions from energy consumption related to the tire manufacturing process and other facilities on production sites. The energy sold to external third parties (electricity and steam) is not deducted for the CO₂ emissions calculations. CO₂ emissions associated with fuel consumption related to off-site transportation (employees, products) are excluded.


Water intake: The water intake represents the net amount of water entering the sites and withdrawn from any external source (pumping from natural resources, public networks, recycled water from external companies or from desalination plants, steam purchases, etc.). All external sources of water intake are considered, including the amount of water sold to off-site third parties or consumed by activities of third-party companies on-site.

ISO 14001: The certification rate has been calculated based on dividing the total number of sites with ISO 14001 certification by the total number of sites. A site is recognized for ISO 14001 certification during a given calendar year, only if an external certificate is valid on December 31st of that year.

Production: Production is calculated as the weight of intended products to be sold to end-users as an output of the production lines, as well as the weight of new materials integrated in retread tires if part of the tire manufacturing plant.

The published value for the intensity indicators is the weighted average for the 11 companies who were TIP members at the time of reporting.
Summary of KPIs

Figure 8: Absolute environmental indicators: Manufacturing (2009 value = 100%)

Figure 9: Environmental intensity indicators: Manufacturing (2009 value = 100%)
WBCSD is the premier global, CEO-led community of over 200 of the world’s leading sustainable businesses working collectively to accelerate the system transformations needed for a net zero, nature positive, and more equitable future.

We do this by engaging executives and sustainability leaders from business and elsewhere to share practical insights on the obstacles and opportunities we currently face in tackling the integrated climate, nature and inequality sustainability challenge; by co-developing “how-to” CEO-guides from these insights; by providing science-based target guidance including standards and protocols; and by developing tools and platforms to help leading businesses in sustainability drive integrated actions to tackle climate, nature and inequality challenges across sectors and geographical regions.

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 9+ billion people are living well, within planetary boundaries, by mid-century.

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