C0. Introduction

C0.1

(C0.1) Give a general description and introduction to your organization.

Since 1889, Michelin has constantly innovated to facilitate the mobility of people and goods. Today, the Group is setting the standard across every tire and travel-related services market, while leading a global strategy to drive responsible, sustainable and profitable growth. In short, Michelin is making mobility safer, cleaner, more connected and more accessible. Michelin enjoys exceptional geographic coverage and is stepping up its deployment in emerging markets. In 2017, Michelin produced more than 190 million tires, published over 8 million maps and guides and calculated over 700 million itineraries. Currently operating in 17 countries at 70 production facilities and 3 research centers, and with marketing operations in 170 countries, Michelin employs a total of 114,000 people worldwide. Net sales in 2017 were €21.9 billion. Michelin holds forefront positions in every segment of the tire market. Associated brands and services also include dealerships and service centers (Euromaster, TCI, TyrePlus), online retailing (Allopneus, Blackcircles), wholesalers (Euromaster, Meyer Lissendorf and Ihle AG), truck driver assistance services (Michelin Euro Assist), fleet tire advice, maintenance and management services (MICHELIN® services and solutions in Europe and Michelin Business Solutions in North America), Michelin Travel Partner (maps and guides, ViaMichelin mobility assistance services) and Michelin Lifestyle products.

Inspired by its founders, Michelin is dedicated to enhancing mobility through innovation and quality, by basing its development on the core values of Respect for Customers, Respect for People, Respect for Shareholders, Respect for the Environment and Respect for Facts. Our sustainable development approach, embodied in the 2002 Michelin Performance and Responsibility Charter, structures this corporate culture and coordinates our commitment to the principles of sustainable, balanced, responsible growth.

C0.2

(C0.2) State the start and end date of the year for which you are reporting data.

<table>
<thead>
<tr>
<th>Row</th>
<th>Start date</th>
<th>End date</th>
<th>Indicate if you are providing emissions data for past reporting years</th>
<th>Select the number of past reporting years you will be providing emissions data for</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>January 1 2017</td>
<td>December 31 2017</td>
<td>No</td>
<td>&lt;Not Applicable&gt;</td>
</tr>
<tr>
<td>2</td>
<td>&lt;Not Applicable&gt;</td>
<td>&lt;Not Applicable&gt;</td>
<td>&lt;Not Applicable&gt;</td>
<td>&lt;Not Applicable&gt;</td>
</tr>
<tr>
<td>3</td>
<td>&lt;Not Applicable&gt;</td>
<td>&lt;Not Applicable&gt;</td>
<td>&lt;Not Applicable&gt;</td>
<td>&lt;Not Applicable&gt;</td>
</tr>
<tr>
<td>4</td>
<td>&lt;Not Applicable&gt;</td>
<td>&lt;Not Applicable&gt;</td>
<td>&lt;Not Applicable&gt;</td>
<td>&lt;Not Applicable&gt;</td>
</tr>
</tbody>
</table>

C0.3
(C0.3) Select the countries/regions for which you will be supplying data.

Brazil
Canada
China
France
Germany
Hungary
India
Italy
Japan
Mexico
Poland
Romania
Russian Federation
Serbia
Spain
Thailand
United Kingdom of Great Britain and Northern Ireland
United States of America

C0.4

(C0.4) Select the currency used for all financial information disclosed throughout your response.
EUR

C0.5

(C0.5) Select the option that describes the reporting boundary for which climate-related impacts on your business are being reported. Note that this option should align with your consolidation approach to your Scope 1 and Scope 2 greenhouse gas inventory.

Financial control

C1. Governance

C1.1

(C1.1) Is there board-level oversight of climate-related issues within your organization?
Yes

C1.1a

(C1.1a) Identify the position(s) of the individual(s) on the board with responsibility for climate-related issues.

<table>
<thead>
<tr>
<th>Position of individual(s)</th>
<th>Please explain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Board/Executive board</td>
<td>The Group Executive Committee (GEC), chaired by the CEO and comprised of Michelin's 13 executive vice presidents, serves as the Sustainable Development and Mobility Governance. As such, it oversees all climate change issues for Michelin and its subsidiaries.</td>
</tr>
</tbody>
</table>
(C1.1b) Provide further details on the board's oversight of climate-related issues.

<table>
<thead>
<tr>
<th>Frequency with which climate-related issues are a scheduled agenda item</th>
<th>Governance mechanisms into which climate-related issues are integrated</th>
<th>Please explain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scheduled – all meetings</td>
<td>Reviewing and guiding strategy Monitoring implementation and performance of objectives</td>
<td>The GEC’s (Board’s) oversight focuses on setting and following strategic orientations. Examples: 1) decision in 2017 to continue the Movin’on sustainable mobility event in 2018 and approving the main themes to be developed, including decarbonization of the transport sector; 2) monitoring of progress on Michelin’s 2020 Ambitions which include 3 objectives for mitigating CO2 emissions.</td>
</tr>
<tr>
<td>Scheduled – some meetings</td>
<td>Reviewing and guiding major plans of action Monitoring and overseeing progress against goals and targets for addressing climate-related issues</td>
<td>Major plans of action are brought to the agenda on an as needed basis. If additional monitoring of progress on climate-related objectives (see above) is required, it is also done on an ad hoc basis.</td>
</tr>
<tr>
<td>Other, please specify (Annually)</td>
<td>Setting performance objectives Overseeing major capital expenditures, acquisitions and divestitures</td>
<td>Once a year the GEC (board) reviews and sets the Group Balance Score Card (BSC), an internal mechanism for driving performance. As of 2017, the BSC includes climate-change related objectives for emissions mitigation in manufacturing and product use as well as reducing resource consumption. All major decisions on Capex and mergers/acquisitions/divestitures are overseen by the GEC in dedicated meetings either at the conclusion of the annual strategic planning process, which covers all divisions and activities, or at special ad hoc meetings. As such, decisions on climate change-related issues are not handled separately under the Sustainable Development and Mobility Governance.</td>
</tr>
</tbody>
</table>

(C1.2) Below board-level, provide the highest-level management position(s) or committee(s) with responsibility for climate-related issues.

<table>
<thead>
<tr>
<th>Name of the position(s) and/or committee(s)</th>
<th>Responsibility</th>
<th>Frequency of reporting to the board on climate-related issues</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other C-Suite Officer, please specify (5 C-Suite Officers including CEO)</td>
<td>Both assessing and managing climate-related risks and opportunities</td>
<td>More frequently than quarterly</td>
</tr>
</tbody>
</table>

C1.2a
Describe where in the organizational structure this/these position(s) and/or committees lie, what their associated responsibilities are, and how climate-related issues are monitored.

Below board level, climate change-related issues are overseen by two sub-committees operating under the Group Executive Committee's (GEC, or board) Sustainable Development and Mobility Governance: 1) Environment and 2) Sustainable Mobility. Each sub-committee meets a minimum of 2 times per year. The Environment sub-committee is chaired by 3 members of the GEC: executive vice presidents of manufacturing (lead chair), research and development, and brands/external relations. It focuses on integrating climate change-related issues into internal operations and strategy for research and development, manufacturing, marketing & sales of products and services, logistics and purchasing. It monitors climate-related issues with the help of a) its members bringing expertise from key departments concerned with climate change issues (research and development, manufacturing, purchasing, main business lines, communications, public affairs, norms & regulations and sustainability); and b) several standing work groups that analyze and make recommendations on strategic issues related to energy use, carbon pricing, mitigation, adaptation, and current and future objectives, among others. Lastly, the Environment sub-committee is particularly suited to bottom-up identification of emerging risk factors and analyzing their impacts over the short-, medium- and long-term. The Sustainable Mobility sub-committee is chaired by 3 members of the GEC: the CEO and 2 executive vice presidents covering brands & external relations (lead chair) and the retail/wholesale division. It focuses on developing external partnerships and relations covering a diverse set of mobility ecosystems. It monitors climate-related issues with the help of a) its members bringing expertise from key departments concerned with climate change issues (business lines, corporate development, brands and external relations, sustainable mobility, purchasing and public affairs); b) internal experts from Michelin-developed ecosystems for sustainable mobility (Movin'on by Michelin, OpenLab Mobility); and c) internal experts representing Michelin in other sustainable mobility ecosystems (Paris Process for Mobility and Climate, Transport Decarbonization Alliance, and SuM4All). Lastly, the Sustainable Mobility sub-committee is more focused on identifying, developing and monitoring opportunities, but does allow for external risk factors to be identified. All major decisions on risks, opportunities and investments that are not made by the GEC (board level) are made at this sub-committee level. This approach ensures that major decisions are made at the highest level of the company with the relevant divisions and activities of the Group represented.

C1.3

Do you provide incentives for the management of climate-related issues, including the attainment of targets?

Yes

C1.3a
(C1.3a) Provide further details on the incentives provided for the management of climate-related issues.

Who is entitled to benefit from these incentives?
Chief Executive Officer (CEO)

Types of incentives
Monetary reward

Activity incentivized
Emissions reduction target

Comment
A portion (15%) of the CEO's long-term incentive bonus is indexed on Michelin's Environmental Footprint (MEF) composite indicator. Energy consumption and CO2 emissions targets are part of this indicator. The 3-year average of this composite indicator must be below a defined threshold for the monetary reward to be triggered.

Who is entitled to benefit from these incentives?
Other, please specify (R&D employees and managers)

Types of incentives
Monetary reward

Activity incentivized
Efficiency project

Comment
Michelin Total Performance (MTP) Indicator and/or attainment of key milestones for tire development projects involving improvement of tire energy efficiency. An individual performance bonus takes into account progress made through tire development projects: either measured by passing key project milestones and/or by the MTP indicator, which assesses a new tire's energy efficiency and carbon footprint. Tire fuel efficiency as measured by rolling resistance is one of several tire performance indicators that drive product design. Rolling resistance is one of four performance indicators of the MTP.

Who is entitled to benefit from these incentives?
Management group

Types of incentives
Monetary reward

Activity incentivized
Emissions reduction project

Comment
A group of managers covering environment, energy use and energy purchasing are evaluated at year-end on their performance in steering the implementation of energy and CO2 reduction targets and projects.

C2. Risks and opportunities

C2.1
(C2.1) Describe what your organization considers to be short-, medium- and long-term horizons.

<table>
<thead>
<tr>
<th>From (years) To (years)</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Short-term</strong> 0 5</td>
<td>This time horizon is aligned with corporate-level and business units' management of operational risks. It applies to 1) operational decisions about energy purchasing and usage in manufacturing (e.g., contracts for purchasing renewable electricity); 2) management of CO2 quotas under emissions trading systems; 3) strategic planning and partnerships for new mobility offers (e.g., hydrogen fuel cell vehicles and related infrastructure); 4) development of supplier partnerships for reducing carbon footprints (e.g., logistics services, engagement through CDP Supply Chain); 5) market and external environment/stakeholder analysis (e.g., corporate climate strategies, NGO expectations, positions and expectations of influencers); 6) tactical implementation of norms and regulations strategy (see below); 7) management of operations risks related to extreme weather events; 8) management of media coverage of corporate responsibility regarding climate change; 9) engaging public and private actors in sustainable mobility through Movin' on by Michelin, Open Lab Mobility, and the Transport Decarbonization Alliance.</td>
</tr>
<tr>
<td><strong>Medium-term</strong> 5 15</td>
<td>This time horizon is aligned with corporate-level and business units' management of strategic risks and the strategic planning process. It applies to 1) industrial footprint restructuring and decisions about energy usage and energy-efficient technologies in manufacturing; 2) strategic planning for CO2 quotas in emissions trading systems; 3) research and development cycle for new tire projects addressing energy efficiency/materials/mass in concert with the other key tire performances; 4) strategic anticipation analysis of mobility trends; 5) strategic plans related to norms and regulations related to vehicle/tire energy efficiency, CO2 emissions, long-lasting performance vs. planned obsolescence.</td>
</tr>
<tr>
<td><strong>Long-term</strong> 15 30</td>
<td>This time horizon applies to 1) developing a corporate SBT roadmap under a 2°C or below scenario for long-term reductions to CO2 emissions from manufacturing and product use; 2) implementing the Paris Process for Mobility and Climate global macro roadmap for zero net emissions of the transport sector by 2050 under the UNFCC process.</td>
</tr>
</tbody>
</table>

(C2.2) Select the option that best describes how your organization's processes for identifying, assessing, and managing climate-related issues are integrated into your overall risk management.

Integrated into multi-disciplinary company-wide risk identification, assessment, and management processes

(C2.2a) Select the options that best describe your organization's frequency and time horizon for identifying and assessing climate-related risks.

<table>
<thead>
<tr>
<th>Frequency of monitoring</th>
<th>How far into the future are risks considered?</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Row 1</strong> Six-monthly or more frequently</td>
<td>&gt;6 years</td>
<td>Several time horizons are taken into account. Michelin's overall risk map covers operational risks, considered for 1 to 2 years in the future, and tactical risks and strategic risks up to 15 years in the future. Climate change presents an array of potential consequences that would impact Michelin primarily through the need for low carbon products and services and transition its overall mobility offer as the landscape for transporting people and goods goes through major change. Through the lens of this major paradigm shift, risks are considered 15 to 30 years in the future.</td>
</tr>
</tbody>
</table>

(C2.2b)
Michelin has been applying Enterprise Risk Management practices for more than ten years. Risk identification began as a bottom-up process enabling a corporate risk map to be built. The levels of acceptable or tolerable risk are defined by the Group Executive Committee (GEC), which acts as the Group’s Risk Committee. Currently, the risk map comprises 14 main families, which are overseen by separate governance committees and which are the basis for assessing existing risks, identifying emerging risks and steering necessary actions to treat risks. This process of iterative updating is overseen by the corporate risk management department across all other departments and activities. In the context of its worldwide reorganization, begun in 2017 and being implemented as of January 2018, a bottom-up process has been relaunched so that each department (corporate and regional) and business line will maintain its risk portfolio overseen by a risk manager.

Systemic Group-level risks are those that could have a substantive, adverse effect on annual revenue (>150 M €), annual operating income (>50 M €), image and reputation (quantitative and qualitative criteria that are confidential) and health & safety of employees and the public. They are reassessed annually to identify the priority risks requiring actions plans. At asset level, business units integrate critical corporate-level and activity-specific risks into their 5-year business plans & annual risk management action plans. As such, climate-related risks in the corporate risk map are assessed for their significance in the same way as any other type of risk in the corporate risk map. Climate change is not considered a risk in and of itself but is articulated through the following risks: volatility of energy prices (asset level), air pollution (asset and corporate levels), financial loss due to production stoppage or shortage of finished product (asset level), disruption in raw materials supply (asset level), non-compliance with environmental regulations – for example tire and vehicle energy/CO2 standards (asset level) and emissions trading systems – and media attacks on brand or reputation (corporate level).

Current and emerging risks related to climate change are overseen through the corporate Sustainable Development and Mobility Governance, comprised of the full GEC. Monitoring of such risks is ensured by 2 sub-committees: 1) Environment, and 2) Sustainable Mobility, each chaired by three members of the GEC. Both sub-committees are set up to identify risks and opportunities. The Environment sub-committee, with representatives from the key departments concerned with climate change issues (R&D, manufacturing, purchasing, main business lines, and brands & external relations, including public affairs, norms & regulations and sustainability), is particularly suited to bottom-up identification of emerging risk factors and analyzing their impacts over the short-, medium- and long-term. While the Sustainable Mobility sub-committee is more focused on identifying, developing and monitoring opportunities, it does enable external risk factors to be identified. Examples of current and emerging risks being monitored are those related to potential regulations (emissions trading systems and carbon taxes, tire & vehicle energy/CO2 standards), climate change strategies of customers and competitors, and low-carbon mobility trends.

Finally, there are many operational risks whose impacts would be well below the above-mentioned thresholds and occurring over a short time period of 1 to 2 years but that must be identified and assessed nevertheless. These climate-related risks involve current and emerging regulation, market pressures for low-carbon products, negative media coverage. These risks are identified, assessment and managed by the concerned departments: environment/public affairs/norms & regulations, business lines/sustainability, and communications, respectively. Any risk issues that cannot be resolved at the operational level are taken to the appropriate sub-committee mentioned above.

(C2.2c) Which of the following risk types are considered in your organization’s climate-related risk assessments?

<table>
<thead>
<tr>
<th>Relevance &amp; inclusion</th>
<th>Please explain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current regulation</td>
<td>Relevant, always included</td>
</tr>
<tr>
<td></td>
<td>Current regulation is a risk factor than can have impacts across Michelin activities, but particularly on manufacturing, which is impacted by regulations on emissions trading systems in Europe and Shanghai. This risk is handled by the CO2 Allowances Work Group, a standing work group bringing together industrial operations, EHS, purchasing, finance and accounting departments that monitors CO2 allowances applied under the regulations and their current and forecasted costs. Risk assessment is overseen by the Environment sub-committee of the Sustainable Development and Mobility Governance, which has responsibility for all climate-related issues below the board.</td>
</tr>
<tr>
<td>Relevance &amp; inclusion</td>
<td>Please explain</td>
</tr>
<tr>
<td>----------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>Emerging regulation</td>
<td>Relevant, always included</td>
</tr>
<tr>
<td></td>
<td>Emerging regulation is a risk factor than can have an impacts across Michelin’s activities but particularly on manufacturing and product design. Manufacturing could be impacted by newly created CO2 quota or tax systems at country or regional level. For example, China is rolling out additional ETS systems beyond that in Shanghai, and Michelin operations in that country could be impacted. Risk is handled by the CO2 Allowances Work Group, a standing work group bringing together industrial operations, EHS, purchasing, finance and accounting departments with support from public affairs to anticipate requirements and integrate them into operational activities. Product design could be impacted by vehicle tailpipe CO2 emissions standards or tire labeling/grading systems at country level. In the US, the government may weaken tailpipe standards. Under UN vehicle standards, signatory countries are putting in place tire labelling/grading regulations; for example, Japan is expected to do so by 2024. Michelin’s activities in these two markets could be impacted. The risks and opportunities of such emerging regulations are identified and evaluated jointly between the norms and regulations and public affairs departments. Action plans to address potential compliance issues are built by the business units responsible for the type of tires impacted. Risk assessment of emerging regulations related to climate change is overseen by the Environment sub-committee of the Sustainable Development and Mobility Governance, which has responsibility for all climate-related issues below the board.</td>
</tr>
<tr>
<td>Technology</td>
<td>Relevant, always included</td>
</tr>
<tr>
<td></td>
<td>The main technological/innovation risk factor related to climate change is managing the relationship between materials used to build tires and tire rolling resistance (lower rolling resistance means higher vehicle fuel efficiency). For example, it is possible to save resources by building a tire using a majority of feed stock from recycled end-of-life tires. However, the rolling resistance will greatly increase, with a strong negative impact on vehicle fuel efficiency. Furthermore, the tire will not have sufficient performance for safety, endurance, noise-reduction and other key characteristics determined by regulations and customer expectations. An overall research and development technology watch is in place that includes new means to increase energy efficiency and reduce tire mass, while incorporating more materials from recycled or renewable feed stock and maintaining key tire performances. This watch also includes digital innovations for tires. Opportunities for developing technologies and the associated risks, in the form of costs and lost time, are evaluated within the research and development structure. Approved projects are integrated into the research and development cycle, typically 5 to 10 years long. For example, in 2013 Michelin launched the BioButterfly project to produce synthetic rubber from biomass. It will move into the industrialization stage in 2020. Risk assessment is overseen by the Environment sub-committee of the Sustainable Development and Mobility Governance, which has responsibility for all climate-related issues below the board.</td>
</tr>
<tr>
<td>Legal</td>
<td>Not relevant, explanation provided</td>
</tr>
<tr>
<td></td>
<td>As regulations are promulgated on CO2 tailpipe emissions standards, compliance is relevant for vehicle manufacturers, but not for tire manufacturers, like Michelin. Because tires rolling resistance contributes significantly to vehicle energy efficiency and therefore to the CO2 emissions generated by the vehicle, Michelin does strongly advocate for the use of real rolling resistance values, and not just theoretical values, in the determination of vehicle CO2 emissions. However, this issue is a technical one, and does not represent a relevant legal risk for Michelin. CO2 regulations on industrial emissions via quotas or taxes can have a financial impact, but have not in actual practice represented any kind of legal risk for Michelin and are therefore not relevant.</td>
</tr>
<tr>
<td>Market</td>
<td>Relevant, always included</td>
</tr>
<tr>
<td></td>
<td>An increasing number of Michelin customers are including climate change-related criteria in tenders, particularly original equipment manufacturers (1 customer), vehicles fleets (5 customers) and public transport operators (4 customers) in Europe and mining companies (2 customers worldwide). Risk assessment of such criteria is handled within the Environment sub-committee of the Sustainable Development and Mobility Governance, which has responsibility for all climate-related issues below the board.</td>
</tr>
<tr>
<td>Reputition</td>
<td>Relevant, always included</td>
</tr>
<tr>
<td></td>
<td>Damage to brand value and reputation is a corporate-level risk that requires vigilance. With eroding public trust of the private sector in general, the need for transparency is evident when making claims of climate change-related performance (e.g., reporting CO2 reductions), following up on announced objectives and ambitions, and engaging with suppliers to reduce the Scope 3 footprint. This is why Michelin requests third-party verification of its Scope 1, 2 and 3 emissions prior to publication in the annual report and on the corporate web site. Risk assessment is overseen by the Environment sub-committee of the Sustainable Development and Mobility Governance, which has responsibility for all climate-related issues below the board.</td>
</tr>
<tr>
<td>Acute physical</td>
<td>Relevant, always included</td>
</tr>
<tr>
<td></td>
<td>Extreme weather events appear to be increasing in frequency and force. While the number of Michelin sites impacted by such events over the last 10 years remains quite low, impacts to sites in the upstream and downstream value chain are being identified more and more often. For example, a number of supplier sites were shut down following Hurricane Harvey in Texas in 2017. Risk assessment is overseen by the Environment sub-committee of the Sustainable Development and Mobility Governance, which has responsibility for all climate-related issues below the board.</td>
</tr>
<tr>
<td>Chronic physical</td>
<td>Not relevant, explanation provided</td>
</tr>
<tr>
<td></td>
<td>Unlike acute physical impacts, chronic physical impacts from climate change are not relevant to Michelin activities at this time. The reason is two-fold: 1) impacts have not been observed, and 2) information about future impacts is not specific enough to inform the company about potential risks. Example: as global temperatures increase, geographic distribution of crops and vegetation will shift. This could have an impact on production of natural rubber, a key raw material for making tires. Areas of optimum versus suitable rubber production will surely evolve but what predictions exist are long-term hypothesis and with levels of uncertainty so high that they do not influence current decision-making on rubber procurement. In the meantime, Michelin’s response to this future unknown situation is diversification, with supplies from different countries in the tropical zone.</td>
</tr>
<tr>
<td>Upstream</td>
<td>Relevant, sometimes included</td>
</tr>
<tr>
<td></td>
<td>With the mobility sector undergoing major transformation, new mobility offers will not only involve new technologies provided by future suppliers but also new partnerships both upstream and downstream in order to roll out innovative products and services. An example is the production of natural rubber in a sustainable manner. To develop sustainable sourcing of natural rubber, redress deforestation and address the lack of arable land for food crops, Michelin entered into a business partnership with Barito and a sustainability partnership with WWF France. Risk assessment is overseen by the Environment sub-committee of the Sustainable Development and Mobility Governance, which has responsibility for all climate-related issues below the board.</td>
</tr>
<tr>
<td>Downstream</td>
<td>Relevant, sometimes included</td>
</tr>
<tr>
<td></td>
<td>With the mobility sector undergoing major transformation, new mobility offers will not only involve new technologies provided by future suppliers but also new partnerships both upstream and downstream in order to roll out innovative products and services. To develop zero carbon mobility, Michelin has been actively promoting the use of hydrogen fuel cells with industrial partner SymbioFuel Cell and as a member of French and European public-private fuel cell associations. Risk assessment is overseen by the Sustainable Mobility sub-committee of the Sustainable Development and Mobility Governance, which has responsibility for all climate-related issues below the board.</td>
</tr>
</tbody>
</table>
(C2.2d) Describe your process(es) for managing climate-related risks and opportunities.

The Group Executive Committee (GEC) makes all decisions about major risks and opportunities, including those related to climate change. The GEC serves as the Sustainable Development and Mobility (SDM) Governance. As such, it oversees all climate change risks and opportunities for Michelin and its subsidiaries. To manage opportunities and risks, it is supported by the Corporate Innovation Board (CIB) and corporate risk management and corporate development departments.

The SDM Governance, supported by 2 sub-committees – Environment and Sustainability Mobility – has 2 roles: 1) managing opportunities in sustainable mobility by bringing together a diverse array of actors in the transport sector – public and private – in ecosystems for innovation, experimentation and action, and on creating the conditions for successful implementation of the Paris Agreement within the transport sector; 2) monitoring and making decisions on current and emerging risks and opportunities related to mitigation, resilience, regulation and stakeholder expectations. Each sub-committee oversees standing and ad hoc work groups of experts from the relevant departments. Decisions on risks and opportunities are made at the appropriate level depending on strategic importance, amount of resources to mobilize and complexity, from working groups, to sub-committee level of the GEC, to the full GEC. Transitional risk example: the European ETS presents a financial risk if CO2 allowances are not well managed over time. To minimize costs and ensure regulatory compliance, a CO2 Allowances Work Group, staffed with EHS, purchasing and finance experts monitors pricing vs. level of allowances across sites, according to country-level regulations, on an annual basis. It makes recommendations that are validated by the corporate finance department, and it executes the necessary actions. Any issues not resolved by this work group are taken up by the Environment sub-committee for decision.

The CIB’s mission is to define the innovation strategy from a cross-functional perspective, ensure innovation dynamism and make decisions on research priorities and investments. It enables Michelin to open up to fresh opportunities to expand its resources and methods, focus its research priorities, seek customer and market feedback on projects as early as possible in order to speed up innovation and maintain alignment on requirements. Not all topics are related to climate change, but those that are follow this steering process. Transitional opportunity example: In the context of carbon-free mobility, the objective is to implement viable solutions on the ground. Michelin’s main action in this area has focused over the last 15 years on developing hydrogen fuel cell technology and infrastructure approaches in its incubator and research and development departments, both overseen by the CIB. This carbon-free mobility opportunity is now being pursued as a business activity through Michelin’s investment in Symbio FCCell and as test project in a public-private partnership named “Zero Emission Valley” in the Auvergne-Rhône-Alpes region.

The corporate risk management department focuses its risk management activities on the set of substantive risks assessed above corporate thresholds. It manages risks through 1) ensuring assignment of all risks in the corporate map to a risk manager at the asset level, and 2) checking that risk portfolio management at the asset level is up-to-date, through a) a review of adequacy of actions taken against the assessed risk level, b) internal audit, c) lower-level internal control, d) advising on transfer of risk via insurance and e) overseeing crisis management readiness where appropriate. All decisions on risk management are made by the responsible department or business unit with support from the corporate risk management department. This department monitors risks in the corporate risk map to ensure that any residual exposure remaining after implementing the risk management process is consistent with the Group’s risk tolerance. Physical risk example: To reduce the risk of supply rupture from suppliers in the hurricane-prone Gulf of Mexico region, a region experiencing increasing frequency and intensity of climate event, Michelin has put in place strategic stocks of certain raw materials.

The corporate development department supports management of risks and opportunities by ensuring business units’ 5-year strategic plans have taken into account sustainable mobility goals and trends identified by the sustainability and strategic anticipation departments, including opportunities for mitigation and resilience. Physical opportunity example: Resilience for motorists means facing increasingly unpredictable weather and driving conditions that can suddenly become dangerous. Michelin’s CrossClimate tire was a strategic choice supported by the corporate development department to meet this need as the world’s first summer tire certified for winter (snow) use.

C2.3

(C2.3) Have you identified any inherent climate-related risks with the potential to have a substantive financial or strategic impact on your business?

Yes

C2.3a

(C2.3a) Provide details of risks identified with the potential to have a substantive financial or strategic impact on your
business.

Identifier
Risk 1

Where in the value chain does the risk driver occur?
Direct operations

Risk type
Transition risk

Primary climate-related risk driver
Technology: Costs to transition to lower emissions technology

Type of financial impact driver
Technology: Costs to adopt/deploy new practices and processes

Company-specific description
Michelin has committed to reducing its manufacturing carbon footprint by 50% over the long term (2050). One major means to achieve this goal is increasing the energy efficiency of industrial operations. With 70 plants across 4 geographic zones, the financial implications are major. Thus, the choice and cost of new methods, equipment, technologies constitutes the risk driver. Manufacturing energy efficiency can be optimized across all Michelin’s plants with new types of equipment and processes, as well as application of new management methods. Examples of process improvements: actions include reducing steam leaks in the tire curing process, controlling leaks of compressed air, capturing heat in cooling towers, increasing the efficiency of electric motors. Example of management methods: optimizing machine start-up and shut-down time to curtail energy needs.

Time horizon
Short-term

Likelihood
Virtually certain

Magnitude of impact
Low

Potential financial impact
25000000

Explanation of financial impact
The estimated figure reported is at the top of the bracket of € 15 to 25 million in annual capital investments in energy efficiency required over the short term.

Management method
To manage the financial risk over the short-term, the main opportunities (energy audits, the identification and application of best practices, equipment upgrades, etc.) and their deployment across Michelin’s manufacturing facilities is coordinated at the corporate level by a team of energy experts in the industrial operations department and implemented by a network of on-site energy experts. In all, 16 initiatives have been launched worldwide covering behavioral changes (no cost), management of industrial processes (low cost), and capital investment in equipment and infrastructure (medium to high costs). Projects implemented at one site can often be replicated at others. For example, in 2017 a heat recovery pump was installed in a cooling tower at a French plant. This technical solution is now being studied for application at other sites around the world. Plant-level operating and capital costs are managed through the annual strategic planning process, starting with bottom-up plans, with major capital investments approved by the Group Executive Committee (GEC). Progress against the 2020 energy efficiency target (-38% in energy intensity from 2010 to 2020) is monitored by the GEC’s Sustainable Development and Mobility Governance.

Cost of management
1000000

Comment
Costs are those associated with the number of full-time equivalent staffing required on an annual basis.

Identifier
Risk 2

Where in the value chain does the risk driver occur?
Direct operations

Risk type
Transition risk
**Primary climate-related risk driver**
Technology: Costs to transition to lower emissions technology

**Type of financial impact driver**
Market: Re-pricing of assets (e.g., fossil fuel reserves, land valuations, securities valuations)

**Company-specific description**
5 of Michelin's production sites are fueled by energy from burning coal: 3 in Europe, 1 in North America and 1 in China. With international momentum via the Paris Agreement, CO2 regulations, and societal demand to reduce fossil fuel usage, and in particular to eliminate coal, these sites could become economically stranded assets in the long-term. The costs of replacing current coal-burning equipment with low- or zero-carbon equipment represent a significant proportion of investments for other industrial improvements and thus constitute the risk driver.

**Time horizon**
Long-term

**Likelihood**
Very likely

**Magnitude of impact**
Medium

**Potential financial impact**
60000000

**Explanation of financial impact**
This is the maximum of the bracket of the estimated additional capital investment that would be required, which corresponds to 1 to 4% of current levels of just under € 2 billion/year.

**Management method**
A strategy for completely phasing out coal-fired boiler use by 2030 has been under development by the EHS, industrial operations and purchasing departments since 2017. The opportunity has been shared with the Environment sub-committee under the Group Executive Committee's Sustainable Development and Mobility Governance. Complete feasibility studies, to achieve coal replacement while controlling costs, will be required for each site and managed by individual steering committees. Oversight of all feasibility studies is ensured by the above-mentioned Environment sub-committee. An example of a coal phase-out project in 2017: the production plant located in North America passed the opportunity study milestone and is now preparing the feasibility study.

**Cost of management**
1200000

**Comment**
Costs are those associated with the number of full-time equivalent staffing required and partnerships/contracts with external organizations to carry out the coal phase-out projects.

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**Identifier**
Risk 3

**Where in the value chain does the risk driver occur?**
Direct operations

**Risk type**
Transition risk

**Primary climate-related risk driver**
Technology: Costs to transition to lower emissions technology

**Type of financial impact driver**
Technology: Research and development (R&D) expenditures in new and alternative technologies

**Company-specific description**
Because the majority of CO2 emissions are generated during the use phase of the tire, Michelin has since 1992 placed a top priority on reducing tire rolling resistance, which increases the energy efficiency of the vehicle. In 2015, Michelin set a medium-term goal to achieve a 20% reduction of CO2 emissions associated with the use phase by 2030. To achieve this goal, major research and development programs must be continued for all tire lines, particular passenger car/light truck and heavy duty truck tires. In addition, new areas of research, namely in digital platforms and applications for mobility solutions and services that have potential to improve energy efficiency, will grow over time.

**Time horizon**
Medium-term
Likelihood
 Virtually certain

Magnitude of impact
Medium-high

Potential financial impact
700000000

Explanation of financial impact
The financial risk involves the size - bigger or smaller - of the future R&D budget required as the mobility landscape evolves and research needs beyond the traditional area of tire performance must be identified. The figure reported corresponds to the current level of annual spending on R&D, as a proxy for future annual spending.

Management method
The costs of transitioning to low-emissions technologies for tires and vehicle propulsion systems is managed by the research and development department. The budget required for technological breakthroughs in both tire performance and manufacturing processes to produce even more energy-efficient tires is managed through the annual strategic planning process, in which the 5 to 10-year product development plan is defined/adjusted and an investment budget is allocated to respond to market needs and meet CO2 reduction targets. An example of a priority program approved in this process and underway in 2017: BASYS, a 5-year public-private materials research project that aims to shave off 4g CO2/km towards reaching an energy efficiency of 50g CO2/km in the passenger car B-segment. Progress against the 2030 and 2050 goals is monitored by the Group Executive Committee’s Sustainable Development and Mobility Governance. This risk represents regulatory opportunities for Michelin to push the envelope in energy efficient tires, namely: 1) tire energy-efficiency labeling, 2) vehicle emission standards, 3) long-lasting tire performances. Concerning the third point, Michelin launched its advocacy in 2017 for “planned longevity”, since a tire used to its legal tread limit will be more energy efficient during the full cycle of its use.

Cost of management
300000000

Comment
Costs are those associated with the number of full-time equivalent staffing required (about 6000 R&D employees) on an annual basis. Because tire energy efficiency as a tire performance must be managed with all the other key tire performances, it is not relevant to separate out costs for specific research and development programs.

Identifier
Risk 4

Where in the value chain does the risk driver occur?
Direct operations

Risk type
Transition risk

Primary climate-related risk driver
Policy and legal: Increased pricing of GHG emissions

Type of financial impact driver
Policy and legal: Increased operating costs (e.g., higher compliance costs, increased insurance premiums)

Company-specific description
Michelin manufacturing operations are subject to carbon quota systems and taxes in several jurisdictions: European Union, Shanghai and France. Since the European ETS costs alone are projected to exceed annual operating expenses & capital investments for sustainable use of energy by 50% to 100%, this risk is relevant.

Time horizon
Medium-term

Likelihood
Virtually certain

Magnitude of impact
Low

Potential financial impact
30000000

Explanation of financial impact
The annual financial impact for CO2 allowances covering Michelin operations is projected to increase from € 0 to € 30 million.
Management method
In 2005, the multidisciplinary CO2 Allowances Work Group was created to track legislation governing carbon markets and taxes in all of the Michelin plants’ host countries. Comprising specialists in greenhouse gases (GHG), energy buying, energy efficiency, finance and accounting, its role is to define carbon quota management principles and guidelines, ensure their proper application, conduct the necessary forecasting studies, make recommendations to the corporate head of finance on major decisions to buy, sell or hold allowances and to execute the decisions. This work is done currently, and for both the short- and medium-term time horizons, and is supported by the norms and regulations and public affairs departments to anticipate upcoming legislation around the world. Any issues not resolved by the finance department are taken to the Group Executive Committee's Sustainable Development and Mobility Governance.

Cost of management
30000

Comment
Costs are those associated with the number of full-time equivalent staffing required on an annual basis.

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<tr>
<th>Identifier</th>
<th>Risk 5</th>
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Where in the value chain does the risk driver occur?
Direct operations

Risk type
Physical risk

Primary climate-related risk driver
Acute: Increased severity of extreme weather events such as cyclones and floods

Type of financial impact driver
Reduced revenue from decreased production capacity (e.g., transport difficulties, supply chain interruptions)

Company-specific description
Taking into account Michelin's diverse activities around the world, the type of business operations that would be the most impacted by a severe weather event is manufacturing. Several Michelin facilities have been impacted in the past 10 years in different geographic regions: Thailand and India (flooding), Brazil (electrical supply shortages caused by drought) and North America (tornado). A number of Michelin supplier sites have also been impacted, for example during the North American hurricane season in 2017.

Time horizon
Medium-term

Likelihood
About as likely as not

Magnitude of impact
Medium

Potential financial impact
500000000

Explanation of financial impact
The figure reported is a conservative estimate in a given year over the medium-term due to prolonged production stoppages.

Management method
Michelin’s production plants are located in 17 countries across Western and Eastern Europe, North America, Brazil, Thailand, India and China. This geographic distribution means that different tire lines are produced in locations that are subject to different weather phenomena occurring at different times during a given year. Tire production is local, with back-up supplies in the same geographic zone, limiting risk of shortages of finished products. In line with the recommendations issued by the corporate risk department, risks associated with climate change have been reviewed and business continuity plans in the event of extreme weather events have been assessed. Extreme weather events have thus far concerned only a few facilities, without material financial repercussions for the Group, which have all devised appropriate business continuity plans specific to their locations and activities. An example is the Chennai production site in India: Following the 2015 monsoon and flooding event, existing emergency management protocols were reinforced, and personnel policies were modified to increase the number of employees hired from neighboring locations. The number and diversity of suppliers has enabled Michelin to avoid climate-related supply chain disruptions. A number of supplier sites have been impacted by extreme weather events in the last few years (e.g., Hurricane Harvey), but none of these events led to a supply disruption for Michelin.

Cost of management
Comment
Costs are those associated with the number of full-time equivalent staffing required to manage site-specific business continuity plans.

Identifier
Risk 6

Where in the value chain does the risk driver occur?
Direct operations

Risk type
Transition risk

Primary climate-related risk driver
Market: Uncertainty in market signals

Type of financial impact driver
Market: Increased production costs due to changing input prices (e.g., energy, water) and output requirements (e.g., waste treatment)

The risk driver is both the availability and cost of renewable energy to meet both needs for both electricity and steam. Many more renewable energy options are available for electricity than for steam. Markets are developing unevenly over time, depending on government subsidies and priorities (e.g., solar panel production promoted by the Chinese government). This has implications for the availability of supplies over time.

Company-specific description
Michelin’s objective by 2020 is to lower the CO2 emissions per ton of finished products by 32 percent compared with 2010. A major means of achieving this target is through purchasing renewable energy, primarily electricity. Michelin’s approach to renewable energy purchases, regardless of the geographic zone, is to meet 3 feasibility criteria: business continuity, capital and operating costs, and CO2 reductions. A given renewable energy source may not meet all three criteria at a sufficiently robust and sustainable level. Furthermore, Michelin production process requires significant use of steam. Unlike electricity, steam cannot be easily generated by renewable energy sources, which increases the risk of unavailability or prohibitive costs.

Time horizon
Short-term

Likelihood
Very likely

Magnitude of impact
Low

Potential financial impact

Explanation of financial impact
Renewable energy prices can fluctuate, with the impact also depending on the type of installation (on- or off-site) and contract period. Given the current renewable energy procurement program at Michelin, the financial implications of plans to increase purchasing beyond Europe, could result in up to a 10% increase in energy operating costs for a given year.

Management method
Management of this risk is handled by the corporate-level Energy Expert Team, drawn from the EHS, purchasing and industrial operations departments, which is tasked with 1) researching all possible opportunities for renewable energy sourcing worldwide, 2) evaluating the risks and opportunities of specific purchasing projects, and 3) applying the 3 feasibility criteria (cost, stability and security of supplies over time, and CO2 reductions). An example of a renewable energy purchasing decision: after a successful trial purchasing program in 2016 in Europe, all production plants in Europe as of 2017 are supplied with renewable energy for 100% of electricity needs. Another example in 2017 was a potential source of steam generated from biomass for a plant in Europe. The identified supplier, however, was unable to follow-up on the necessary project criteria and the project was ended. The portfolio of potential and ongoing projects is reviewed by the Environment sub-committee of the Group Executive Committee’s Sustainable Development and Mobility Governance. It also monitors progress against the 2020 CO2 reduction target noted above.

Cost of management
50000

Comment
Costs are those associated with the number of full-time equivalent staffing required on an annual basis for the Energy Expert Team.
Risk 7
Where in the value chain does the risk driver occur?
Direct operations

Risk type
Transition risk

Primary climate-related risk driver
Reputation: Increased stakeholder concern or negative stakeholder feedback

Type of financial impact driver
Other, please specify (Reduction in brand value)

Company-specific description
The automobile sector has been subject to increasing scrutiny in the last few years, with increasing mistrust by consumers and
government of environmental claims (e.g., tailpipe emissions), including commitments to fight against climate change, made by big
business in general. Michelin is highly aware of such scrutiny because its corporate brand is one of the most known and respected
in the world. In 2017, for the 3rd consecutive year, the Reputation Institute, which ranks the world’s brands according to their
reputation, has put Michelin at the head of the French rankings and 13th worldwide. Michelin also the French brand with the best
reputation in many countries: United States, China, Germany, the United Kingdom and Italy.

Time horizon
Short-term

Likelihood
Exceptionally unlikely

Magnitude of impact
Medium

Potential financial impact
100000000

Explanation of financial impact
The figure reported in euros represents 1% of Michelin’s brand value in 2017 of US$ 7.9 billion.

Management method
Managing this risk is based on thorough transparency. Michelin’s environmental impacts, including CO2 emissions, and its
environmental policy, including its approach to climate change, are reported on annually in the “Reference Document”, which
undergoes third party verification and is available publicly on the corporate web site. Information from the Registration Document
provides the main content for the corporate web site pages on sustainability as well as for investor presentations. NGO involvement
and social media posts on climate change issues are monitored by the public affairs and communications departments,
respectively. Through transparent communications practices with its customers and stakeholders (customers, employees, partners,
suppliers), investor outreach, and management of its reputation and brand, Michelin has maintained strong public trust. In 2018,
Michelin became the world’s most valuable tire brand following 30% brand value growth to US$7.9 billion over the last year
according to the latest Brand Finance Auto & Tyres 2018 report. Sustainability and technology initiatives have strengthened the
Michelin brand. In 2017, Michelin was ranked 15th worldwide by the Reputation Institute in the “Global CSR RepTrak® 100”.
Reputational risk management is overseen by the corporate risk department.

Cost of management
100000

Comment
Costs are those associated with the number of full-time equivalent staffing required and partnerships/contracts with external
organizations.

Risk 8
Where in the value chain does the risk driver occur?
Customer

Risk type
Transition risk

Primary climate-related risk driver
Market: Changing customer behavior

**Type of financial impact driver**
Market: Reduced demand for goods and/or services due to shift in consumer preferences

**Company- specific description**
The mobility of people and goods is in a period of disruption, rapid change and transition, with unforeseen consequences over the long-term. Mobility made possible by digital platforms (e.g., Uber, Blablacar), new technologies (e.g., partial to full automation of vehicle driving), new power trains (e.g., battery and fuel cells) and new infrastructure (e.g., multi-modal) are driving changes in consumer and market behavior, as are social trends (e.g., importace of vehicle ownership decreasing or increasing), workplace habits (e.g., e-commuting), regulations (e.g., tighter tailpipe CO2 emissions standards), and market forces (e.g., e-commerce). In addition to evolving mobility needs and preferences, vehicles of the future will be radically different in size, design, purpose and number. Michelin is adapting its current offer, predominantly based on tires, and expanding its mobility services and solutions in anticipation of the future mobility landscape.

**Time horizon**
Long-term

**Likelihood**
Very likely

**Magnitude of impact**
High

**Potential financial impact**
20000000000

**Explanation of financial impact**
The potential annual impact is in the same order of magnitude as Michelin's current turnover of € 21.9 billion: in the billions of euros. The potential financial impact could be negative but also could be positive. Michelin takes the latter view that the company will continue to grow with new productions & services adapted to the new mobility landscape.

**Management method**
Michelin's management approach to the uncertainties of the future mobility landscape is three-pronged: 1) to conduct strategic anticipation analysis internally and with external partners (e.g., Michelin is founder of Open Lab Mobility) and integration of mobility trends into the annual strategic planning process; 2) to engage with public and private actors across the mobility sector to develop dialogue on sustainable mobility problems and solutions (e.g., as founder of Movin'on, the unique international event on sustainable mobility; as co-founder of the Paris Process on Mobility and Climate ; as a founding member of the Transport Decarbonization Alliance); 3) to identify opportunities and develop concrete solutions to low-carbon mobility (e.g., through Michelin solutions, providing services and solutions to fleets; through investments and partnerships to develop hydrogen fuel cell technology and infrastructure). The sustainability and strategic anticipation departments provide the framework for collaboration and involve key business lines in actions undertaken under the 3 priorities outlined above. Management of the risks and opportunities is overseen by the Group Executive Committee's Sustainable Development and Mobility Governance.

**Cost of management**
4000000000

**Comment**
The figure reported is an estimated annual cost of the staffing required, and excluding the cost of external services. The market transition described here would mobilize the majority of staff resources outside manufacturing operations, which is the basis of the figure provided corresponding about 40% of the workforce.

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(C2.4) Have you identified any climate-related opportunities with the potential to have a substantive financial or strategic impact on your business?

Yes

---

(C2.4a) Provide details of opportunities identified with the potential to have a substantive financial or strategic impact on
your business.

**Identifier**  
Opp1

**Where in the value chain does the opportunity occur?**  
Customer

**Opportunity type**  
Products and services

**Primary climate-related opportunity driver**  
Development and/or expansion of low emission goods and services

**Type of financial impact driver**  
Increased revenue through demand for lower emissions products and services

**Company-specific description**  
The rolling resistance of passenger car/light truck tires can account for 15% to 20% of the vehicle’s fuel consumption, and for trucks it can account for up to 30%, depending on the vehicle’s size, use and how it is driven. Michelin is highly favorable to regulations setting minimum performance standards for tire rolling resistance. In the European Union, tire performance minimum requirements and grading -- including rolling resistance -- displayed on standardized labels have been mandatory since November 2012. Stricter minimum requirements are being introduced between 2016 and 2018 for passenger car and light trucks tires and between 2016 and 2020 for truck and bus tires. A third and stricter level of minimum performance is envisioned for introduction starting from 2020. Similar legislation has been in effect in South Korea since 2012 (labeling) and 2013 (thresholds), Brazil since 2015 and other countries; voluntary grading was introduced in Japan in 2010. Legislation introducing minimum performance standards for rolling resistance and wet traction was passed in the United States in December 2015 and will possibly be implemented in 2019, and a new labeling system to help consumers is scheduled for launch in 2018. Regulated tire labeling systems are also under consideration in China. Other countries are likely to follow in the near future.

**Time horizon**  
Short-term

**Likelihood**  
Virtually certain

**Magnitude of impact**  
High

**Potential financial impact**  
4932000000

**Explanation of financial impact**  
Product labeling standards are expected to strengthen demand for low rolling resistance tires, with sales of these tires expected to increase from 200 million units in 2010 to 500 million in 2020 on the original equipment market. This represents a potential market value as of 2020 of US$4,932 million per year. Tire labeling and minimum requirements in Europe, in particular, has shifted the entire market to higher performing tire and accelerate the withdrawal of lower-performing tires.

**Strategy to realize opportunity**  
Michelin is a global leader in tire performance related to GHG emissions and fuel efficiency, and regulations will demonstrate the advantages of Michelin products. Through research and development investment, Michelin’s strategic objective is to remain the technological leader in the market. The Group commissions annual studies by independent bodies to compare its products with the average competing range. In parallel, the norms and regulations department executes a worldwide strategy to advocate the promulgation of country-level regulations setting minimum performance standards and labeling regulations for tire rolling resistance. This has been the case in Europe where legislators promulgated minimum tire performance standards in 2009. Michelin offered data and other input to help define the minimum performance levels and currently participates in the improvement of machine test methods and in the discussions around the review of the European labeling regulation. Michelin has advocated in other geographic zones, e.g., Korea, where tire rolling resistance regulations have come into effect from 2012-2014, and Brazil where legislation was passed in 2015. Michelin works directly with policy makers and through trade associations on consumer awareness, rule making and technical aspects of tire energy efficiency requirement: in the US, within the US Tire Manufacturers Association; in Brazil, as a member of Associação Nacional da Industria de Pneumaticos.

**Cost to realize opportunity**  
641000000

**Comment**  
In 2017, research and development expenses stood at €641 million, with nearly 6,000 employees devoted to furthering the Group’s innovation commitment.
Where in the value chain does the opportunity occur?
Customer

Opportunity type
Products and services

Primary climate-related opportunity driver
Development and/or expansion of low emission goods and services

Type of financial impact driver
Increased revenue through demand for lower emissions products and services

Company-specific description
Regulations and taxes associated with vehicle emissions provide an opportunity for Michelin to contribute towards emissions reductions through increased demand for low rolling resistance tires. Michelin is a global leader in tire performance related to GHG emissions and fuel efficiency, and regulations will demonstrate the advantages of Michelin products. Through research and development investment, Michelin's strategic objective is to remain the technological leader in the market. The Group's green tire ranges help improve the fuel efficiency of vehicles; for example, the Energy Saver tire allows a significant drop of CO2 emissions per km, helping car manufacturers meet the increasingly stringent EU targets for car CO2 emissions. Thus, car manufacturers are voluntarily purchasing Michelin's products to help their vehicles meet new fuel efficiency regulations.

Time horizon
Short-term

Likelihood
Virtually certain

Magnitude of impact
High

Potential financial impact
1600000000

Explanation of financial impact
Regulations and taxes associated with vehicle emissions are expected to strengthen demand for low rolling resistance tires for passenger cars and trucks. In Europe, the potential value of this market for Michelin as of 2022 is estimated at €1,600M per year. Other markets are foreseen in North America and Asia.

Strategy to realize opportunity
Michelin has recently launched both passenger car and truck tire research and development projects aimed at improving the rolling resistance and reducing the tire mass and associated CO2 emissions. As part of the Platform of the Automotive Sector (PFA), Michelin, Solvay, the specialized research lab LRCCP and other partners launched the BASYS project in 2014. This comprehensive program focused on 'low hysteresis' LDV materials aims at bringing down CO2 emissions by 4 g/km in the passenger car B-segment: subcompacts, super minis, and city cars. Michelin is specifically investigating the tire’s role in fuel efficiency and bringing together materials and analytical expertise. The overarching objective is to achieve a passenger car fuel efficiency of 2L/100km. Towards further efficiency improvements, Michelin also partnered with the French Development Agency (ADEME) in 2016 on the PEGASE project. This 3-year research initiative, run by Michelin, aims to reduce the rolling resistance (-1kg/t) and mass (-10kg) of long-haul truck tires while improving the useful lifetime by 10 to 20%. In parallel, Michelin has provided technical support in the development of VECTO, a calculation tool introduced by the European Commission for Heavy Duty Vehicle CO2 emissions and fuel consumption. The introduction of this calculation model allows the evaluation of a vehicle’s fuel efficiency in the use phase by taking into account the impact of tires and a range of other components.

Cost to realize opportunity
700000000

Comment
In 2017, Michelin's overall research and development expenses stood at €641 million. The Michelin contributions to the BASYS and PEGASE initiatives are respectively €23.1M and €37M, over 3-year periods.

Where in the value chain does the opportunity occur?
Supply Chain
Opportunity type
Resilience

Primary climate-related opportunity driver
Other

Type of financial impact driver
Increased reliability of supply chain and ability to operate under various conditions

Company-specific description
Natural rubber’s physical properties make it irreplaceable for the production tires, which is why 75% of the global output goes to the tire industry. Michelin is among the world’s leading buyers of natural rubber. Roughly 40% of the rubber used in tire manufacturing is natural and 60% is synthetic. The production of natural rubber is geographically concentrated, with around 90% of the global output coming from Asia. As a global commodity, natural rubber is subject to extreme pricing variations. Due to growing global demand, the rubber industry is associated with the deforestation of primary tropical forests, an important climate change driver. Conscious of its footprint and its responsibility to address it, Michelin has committed to source exclusively from plantations that respect “zero deforestation” principles as per its Sustainable Natural Rubber Policy published in 2016. The purchase of sustainable natural rubber is an opportunity to strengthen CSR practices within the industry and to mitigate impacts on natural environments. With the example of General Motors, a growing number of car manufacturers are also committing to sourcing tires made of sustainably produced rubber.

Time horizon
Short-term

Likelihood
About as likely as not

Magnitude of impact
Low

Potential financial impact
79000000

Explanation of financial impact
In the supply chain, the joint-venture project in Indonesia ultimately aims to create 16,000 direct or indirect long-term stable local jobs (see management method). All the actions taken to make Michelin’s natural rubber supply sustainable add to the Group’s brand value that was estimated at US$7.9 billion in 2017. If these actions add 1% to this value, this could represent a potential financial impact of US$79 million.

Strategy to realize opportunity
Michelin published its first Sustainable Natural Rubber Policy in 2016. The key elements of this policy are respecting people, protecting the environment, the careful use of natural resources, improved agricultural practices and transparent governance. The sector is dominated by smallholders with plantations of less than 5 hectares, making the value chain fragmented and complex. Michelin assesses the CSR performance of its direct natural rubber suppliers via the EcoVadis rating platform. In addition, Michelin is working directly with suppliers and NGOs to map out its complex natural rubber value chain with a mobile application based on CSR questionnaires adapted to farmers, intermediaries and factories. The Group aims to achieve this mapping for at least 80% of purchased volumes by 2020. In 2015 Michelin entered into a joint-venture agreement with the Barito Pacific Group to produce sustainable natural rubber in Indonesia. This cooperation involves the reforestation of 3 concessions totaling 88,000 ha in the provinces of Jambi (Sumatra) and Kalimantan Timur (Borneo), which have been devastated by uncontrolled deforestation. Half of the plots will be planted with rubber trees, while the other half will be earmarked for growing subsistence crops, with a focus on the reintroduction of endemic plants. The best practices developed as part of this project will be shared with other rubber producers. This joint venture will enable Michelin to source ~10% of its natural rubber needs.

Cost to realize opportunity
55000000

Comment
Michelin’s 47% stake in the joint-venture with the Barito Pacific Group was valued at $US 55 million.
**Primary climate-related opportunity driver**
Development and/or expansion of low emission goods and services

**Type of financial impact driver**
Better competitive position to reflect shifting consumer preferences, resulting in increased revenues

**Company-specific description**
Michelin stands ready to meet changing customer demand for different tire performances able to respond to changing and new weather conditions (e.g., with winter tires and all-season tires). Climate change might alter consumer demand for tires: in the US, Michelin is already responding to customers demand for all-season tires to avoid having to switch from winter tires to summer tires and vice versa. The unpredictable weather patterns that might result from climate change means that tires must perform well under a wide range of road conditions all year long. Since the Group's products are designed to deliver excellent performance in a wide range of conditions, this could help increase sales.

**Time horizon**
Short-term

**Likelihood**
Very likely

**Magnitude of impact**
Medium

**Potential financial impact**
900000000

**Explanation of financial impact**
The global tire market was estimated at US$150 billion in 2016, with light-vehicle tires accounting for 60% for a total market segment worth US$90 billion. Michelin's market share was 14% in 2017; an increase in market share of just 1% could represent an increase in earnings of US$900 million. This is without considering increased demand for tires; over the period 2017-2020 Michelin anticipates an annual segment growth of 2.5%. Over the long term, Michelin expects demand for tires to grow by 1.5% per year. Note: these financial estimates have been officially published in US$ in the 2017 annual report. Converting them here to euros would not provide a meaningful value given the exchange rate fluctuations.

**Strategy to realize opportunity**
Michelin invests heavily in research and innovation to retain the technological leadership required to meet changing customer demands. The innovation strategy is driven by the Corporate Innovation Board which supervises a process involving: 1/ research and development teams and their adoption of new technologies, collaboration with external research centers and close cooperation with advanced marketing teams specialized by product lines; 2/ marketing teams to adapt creative products or service concepts to customers’ needs & get them quickly to market, while meeting the highest quality standards. As a case in point, Michelin launched two new products over the last 3 years: 1/ the all-season Premier A/S tire for the North American market especially designed for safe braking under varied temperatures and prolonged wet grip traction to handle onset of rain; 2/ the CrossClimate tire, the first summer tire in the world with a winter certification, providing enhanced mobility for motorists in daily changing conditions. A CrossClimate+ version with longer lasting performances was launched in October 2016. All these products are designed to perform optimally in extreme temperatures from -30°C to +40°C and rely on Michelin EverGrip, a combination of material and sculpture technology. This opportunity has been confirmed both by the market response and an industry award: annual sales for the tire line exceeded forecasts.

**Cost to realize opportunity**
641000000

**Comment**
In 2017, research and development expenses stood at €641 million, with nearly 6,000 employees devoted to furthering the Group’s innovation commitment.

**Identifier**
Opp5

**Where in the value chain does the opportunity occur?**
Customer

**Opportunity type**
Products and services

**Primary climate-related opportunity driver**
Development of new products or services through R&D and innovation

**Type of financial impact driver**
Increased revenue through new solutions to adaptation needs (e.g., insurance risk transfer products and services)

**Company-specific description**
In every market, climate issues and societal expectations (e.g., COP21) are forcing people to seek alternatives for their personal mobility. Consumer aspirations are converging on the importance of vehicles that are safe, with a low total cost of ownership and a small environmental footprint. Thus, fuel-efficient, durable and safe tires are important. With its technical leadership in total performance of tires, Michelin stands to benefit from its business to consumers, both directly and via original equipment manufacturers. Meeting the challenges of sustainable mobility require continuous improvement in the energy efficiency of all vehicles, whatever the power train. Rolling resistance accounts for 20% of fuel use in a passenger car and 30% in a truck. For electric vehicles, the impact of tires can exceed 30% of total energy consumption. Michelin's research leadership in reducing rolling resistance and tire mass without sacrificing safety offers many opportunities for growth and differentiation.

**Time horizon**
Short-term

**Likelihood**
More likely than not

**Magnitude of impact**
Medium

**Potential financial impact**
900000000

**Explanation of financial impact**
The global tire market was estimated at US$150 billion in 2016, with light-vehicle tires accounting for 60% for a total market segment worth US$90 billion. Michelin’s market share was 14% in 2017; an increase in market share of just 1% could represent an increase in earnings of US$900 million. This is without considering increased demand for tires; over the period 2017-2020 Michelin anticipates an annual segment growth of 2.5%. Over the long term, Michelin expects demand for tires to grow by 1.5% per year. Note: these financial estimates have been officially published in US$ in the 2017 annual report. Converting them here to euros would not provide a meaningful value given the exchange rate fluctuations.

**Strategy to realize opportunity**
Sustainable mobility requires vehicles to move towards cleaner propulsion. Original equipment (vehicle) manufacturers have to consistently improve the level of emissions of their new cars and Michelin has always been a leader to provide them with the better possible low rolling resistance tires (introduction of silica in 1992, Energy tire line etc...). Michelin aims at continuing improving the energy efficiency of its offers, while keeping the best possible balance of performance on other items such as wear and grip to provide the best possible cost of ownership and avoid planned obsolescence. A Rolling Resistance road map has been defined and drives future innovation in this field. All time horizon R&D teams (advanced research, pre-development and development) are working to make it progress. Michelin targets another 30% RR improvement in the coming 5 to 10 years. Furthermore, Michelin adapted its tire offerings for the electric vehicle market with MICHELIN ENERGY™ E-V (Electric Vehicle) tire being the first step in a joint research and innovation program with Renault Zoe (improvement in the vehicle’s general autonomy while providing excellent stick, longevity, silence and comfort). New E-V tire lines are being defined in the 2021 and above Product Plan.

**Cost to realize opportunity**
641000000

**Comment**
In 2017, research and development expenses stood at €641 million, with nearly 6,000 employees devoted to furthering the Group’s innovation commitment.

**Identifier**
Opp6

**Where in the value chain does the opportunity occur?**
Customer

**Opportunity type**
Products and services

**Primary climate-related opportunity driver**
Shift in consumer preferences

**Type of financial impact driver**
Better competitive position to reflect shifting consumer preferences, resulting in increased revenues

**Company-specific description**
Business to Business – Road transportation accounts for over 70% of total transport-related emissions worldwide. Consequently,
the road transportation industry as a whole has to respond to the challenge of maintaining mobility while decreasing GHG emissions. The influence of tires (i.e., rolling resistance) can account for over 30% of total energy consumption of a truck. Michelin’s research leadership in reducing rolling resistance and tire mass without sacrificing safety is captured by the Group’s “materials-efficiency index”, which ensures that tire performance is steadily increased while using fewer materials. Optimizing tire rolling resistance is a key lever for original equipment manufacturers (OEMs) and truck fleets to reduce their environmental footprints; it is also an extremely attractive means to improve overall truck energy efficiency in terms of cost, time to market, and technical accessibility. The Michelin group develops a wide range of services to help fleets and OEMs to optimize their operations, in tire and asset management (e.g., number of trailers).

**Time horizon**
Short-term

**Likelihood**
Very likely

**Magnitude of impact**
Medium-high

**Potential financial impact**
675000000

**Explanation of financial impact**
The global tire market was estimated at US$150 billion in 2016, with truck tires accounting for 30% for a total market segment worth US$67.5 billion. Michelin’s market share was 14% in 2016; an increase in market share of just 1% could represent an increase in earnings of US$675 million. This is without considering increased demand for tires; over the period 2015-2020 Michelin anticipates an annual segment growth of 1.5%. Over the long term, Michelin expects demand for tires to grow by 1.5% a year. Note: these financial estimates have been officially published in US$ in the 2017 annual report. Converting them here to euros would not provide a meaningful value given the exchange rate fluctuations.

**Strategy to realize opportunity**
For truck tires, the technological innovations known as MICHELIN Durable Technologies deliver a significant improvement in fuel efficiency and a reduction in CO2 emissions. Illustrating these gains, MICHELIN X® LINE™ ENERGY™ tires for large-volume trucks are the first set of big rig tires to be rated A in energy efficiency under EU tire-labeling rules. Retreading and regrooving tires not only increases the lifespan of a tire by 2.5 times when compared to a new Michelin tire, it also has better environmental characteristics. Compared to non-retreadable tires, retreaded tires generate 70% material savings thanks to material recovery and a longer lifespan, the saving of 29% more land, 19% less water compared to producing a new tire and 21% less air pollution. Lower rolling resistance enables 24% less CO2 emissions. In 2017, Michelin solutions launched 4 new products aimed at fleet operators. These 4 new products are MyBestRoute, MyRoadChallenge, MyInspection and MyTraining. These products have the aim to reduce costs, improve efficiency and reduce CO2 emissions for transport fleets. The Group has already developed a Michelin value toolkit by offering integrated tire management, with the supply of the best low-rolling resistance tires (EFFITIRES™). EFFITRAILER™ has the goal to optimize semi-trailer management by reducing the number of empty run kilometers and truck downtime. This business model means that Michelin can have greater influence on the CO2 emissions of its customers.

**Cost to realize opportunity**
641000000

**Comment**
The source for the retreading information can be found in the EY report “The socio-economic impact of truck tire retreading in Europe,” October 2016.
<table>
<thead>
<tr>
<th>Impact and/or value chain</th>
<th>Impact</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Products and services</td>
<td>Impacted</td>
<td>There has been a positive financial impact from the sale of low-carbon products and services: 1) low rolling-resistance tires in markets with thresholds and grading for tire energy efficiency, mainly in Europe, Japan; and 2) for original equipment manufacturers to meet vehicle emissions standards in Europe; 3) services and solutions provided in multiple markets for fleets, mainly in Europe and North America; 4) all-weather tires, mainly in North America and Europe. The magnitude of the impact is between 40 and 60% of net sales over the last 5 years.</td>
</tr>
<tr>
<td>Supply chain and/or value chain</td>
<td>Not yet impacted</td>
<td>The potential impacts identified through analysis of risks and opportunities would be to production of raw materials. The number of diversity of suppliers – across all types of raw materials – has enabled Michelin to avoid any repercussions of climate-related impacts on suppliers. A number of supplier sites have been damaged or otherwise impacted by extreme weather events in the last few years (sites of several important suppliers in the Houston, Texas area were temporarily shut down following Hurricane Harvey in 2017), but none of these events led to a supply disruption for Michelin. As extreme weather events increase in force and frequency, this could lead to supply disruptions. The impact on Michelin’s business has been conservatively estimated to be up to € 500 million in a given year over the medium-term (next 5 to 15 years) in a worst-case scenario of prolonged plant stoppage.</td>
</tr>
<tr>
<td>Adaptation and mitigation activities</td>
<td>Impacted for some suppliers, facilities, or product lines</td>
<td>Adaptation to extreme weather events: Costs to production activities have thus far been minimal and have been absorbed by the handful of sites involved without material financial repercussions for those sites. Costs can be incurred as capital expenditure for new infrastructure (e.g., dikes built at a plant in Thailand, repair to tornado damages in North America), operating expenditures for new equipment (e.g., back-up generators at plants in Brazil) or lost production (e.g., around 3,000 tires at the plant in India). Mitigation activities: All of Michelin's production sites undertake CO2 mitigation actions since 2005 and have a 2020 reduction target to meet. As such, capital investments are made annually ranging from € 15 to 25 million per year towards improving energy efficiency through 16 identified action areas (e.g., reducing start-up and shut-down energy use, controlling steam leaks in the curing process, controlling leaks from air compressors). The short-term impact (up to 5 years in the future) is zero because all mitigation projects must meet the criterion of 100% return on investment within a maximum of 3 years. Renewable energy procurement is another mitigation action. A new program was begun in 2017 across all European production sites to purchase 100% of electricity needs from renewable sources; additional costs compared to non renewable energy procurement costs varied at site level between 0 and 10%.</td>
</tr>
<tr>
<td>Investment in R&amp;D</td>
<td>Not impacted</td>
<td>Because Michelin’s strategy for the last two decades has been based on 1) continual improvement of tire energy efficiency, 2) resource-saving, low-carbon services and solutions for fleets, and 3) innovations in new power trains (e.g., hydrogen fuel cell), the research and development budget has intrinsically included the investments needed under an energy transition scenario in the mobility sector, and all this well before climate scenarios existed.</td>
</tr>
<tr>
<td>Operations</td>
<td>Impacted for some suppliers, facilities, or product lines</td>
<td>Michelin’s manufacturing operations have been impacted by costs associated with 1) mitigating its CO2 emissions through renewable energy procurement at all production sites in Europe starting in 2017 at 0 to 10% additional operating costs at site level compared to non renewable energy procurement costs; and 2) carbon taxes imposed on the sites in France amounting to just under € 900,000 in 2017.</td>
</tr>
<tr>
<td>Other, please specify</td>
<td>Not evaluated</td>
<td>-</td>
</tr>
</tbody>
</table>
### (C2.6) Describe where and how the identified risks and opportunities have factored into your financial planning process.

<table>
<thead>
<tr>
<th>Relevance</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenues</td>
<td>Michelin's revenues have been impacted from its services and solutions (SES) business line through the expansion of existing offers (EFFITIRES, EFFITRAILER) and through new ones (MyBestRoute, MyRoadChallenge, etc.) that allow fleets to reduce their costs, but also reduce their impact on the climate through reduced fuel consumption. The magnitude of this current impact could be qualified as medium to high. Each year, this business unit submits its 5-year strategic plan to be reviewed and validated by the Group Executive Committee. The current objective is to double revenue of this business unit in part by offering a premium for greenness. Climate change-related opportunities will lead to increasing needs from fleets for such services and thus increasing Michelin future revenues. However, their specific impact cannot be separated from the rest. The magnitude of future impacts could be classified as positive, but unknown.</td>
</tr>
<tr>
<td>Operating costs</td>
<td>Operating costs to cover future renewable energy procurement for just under 40 European production sites (current additional costs per site compared to non renewable energy procurement vary between 0 and 10%), future purchase of CO2 allowances under the European ETS (estimated at € 30 million per year) for 22 production sites, and the carbon tax in France (currently at just under € 900,000) covering 16 production sites are anticipated by the business lines and the manufacturing facilities they manage. Each year the 5-year strategic plan at business unit level is reviewed and readjusted to include such expenses, which remain up until now been low and are absorbed in routine operating costs. The cost most likely to increase significantly from current levels is for CO2 allowances under the European ETS. Forecasted increases in CO2 allowances are determined by the CO2 Allowances Work Group, a cross-functional committee tasked with optimizing compliance costs. The work group communicates its findings directly to the manufacturing sites that would be impacted so that future costs can be integrated into the 5-year strategic plan.</td>
</tr>
<tr>
<td>Capital expenditures / capital allocation</td>
<td>At the corporate level for manufacturing operations, an annual target is set for investments in energy efficiency projects towards meeting the 2020 objective for improving energy efficiency, which varies between € 15 and € 25 million. Each year the 5-year strategic plan at business unit level is reviewed and readjusted to include an investment budget corresponding to the energy efficiency projects that have been prioritized according to three criteria: 1) technical feasibility, 2) cost and return on investment, and 3) contribution to meeting the Michelin’s 2020 energy intensity objective of -38% compared to the 2005 baseline.</td>
</tr>
<tr>
<td>Acquisitions and divestments</td>
<td>Recent acquisitions outside Michelin’s historic core activity of diverse tire lines have taken into account both risks and opportunities driven by evolving market needs to reduce materials extraction - and the associated carbon footprint - and increase energy efficiency of products and services. Michelin acquisitions in 2017 focused on innovative materials and services: 1) Lehigh Technologies offers high-performance materials that are produced from end-of-life tires and that can be used in industrial and consumer applications such as road and building construction, tubing and containers, footwear and new tires. 2) NexTraq, PTG and Téleflow, Copilot Satelital, and Smartdrive provide digital technologies that enable more efficient movement of goods and people. In 2017 a total of €476 million were spent on acquisitions. Equity interests in held in Smartdrive, Lehigh Technologies, PTG and Téleflow, among others, resulted in a €112 million increase in available-for-sale financial assets.</td>
</tr>
<tr>
<td>Access to capital</td>
<td>Michelin regularly meets with current and potential investors and includes sustainability issues in its presentation. Over the last several years, the exchanges have remained general regarding Michelin’s CSR performance, including that related to climate change, and involve Michelin providing further information in response to questions. At no time has the question of access to capital as it relates to Michelin’s overall approach to climate change arisen.</td>
</tr>
<tr>
<td>Assets</td>
<td>Michelin has 5 production sites that use steam produced from coal-fired boilers: 3 in Europe, 1 in North America and 1 in China. With current pressure to decarbonize manufacturing, Michelin considers these boilers as potential economically stranded assets in the future and is preparing its coal exit strategy for manufacturing. It is estimated that the level of capital investment required would be from 1 to 4% of current levels of just under €2 billion/year.</td>
</tr>
<tr>
<td>Liabilities</td>
<td>Regarding climate change, liability risk is primarily related to the act of providing misleading information (e.g., on prospects, compliance, reporting, risk management) or growing/excessive CO2 emissions. Michelin’s history of transparent and compliant reporting and of reducing its carbon footprint has meant that this kind of liability is not material.</td>
</tr>
</tbody>
</table>

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### C3. Business Strategy

#### C3.1

(C3.1) Are climate-related issues integrated into your business strategy?

Yes

#### C3.1a

(C3.1a) Does your organization use climate-related scenario analysis to inform your business strategy?

Yes, quantitative
(C3.1c) Explain how climate-related issues are integrated into your business objectives and strategy.

Michelin’s past explains clearly why its current objectives and strategy have been influenced by climate-related issues. Michelin has historically been addressing climate-related issues through its two major innovations of the 20th century: the radial tire and the “green tire”. The radial tire has a lower rolling resistance than the traditional bias ply tires, thus increasing the energy efficiency of the vehicle and reducing CO2 emissions. Michelin was the first major tire manufacturer to design, develop, patent, and commercialize the radial tire. The green tire, invented by Michelin in 1992 with the introduction of silica into rubber mixes, brought a breakthrough in achieving lower rolling resistance of tires and thus higher energy efficiency of the vehicle, while maintaining or improving safety, longevity and other key performance characteristics. Furthermore, Michelin has been a pioneer in the circular economy (e.g., retreading tires) and the functional economy (e.g., selling tires as a service), and has been at the forefront advocating sustainability of the transport sector through the Challenge Bibendum event created in 1998 and transformed in 2017 to become Movin’On, unique international summit on sustainable mobility. Against this historical backdrop, current business strategy has been influenced by climate-related issues in the following ways:

1) Operations – internal awareness, regulatory changes & rising energy costs have changed both how Michelin uses and sources energy to produce tires with energy efficiency programs and renewable energy procurement; 2) Products, solutions & services – continued development of long-lasting, energy-efficient tires and innovative offers for fleets to improve fuel efficiency; 3) New markets – exploration of new business areas to address the need to for zero- and low-carbon mobility (e.g., hydrogen fuel cells); 4) Decarbonized transport – Michelin plays a leading role to drive decarbonization in the transport sector as a cofounder of the Paris Process for Mobility and Climate (PPMC), designated by the UNFCCC to promote dialogue and coordinated action, and as organizer of Movin’On bringing diverse public and private actors together to innovate, collaborate and demonstrate on low- and zero-carbon mobility.

Michelin’s short-, medium- and long-term business strategy is linked to short-, medium- and long-term objectives and targets: 1) Short-term targets: Michelin’s externally published 2020 ambitions and internal balance score card include sustainability ambitions which serve as inputs to the annual 5-year strategic planning process and include several targets for reducing CO2 emissions (all with a 2010 baseline): a/ improving tire fuel efficiency to reduce CO2 emissions by more than 8 million tons; b/ improving energy efficiency in manufacturing operations by 25%; and c/ achieving a 10% reduction in CO2 emissions of downstream logistics operations. 2) Short-term objective: Double revenues from mobility services and solutions, including offers that improve fleet fuel efficiency, from 2015 to 2020; 3) Medium-term target: In 2015 Michelin publicly committed to reducing CO2 emissions associated with tire performance by 20% between 2010 and 2030; this ambition will guide medium-term research and development programs as it gets formalized in a Science Based Target. 3) Long-term: In 2015 Michelin publicly committed to a 50% reduction in manufacturing-related CO2 emissions by 2050; this target is driving technical and cost feasibility studies and will inform future investments once it is formalized in a Science Based Target.

In line with strategy, objectives and targets, the most substantial business decisions in 2017 were the following: 1) Acquisition of leading US telematics provider NexTraq which will enable faster development of fleet solutions for the North American market that help reduce CO2 emissions of a wide variety of fleets. Services have been part of Michelin’s corporate DNA for 125 years. The Effi™, Effi™, and now Effitra™ programs deployed by MICHELIN® solutions, as well as the MICHELIN TIRE CARE truck fleet service program, are offering our business customers tools to reduce their carbon footprint and optimize their overall tire management, with improved safety performance and productivity and lower costs. Michelin’s strategy to increase solutions and services involves fully harnessing digital technologies to process enormous amounts of data. The NexTraq acquisition follows that of Sascar in 2014. 2) Launch of the initiative “The Truth about Worn Tires” to promote “programmed longevity” and discourage the early scrapping of tires based on tread wear indicator alone: changing tires too early would result in 128 million additional tires per year being used in Europe, corresponding to 9 million metric tons of additional CO2 emissions. Based on European data, recommending the scrapping of tires worn down to the minimum legal tread depth of 1.6 mm would avoid the unnecessary use of 400 million tires a year worldwide, while reducing carbon emissions by 35 million metric tons a year. Michelin’s initiative calls on industry test bodies and consumer organizations to start comparing and testing tires when they are worn to the legal limit. This is a business strategy decision in that Michelin’s diverse tire offers are grounded in long-lasting, sustainable performances that would be not fully realized during the use phase should early tire removal become a regulatory requirement.
(C3.1d) Provide details of your organization’s use of climate-related scenario analysis.

<table>
<thead>
<tr>
<th>Climate-related scenarios</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>2DS</td>
<td>In 2016 Michelin conducted a scoping study as part of preparations for making a commitment to the Science Based Targets initiative (commitment made in May 2018) under assumption that the SBT target would be Michelin’s 2050 ambition to reduce scope 1 and 2 emissions of manufacturing operations by 50% in absolute value by 2050 compared to a 2010 base-year. The 2050 time horizon is appropriate for planning a complete retooling of manufacturing operations required to achieve major CO2 reductions. After modeling this target against different 2°C scenarios, it was assessed that this percentage reduction is aligned to the low-end reduction of the IPCCs range in its 5th Assessment Report (linear decarbonization equivalent to a -49% reduction from 2010 to 2050) but under the RCP 2.6/Global scenario (equivalent to a -66% reduction from 2010 to 2050). Because a reduction of -50% in absolute value from 2010 to 2050 has major implications for retooling all manufacturing plants and developing a renewable energy purchasing strategy, it was decided based on the scenario analysis described above to conduct technical and cost feasibility studies of the key opportunities for improving energy efficiency and reducing the Group’s overall CO2 emissions coefficient. These studies are currently in progress. The SBT scenarios will be refined in the next year towards submitting Michelin’s proposed targets. Separately, for Scope 3 SBT targets, Michelin is using the International Energy Agency (IEA) Mobility Model 2DS and has provided technical information to IEA in 2017-early 2018 on the tire’s contribution to vehicle energy efficiency in order for the model to be refined.</td>
</tr>
</tbody>
</table>

C4. Targets and performance

C4.1

(C4.1) Did you have an emissions target that was active in the reporting year?
Both absolute and intensity targets

C4.1a

(C4.1a) Provide details of your absolute emissions target(s) and progress made against those targets.

<table>
<thead>
<tr>
<th>Target reference number</th>
<th>Abs 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scope</td>
<td>Scope 1 +2 (market-based)</td>
</tr>
<tr>
<td>% emissions in Scope</td>
<td>100</td>
</tr>
<tr>
<td>% reduction from base year</td>
<td>15</td>
</tr>
<tr>
<td>Base year</td>
<td>2010</td>
</tr>
<tr>
<td>Start year</td>
<td>2016</td>
</tr>
<tr>
<td>Base year emissions covered by target (metric tons CO2e)</td>
<td>4067000</td>
</tr>
<tr>
<td>Target year</td>
<td>2020</td>
</tr>
<tr>
<td>Is this a science-based target?</td>
<td>Yes, we consider this a science-based target, but this target has not been approved as science-based by the Science-Based Targets initiative</td>
</tr>
<tr>
<td>% achieved (emissions)</td>
<td>100</td>
</tr>
<tr>
<td>Target status</td>
<td></td>
</tr>
</tbody>
</table>
Please explain
Michelin’s objective by 2020 is to lower CO2 emissions per metric ton of finished product by 32 percent compared with 2010. If production growth is 25 percent over the same period, then CO2 emissions will be reduced by 15 percent over the period. The actual % complete is 169% (100% was entered as the ORS system does not accept a higher value). The target is -15%, and the 2017 result is -25%, which is partly explained by the fact that the we anticipated our renewable electricity purchases necessary to reach the 2020 target, and partly because production growth has been lower than expected. Yet, if Michelin’s production growth prediction for 2020 is met, the resulting reduction will be around -15%. This is why the target status is “underway” through 2020 when the final result will be known. Intermediate results cannot be considered as achieved because of year-to-year fluctuations in production.

Target reference number
Abs 2

Scope
Scope 1 +2 (market-based)

% emissions in Scope
100

% reduction from base year
50

Base year
2010

Start year
2015

Base year emissions covered by target (metric tons CO2e)
4067000

Target year
2050

Is this a science-based target?
Yes, we consider this a science-based target, but this target has not been approved as science-based by the Science-Based Targets initiative

% achieved (emissions)
49

Target status
Underway

Please explain
Michelin has a long term ambition to halve its Scope 1 & 2 emissions between 2010 and 2050. Intermediary targets are being prepared to guide this process. Note: Michelin is in the process of preparing science-based targets. Michelin must submit for all 3 scopes since scope 3 emissions are greater than 40% of the total. However because the SBT methodology for the transport sector is under development we must wait for the scope 3 methodology to be ready in order to submit target for all three scopes at the same time. Halving emissions from 2010 base year will necessitate reducing annual Scope 1 & 2 emissions to 2,033,500 metric tons. To date Michelin is on track to meet this ambition by 2050.

C4.1b

(C4.1b) Provide details of your emissions intensity target(s) and progress made against those target(s).

Target reference number
Int 1

Scope
Scope 1 +2 (market-based)

% emissions in Scope
% reduction from baseline year
7

Metric
Metric tons CO2e per metric ton of product

Base year
2016

Start year
2016

Normalized baseline year emissions covered by target (metric tons CO2e)
0.99

Target year
2017

Is this a science-based target?
Yes, we consider this a science-based target, but this target has not been approved as science-based by the Science Based Targets initiative

% achieved (emissions)
100

Target status
Expired

Please explain
2017 target published in the 2016 Registration Document (annual report). This target is a year-on-year target.

% change anticipated in absolute Scope 1+2 emissions
-3.4

% change anticipated in absolute Scope 3 emissions
0

Target reference number
Int 2

Scope
Scope 1 +2 (market-based)

% emissions in Scope
100

% reduction from baseline year
32

Metric
Metric tons CO2e per metric ton of product

Base year
2010

Start year
2016

Normalized baseline year emissions covered by target (metric tons CO2e)
1.28

Target year
2020

Is this a science-based target?
Yes, we consider this a science-based target, but this target has not been approved as science-based by the Science Based Targets initiative

% achieved (emissions)
Target status
Underway

Please explain
This target is not published. It is an internal target consistent with the Michelin Environmental Footprint target of -50% between 2010 and 2020, published in the 2015 Registration Document (annual report). The 96% completion stated here relates to Michelin’s reported reduction in CO2 emissions intensity from 1.28 to 0.89 metric tons per metric ton of tire produced between 2010 and 2016, compared with the target of 0.87 metric tons per metric ton of tire produced (32% reduction) by 2020. Michelin’s objective is to lower the CO2 emissions per metric ton of finished product by 32 percent in 2020 compared with 2010. If the growth in tire production is 25 percent over the same period, then CO2 emissions will be reduced by 15 percent over the period.

% change anticipated in absolute Scope 1+2 emissions
-15

% change anticipated in absolute Scope 3 emissions
0

Target reference number
Int 3

Scope
Scope 3: Use of sold products

% emissions in Scope
86

% reduction from baseline year
8

Metric
Grams CO2e per kilometer*

Base year
2010

Start year
2013

Normalized baseline year emissions covered by target (metric tons CO2e)
50

Target year
2020

Is this a science-based target?
No, but we are reporting another target that is science-based

% achieved (emissions)
70

Target status
Underway

Please explain
The key to reducing vehicular CO2 emissions is to improve the energy efficiency of tires. 1 out of 5 fuel tanks for a passenger car and 1 out of 3 for a truck are required to overcome the phenomenon referred to as “rolling resistance”. This target covers Michelin’s product plan for passenger/light vehicle and truck tires. In 2010, vehicles equipped with Michelin tires generate on average 50g CO2/km, to compensate for rolling resistance of their tires. Michelin is committed to reducing rolling resistance of its tires by 8.5% on average by 2020 compared to 2010. So, in 2020, vehicles equipped with Michelin tires will generate 8 Mt of CO2 less than compared to 2010, which corresponds to a reduction of 8% of the gCO2 emitted per km on average. Note about SBT: while there is a method for the transport sector as a whole, it cannot be applied to auto parts suppliers without taking into account the different actors in the auto sector. A work group was run by WWF from 2017 to 2018 to develop more refined decarbonization pathways for the road transport sector. Michelin was a participating member of this work group and continues to work with WWF and the International Energy Agency to finalize an appropriate tool for auto equipment manufacturers like Michelin to set SBT targets. In 2017, Michelin has reached 70% of its target in rolling resistance reduction: that is to say a reduction of 5.6 Mt CO2, compared to 2010.
% change anticipated in absolute Scope 1+2 emissions
0

% change anticipated in absolute Scope 3 emissions
-8.7

C4.2

(C4.2) Provide details of other key climate-related targets not already reported in question C4.1/a/b.

<table>
<thead>
<tr>
<th>Target</th>
<th>Renewable energy consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>KPI – Metric numerator</td>
<td>% renewable energy</td>
</tr>
<tr>
<td>KPI – Metric denominator (intensity targets only)</td>
<td></td>
</tr>
<tr>
<td>Base year</td>
<td>2010</td>
</tr>
<tr>
<td>Start year</td>
<td>2016</td>
</tr>
<tr>
<td>Target year</td>
<td>2020</td>
</tr>
<tr>
<td>KPI in baseline year</td>
<td>0.2</td>
</tr>
<tr>
<td>KPI in target year</td>
<td>33</td>
</tr>
<tr>
<td>% achieved in reporting year</td>
<td>46</td>
</tr>
<tr>
<td>Target Status</td>
<td>Underway</td>
</tr>
</tbody>
</table>

Please explain
This target has not been set as a target in itself, but as a means to reach the 2020 CO2 target of -32 % per ton of finished product by 2020 (vs 2010). It could be readjusted in the next years depending on how far we stand from the CO2 target.

Part of emissions target
The target covers all our industrial and research activities in scope 1 and 2. It is part of our 2050 target to halve our CO2 emission vs 2010 (in absolute values)

Is this target part of an overarching initiative?
Other, please specify (It will be part of our future SBT.)

<table>
<thead>
<tr>
<th>Target</th>
<th>Land use</th>
</tr>
</thead>
<tbody>
<tr>
<td>KPI – Metric numerator</td>
<td>Hectares reforested</td>
</tr>
<tr>
<td>KPI – Metric denominator (intensity targets only)</td>
<td></td>
</tr>
<tr>
<td>Base year</td>
<td>2015</td>
</tr>
<tr>
<td>Start year</td>
<td>2016</td>
</tr>
<tr>
<td>Target year</td>
<td>2030</td>
</tr>
</tbody>
</table>
**KPI in baseline year**  
0

**KPI in target year**  
88000

**% achieved in reporting year**  
54

**Target Status**  
Underway

**Please explain**  
This target involves the reforestation of 3 concessions in the Indonesian provinces of Jambi (Sumatra) and North East Kalimantan (Borneo) previously ravaged by uncontrolled deforestation. As part of a joint venture with the Barito Group, Michelin’s objective is to reforest its part of the concessions acreage to re-create a natural environment with endemic species and community crops on one half and rubber trees on the other half. The percentage achieved represents the coverage of replanting, not the coverage of the vegetation at full maturity.

**Part of emissions target**  
Not part of emissions target

**Is this target part of an overarching initiative?**  
Remove deforestation

**Target**  
Engagement with suppliers

**KPI – Metric numerator**  
% suppliers obtaining “confirmed” status through EcoVadis (>45 score)

**KPI – Metric denominator (intensity targets only)**

**Base year**  
2012

**Start year**  
2013

**Target year**  
2020

**KPI in baseline year**  
0

**KPI in target year**  
70

**% achieved in reporting year**  
100

**Target Status**  
Underway

**Please explain**  
Since 2012, Michelin has evaluated the CSR performance of its key suppliers through EcoVadis. The Group assures a regular follow up of suppliers with which it works with through evaluations of their performance including CSR performance. The Group’s 2020 ambition in terms of sustainable development is to evaluate its main suppliers and accompany them so that at least 70% of them achieve the confirmed status of the Group’s standards.

**Part of emissions target**  
Not part of emissions target

**Is this target part of an overarching initiative?**  
No, it’s not part of an overarching initiative

**Target**  
Energy usage
KPI – Metric numerator
Gigajoules

KPI – Metric denominator (intensity targets only)
Metric tons of finished product

Base year
2010

Start year
2010

Target year
2020

KPI in baseline year
14.4

KPI in target year
10.8

% achieved in reporting year
64

Target Status
Underway

Please explain
This target is part of the Michelin Environmental Footprint since the beginning of this Groupwide indicator. In 2017, the indicator was at 12.11 GJ/ton of FP. In other words, the Group reduced its energy usage by 15.9% when compared to 2010 levels, thus avoiding the use of almost 4.1 million GJ or the equivalent of the consumption of 40,000 French households (based on 2015 INSEE numbers of 98 GJ per person for 2014).

Part of emissions target
Int1 & Int2

Is this target part of an overarching initiative?
Other, please specify (Michelin Environmental Footprint (MEF))

C4.3

(C4.3) Did you have emissions reduction initiatives that were active within the reporting year? Note that this can include those in the planning and/or implementation phases.
Yes

C4.3a

(C4.3a) Identify the total number of projects at each stage of development, and for those in the implementation stages, the estimated CO2e savings.

<table>
<thead>
<tr>
<th>Phase</th>
<th>Number of projects</th>
<th>Total estimated annual CO2e savings in metric tonnes CO2e (only for rows marked *)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under investigation</td>
<td>6</td>
<td>107000</td>
</tr>
<tr>
<td>To be implemented*</td>
<td>5</td>
<td>51000</td>
</tr>
<tr>
<td>Implementation commenced*</td>
<td>1</td>
<td>2000</td>
</tr>
<tr>
<td>Implemented*</td>
<td>230</td>
<td>491000</td>
</tr>
<tr>
<td>Not to be implemented</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

C4.3b
(C4.3b) Provide details on the initiatives implemented in the reporting year in the table below.

<table>
<thead>
<tr>
<th>Activity type</th>
<th>Process emissions reductions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description of activity</strong></td>
<td>Changes in operations</td>
</tr>
<tr>
<td><strong>Estimated annual CO2e savings (metric tonnes CO2e)</strong></td>
<td>30739</td>
</tr>
<tr>
<td><strong>Scope</strong></td>
<td>Scope 1</td>
</tr>
<tr>
<td></td>
<td>Scope 2 (market-based)</td>
</tr>
<tr>
<td><strong>Voluntary/Mandatory</strong></td>
<td>Voluntary</td>
</tr>
<tr>
<td><strong>Annual monetary savings (unit currency – as specified in CC0.4)</strong></td>
<td>4493798</td>
</tr>
<tr>
<td><strong>Investment required (unit currency – as specified in CC0.4)</strong></td>
<td>0</td>
</tr>
<tr>
<td><strong>Payback period</strong></td>
<td>&lt;1 year</td>
</tr>
<tr>
<td><strong>Estimated lifetime of the initiative</strong></td>
<td>Ongoing</td>
</tr>
<tr>
<td><strong>Comment</strong></td>
<td>Better management of processes in order to use energy more efficiently (for example managing production bottlenecks, organizing staff shifts, better managing machine down time by shutdown procedures). Behavioral changes consistently generate as much energy savings as those made through specific investments. No additional investment required beyond regular management activities and application of best practices. Good habits can be lost, which is why this initiative is ongoing.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Activity type</th>
<th>Process emissions reductions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description of activity</strong></td>
<td>Changes in operations</td>
</tr>
<tr>
<td><strong>Estimated annual CO2e savings (metric tonnes CO2e)</strong></td>
<td>61478</td>
</tr>
<tr>
<td><strong>Scope</strong></td>
<td>Scope 1</td>
</tr>
<tr>
<td><strong>Voluntary/Mandatory</strong></td>
<td>Voluntary</td>
</tr>
<tr>
<td><strong>Annual monetary savings (unit currency – as specified in CC0.4)</strong></td>
<td>8987595</td>
</tr>
<tr>
<td><strong>Investment required (unit currency – as specified in CC0.4)</strong></td>
<td>15700000</td>
</tr>
<tr>
<td><strong>Payback period</strong></td>
<td>1-3 years</td>
</tr>
<tr>
<td><strong>Estimated lifetime of the initiative</strong></td>
<td>3-5 years</td>
</tr>
<tr>
<td><strong>Comment</strong></td>
<td>1/ Reducing steam leaks in curing and other high-use workshops, 2/ optimizing insulation and physical pathway of heated piping, 3/ optimizing output of compressed air networks, 4/ implementing variable speed motors on machines, 5/ better control of regulation on Thermal Control Units (TCUs), 6/ optimizing energy consumption during plant stoppages, and 7/ improving overall efficiency of tire curing presses. Progress is planned and achieved through individually managed projects that mainly address scope 1 emissions. Investments are equivalent to a better management of processes both in terms of CO2 savings and monetary savings.</td>
</tr>
</tbody>
</table>
**Activity type**
Energy efficiency: Processes

**Description of activity**
Heat recovery

**Estimated annual CO2e savings (metric tonnes CO2e)**
640

**Scope**
Scope 1

**Voluntary/Mandatory**
Voluntary

**Annual monetary savings (unit currency – as specified in CC0.4)**
48000

**Investment required (unit currency – as specified in CC0.4)**
355000

**Payback period**
4 - 10 years

**Estimated lifetime of the initiative**
11-15 years

**Comment**
In 2017, a heat pump that recovers heat from a cooling tower has been installed in Ladoux, France. Similar projects are under study in several other sites. The investment is done by a third party. Subsidies through energy efficiency certificates are likely to cover 70 percent of the investment.

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**Activity type**
Low-carbon energy purchase

**Description of activity**
Other, please specify (electricity from renewable sources)

**Estimated annual CO2e savings (metric tonnes CO2e)**
387000

**Scope**
Scope 2 (market-based)

**Voluntary/Mandatory**
Voluntary

**Annual monetary savings (unit currency – as specified in CC0.4)**
0

**Investment required (unit currency – as specified in CC0.4)**
0

**Payback period**
Please select

**Estimated lifetime of the initiative**
3-5 years

**Comment**
In 2017, the Group used 1,583,000 MWh of electricity from renewable sources in eight European Union countries where it has production facilities, thereby avoiding the emission of 387,000 tonnes of CO2, or the equivalent of 13% of total consolidated emissions in 2017. There is no monetary savings for this project, but an added cost of 470,000€.
(C4.3c) What methods do you use to drive investment in emissions reduction activities?

<table>
<thead>
<tr>
<th>Method</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dedicated budget for energy efficiency</td>
<td>In 2017, the energy efficiency improvement program was supported by €16 million in capital expenditure. It is still being deployed in 2018.</td>
</tr>
<tr>
<td>Internal price on carbon</td>
<td>In 2015, the Group made the decision to introduce an internal CO2 price in its return on investment (ROI) analysis tools as a decision-making element. As of 2016, the price has been set at €50 per ton of CO2.</td>
</tr>
<tr>
<td>Other Method: Engagement with energy project managers</td>
<td>On each energy-saving project, the impact of CO2 reductions on the Michelin Environmental Footprint (MEF) is highlighted.</td>
</tr>
<tr>
<td>Other Method: Energy portfolio oversight</td>
<td>The corporate Energy Expert Team, covering all industrial operations in its scope, oversees all projects involving energy transformation or major energy efficiency gains.</td>
</tr>
</tbody>
</table>

C4.5

(C4.5) Do you classify any of your existing goods and/or services as low-carbon products or do they enable a third party to avoid GHG emissions?

Yes

C4.5a

(C4.5a) Provide details of your products and/or services that you classify as low-carbon products or that enable a third party to avoid GHG emissions.

**Level of aggregation**
Group of products

**Description of product/Group of products**
Low rolling resistance truck and passenger car/light truck tires.

**Are these low-carbon product(s) or do they enable avoided emissions?**
Avoided emissions

**Taxonomy, project or methodology used to classify product(s) as low-carbon or to calculate avoided emissions**
Other, please specify (Rolling resistance performance)

**% revenue from low carbon product(s) in the reporting year**
30

**Comment**
Tire rolling resistance is the measure of its energy efficiency. The percentage revenue takes into account sales of truck tires in the European Union, Norway, Turkey, Brazil and Gulf Cooperation Council countries and of passenger car/light truck tires in these same markets as well as in South Korea, Japan and Israel. Michelin sells tires of equal or better energy efficiency in other countries around the world, but for this exercise the percentage of revenues was limited to markets with rolling resistance regulations.

C5. Emissions methodology

C5.1
(C5.1) Provide your base year and base year emissions (Scopes 1 and 2).

Scope 1

**Base year start**
January 1 2010

**Base year end**
December 31 2010

**Base year emissions (metric tons CO2e)**
1832384

**Comment**

Scope 2 (location-based)

**Base year start**
January 1 2010

**Base year end**
December 31 2010

**Base year emissions (metric tons CO2e)**
2237051

**Comment**

Scope 2 (market-based)

**Base year start**
January 1 2010

**Base year end**
December 31 2010

**Base year emissions (metric tons CO2e)**
2234380

**Comment**

C5.2

(C5.2) Select the name of the standard, protocol, or methodology you have used to collect activity data and calculate Scope 1 and Scope 2 emissions.


C6. Emissions data

C6.1

(C6.1) What were your organization’s gross global Scope 1 emissions in metric tons CO2e?

**Row 1**

**Gross global Scope 1 emissions (metric tons CO2e)**
1502493

**End-year of reporting period**

<Not Applicable>

**Comment**
C6.2

(C6.2) Describe your organization’s approach to reporting Scope 2 emissions.

Row 1

Scope 2, location-based
We are reporting a Scope 2, location-based figure

Scope 2, market-based
We are reporting a Scope 2, market-based figure

Comment
Until 2015, we reported that our scope 2 emission figure was location-based, which we now understand was mistaken: in 2016, we thoroughly studied the Guide “Accounting of scope 2 emissions, Technical notes for reporting to CDP Climate Change and Supply Chain in 2016” and consulted with a CDP recommended service provider. As a result we now understand that our scope emissions have always been calculated in line with the market-based approach.

C6.3

(C6.3) What were your organization’s gross global Scope 2 emissions in metric tons CO2e?

Row 1

Scope 2, location-based
1929505

Scope 2, market-based (if applicable)
1536289

End-year of reporting period
<Not Applicable>

Comment

C6.4

(C6.4) Are there any sources (e.g. facilities, specific GHGs, activities, geographies, etc.) of Scope 1 and Scope 2 emissions that are within your selected reporting boundary which are not included in your disclosure?

Yes

C6.4a
(C6.4a) Provide details of the sources of Scope 1 and Scope 2 emissions that are within your selected reporting boundary which are not included in your disclosure.

Source
Tire distribution centers, retail and wholesale

Relevance of Scope 1 emissions from this source
Emissions are not relevant

Relevance of location-based Scope 2 emissions from this source
Emissions are not relevant

Relevance of market-based Scope 2 emissions from this source (if applicable)
Emissions are not relevant

Explain why the source is excluded
Calculations show that this source represents less than 3% of the Group total. For this reason, and consistent with legal requirements for reporting Group-wide extra-financial information under French law, this source is not included in the Group’s consolidated annual report.

C6.5

(C6.5) Account for your organization’s Scope 3 emissions, disclosing and explaining any exclusions.

Purchased goods and services

Evaluation status
Relevant, calculated

Metric tonnes CO2e
8981740

Emissions calculation methodology
i. Data used: The primary data used are the total global raw materials, packaging and finished goods purchases, broken down into 70 purchasing families, valid for 2016. They represent a total of 2,605 lines of information. For each category, a GHG emission factor (secondary data) from a representative product is selected. Other types of products from Michelin: services, roadmaps, etc. were excluded from this category as their impacts are accounted for in the capital goods category. ii. Methodology: The mass purchased is multiplied by the selected emissions factor (EF) to obtain a screening assessment of the GHG emissions associated with each family. The database used is Ecoinvent v.3 Global Warming Potential used comes from IPCC 2013 GWP 100-year values. This allows for the identification of purchasing categories likely to be the main contributors to the impact. Some emissions factors are based on specific EF for Michelin raw material. For example Carbon black emissions factor are calculated based on Michelin's supplier data. Some significant changes to EF were made to 2016 data compared to 2015 data. The most significant change is to the “Silane” category. The LCA process of “Silane” was updated to reflect the product “Silicon” as this process is more representative of the product used by Michelin, though it is to be noted that is a lower value than the true EF. iii. Quality: The quality of the primary data used is considered high. All purchases were assessed with an emission factor. Simplifications of modeling remain highly reduced. The results quality is therefore also considered high. Calculation for year 2016, first year in a 3-year cycle.

Percentage of emissions calculated using data obtained from suppliers or value chain partners
20

Explanation
Capital goods

Evaluation status
Relevant, calculated

Metric tonnes CO2e
1093127

Emissions calculation methodology
i. Data used: The primary data used covers the purchases from fixed assets and supplies for 2016 in monetary terms, broken down into 222 categories, and various services. For most of the capital goods, a GHG emission factor was selected from an input-output database referenced below. Some categories in the data supplies were excluded because they are redundant with other scope 3 categories. ii. Methodology: Each sub-category or flow within the categories is associated with an economic sector from the environmentally-extended Input-Output Model Open IO v1.4. The model, originally developed in 2002, was adjusted for inflation, evolution of the purchasing power parity and of energy efficiency of the global economy for 2016. The amount spent in each sub-category is then multiplied by the sector unit GHG emission factor, except for the negative amounts which, were considered as zero, and for some sub-categories already accounted in other categories. Note: An overall global emission factor was chosen for the unclassifiable services category ‘Other support services’. The amount spent was then multiplied by this unique emission factor. The amount of these services represents only 15% of the total category (in €). iii. Quality: The quality of the primary data used is high. However, due to the simplification involved in the modeling, especially for the services, the quality of the emissions data is considered as medium. In particular, several flows cannot be properly characterized with existing economic sector of the database, requiring proxies for the assessment. Calculation for year 2016, first year in a 3-year cycle.

Percentage of emissions calculated using data obtained from suppliers or value chain partners
0

Explanation

Fuel-and-energy-related activities (not included in Scope 1 or 2)

Evaluation status
Relevant, calculated

Metric tonnes CO2e
731009

Emissions calculation methodology
i. Data used: The primary data used are the types and quantities of fuels, electricity and heat purchased worldwide in 2016, under scopes 1 & 2. Aggregated values for all countries were gathered. ii. Methodology: The emissions were calculated by multiplying fuel quantities, electricity and heat purchased by upstream and energy loss Transport and Distribution GHG emission factors for the different countries. Emissions factors and total LCA emissions factors were found or calculated from IEA (2015) and DEFRA (2016). A location-based approach was chosen to compute energy. Scope 2 and Scope 3 are related to the country mix and not a residual mix. Renewable energy emissions are based on the different production technologies of renewable sources. iii. Quality: The quality of the primary data used is medium the quality of the emissions factors is high. The quality of the emissions data is considered as medium. Calculation for year 2016, first year in a 3-year cycle.

Percentage of emissions calculated using data obtained from suppliers or value chain partners
0

Explanation
Upstream transportation and distribution

Evaluation status
Relevant, calculated

Metric tonnes CO2e
1730446

Emissions calculation methodology
i. Data used: The primary data used are the quantity of goods purchased provided for category 1 (purchased goods and services); their origin of sourcing and the destination country, as well as the transportation mode of transporting and distributing purchased goods. This represents a total of 2,605 lines of information to be analyzed. Michelin plant locations within each country have been taken into account to establish a distance table for each continent, with the estimated distances corresponding to each type of transport taken from www.searates.com and www.maps.google.com. Data still excludes warehouses (i.e. no intermediate temporary storage locations have been included; the method is strictly from site of origin to site of destination). ii. Methodology: Transportation distances have been rounded to represent generic geographical areas (i.e. by continent). For internal transportation (within a country), generic (specific to Michelin site addresses are not taken into account yet), realistic distances have been chosen. The impacts have been obtained by multiplying the amount of transported goods by the estimated distance, and the Emission Factor corresponding to the mode of transportation. The emission factors associated with each mode of transportation (secondary data) are taken from the ecoinvent v3 database and GWP from IPCC 2013 GWP 100-year. A distinction is made between full and partial load vehicles. iii. Quality: The quality of the primary data used is high and the quality of the secondary data is high, however, some extrapolations (coming from rounding transport distance to continent) produced data considered to be medium quality. On average, the quality of the results is considered medium to high. Calculation for year 2016, first year in a 3-year cycle.

Percentage of emissions calculated using data obtained from suppliers or value chain partners
0

Explanation

Waste generated in operations

Evaluation status
Relevant, calculated

Metric tonnes CO2e
427613

Emissions calculation methodology
i. Data used: The primary data used for this category are the amount of waste generated at production sites. The data used are from 2015 as 2016 data are not available. The total amount of waste was given but there was no detailed information provided on the different types of end-of-life disposal method or fate of materials. ii. Methodology: Each waste flow considered has a specific end-of-life recovery associated with an emission factor to assess the GHG emissions of the treatment (Ecoinvent v3, Base Carbone from ADEME). For tire waste, Aliapur LCA study Emission Factors were used (extracted from a 2009 Aliapur report and coefficient update). For the other types of waste, emission factors for the recovery processes were updated. For some of the waste recycled, considering the limited information available in LCA databases, proxies have been used to estimate the impacts. Transportation to end-of-life installations was excluded from the modeling. Facilities are amortized over several years, so the impacts are marginal at the scale of 1 ton of waste. Transportation of waste is assumed to be insignificant for the calculation of this category's impacts. For some waste categories (i.e. Others, Mixed Waste, Hazardous waste) recycling Emission Factors are not available and disposal was considered to occur via incineration. Mixed waste and non-hazardous waste are considered to be general Municipal Solid Waste. For Ferrous, and Plastic materials, we consider material-specific recycling processes. For hazardous waste, only one recovery process was taken into account: incineration. Additional landfilled waste was included this year by using an inert waste EF. Global Warming Potential used comes from IPCC 2013 GWP 100-year values. iii. Quality: The quality of the primary data used is medium. It is consolidated into Group-level totals for just several main recovery outlets. No details are given about different types of recovery outlets used in the different countries where production sites are located. So due to the simplification involved in the modeling (i.e. the lack of qualitative data on the end-of-life treatment of the different waste streams, no geographical differentiation of waste treatment), the overall quality of the emission is estimated as medium. Calculation for year 2016, first year in a 3-year cycle.

Percentage of emissions calculated using data obtained from suppliers or value chain partners
0

Explanation
Business travel

Evaluation status
Relevant, calculated

Metric tonnes CO2e
10176

Emissions calculation methodology
i. Data used: The primary data were gathered for car rental from the service providers in Europe, and North America, and for train and air travel from Michelin's corporate travel agency covering the full geographic scope of activities. ii. Methodology: - Car rentals: For short-term rentals a specific calculation from one car rental agency in Europe provided information, combined with extrapolation for the rest of the world based on the number of employees per country. For long-term car leasing, the total carbon emissions were reported by service providers in Europe, and North America. An extrapolation has been done for Brazil based on the 2015 emission number and the ratio of employee count between 2015 and 2016. The other geographic zones were handled by using a per employee emission factor. - Plane & Train: Michelin CO2 emissions for 2016 have been calculated worldwide by the corporate travel agency. Moreover, a detailed methodology was provided by the travel agency, in which a relatively high confidence of accuracy is assumed. iii. Quality: The overall quality of the emissions is estimated as medium considering the extrapolations required for short-term car rentals and some minor gaps in primary data for long-term rentals. Calculation for year 2016, first year in a 3-year cycle.

Percentage of emissions calculated using data obtained from suppliers or value chain partners
100

Explanation

Employee commuting

Evaluation status
Relevant, calculated

Metric tonnes CO2e
185133

Emissions calculation methodology
i. Data used: The primary data used covers the total number of employees per country and region. They were aggregated by geographical regions where Michelin operates. Several different commuting scenarios were considered for areas where the number of employees was sufficiently high, while a default scenario was used for the remaining areas. It is assumed that these other commuting travels are made according to "outer suburban periphery" statistics. ii. Methodology: 2011 DEFRA Guidelines for Company GHG reporting were used for this category, especially for Emission Factors and an assumption regarding the use of personal vehicles by employees. Both EcoInvent and Base Carbone from ADEME (French EPA) were also used. IPCC 2007 GWP 100-year emission factors were used. Eurostat and specific literature were used to compute the distribution of different modes of transport. iii. Quality: Due to the generalization of these calculations, the quality of reported emissions data is medium to high. Calculation for year 2016, first year in a 3-year cycle.

Percentage of emissions calculated using data obtained from suppliers or value chain partners
0

Explanation

Upstream leased assets

Evaluation status
Not relevant, explanation provided

Metric tonnes CO2e

Emissions calculation methodology

Percentage of emissions calculated using data obtained from suppliers or value chain partners

Explanation
Michelin does not own upstream assets that are leased to other entities not included in Scope 1 or 2.
Downstream transportation and distribution

Evaluation status
Relevant, calculated

Metric tonnes CO2e
824032

Emissions calculation methodology
i. Data used and ii. Methodology: The methodology follows Michelin’s internal Supply Chain reference document, which relies on service provider invoicing for primary data. Distance driven by clients to obtain the sold products was excluded. The tonnage reported here is based on the tonnage calculated for the year 2014, the most recent year for which such invoicing is available. We have chosen to report the 2014 figure, which was adjusted to take into account 2016 production volumes (Finished and semi-finished goods), rather than not report any figure at all, to enable a full view of Scope 3 emissions and avoid any gaps. iii. Quality: The overall quality of the emissions is estimated as low to medium considering that there are gaps in the primary data for maritime and air transport, and for several geographic zones. Calculation for year 2016, first year in a 3-year cycle.

Percentage of emissions calculated using data obtained from suppliers or value chain partners
0

Explanation

Processing of sold products

Evaluation status
Not relevant, explanation provided

Metric tonnes CO2e

Emissions calculation methodology

Use of sold products

Evaluation status
Relevant, calculated

Metric tonnes CO2e
123500000

Emissions calculation methodology
i. Data used: Use of sold products is evaluated for passenger car/light truck and truck tires. Earthmover, aircraft, agricultural and two-wheel tires were not included, as they represent a minority of Michelin production and an even smaller proportion of kilometers traveled. Also excluded are products under the Michelin Lifestyle Ltd line; the calculation for 2015 showed that these products represent less than 0.01% of the total, and therefore deemed insignificant. For tire use, the primary data come from the IEA database ”Mobility Model” or MoMo (published in 2017 with data updated through 2015) providing worldwide tank-to-wheel CO2 emissions for road transport and from the estimated 2016 Michelin market share in units of passenger car/light vehicle and truck tires, respectively. ii. Methodology: For tires:1/ 2016 scenario of carbon impact of tires is based on 2015 IEA worldwide market data, the most recent data available, and adjusted for 2016.2/ Fuel consumption (and by proxy CO2 emissions) associated with tire rolling resistance was determined as an average percentage for passenger car/ light vehicles (20% of vehicle fuel consumption) and for trucks (33% of vehicle fuel consumption), respectively.3/ The influence on CO2 emissions of different types vehicle engine technologies in use during 2016 was not taken into account, since the most updated MoMo data is from 2015.4/ Michelin’s share of passenger car/light vehicle and truck tires on the road in 2016 is based on estimated market share in units of tires. iii. Quality: The overall quality of the emissions is estimated as medium considering the data source (updated IEA Mobility Model), which represents a consistent approach to the carbon impacts of transport, and the application of average overall tire energy efficiency, rather than the actual energy efficiency of the many different tire lines put on the market during the year. Calculation for year 2016, first year in a 3-year cycle.

Percentage of emissions calculated using data obtained from suppliers or value chain partners
0

Explanation
End of life treatment of sold products

Evaluation status
Relevant, calculated

Metric tonnes CO2e
3074453

Emissions calculation methodology
i. Data used: An aggregation of primary data from different End-of-Life (EoL) tire markets was provided by Michelin, including a general picture of ELT generated, with different volumes of material recovery, energy recovery, landfill in different countries. The GHG emission factors used are taken from an Aliapur study combined with Ecoinvent v3, using IPCC 2013, GWP100 (secondary data). Other end-of-life products (Michelin Travel Partner and Michelin Lifestyle Limited) were excluded because their contribution was determined as insignificant (2%).

ii. Methodology: The total weight of Michelin tires at end-of-life in 2016 is based on the estimated market share (in units of tires) of tires sold by Michelin in 2012, allowing for an average 4-year lifetime. Tires sold and reused in secondary markets were not included in this category. The sub categories are normalized based on this total amount. The emissions are then calculated by multiplying this amount by the average share for each type of end-of-life by the corresponding GHG emission factors. No benefits are considered because they are not included in the boundaries of the Scope 3 methodology defined by the GHG Protocol. Benefits can be taken into account in a life cycle assessment approach.

iii. Quality: The overall quality of the emissions is estimated as medium considering, on the one hand, that the worldwide ELT data set is now more complete, but that, on the other hand, methodological details on the computation are not yet available, namely how statistical extrapolations were done. Calculation for year 2016, first year in a 3-year cycle.

Percentage of emissions calculated using data obtained from suppliers or value chain partners
0

Explanation
Note for end-of-life (EOL) tires: if the full recovery process is taken into account (that is treatment of sold products AND uses of the recovered materials in manufacturing, energy production, civil engineering applications, etc., the net CO2 emissions are negative. Overall, 1.66 kg CO2 per kg EOL tire is generated in the treatment phase, and 3.36 kg CO2 per kg EOL tire are avoided in the phase using processed materials, for a net of -1.7 kg CO2 per kg EOL tire.

Downstream leased assets

Evaluation status
Not relevant, explanation provided

Metric tonnes CO2e

Emissions calculation methodology

Percentage of emissions calculated using data obtained from suppliers or value chain partners

Explanation
Michelin does not own downstream assets that are leased to other entities not included in Scope 1 or 2.

Franchises

Evaluation status
Relevant, calculated

Metric tonnes CO2e
265173

Emissions calculation methodology
i. Data used: Primary data are the number of franchise sites for each country. ii. Methodology: An average surface area was estimated for each franchise, using Google Maps, to calculate generic surface areas of the different types of franchises (Tyreplus, Euromaster). Electricity consumption in kWh/m2/year was associated (the same for every country, from Base Carbone of ADEME). Country Specific Emission factors (Ecoinvent) were associated with electricity consumption to evaluate the impacts. The IPCC 2013 GWP 100 was used. iii. Quality: The overall quality of the emissions is estimated as medium to high. Calculation for year 2016, first year in a 3-year cycle.

Percentage of emissions calculated using data obtained from suppliers or value chain partners
0

Explanation
Investments

Evaluation status
Not relevant, explanation provided

Metric tonnes CO2e

Emissions calculation methodology
Percentage of emissions calculated using data obtained from suppliers or value chain partners

Explanation
Michelin's main activity is not related to investments: it is neither a private financial institution (e.g., commercial banks), nor a public financial institution (e.g., multilateral development banks, export credit agencies, etc.).

Other (upstream)

Evaluation status
Metric tonnes CO2e

Emissions calculation methodology
Percentage of emissions calculated using data obtained from suppliers or value chain partners

Explanation

Other (downstream)

Evaluation status
Metric tonnes CO2e

Emissions calculation methodology
Percentage of emissions calculated using data obtained from suppliers or value chain partners

Explanation

C6.7

(C6.7) Are carbon dioxide emissions from biologically sequestered carbon relevant to your organization?
Yes

C6.7a

(C6.7a) Provide the emissions from biologically sequestered carbon relevant to your organization in metric tons CO2.
31000

C6.10
(C6.10) Describe your gross global combined Scope 1 and 2 emissions for the reporting year in metric tons CO2e per unit currency total revenue and provide any additional intensity metrics that are appropriate to your business operations.

Intensity figure
0.000138

Metric numerator (Gross global combined Scope 1 and 2 emissions)
3038782

Metric denominator
unit total revenue

Metric denominator: Unit total
21960000000

Scope 2 figure used
Market-based

% change from previous year
12.87

Direction of change
Decreased

Reason for change
A decrease in CO2 emissions (numerator) was combined with an increase in total revenue (net sales) (denominator). The two main emission reduction activities where the following: (a) optimized operations management and deployment of Michelin's best manufacturing practices drove a reduction in energy use; (b) renewable electricity purchases (see details in C8.2f).

Intensity figure
0.89

Metric numerator (Gross global combined Scope 1 and 2 emissions)
3038782

Metric denominator
metric ton of product

Metric denominator: Unit total
3425561

Scope 2 figure used
Market-based

% change from previous year
10.7

Direction of change
Decreased

Reason for change
Total CO2 emissions amounted to 0.89 metric tons per metric ton of tires produced in 2017, a decrease of 30.7% compared with 2010 and of 10.7% compared with 2016. The two main emission reduction activities where the following: (a) optimized operations management and deployment of Michelin's best manufacturing practices drove a reduction in energy use per ton of finished product; (b) renewable electricity purchases (see details in C8.2f).

C7. Emissions breakdowns

C7.1

(C7.1) Does your organization have greenhouse gas emissions other than carbon dioxide?
No
(C7.2) Break down your total gross global Scope 1 emissions by country/region.

<table>
<thead>
<tr>
<th>Country/Region</th>
<th>Scope 1 emissions (metric tons CO2e)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Europe</td>
<td>937805</td>
</tr>
<tr>
<td>Asia, Australasia</td>
<td>18916</td>
</tr>
<tr>
<td>North America</td>
<td>506352</td>
</tr>
<tr>
<td>South America</td>
<td>39420</td>
</tr>
</tbody>
</table>

(C7.3) Indicate which gross global Scope 1 emissions breakdowns you are able to provide.

By activity

(C7.3c) Break down your total gross global Scope 1 emissions by business activity.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Scope 1 emissions (metric tons CO2e)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production of tires specialty uses: two-wheel vehicles, aviation, agriculture and earth-moving engines, heavy-duty equipment</td>
<td>52816</td>
</tr>
<tr>
<td>Production of passenger car and light truck tires</td>
<td>809918</td>
</tr>
<tr>
<td>Production of truck tires</td>
<td>207988</td>
</tr>
<tr>
<td>Production of semi-finished products to make all types of tires marketed by Michelin</td>
<td>420002</td>
</tr>
<tr>
<td>Research and develop activities, including track testing of tires</td>
<td>11769</td>
</tr>
</tbody>
</table>

(C7.5) Break down your total gross global Scope 2 emissions by country/region.

<table>
<thead>
<tr>
<th>Country/Region</th>
<th>Scope 2, location-based (metric tons CO2e)</th>
<th>Scope 2, market-based (metric tons CO2e)</th>
<th>Purchased and consumed electricity, heat, steam or cooling (MWh)</th>
<th>Purchased and consumed low-carbon electricity, heat, steam or cooling accounted in market-based approach (MWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Europe</td>
<td>579908</td>
<td>186693</td>
<td>2351648</td>
<td>1702028</td>
</tr>
<tr>
<td>Asia, Australasia</td>
<td>593154</td>
<td>593154</td>
<td>1673292</td>
<td>0</td>
</tr>
<tr>
<td>North America</td>
<td>724740</td>
<td>724740</td>
<td>381519</td>
<td>67641</td>
</tr>
<tr>
<td>South America</td>
<td>31702</td>
<td>31702</td>
<td>1147276</td>
<td>0</td>
</tr>
</tbody>
</table>

(C7.6) Indicate which gross global Scope 2 emissions breakdowns you are able to provide.

By activity
(C7.6c) Break down your total gross global Scope 2 emissions by business activity.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Scope 2, location-based emissions (metric tons CO2e)</th>
<th>Scope 2, market-based emissions (metric tons CO2e)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production of tires specialty uses: two-wheel vehicles, aviation, agriculture and earth-moving engines, heavy-duty equipment</td>
<td></td>
<td>74252</td>
</tr>
<tr>
<td>Production of passenger car and light truck tires</td>
<td></td>
<td>845070</td>
</tr>
<tr>
<td>Production of truck tires</td>
<td></td>
<td>244095</td>
</tr>
<tr>
<td>Production of semi-finished products to make all types of tires marketed by Michelin</td>
<td></td>
<td>351891</td>
</tr>
<tr>
<td>Research and develop activities, including track testing of tires</td>
<td></td>
<td>20981</td>
</tr>
</tbody>
</table>

(C7.9) How do your gross global emissions (Scope 1 and 2 combined) for the reporting year compare to those of the previous reporting year?
  Decreased

(C7.9a)
(C7.9a) Identify the reasons for any change in your gross global emissions (Scope 1 and 2 combined) and for each of them specify how your emissions compare to the previous year.

<table>
<thead>
<tr>
<th>Change in renewable energy consumption</th>
<th>Change in emissions (metric tons CO2e)</th>
<th>Direction of change</th>
<th>Emissions value (percentage)</th>
<th>Please explain calculation</th>
</tr>
</thead>
</table>
|                                        | 387000                                | Decreased            | 11.66                       | Calculation method: \((387,000/3,320,241)*100 = 11.66\%\) In 2017, the Group bought renewable electricity: green electricity was purchased in eight European countries, with the total of around 1,583,000 MWh representing 34.5% of all of the electricity used by the Group in the region. This avoided the emission of 387,000 tons of CO2. Calculation method: MWh of renewable electricity bought in each European Country multiplied by the country emission factor (IEA/ total CO2 emission)).
| Other emissions reduction activities   | 106484                                | Decreased            | 3.21                        | Calculation method: \((106,484/3,320,241)*100 = 3.21\%\) Additional Information: In 2017 one of the main emission reduction activities was the optimization of operations management and deployment of the Group’s best manufacturing practices that drove a reduction in energy use per ton of finished product. Calculation method: 2016 emissions multiplied by the decrease in specific energy consumption, as a percentage (thus determining how many more ton of CO2 would have been emitted in case of higher energy consumption per ton, all other things being equal, notably no change in the energy mix). |

Divestment: <Not Applicable>

Acquisitions: <Not Applicable>

Mergers: <Not Applicable>

Change in output: 58722 Increased 1.77 Calculation method: \((58,722/3,320,241)*100 = 1.77\%\)

Change in methodology: <Not Applicable>

Change in boundary: <Not Applicable>

Change in physical operating conditions: <Not Applicable>

Unidentified: 66666 Decreased 2.01 Calculation method: \((66,666/3,320,241)*100 = 2.01\%\)

Other: 219970 Increased 6.63 Calculation method: \((219,970/3,320,241)*100 = 6.63\%\) Additional Information: Increase in grid electricity factors (indirect) in the countries where we do not buy renewable electricity (source: IEA). (Weighted average)

(C7.9b) Are your emissions performance calculations in C7.9 and C7.9a based on a location-based Scope 2 emissions figure or a market-based Scope 2 emissions figure?

Market-based

C8. Energy

C8.1

(C8.1) What percentage of your total operational spend in the reporting year was on energy?

More than 0% but less than or equal to 5%

C8.2
(C8.2) Select which energy-related activities your organization has undertaken.

| Consumption of fuel (excluding feedstocks) | Yes |
| Consumption of purchased or acquired electricity | Yes |
| Consumption of purchased or acquired heat | Yes |
| Consumption of purchased or acquired steam | No |
| Consumption of purchased or acquired cooling | No |
| Generation of electricity, heat, steam, or cooling | Yes |

C8.2a

(C8.2a) Report your organization’s energy consumption totals (excluding feedstocks) in MWh.

<table>
<thead>
<tr>
<th>Consumption of fuel (excluding feedstock)</th>
<th>Heating value</th>
<th>MWh from renewable sources</th>
<th>MWh from non-renewable sources</th>
<th>Total MWh</th>
</tr>
</thead>
<tbody>
<tr>
<td>LHV (lower heating value)</td>
<td>0</td>
<td>5969790</td>
<td>5969790</td>
<td></td>
</tr>
<tr>
<td>Consumption of purchased or acquired electricity</td>
<td>&lt;Not Applicable&gt;</td>
<td>1596524</td>
<td>3037221</td>
<td>4633745</td>
</tr>
<tr>
<td>Consumption of purchased or acquired heat</td>
<td>&lt;Not Applicable&gt;</td>
<td>173145</td>
<td>746845</td>
<td>919990</td>
</tr>
<tr>
<td>Consumption of purchased or acquired steam</td>
<td>&lt;Not Applicable&gt;</td>
<td>&lt;Not Applicable&gt;</td>
<td>&lt;Not Applicable&gt;</td>
<td>&lt;Not Applicable&gt;</td>
</tr>
<tr>
<td>Consumption of purchased or acquired cooling</td>
<td>&lt;Not Applicable&gt;</td>
<td>&lt;Not Applicable&gt;</td>
<td>&lt;Not Applicable&gt;</td>
<td>&lt;Not Applicable&gt;</td>
</tr>
<tr>
<td>Consumption of self-generated non-fuel renewable energy</td>
<td>&lt;Not Applicable&gt;</td>
<td>&lt;Not Applicable&gt;</td>
<td>&lt;Not Applicable&gt;</td>
<td>&lt;Not Applicable&gt;</td>
</tr>
<tr>
<td>Total energy consumption</td>
<td>&lt;Not Applicable&gt;</td>
<td>1769669</td>
<td>9753856</td>
<td>11523525</td>
</tr>
</tbody>
</table>

C8.2b

(C8.2b) Select the applications of your organization’s consumption of fuel.

| Consumption of fuel for the generation of electricity | No |
| Consumption of fuel for the generation of steam | Yes |
| Consumption of fuel for the generation of cooling | No |
| Consumption of fuel for co-generation or tri-generation | No |

C8.2c

(C8.2c) State how much fuel in MWh your organization has consumed (excluding feedstocks) by fuel type.

**Fuels (excluding feedstocks)**

- Anthracite Coal

**Heating value**

- LHV (lower heating value)

**Total fuel MWh consumed by the organization**

- 1911255

**MWh fuel consumed for the self-generation of electricity**

- <Not Applicable>
<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>MWh fuel consumed for self-generation of heat</td>
<td>1911255</td>
</tr>
<tr>
<td>MWh fuel consumed for self-generation of steam</td>
<td></td>
</tr>
<tr>
<td>MWh fuel consumed for self-generation of cooling</td>
<td>&lt;Not Applicable&gt;</td>
</tr>
<tr>
<td>MWh fuel consumed for self- cogeneration or self-trigeneration</td>
<td>&lt;Not Applicable&gt;</td>
</tr>
</tbody>
</table>

**Fuels (excluding feedstocks)**

**Diesel**

**Heating value**

LHV (lower heating value)

**Total fuel MWh consumed by the organization**

9940

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>MWh fuel consumed for the self-generation of electricity</td>
<td>&lt;Not Applicable&gt;</td>
</tr>
<tr>
<td>MWh fuel consumed for self-generation of heat</td>
<td>9940</td>
</tr>
<tr>
<td>MWh fuel consumed for self-generation of steam</td>
<td></td>
</tr>
<tr>
<td>MWh fuel consumed for self-generation of cooling</td>
<td>&lt;Not Applicable&gt;</td>
</tr>
<tr>
<td>MWh fuel consumed for self- cogeneration or self-trigeneration</td>
<td>&lt;Not Applicable&gt;</td>
</tr>
</tbody>
</table>

**Fuels (excluding feedstocks)**

**Residual Fuel Oil**

**Heating value**

LHV (lower heating value)

**Total fuel MWh consumed by the organization**

71689

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>MWh fuel consumed for the self-generation of electricity</td>
<td>&lt;Not Applicable&gt;</td>
</tr>
<tr>
<td>MWh fuel consumed for self-generation of heat</td>
<td>71689</td>
</tr>
<tr>
<td>MWh fuel consumed for self-generation of steam</td>
<td></td>
</tr>
<tr>
<td>MWh fuel consumed for self-generation of cooling</td>
<td>&lt;Not Applicable&gt;</td>
</tr>
<tr>
<td>MWh fuel consumed for self- cogeneration or self-trigeneration</td>
<td>&lt;Not Applicable&gt;</td>
</tr>
</tbody>
</table>

**Fuels (excluding feedstocks)**

**Natural Gas**

**Heating value**

LHV (lower heating value)

**Total fuel MWh consumed by the organization**

3976906

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>MWh fuel consumed for the self-generation of electricity</td>
<td>&lt;Not Applicable&gt;</td>
</tr>
<tr>
<td>MWh fuel consumed for self-generation of heat</td>
<td></td>
</tr>
<tr>
<td>MWh fuel consumed for self-generation of steam</td>
<td></td>
</tr>
<tr>
<td>MWh fuel consumed for self-generation of cooling</td>
<td>&lt;Not Applicable&gt;</td>
</tr>
</tbody>
</table>
MWh fuel consumed for self-generation of steam
MWh fuel consumed for self-generation of cooling
<Not Applicable>
MWh fuel consumed for self-cogeneration or self-trigeneration
<Not Applicable>

C8.2d

(C8.2d) List the average emission factors of the fuels reported in C8.2c.

Anthracite Coal

Emission factor
354

Unit
kg CO2e per MWh

Emission factor source
Emission Factors from Cross-sector Tools

Comment

Diesel

Emission factor
266

Unit
kg CO2e per MWh

Emission factor source
Emission Factors from Cross-sector Tools

Comment

Natural Gas

Emission factor
202

Unit
kg CO2e per MWh

Emission factor source
Emission Factors from Cross-sector Tools

Comment

Residual Fuel Oil

Emission factor
278278

Unit
kg CO2e per MWh

Emission factor source
Emission Factors from Cross-sector Tools

Comment
(C8.2e) Provide details on the electricity, heat, steam, and cooling your organization has generated and consumed in the reporting year.

<table>
<thead>
<tr>
<th></th>
<th>Total Gross generation (MWh)</th>
<th>Generation that is consumed by the organization (MWh)</th>
<th>Gross generation from renewable sources (MWh)</th>
<th>Generation from renewable sources that is consumed by the organization (MWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electricity</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Heat</td>
<td>17923531</td>
<td>15902805</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Steam</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Cooling</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
(C8.2f) Provide details on the electricity, heat, steam and/or cooling amounts that were accounted for at a low-carbon emission factor in the market-based Scope 2 figure reported in C6.3.

**Basis for applying a low-carbon emission factor**
Off-grid energy consumption from an on-site installation or through a direct line to an off-site generator owned by another company

**Low-carbon technology type**
Biomass (including biogas)

**MWh consumed associated with low-carbon electricity, heat, steam or cooling**
173145

**Emission factor (in units of metric tons CO2e per MWh)**
0

**Comment**
Thermal energy

**Basis for applying a low-carbon emission factor**
Contract with suppliers or utilities (e.g. green tariff), not supported by energy attribute certificates

**Low-carbon technology type**
Wind

**MWh consumed associated with low-carbon electricity, heat, steam or cooling**
13092

**Emission factor (in units of metric tons CO2e per MWh)**
0

**Comment**
Electricity

**Basis for applying a low-carbon emission factor**
Contract with suppliers or utilities (e.g. green tariff), supported by energy attribute certificates

**Low-carbon technology type**
Hydropower

**MWh consumed associated with low-carbon electricity, heat, steam or cooling**
1460831

**Emission factor (in units of metric tons CO2e per MWh)**
0

**Comment**
Electricity

**Basis for applying a low-carbon emission factor**
Energy attribute certificates, Guarantees of Origin

**Low-carbon technology type**
Hydropower

**MWh consumed associated with low-carbon electricity, heat, steam or cooling**
122600

**Emission factor (in units of metric tons CO2e per MWh)**
0

**Comment**
Electricity

---

C9. Additional metrics
C9.1

(C9.1) Provide any additional climate-related metrics relevant to your business.

C10. Verification

C10.1

(C10.1) Indicate the verification/assurance status that applies to your reported emissions.

<table>
<thead>
<tr>
<th>Scope</th>
<th>Verification/assurance status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scope 1</td>
<td>Third-party verification or assurance process in place</td>
</tr>
<tr>
<td>Scope 2 (location-based or market-based)</td>
<td>Third-party verification or assurance process in place</td>
</tr>
<tr>
<td>Scope 3</td>
<td>Third-party verification or assurance process in place</td>
</tr>
</tbody>
</table>

C10.1a
(C10.1a) Provide further details of the verification/assurance undertaken for your Scope 1 and/or Scope 2 emissions and attach the relevant statements.

Scope
Scope 1

Verification or assurance cycle in place
Annual process

Status in the current reporting year
Complete

Type of verification or assurance
Limited assurance

Attach the statement
MICHELIN_DDR_2017_EXCERPT.pdf

Page/section reference
2017 Registration Document, chapter 6.6, pages 228-230

Relevant standard
ISAE3000

Proportion of reported emissions verified (%)
100

Scope
Scope 2 market-based

Verification or assurance cycle in place
Annual process

Status in the current reporting year
Complete

Type of verification or assurance
Limited assurance

Attach the statement
MICHELIN_DDR_2017_EXCERPT.pdf

Page/section reference
2017 Registration Document, chapter 6.6, pages 228-230

Relevant standard
ISAE3000

Proportion of reported emissions verified (%)
100

C10.1b
(C10.1b) Provide further details of the verification/assurance undertaken for your Scope 3 emissions and attach the relevant statements.

Scope
- Scope 3- all relevant categories

Verification or assurance cycle in place
- Triennial process

Status in the current reporting year
- Complete

Attach the statement
- Michelin_Scope 3_20170628.pdf

Page/section reference
- Entire document. In the triennial process, the last completed year was for 2016.

Relevant standard
- ISAE3000

C10.2

(C10.2) Do you verify any climate-related information reported in your CDP disclosure other than the emissions figures reported in C6.1, C6.3, and C6.5?
- Yes

C10.2a

(C10.2a) Which data points within your CDP disclosure have been verified, and which verification standards were used?

<table>
<thead>
<tr>
<th>Disclosure module verification relates to</th>
<th>Data verified</th>
<th>Verification standard</th>
<th>Please explain</th>
</tr>
</thead>
<tbody>
<tr>
<td>C6. Emissions data</td>
<td>Year on year emissions intensity figure</td>
<td>ISAE3000</td>
<td>100% of the data (Scope 1 and 2 emissions as the numerator, and mass of finished products as the denominator) have been verified by a third party providing limited assurance according to the ISAE3000 standard.</td>
</tr>
<tr>
<td>C5. Emissions performance</td>
<td>Other, please specify (CO2 emissions avoided)</td>
<td>ISAE3000</td>
<td>100% of the data have been verified by a third party providing limited assurance according to the ISAE3000 standard.</td>
</tr>
<tr>
<td>C8. Energy</td>
<td>Other, please specify (Energy consumption)</td>
<td>ISAE3000</td>
<td>100% of the data have been verified by a third party providing limited assurance according to the ISAE3000 standard. This data, along with the CO2 emission factors, allows the CO2 emissions to be calculated.</td>
</tr>
</tbody>
</table>

C11. Carbon pricing

C11.1

(C11.1) Are any of your operations or activities regulated by a carbon pricing system (i.e. ETS, Cap & Trade or Carbon Tax)?
- Yes
(C11.1a) Select the carbon pricing regulation(s) which impacts your operations.
EU ETS
France carbon tax
Shanghai pilot ETS

C11.1b

(C11.1b) Complete the following table for each of the emissions trading systems in which you participate.

<table>
<thead>
<tr>
<th>Emissions Trading System</th>
<th>% of Scope 1 emissions covered by the ETS</th>
<th>Period start date</th>
<th>Period end date</th>
<th>Allowances allocated</th>
<th>Allowances purchased</th>
<th>Verified emissions in metric tons CO2e</th>
<th>Details of ownership</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>EU ETS</td>
<td>53</td>
<td>January 1 2017</td>
<td>December 31 2017</td>
<td>529000</td>
<td>0</td>
<td>795000</td>
<td>Facilities we own and operate</td>
<td></td>
</tr>
<tr>
<td>Shanghai pilot ETS</td>
<td>0</td>
<td>January 1 2017</td>
<td>December 31 2017</td>
<td>123000</td>
<td>0</td>
<td>113000</td>
<td>Other, please specify (Heat purchased from an ETS supplier)</td>
<td></td>
</tr>
</tbody>
</table>

C11.1c
(C11.1c) Complete the following table for each of the tax systems in which you participate.

**France carbon tax**

**Period start date**  
January 1 2017

**Period end date**  
December 31 2017

% of emissions covered by tax  
56

**Total cost of tax paid**  
871560

**Comment**  
The French carbon tax covers the Group's natural gas and coal purchases in France during the reporting year.

(C11.1d) What is your strategy for complying with the systems in which you participate or anticipate participating?

First, a corporate CO2 Allowances Work Group is in charge of monitoring the trading scheme and making sure the balance between allowances and emissions is reached. The work group makes decisions on necessary banking, pooling, and purchases. It comprises team members from EHS, energy purchasing, industrial operations, finance, accounting, and norms and regulations departments. It reports to the Environment sub-committee of the Group Executive Committee's (board-level) Sustainable Development and Mobility Governance. So far no purchase of allowances has been necessary. As an example of how this has been achieved under the European ETS, involving 22 manufacturing sites in 8 EU countries, in 2017 a deficit of CO2 allowances for sites in “exposed sectors” were compensated for by surplus allowances for sites in “non exposed sectors”.

Second, the work group is supported by two local “mirror” work groups: one in Europe (since 2005) and one in China (created in 2013). Second, a multi-disciplinary team focused on energy efficiency of industrial processes and on the energy mix of industrial sites continues its work. Specialists of all the fields involved in the Group are represented. Michelin has set an ambition to reduce its specific energy consumption by 25% between 2010 and 2020. In order to implement energy-efficiency programs, each plant has an appointed energy specialist.

(C11.2) Has your organization originated or purchased any project-based carbon credits within the reporting period?

Yes

(C11.2a) Provide details of the project-based carbon credits originated or purchased by your organization in the reporting period.

**Credit origination or credit purchase**  
Credit origination

**Project type**  
Forests

**Project identification**  
Livelihoods with NGO Oceanium : mangrove restauration in Senegal

**Verified to which standard**  
VER+ (TÜV SÜD standard)
Number of credits (metric tonnes CO2e)
8346

Number of credits (metric tonnes CO2e): Risk adjusted volume
8346

Credits cancelled
No

Purpose, e.g. compliance
Voluntary Offsetting

Credit origination or credit purchase
Credit origination

Project type
Energy efficiency: households

Project identification
Livelihoods with NGO Hifadhi: Clean, energy-saving cookstove distribution in the Embu region at the foot of Mount Kenya

Verified to which standard
VER+ (TÜV SÜD standard)

Number of credits (metric tonnes CO2e)
23408

Number of credits (metric tonnes CO2e): Risk adjusted volume
23408

Credits cancelled
No

Purpose, e.g. compliance
Voluntary Offsetting

Credit origination or credit purchase
Credit origination

Project type
Energy efficiency: households

Project identification
Livelihoods with NGO Tiipaalga households equipped with improved cookstove in Burkina Faso

Verified to which standard
VER+ (TÜV SÜD standard)

Number of credits (metric tonnes CO2e)
3918

Number of credits (metric tonnes CO2e): Risk adjusted volume
3918

Credits cancelled
No

Purpose, e.g. compliance
Voluntary Offsetting

Credit origination or credit purchase
Credit origination

Project type
Energy efficiency: households

Project identification
Livelihoods with NGO Tiipaalga households equipped with improved cookstove in Burkina Faso
<table>
<thead>
<tr>
<th>Verified to which standard</th>
<th>VER+ (TÜV SÜD standard)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of credits (metric tonnes CO2e)</td>
<td>282</td>
</tr>
<tr>
<td>Number of credits (metric tonnes CO2e): Risk adjusted volume</td>
<td>282</td>
</tr>
<tr>
<td>Credits cancelled</td>
<td>Yes</td>
</tr>
<tr>
<td>Purpose, e.g. compliance</td>
<td>Voluntary Offsetting</td>
</tr>
</tbody>
</table>

**Project origination or credit purchase**
Credit origination

**Project type**
Energy efficiency: households

**Project identification**
Livelihoods with NGO Hifadhi: Clean, energy-saving cookstove distribution in the Embu region at the foot of Mount Kenya

<table>
<thead>
<tr>
<th>Verified to which standard</th>
<th>VER+ (TÜV SÜD standard)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of credits (metric tonnes CO2e)</td>
<td>1900</td>
</tr>
<tr>
<td>Number of credits (metric tonnes CO2e): Risk adjusted volume</td>
<td>1900</td>
</tr>
<tr>
<td>Credits cancelled</td>
<td>Yes</td>
</tr>
<tr>
<td>Purpose, e.g. compliance</td>
<td>Voluntary Offsetting</td>
</tr>
</tbody>
</table>

**C11.3**

(C11.3) Does your organization use an internal price on carbon?
Yes

**C11.3a**
(C11.3a) Provide details of how your organization uses an internal price on carbon.

**Objective for implementing an internal carbon price**
- Stakeholder expectations
- Change internal behavior
- Drive energy efficiency
- Drive low-carbon investment

**GHG Scope**
- Scope 1
- Scope 2

**Application**
The price has been incorporated into the method of calculating return on investment for projects requiring major capital expenditure, such as production capacity increases, boiler upgrades and improvements to logistics operations worldwide.

**Actual price(s) used (Currency /metric ton)**
- 50

**Variance of price(s) used**
None

**Type of internal carbon price**
- Shadow price

**Impact & implication**
As part of its commitment to significantly, yet cost-effectively reduce its CO2 emissions, Michelin supports the introduction of an international carbon pricing system. Today, there is no global carbon market or price, but only fragmented and uncoordinated systems in the European Union, certain Chinese provinces, California, Quebec, etc. Michelin, however, is strongly encouraging public stakeholders to support the development of a more structured market. This is why it has been a member of the World Bank’s Carbon Pricing Leadership Coalition since 2015. Since 2016, the Group has also been preparing for the emergence of a global carbon market by experimenting with an internal carbon price for its capital projects, set at €50 per ton of CO2. Since 2016, this price has been incorporated into the method of calculating return on investment for projects requiring major capital expenditure, such as production capacity increases, boiler upgrades and supply chain improvements. For projects designed to increase the energy efficiency of existing installations (curing press insulation, lighting upgrades, etc.), which require more modest outlays, the internal carbon price is now integrated into a new project consolidation application developed in 2016 as part of the new energy efficiency improvement program for industrial operations. Since 2016, each project leader is expected to submit two scenarios, one conventional and the other based on carbon costing €50 a ton. In this way, each project sponsor can compare the payback calculated with a carbon market price (now zero in every host region except Europe and Shanghai) and the payback calculated with the projected carbon price over the lifetime of the equipment being purchased today.

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**C12. Engagement**

**C12.1**

(C12.1) Do you engage with your value chain on climate-related issues?
- Yes, our suppliers
- Yes, our customers
- Yes, other partners in the value chain

**C12.1a**

(C12.1a) Provide details of your climate-related supplier engagement strategy.

- **Type of engagement**
  - Information collection (understanding supplier behavior)

- **Details of engagement**
Collect climate change and carbon information at least annually from suppliers

% of suppliers by number
93

% total procurement spend (direct and indirect)
55

% Scope 3 emissions as reported in C6.5
3.95

Rationale for the coverage of your engagement
Michelin began engagement with its suppliers in 2012 using the EcoVadis rating platform, a high-level tool for assessing CSR performance, including on climate change issues: formalized environmental policy including GHG emissions, type of actions in place for reducing emissions, employee awareness program, use of efficient equipment or technology, training programs. The goal was to include the highest number of suppliers from the relevant purchasing categories in terms of risks: 1) purchasing categories more at risk, 2) countries at risk, 3) high spend. The suppliers selected for this engagement come from raw material, industrial and service categories. The rationale for this approach was to provide an overview of suppliers representing potentially more CSR risks, including on climate change issues. A total of 706 suppliers have been rated, and participation is iterative as progress is made and action plans are implemented.

Impact of engagement, including measures of success
In 2013, Michelin set a sustainable development target of at least 70% of 400 key suppliers achieving a minimum score of 45 on the EcoVadis CSR rating platform, meaning a “confirmed” CSR status, by 2020. In 2017, 82% of the 547 suppliers responding had achieved a score of 45 or above of the overall rating, with 3/4 of these suppliers above the confirmed level for the “environment” rating, therefore meeting the corporate target ahead of schedule and more importantly providing an assurance of supplier awareness and initiative on climate change issues. While the EcoVadis approach provided a basic understanding of suppliers’ maturity in this area, it was decided that more information is necessary to engage suppliers more concretely in CO2 mitigation. Thus, in 2017 preparations were made to begin supplier engagement via the CDP Climate Change Supply Chain questionnaire, which was indeed launched in 2018.

Comment

Type of engagement
Compliance & onboarding

Details of engagement
Included climate change in supplier selection / management mechanism
Climate change is integrated into supplier evaluation processes

% of suppliers by number
50

% total procurement spend (direct and indirect)
2

% Scope 3 emissions as reported in C6.5
0.5

Rationale for the coverage of your engagement
Michelin has started to engage with about half of its logistics partners, even if the portion CO2 emissions is under 1% of Scope 3 emissions (the use phase dominates the total emissions), because purchasing sustainable transportation services is in line with Michelin corporate values and the strategy behind selling its own productions and services. Work began with logistics partners in 2017 to including GHG emissions in new tenders for maritime transportation and including climate change in its contractual conditions for European road transporters. These two categories of logistics partners represent about 50% of all transport related GHG emissions for the Group.

Impact of engagement, including measures of success
Because engagement was just begun in 2017, the impacts can not yet be measured. This first year of supplier engagement was focused on building the action plan and onboarding transport partners into the plan. As a measure of supplier interest, in 2018, several major logistics partners were invited and came to Movin’On, Michelin’s sustainable mobility event in Montreal to learn Michelin’s approach to sustainable mobility and the ambitions the Group has for its transport/logistics suppliers. The action plan consists of 5 elements: 1) establish a current state of play on carbon footprint, 2) measure the carbon footprint of transporters, 3) formulate objectives for improvement, 4) measure and monitor progress, 5) implement a CSR scoring system, including GHG emissions, of service providers.

Comment
Give details of your climate-related engagement strategy with your customers.

**Type of engagement**
- Education/information sharing

**Details of engagement**
- Share information about your products and relevant certification schemes (i.e. Energy STAR)

**Size of engagement**
- 75% Scope 3 emissions as reported in C6.5

**% Scope 3 emissions as reported in C6.5**
- 66%

**Please explain the rationale for selecting this group of customers and scope of engagement**
Michelin strives to engage with all segments of B2C and B2B customers worldwide through reliable information on tire performance, including rolling resistance which has a direct impact on vehicle fuel efficiency, because this is the purpose of the company: to give everyone a better way forward, which means a more sustainable way forward. Michelin provides tire performance information in 3 ways: 1) through regulatory product labeling, for which Michelin has always been an advocate, covering fuel efficiency, wet grip and noise; 2) through information on tire performance and fuel efficiency provided by Michelin distribution networks, whether own (Euromaster, Allopneus, Ihle, Blackcircles), franchised (Euromaster, TCI, TyrePlus) or dealer/partnership networks; through direct relations with existing and potential fleet customers.

**Impact of engagement, including measures of success**
It is estimated that through retail product labeling and other tire-performance information provided to customers through distribution networks, Michelin reaches about 3/4 of its customers, therefore potentially impacting 3/4 of the CO2 emissions during the use phase of tires. Measuring the success of this engagement is difficult, given that consumer choice in buying tires is not limited to the energy efficiency performance but takes into account many different factors. The most reliable indicator that Michelin has is through the reputational surveys that are conducted by third parties. Through transparent communications practices with its customers, Michelin has maintained strong trust, as shown by the following: 1) In 2017, for the 3rd consecutive year, the Reputation Institute, which ranks the world’s brands according to their reputation, has put Michelin at the head of the French rankings and 13th worldwide. Michelin also the French brand with the best reputation in many countries: United States, China, Germany, the United Kingdom and Italy. 2) In 2018, Michelin became the world’s most valuable tire brand following 30% brand value growth to US$7.9 billion over the last year according to the latest Brand Finance Auto & Tyres 2018 report. 3) In 2017, Michelin was ranked 15th worldwide by the Reputation Institute in the “Global CSR RepTrak® 100”.

Give details of your climate-related engagement strategy with other partners in the value chain.

**BASYS Project running from 2014 to 2019:**
Michelin is a major player in this project (for “low hysteresis”), part of the French Platform of the Automotive Sector (PFA) research program, launched in 2014, that aims to achieve passenger car fuel efficiency at 2 L per 100 km by developing technological bricks to produce breakthroughs at an affordable sticker price. Michelin is investigating the tire’s role in fuel efficiency and bringing together expertise on materials by partnering with a major supplier of silica (Solvay) and several research institutions, public & private (LRCCP, ARMINES-CEMEF, IMP, IPREM-EPCP) to make a breakthrough in tire energy efficiency. The partners will analyze the rheological properties of materials & test the industrial feasibility of the developed solutions. These partnerships bring cutting edge scientific know-how to the project. The project’s goal is to shave off 4g of CO2 per km, a major contribution to the PFA’s ultimate goal of reaching an energy efficiency of 50g of CO2 per km in the passenger car B-segment: subcompacts, super minis & city cars. Such a breakthrough would be equivalent to the market introduction of the “green tire” in the 1990s.
(C12.3) Do you engage in activities that could either directly or indirectly influence public policy on climate-related issues through any of the following?
- Direct engagement with policy makers
- Trade associations
- Funding research organizations
- Other

C12.3a

(C12.3a) On what issues have you been engaging directly with policy makers?

<table>
<thead>
<tr>
<th>Focus of legislation</th>
<th>Corporate position</th>
<th>Details of engagement</th>
<th>Proposed legislative solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cap and trade</td>
<td>Support</td>
<td>European Trading Scheme: Exchanges with country-level and EU regulators and associations.</td>
<td>Focus on adequate implementation ensuring a level playing field.</td>
</tr>
<tr>
<td>Other, please specify (Tire rolling resistance)</td>
<td>Support</td>
<td>Michelin was very active in advocating for threshold and labeling regulation for tire rolling resistance now in place in Europe (2009 legislation), as well as in South Korea, Brazil, Norway, Turkey, Israel, Saudi Arabia and GSO. Michelin actively contributes to the introduction of regulations in other countries, in particular the USA, China and India. With the European commission, Michelin participates in the improvement of machine test methods within the EGLA (Expert Group for Laboratory Alignment for Rolling Resistance Measurement). Michelin also participates in the discussions around the review of the European labeling regulation and the update of ISO 28580 standards.</td>
<td>Based on EGLA results, proposed content for improving the European Regulation 1235/2011 amending the “Regulation N° 1222/2009.”</td>
</tr>
<tr>
<td>Other, please specify (CO2 emission testing)</td>
<td>Support</td>
<td>Michelin has brought technical recommendations to the European Commission and their experts regarding tailpipe testing procedures, including CO2, for light vehicles towards implementing worldwide rules.</td>
<td>Technical recommendations for the United Nations Global Technical Regulation n° 15 on Worldwide Harmonized Light Vehicle Test Procedure (WLTP).</td>
</tr>
<tr>
<td>Other, please specify (CO2 emission testing)</td>
<td>Support</td>
<td>Michelin is bringing technical support for definition of testing procedures for calculating the CO2 emissions of trucks, including distinguishing the effects of rolling resistance versus aerodynamics (VECTO simulation tool). Michelin also participates in the Experts Group for Heavy Duty Vehicles (HDV) CO2 emissions.</td>
<td>Technical content for the European regulation 2017/2400 on the determination of the CO2 emissions and fuel consumption of HDV.</td>
</tr>
<tr>
<td>Other, please specify (Performance testing)</td>
<td>Support</td>
<td>Michelin supports testing wet grip on tires at legal tread depth limit in order to ensure safety performance level throughout the lifetime of tires. Such testing would push drivers to use their tires up to the minimum tread depth, avoiding premature renewal of tires and saving CO2 emissions</td>
<td>Michelin proposes a wet grip performance threshold at legal tread wear limit.</td>
</tr>
<tr>
<td>Other, please specify (Adaptation, CO2 targets and CO2 pricing)</td>
<td>Support</td>
<td>The International Transport Forum at the OECD is an intergovernmental organization. It acts as a strategic think tank for transport policy and organizes an Annual Summit of ministers. Its goal is to help shape the transport policy agenda on a global level, and ensure that it contributes to economic growth, environmental protection, social inclusion and the preservation of human life and well-being.</td>
<td>Active participation in the Corporate Board Partnership where climate change mitigation and adaptation issues are frequently debated. Michelin is instrumental in engaging stakeholders from across a highly competitive industry to work together for sustainable multi-modal mobility. Michelin finances the “Energie et Climat” academic chair at the Paris-Dauphine University specialized on negative externalities taxation and pricing (among them Carbon) The Michelin Foundation finances IDDRI for its DDPP-T project (Deep Decarbonization Pathways Project for Transport).</td>
</tr>
<tr>
<td>Other, please specify (Sustainable mobility)</td>
<td>Support</td>
<td>Michelin is co-founder of the Paris Process for Mobility and Climate (PPMC) partnership, created in 2015 on the way to COP21, aiming to strengthen the voice of the sustainable transport community in the UNFCCC process.</td>
<td>Under the auspices of the UN, PPMC’s work has been dedicated to building a macro roadmap for decarbonisation of the transport sector by 2050+, a holistic, synergized transformative approach of all transportation modes in order to reach the Paris Agreement) as well as regional specific adaptations of this road map: Morocco, Africa, Europe (India coming soon).</td>
</tr>
</tbody>
</table>

C12.3b

(C12.3b) Are you on the board of any trade associations or do you provide funding beyond membership?
Yes
(C12.3c) Enter the details of those trade associations that are likely to take a position on climate change legislation.

**Trade association**
European Tyre and Rubber Manufacturers’ Association (ETRMA) with the European Tires and Rims Technical Organization (ETRTO)

Is your position on climate change consistent with theirs?
Mixed

**Please explain the trade association’s position**
For heavy duty vehicle CO2 emissions: these 2 associations support the use of specific rolling resistance values.

How have you, or are you attempting to, influence the position?
Michelin strongly advocated and pushed successfully for the use of real rolling resistance values in the calculation of CO2 emissions for HDV.

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**Trade association**
European Tyre and Rubber Manufacturers’ Association (ETRMA)

Is your position on climate change consistent with theirs?
Consistent

**Please explain the trade association’s position**
The European tire industry has contributed significantly to the EU objectives of reducing CO2 emissions. It supports ETS as a market-based mechanism setting a level playing field. Currently, work is focused on renewing the ETS regulation, notably on “carbon leakage”.

How have you, or are you attempting to, influence the position?
Active participation in working groups and in the drafting of position papers.

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**Trade association**
USTMA (US Tire Manufacturers Association)

Is your position on climate change consistent with theirs?
Consistent

**Please explain the trade association’s position**
For light duty vehicle CO2 emissions: The USTMA advocates for establishing a federal rule on tire fuel efficiency performance standards (coupled with a wet traction performance standard). For heavy duty vehicle CO2 emissions: The USTMA supports federal greenhouse gas emissions requirements for tires and the EPA Smartway fuel efficiency and emissions reduction program.

How have you, or are you attempting to, influence the position?
Technical and advocacy support for consumer information on tire energy efficiency and rolling resistance test methods. Advocacy within USTMA for future support for a federal tire fuel efficiency performance standard for heavy duty vehicle tires.

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**Trade association**
Associação Nacional da Industria de Pneumaticos (ANIP)

Is your position on climate change consistent with theirs?
Consistent

**Please explain the trade association’s position**
ANIP has given support to Brazilian authorities in the adoption of a threshold and labeling regulation regarding tire rolling resistance. The regulation was published in 2012 and took effect in October 2016.

How have you, or are you attempting to, influence the position?
Active participation in ANIP’s technical commission, including rolling resistance requirements for passenger car and truck tires.

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**Trade association**
Syndicat National du Caoutchouc et des Polymères (SNCP)

Is your position on climate change consistent with theirs?
Consistent
Please explain the trade association's position
Create a level playing field regarding CO2 emissions allowances in the European Union.

How have you, or are you attempting to, influence the position?
Active participation in working groups on climate change including the revision of the ETS directive.

Trade association
Entreprises Pour l’Environnement (EPE)

Is your position on climate change consistent with theirs?
Consistent

Please explain the trade association's position
Business must be at the forefront of the movement towards sustainable development and tackle climate change challenges through innovation.

How have you, or are you attempting to, influence the position?
Active participation in working groups on climate change to share practices and dialogue with main stakeholders. Since December 2015 Michelin’s CEO Jean-Dominique Senard is the president of the organization for a 3-year term.

Trade association
Carbon Pricing Leadership Coalition (CPLC)

Is your position on climate change consistent with theirs?
Consistent

Please explain the trade association's position
The Carbon Pricing Leadership Coalition led by the World Bank aims at promoting carbon pricing mechanisms worldwide.

How have you, or are you attempting to, influence the position?
Michelin supports CPLC’s efforts to ensure the effective implementation of carbon pricing worldwide.

Trade association
Tire Industry Project (TIP), supported by the World Business Council for Sustainable Development

Is your position on climate change consistent with theirs?
Consistent

Please explain the trade association's position
Improving rolling resistance performance is the major lever for reducing tire-related CO2 emissions. Towards this end, the TIP is supportive of the tire grading and labeling regulations aimed at educating consumers about rolling resistance (as well as wet grip and noise).

How have you, or are you attempting to, influence the position?
As a co-chair of the TIP, Michelin participated in the preparation & validation of this statement.

C12.3d

(C12.3d) Do you publicly disclose a list of all research organizations that you fund?
No

C12.3e
(C12.3e) Provide details of the other engagement activities that you undertake.

I. Work with the NGO the World Wildlife Fund (WWF)

1) Description of the method of engagement: Michelin & WWF signed a partnership in 2015 and renewed it in 2018 to promote sustainable rubber cultivation & prevent deforestation.

2) Topic of the engagement: Developing & applying responsible and sustainable rubber production practices and protecting primary forests.

3) Nature of the engagement: Michelin works with WWF on natural rubber at a global level, in Indonesia through a joint venture (JV) with the Barito Pacific Group and helps locally in Sumatra and Borneo to protect and restore flora and fauna. These efforts jointly aim to be a model of cooperation to fight against climate change and to influence the automotive industry worldwide.

4) Actions advocated as part of engagement: Initially an analysis was conducted to identify the best ways to produce natural rubber responsibly. Done in collaboration with the WWF and other NGOs, this work resulted in the publication of Michelin’s Sustainable Natural Rubber Policy. This document aims at promoting best practices across the entire value chain, from the plantations to the end-consumers. Now in the implementation phase, the identified practices are being rolled out in Indonesia, starting with the JV cited above. The local partnership strives to protect Indonesian forests & biodiversity. WWF helps Michelin in developing an international sustainable rubber platform (SNRP) to promote best practices through the entire supply chain.

II. Sustainable mobility solutions for cities

1) Description of the method of engagement: Michelin, as a member of the World Business Council for Sustainable Development, is active in development and application of the Sustainable Urban Mobility (SiMPlify) initiative.

2) Topic of the engagement: SiMPlify is a data-driven multi-stakeholder approach with the vision to accelerate progress towards multimodal, inclusive and low-environmental impact mobility in cities.

3) Nature of the engagement: Develop an online planning tool for improving mobility in cities. An initial group of 6 cities participated in the pilot, and an additional 6 joined the initiative in 2016. Michelin lead the task force with the City of Chengdu on its specific mobility issues to produce a road map for scaling up implementation of sustainable mobility solutions, including lowering CO2 emissions and other impacts of urban transportation.

4) Actions advocated as part of engagement: The SiMPlify toolkit integrates a set of tailored indicators and economic instruments for cities to measure the current level of sustainability of their transport systems and identify opportunities to improve mobility of people & goods. In April 2016 the European Commission endorsed the SiMPlify process as the recommended approach for cities in the EU. In 2017, Michelin launched a SiMPlify project with the city of Clermont-Ferrand, France, where Michelin’s corporate headquarters are located.

(C12.3f) What processes do you have in place to ensure that all of your direct and indirect activities that influence policy are consistent with your overall climate change strategy?

External engagement on climate change-related issues is overseen by the Group Executive Committee’s (board-level) Sustainable Development and Mobility Governance, supported by its two sub-committees: 1) Environment and 2) Sustainable Mobility. Each sub-committee meets a minimum of 2 times per year. The Environment sub-committee coordinates external engagement related to a/ Michelin products and services and b/ direct operations, which is planned and executed via the norms and regulations and public affairs departments, and also to c/ actors in the value chain, which is planned and executed by the appropriate business line or by the purchasing department if suppliers are involved. The Sustainable Mobility sub-committee coordinates external engagement related to new mobility business models, which is planned and executed by several teams and departments, from the corporate sustainability and strategic anticipation departments to the communications department to business lines to the corporate incubator program. An example of where this coordination all comes together is the organization of Movin’on by Michelin since 2017, the only international forum of its kind on sustainable mobility. This event brings together diverse actors to exchange, innovate and push forward new thinking in sustainable mobility, to transform ideas into actions. Many of these actors are those that Michelin has been already engaged with, as well as new ones.
(C12.4) Have you published information about your organization’s response to climate change and GHG emissions performance for this reporting year in places other than in your CDP response? If so, please attach the publication(s).

**Publication**
In mainstream reports

**Status**
Complete

**Attach the document**
20180312_MICHELIN_DDR_2017_EN.pdf

**Content elements**
Governance
Strategy
Risks & opportunities
Emissions figures
Emission targets
Other metrics

**Publication**
In voluntary sustainability report

**Status**
Complete

**Attach the document**
MICHELIN_RADD_2017_EN.pdf

**Content elements**
Governance
Strategy
Emissions figures
Emission targets
Other metrics

**Publication**
In voluntary communications

**Status**
Complete

**Attach the document**
GlobalMacroRoadmap2017.pdf

**Content elements**
Strategy
Risks & opportunities
Emissions figures
Emission targets

**Publication**
In voluntary communications

**Status**
Complete

**Attach the document**

**Content elements**
Strategy
In voluntary communications

**Status**
Complete

**Attach the document**
Michelin solutions_Solutrans_2017.pdf

**Content elements**
Strategy
Other metrics

---

**Publication**
In voluntary communications

**Status**
Complete

**Attach the document**
LesEchos_20170407.pdf

**Content elements**
Governance
Strategy
Emission targets

---

**Publication**
In voluntary communications

**Status**
Complete

**Attach the document**
lettre_forets_vivantes_n4_2017.pdf

**Content elements**
Strategy

---

**Publication**
In voluntary communications

**Status**
Complete

**Attach the document**
20170613_MICHELIN_DP_MovinOn_EN.pdf

**Content elements**
Strategy
Emission targets

---

C14. Signoff

---

C-FI

(C-FI) Use this field to provide any additional information or context that you feel is relevant to your organization's response. Please note that this field is optional and is not scored.

---

C14.1
(C14.1) Provide details for the person that has signed off (approved) your CDP climate change response.

<table>
<thead>
<tr>
<th>Job title</th>
<th>Corresponding job category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Member of the Group Executive Committee, Executive Vice President of Manufacturing and Chair, Member of the Corporate Sustainable Development and Mobility Committee</td>
<td>Director on board</td>
</tr>
</tbody>
</table>

SC. Supply chain module

SC0.0

(SC0.0) If you would like to do so, please provide a separate introduction to this module.

SC0.1

(SC0.1) What is your company’s annual revenue for the stated reporting period?

<table>
<thead>
<tr>
<th>Annual Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>21960000000</td>
</tr>
</tbody>
</table>

SC0.2

(SC0.2) Do you have an ISIN for your company that you would be willing to share with CDP?
Yes

SC0.2a

(SC0.2a) Please use the table below to share your ISIN.

<table>
<thead>
<tr>
<th>ISIN country code (2 letters)</th>
<th>ISIN numeric identifier and single check digit (10 numbers overall)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FR</td>
<td>0000121261</td>
</tr>
</tbody>
</table>

SC1.1

(SC1.1) Allocate your emissions to your customers listed below according to the goods or services you have sold them in this reporting period.

**Requesting member**
Ford Motor Company

**Scope of emissions**
Scope 1

**Emissions in metric tonnes of CO2e**
49809
Uncertainty (±%) 2

Major sources of emissions
Energy consumption by onsite boilers at tire production sites.

Verified Yes

Allocation method
Allocation based on mass of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made
The sources of emissions identified are the sources over which the company has financial control. Within this boundary CO2 emissions from tire distribution centers were excluded as they represent less than 3% of total emissions (for this reason, and consistent with legal requirements for reporting Group-wide extra-financial information under French law, this source is not included in the Group’s consolidated annual report). Using "The Green House Gas Protocol: A Corporate Accounting and Reporting Standard" methodology, our scope 1 emissions sources were identified. When calculating annual scope 1 emissions, there is a minor source of uncertainty: by the date we consolidate annual environmental results, energy consumption data for the month of December are still being collected at site level; thus the data related to CO2 emissions may be estimated in some cases. Our calculations were based on an Emission Factor method. The figure provided is based on the mass of products purchased in 2016. Scope 1, 2 and 3 calculations for customer supply chain purposes are determined on a 3-year cycle for 2 reasons: 1) the high level of uncertainty of Scope 3 emissions (+/- 30%) does not allow for annual changes (+/-) in total CO2 emissions to be statistically significant; 2) despite the fact that the uncertainty of Scope 1 and 2 emissions is very low (+/- 2%), the combined emissions represent less than 3% of the total Scope 1+2+3), rendering an annual update insignificant compared to the total with its high level of uncertainty.

Requesting member
Ford Motor Company

Scope of emissions
Scope 2

Emissions in metric tonnes of CO2e
58571

Uncertainty (±%) 2

Major sources of emissions
Net purchased electricity and steam for tire production sites.

Verified Yes

Allocation method
Allocation based on mass of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made
The sources of emissions identified are the sources over which the company has financial control. Within this boundary CO2 emissions from tire distribution centers were excluded as they represent less than 3% of total emissions (for this reason, and consistent with legal requirements for reporting Group-wide extra-financial information under French law, this source is not included in the Group’s consolidated annual report). Using "The Green House Gas Protocol: A Corporate Accounting and Reporting Standard" methodology, our scope 2 emissions sources were identified. When calculating annual scope 2 emissions, there is a minor source of uncertainty: by the date we consolidate annual environmental results, energy consumption data for the month of December are still being collected at site level; thus the data related to CO2 emissions may be estimated in some cases. Our calculations were based on the market-based approach, following the "GHG Protocol Scope 2 Guidance: an amendment to the GHG Protocol Corporate Standard", 2015. The figure provided is based on the mass of products purchased in 2016. Scope 1, 2 and 3 calculations for customer supply chain purposes are determined on a 3-year cycle for 2 reasons: 1) the high level of uncertainty of Scope 3 emissions (+/- 30%) does not allow for annual changes (+/-) in total CO2 emissions to be statistically significant; 2) despite the fact that the uncertainty of Scope 1 and 2 emissions is very low (+/- 2%), the combined emissions represent less than 3% of the total Scope 1+2+3), rendering an annual update insignificant compared to the total with its high level of uncertainty.

Requesting member
CDP
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Ford Motor Company

**Scope of emissions**
Scope 3

**Emissions in metric tonnes of CO2e**
4576526

**Uncertainty (±%)**
30

**Major sources of emissions**
Use phase: fuel consumed by the vehicle to overcome the tires' rolling resistance

**Verified**
Yes

**Allocation method**
Allocation based on mass of products purchased

*Please explain how you have identified the GHG source, including major limitations to this process and assumptions made*

Using "The Green House Gas Protocol: A Corporate Accounting and Reporting Standard" methodology, and with the help of an external consultant, the sources of our scope 3 emissions were identified and emissions calculated on the basis of the raw data available and modeling assumptions specific to each category. The level of uncertainty for each category was determined by the quality of the raw data used and the degree to which extrapolations and/or hypotheses were required to compensate for availability or quality of primary data. The predominate Scope 3 category is the use phase, which represents 86% of all Scope 3 emissions. Methodology for the use phase: 1/ a 2016 scenario of tank-to-wheel CO2 emissions for road transport was built, based on data for the year 2015 in IEA database "Mobility Model" (2017 version), the contribution of tires to vehicular CO2 emissions and Michelin's share of the 2016 tire market. 3/ Average tire rolling resistance for passenger car/light vehicles and for trucks was applied to determine the percentage share of the tire's contribution to vehicular CO2 emissions. Rolling resistance performances of specific tire types and models were not taken into account. 4/ The influence on CO2 emissions of different types of vehicle engine technologies in use during 2016 has not been taken into account, since the most updated Mobility Model data available at the time of calculation was from 2015. 5/ The number of Michelin tires on the road was based on 2016 market share, and did not take into account tires sold in previous years and that were used during 2016. The figure provided is based on the mass of products purchased in 2016. Scope 1, 2 and 3 calculations for customer supply chain purposes are determined on a 3-year cycle for 2 reasons: 1) the high level of uncertainty of Scope 3 emissions (+/- 30%) does not allow for annual changes (+/-) in total CO2 emissions to be statistically significant; 2) despite the fact that the uncertainty of Scope 1 and 2 emissions is very low (+/- 2%), the combined emissions represent less than 3% of the total Scope 1+2+3), rendering an annual update insignificant compared to the total with its high level of uncertainty.

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Nissan Motor Co., Ltd.

**Scope of emissions**
Scope 1

**Emissions in metric tonnes of CO2e**
4605

**Uncertainty (±%)**
2

**Major sources of emissions**
Energy consumption by onsite boilers at tire production sites

**Verified**
Yes

**Allocation method**
Allocation based on mass of products purchased

*Please explain how you have identified the GHG source, including major limitations to this process and assumptions made*

The sources of emissions identified are the sources over which the company has financial control. Within this boundary CO2 emissions from tire distribution centers were excluded as they represent less than 3% of total emissions (for this reason, and consistent with legal requirements for reporting Group-wide extra-financial information under French law, this source is not included in the Group’s consolidated annual report). Using "The Green House Gas Protocol: A Corporate Accounting and Reporting Standard" methodology, and with the help of an external consultant, the sources of our scope 1 emissions were identified and emissions calculated on the basis of the raw data available and modeling assumptions specific to each category. The level of uncertainty for each category was determined by the quality of the raw data used and the degree to which extrapolations and/or hypotheses were required to compensate for availability or quality of primary data. The predominate Scope 1 category is the use phase, which represents 93% of all Scope 1 emissions. Methodology for the use phase: 1/ a 2016 scenario of tank-to-wheel CO2 emissions for road transport was built, based on data for the year 2015 in IEA database "Mobility Model" (2017 version), the contribution of tires to vehicular CO2 emissions and Michelin's share of the 2016 tire market. 3/ Average tire rolling resistance for passenger car/light vehicles and for trucks was applied to determine the percentage share of the tire's contribution to vehicular CO2 emissions. Rolling resistance performances of specific tire types and models were not taken into account. 4/ The influence on CO2 emissions of different types of vehicle engine technologies in use during 2016 has not been taken into account, since the most updated Mobility Model data available at the time of calculation was from 2015. 5/ The number of Michelin tires on the road was based on 2016 market share, and did not take into account tires sold in previous years and that were used during 2016. The figure provided is based on the mass of products purchased in 2016. Scope 1, 2 and 3 calculations for customer supply chain purposes are determined on a 3-year cycle for 2 reasons: 1) the high level of uncertainty of Scope 3 emissions (+/- 30%) does not allow for annual changes (+/-) in total CO2 emissions to be statistically significant; 2) despite the fact that the uncertainty of Scope 1 and 2 emissions is very low (+/- 2%), the combined emissions represent less than 3% of the total Scope 1+2+3), rendering an annual update insignificant compared to the total with its high level of uncertainty.
Standard methodology, our scope 1 emissions sources were identified. When calculating annual scope 1 emissions, there is a minor source of uncertainty: by the date we consolidate annual environmental results, energy consumption data for the month of December are still being collected at site level; thus the data related to CO2 emissions may be estimated in some cases. Our calculations were based on an Emission Factor method. The figure provided is based on the mass of products purchased in 2016. Scope 1, 2 and 3 calculations for customer supply chain purposes are determined on a 3-year cycle for 2 reasons: 1) the high level of uncertainty of Scope 3 emissions (+/-30%) does not allow for annual changes (+/-) in total CO2 emissions to be statistically significant; 2) despite the fact that the uncertainty of Scope 1 and 2 emissions is very low (+/-2%), the combined emissions represent less than 3% of the total Scope 1+2+3), rendering an annual update insignificant compared to the total with its high level of uncertainty.

Requesting member
Nissan Motor Co., Ltd.

Scope of emissions
Scope 2

Emissions in metric tonnes of CO2e
5415

Uncertainty (±%)
2

Major sources of emissions
Net purchased electricity and steam for tire production sites

Verified
Yes

Allocation method
Allocation based on mass of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made
The sources of emissions identified are the sources over which the company has financial control. Within this boundary CO2 emissions from tire distribution centers were excluded as they represent less than 3% of total emissions (for this reason, and consistent with legal requirements for reporting Group-wide extra-financial information under French law, this source is not included in the Group's consolidated annual report). Using "The Green House Gas Protocol: A Corporate Accounting and Reporting Standard" methodology, our scope 2 emissions sources were identified. When calculating annual scope 2 emissions, there is a minor source of uncertainty: by the date we consolidate annual environmental results, energy consumption data for the month of December are still being collected at site level; thus the data related to CO2 emissions may be estimated in some cases. Our calculations were based on the market-based approach, following the "GHG Protocol Scope 2 Guidance: an amendment to the GHG Protocol Corporate Standard", 2015. The figure provided is based on the mass of products purchased in 2016. Scope 1, 2 and 3 calculations for customer supply chain purposes are determined on a 3-year cycle for 2 reasons: 1) the high level of uncertainty of Scope 3 emissions (+/-30%) does not allow for annual changes (+/-) in total CO2 emissions to be statistically significant; 2) despite the fact that the uncertainty of Scope 1 and 2 emissions is very low (+/-2%), the combined emissions represent less than 3% of the total Scope 1+2+3), rendering an annual update insignificant compared to the total with its high level of uncertainty.

Requesting member
Nissan Motor Co., Ltd.

Scope of emissions
Scope 3

Emissions in metric tonnes of CO2e
423091

Uncertainty (±%)
30

Major sources of emissions
Use phase: fuel consumed by the vehicle to overcome the tires' rolling resistance

Verified
Yes

Allocation method
Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Using "The Green House Gas Protocol: A Corporate Accounting and Reporting Standard" methodology, and with the help of an external consultant, the sources of our scope 3 emissions were identified and emissions calculated on the basis of the raw data available and modeling assumptions specific to each category. The level of uncertainty for each category was determined by the quality of the raw data used and the degree to which extrapolations and/or hypotheses were required to compensate for availability or quality of primary data. The predominate Scope 3 category is the use phase, which represents 86% of all Scope 3 emissions. Methodology for the use phase: 1/ a 2016 scenario of tank-to-wheel CO2 emissions for road transport was built, based on data for the year 2015 in IEA database "Mobility Model" (2017 version), the contribution of tires to vehicular CO2 emissions and Michelin's share of the 2016 tire market. 3/ Average tire rolling resistance for passenger car/light vehicles and for trucks was applied to determine the percentage share of the tire's contribution to vehicular CO2 emissions. Rolling resistance performances of specific tire types and models were not taken into account. 4/ The influence on CO2 emissions of different types of vehicle engine technologies in use during 2016 has not been taken into account, since the most updated Mobility Model data available at the time of calculation was from 2015. 5/ The number of Michelin tires on the road was based on 2016 market share, and did not take into account tires sold in previous years and that were used during 2016. The figure provided is based on the mass of products purchased in 2016. Scope 1, 2 and 3 calculations for customer supply chain purposes are determined on a 3-year cycle for 2 reasons: 1) the high level of uncertainty of Scope 3 emissions (+/- 30%) does not allow for annual changes (+/-) in total CO2 emissions to be statistically significant; 2) despite the fact that the uncertainty of Scope 1 and 2 emissions is very low (+/- 2%), the combined emissions represent less than 3% of the total Scope 1+2+3), rendering an annual update insignificant compared to the total with its high level of uncertainty.

Requesting member
Jaguar Land Rover Ltd

Scope of emissions
Scope 1

Emissions in metric tonnes of CO2e
561

Uncertainty (%)
2

Major sources of emissions
Energy consumption by onsite boilers at tire production sites

Verified
Yes

Allocation method
Allocation based on mass of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

The sources of emissions identified are the sources over which the company has financial control. Within this boundary CO2 emissions from tire distribution centers were excluded as they represent less than 3% of total emissions (for this reason, and consistent with legal requirements for reporting Group-wide extra-financial information under French law, this source is not included in the Group's consolidated annual report). Using "The Green House Gas Protocol: A Corporate Accounting and Reporting Standard" methodology, our scope 1 emissions sources were identified. When calculating annual scope 1 emissions, there is a minor source of uncertainty: by the date we consolidate annual environmental results, energy consumption data for the month of December are still being collected at site level; thus the data related to CO2 emissions may be estimated in some cases. Our calculations were based on an Emission Factor method. The figure provided is based on the mass of products purchased in 2016. Scope 1, 2 and 3 calculations for customer supply chain purposes are determined on a 3-year cycle for 2 reasons: 1) the high level of uncertainty of Scope 3 emissions (+/- 30%) does not allow for annual changes (+/-) in total CO2 emissions to be statistically significant; 2) despite the fact that the uncertainty of Scope 1 and 2 emissions is very low (+/- 2%), the combined emissions represent less than 3% of the total Scope 1+2+3), rendering an annual update insignificant compared to the total with its high level of uncertainty.

Requesting member
Jaguar Land Rover Ltd

Scope of emissions
Scope 2
Emissions in metric tonnes of CO2e
660

Uncertainty (±%)
2

Major sources of emissions
Net purchased electricity and steam for tire production sites

Verified
Yes

Allocation method
Allocation based on mass of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made
The sources of emissions identified are the sources over which the company has financial control. Within this boundary CO2 emissions from tire distribution centers were excluded as they represent less than 3% of total emissions (for this reason, and consistent with legal requirements for reporting Group-wide extra-financial information under French law, this source is not included in the Group's consolidated annual report). Using "The Green House Gas Protocol: A Corporate Accounting and Reporting Standard" methodology, our scope 2 emissions sources were identified. When calculating annual scope 2 emissions, there is a minor source of uncertainty: by the date we consolidate annual environmental results, energy consumption data for the month of December are still being collected at site level; thus the data related to CO2 emissions may be estimated in some cases. Our calculations were based on the market-based approach, following the "GHG Protocol Scope 2 Guidance: an amendment to the GHG Protocol Corporate Standard", 2015. The figure provided is based on the mass of products purchased in 2016. Scope 1, 2 and 3 calculations for customer supply chain purposes are determined on a 3-year cycle for 2 reasons: 1) the high level of uncertainty of Scope 3 emissions (+/- 30%) does not allow for annual changes (+/-) in total CO2 emissions to be statistically significant; 2) despite the fact that the uncertainty of Scope 1 and 2 emissions is very low (+/- 2%), the combined emissions represent less than 3% of the total Scope 1+2+3, rendering an annual update insignificant compared to the total with its high level of uncertainty.

Requesting member
Jaguar Land Rover Ltd

Scope of emissions
Scope 3

Emissions in metric tonnes of CO2e
51535

Uncertainty (±%)
30

Major sources of emissions
Use phase: fuel consumed by the vehicle to overcome the tires' rolling resistance

Verified
Yes

Allocation method
Allocation based on mass of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made
Using "The Green House Gas Protocol: A Corporate Accounting and Reporting Standard" methodology, and with the help of an external consultant, the sources of our scope 3 emissions were identified and emissions calculated on the basis of the raw data available and modeling assumptions specific to each category. The level of uncertainty for each category was determined by the quality of the raw data used and the degree to which extrapolations and/or hypotheses were required to compensate for availability or quality of primary data. The predominate Scope 3 category is the use phase, which represents 86% of all Scope 3 emissions. Methodology for the use phase: 1/ a 2016 scenario of tank-to-wheel CO2 emissions for road transport was built, based on data for the year 2015 in IEA database "Mobility Model" (2017 version), the contribution of tires to vehicular CO2 emissions and Michelin's share of the 2016 tire market. 3/ Average tire rolling resistance for passenger car/light vehicles and for trucks was applied to determine the percentage share of the tire's contribution to vehicular CO2 emissions. Rolling resistance performances of specific tire types and models were not taken into account. 4/ The influence on CO2 emissions of different types of vehicle engine technologies in use during 2016 has not been taken into account, since the most updated Mobility Model data available at the time of calculation was from 2015. 5/ The number of Michelin tires on the road was based on 2016 market share, and did not take into
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**Requesting member**  
General Motors Company

**Scope of emissions**  
Scope 1

**Emissions in metric tonnes of CO2e**  
27879

**Uncertainty (±%)**  
2

**Major sources of emissions**  
Energy consumption by onsite boilers at tire production sites

**Verified**  
Yes

**Allocation method**  
Allocation based on mass of products purchased

**Please explain how you have identified the GHG source, including major limitations to this process and assumptions made**

The sources of emissions identified are the sources over which the company has financial control. Within this boundary CO2 emissions from tire distribution centers were excluded as they represent less than 3% of total emissions (for this reason, and consistent with legal requirements for reporting Group-wide extra-financial information under French law, this source is not included in the Group’s consolidated annual report). Using “The Green House Gas Protocol: A Corporate Accounting and Reporting Standard” methodology, our scope 1 emissions sources were identified. When calculating annual scope 1 emissions, there is a minor source of uncertainty: by the date we consolidate annual environmental results, energy consumption data for the month of December are still being collected at site level; thus the data related to CO2 emissions may be estimated in some cases. Our calculations were based on an Emission Factor method. The figure provided is based on the mass of products purchased in 2016. Scope 1, 2 and 3 calculations for customer supply chain purposes are determined on a 3-year cycle for 2 reasons: 1) the high level of uncertainty of Scope 3 emissions (+/- 30%) does not allow for annual changes (+/-) in total CO2 emissions to be statistically significant; 2) despite the fact that the uncertainty of Scope 1 and 2 emissions is very low (+/- 2%), the combined emissions represent less than 3% of the total Scope 1+2+3, rendering an annual update insignificant compared to the total with its high level of uncertainty.

**Requesting member**  
General Motors Company

**Scope of emissions**  
Scope 2

**Emissions in metric tonnes of CO2e**  
32784

**Uncertainty (±%)**  
2

**Major sources of emissions**  
Net purchased electricity and steam for tire production sites

**Verified**  
Yes

**Allocation method**  
Allocation based on mass of products purchased

**Please explain how you have identified the GHG source, including major limitations to this process and assumptions made**

The sources of emissions identified are the sources over which the company has financial control. Within this boundary CO2
emissions from tire distribution centers were excluded as they represent less than 3% of total emissions (for this reason, and consistent with legal requirements for reporting Group-wide extra-financial information under French law, this source is not included in the Group’s consolidated annual report). Using “The Green House Gas Protocol: A Corporate Accounting and Reporting Standard” methodology, our scope 2 emissions sources were identified. When calculating annual scope 2 emissions, there is a minor source of uncertainty: by the date we consolidate annual environmental results, energy consumption data for the month of December are still being collected at site level; thus the data related to CO2 emissions may be estimated in some cases. Our calculations were based on the market-based approach, following the “GHG Protocol Scope 2 Guidance: an amendment to the GHG Protocol Corporate Standard”, 2015. The figure provided is based on the mass of products purchased in 2016. Scope 1, 2 and 3 calculations for customer supply chain purposes are determined on a 3-year cycle for 2 reasons: 1) the high level of uncertainty of Scope 3 emissions (+/- 30%) does not allow for annual changes (+/-) in total CO2 emissions to be statistically significant; 2) despite the fact that the uncertainty of Scope 1 and 2 emissions is very low (+/- 2%), the combined emissions represent less than 3% of the total Scope 1+2+3), rendering an annual update insignificant compared to the total with its high level of uncertainty.

**Requesting member**
General Motors Company

**Scope of emissions**
Scope 3

**Emissions in metric tonnes of CO2e**
2561578

**Uncertainty (±%)**
30

**Major sources of emissions**
Use phase: fuel consumed by the vehicle to overcome the tires' rolling resistance

**Verified**
Yes

**Allocation method**
Allocation based on mass of products purchased

**Please explain how you have identified the GHG source, including major limitations to this process and assumptions made**
Using “The Green House Gas Protocol: A Corporate Accounting and Reporting Standard” methodology, and with the help of an external consultant, the sources of our scope 3 emissions were identified and emissions calculated on the basis of the raw data available and modeling assumptions specific to each category. The level of uncertainty for each category was determined by the quality of the raw data used and the degree to which extrapolations and/or hypotheses were required to compensate for availability or quality of primary data. The predominate Scope 3 category is the use phase, which represents 86% of all Scope 3 emissions. Methodology for the use phase: 1/ a 2016 scenario of tank-to-wheel CO2 emissions for road transport was built, based on data for the year 2015 in IEA database "Mobility Model" (2017 version), the contribution of tires to vehicular CO2 emissions and Michelin's share of the 2016 tire market. 3/ Average tire rolling resistance for passenger car/light vehicles and for trucks was applied to determine the percentage share of the tire's contribution to vehicular CO2 emissions. Rolling resistance performances of specific tire types and models were not taken into account. 4/ The influence on CO2 emissions of different types of vehicle engine technologies in use during 2016 has not been taken into account, since the most updated Mobility Model data available at the time of calculation was from 2015. 5/ The number of Michelin tires on the road was based on 2016 market share, and did not take into account tires sold in previous years and that were used during 2016. The figure provided is based on the mass of products purchased in 2016. Scope 1, 2 and 3 calculations for customer supply chain purposes are determined on a 3-year cycle for 2 reasons: 1) the high level of uncertainty of Scope 3 emissions (+/- 30%) does not allow for annual changes (+/-) in total CO2 emissions to be statistically significant; 2) despite the fact that the uncertainty of Scope 1 and 2 emissions is very low (+/- 2%), the combined emissions represent less than 3% of the total Scope 1+2+3), rendering an annual update insignificant compared to the total with its high level of uncertainty.

**Requesting member**
BMW AG

**Scope of emissions**
Scope 1

**Emissions in metric tonnes of CO2e**
5378

**Uncertainty (±%)**
**Major sources of emissions**

Energy consumption by onsite boilers at tire production sites

**Verified**

Yes

**Allocation method**

Allocation based on mass of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

The sources of emissions identified are the sources over which the company has financial control. Within this boundary CO2 emissions from tire distribution centers were excluded as they represent less than 3% of total emissions (for this reason, and consistent with legal requirements for reporting Group-wide extra-financial information under French law, this source is not included in the Group’s consolidated annual report). Using “The Green House Gas Protocol: A Corporate Accounting and Reporting Standard” methodology, our scope 1 emissions sources were identified. When calculating annual scope 1 emissions, there is a minor source of uncertainty: by the date we consolidate annual environmental results, energy consumption data for the month of December are still being collected at site level; thus the data related to CO2 emissions may be estimated in some cases. Our calculations were based on an Emission Factor method. The figure provided is based on the mass of products purchased in 2016. Scope 1, 2 and 3 calculations for customer supply chain purposes are determined on a 3-year cycle for 2 reasons: 1) the high level of uncertainty of Scope 3 emissions (+/- 30%) does not allow for annual changes (+/-) in total CO2 emissions to be statistically significant; 2) despite the fact that the uncertainty of Scope 1 and 2 emissions is very low (+/- 2%), the combined emissions represent less than 3% of the total Scope 1+2+3), rendering an annual update insignificant compared to the total with its high level of uncertainty.

**Requesting member**

BMW AG

**Scope of emissions**

Scope 2

**Emissions in metric tonnes of CO2e**

6324

**Uncertainty (±%)**

2

**Major sources of emissions**

Net purchased electricity and steam for tire production sites

**Verified**

Yes

**Allocation method**

Allocation based on mass of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

The sources of emissions identified are the sources over which the company has financial control. Within this boundary CO2 emissions from tire distribution centers were excluded as they represent less than 3% of total emissions (for this reason, and consistent with legal requirements for reporting Group-wide extra-financial information under French law, this source is not included in the Group’s consolidated annual report). Using “The Green House Gas Protocol: A Corporate Accounting and Reporting Standard” methodology, our scope 2 emissions sources were identified. When calculating annual scope 2 emissions, there is a minor source of uncertainty: by the date we consolidate annual environmental results, energy consumption data for the month of December are still being collected at site level; thus the data related to CO2 emissions may be estimated in some cases. Our calculations were based on the market-based approach, following the “GHG Protocol Scope 2 Guidance: an amendment to the GHG Protocol Corporate Standard”, 2015. The figure provided is based on the mass of products purchased in 2016. Scope 1, 2 and 3 calculations for customer supply chain purposes are determined on a 3-year cycle for 2 reasons: 1) the high level of uncertainty of Scope 3 emissions (+/- 30%) does not allow for annual changes (+/-) in total CO2 emissions to be statistically significant; 2) despite the fact that the uncertainty of Scope 1 and 2 emissions is very low (+/- 2%), the combined emissions represent less than 3% of the total Scope 1+2+3), rendering an annual update insignificant compared to the total with its high level of uncertainty.

**Requesting member**

CDP
BMW AG

**Scope of emissions**

**Scope 3**

**Emissions in metric tonnes of CO2e**

494146

**Uncertainty (±%)**

30

**Major sources of emissions**

Use phase: fuel consumed by the vehicle to overcome the tires' rolling resistance

**Verified**

Yes

**Allocation method**

Allocation based on mass of products purchased

**Please explain how you have identified the GHG source, including major limitations to this process and assumptions made**

Using "The Green House Gas Protocol: A Corporate Accounting and Reporting Standard" methodology, and with the help of an external consultant, the sources of our scope 3 emissions were identified and emissions calculated on the basis of the raw data available and modeling assumptions specific to each category. The level of uncertainty for each category was determined by the quality of the raw data used and the degree to which extrapolations and/or hypotheses were required to compensate for availability or quality of primary data. The predominate Scope 3 category is the use phase, which represents 86% of all Scope 3 emissions. Methodology for the use phase: 1/ a 2016 scenario of tank-to-wheel CO2 emissions for road transport was built, based on data for the year 2015 in IEA database "Mobility Model" (2017 version), the contribution of tires to vehicular CO2 emissions and Michelin's share of the 2016 tire market. 3/ Average tire rolling resistance for passenger car/light vehicles and for trucks was applied to determine the percentage share of the tire's contribution to vehicular CO2 emissions. Rolling resistance performances of specific tire types and models were not taken into account. 4/ The influence on CO2 emissions of different types of vehicle engine technologies in use during 2016 has not been taken into account, since the most updated Mobility Model data available at the time of calculation was from 2015. 5/ The number of Michelin tires on the road was based on 2016 market share, and did not take into account tires sold in previous years and that were used during 2016. The figure provided is based on the mass of products purchased in 2016. Scope 1, 2 and 3 calculations for customer supply chain purposes are determined on a 3-year cycle for 2 reasons: 1) the high level of uncertainty of Scope 3 emissions (+/- 30%) does not allow for annual changes (+/-) in total CO2 emissions to be statistically significant; 2) despite the fact that the uncertainty of Scope 1 and 2 emissions is very low (+/- 2%), the combined emissions represent less than 3% of the total Scope 1+2+3), rendering an annual update insignificant compared to the total with its high level of uncertainty.

**Requesting member**

Volkswagen AG

**Scope of emissions**

**Scope 1**

**Emissions in metric tonnes of CO2e**

22568

**Uncertainty (±%)**

2

**Major sources of emissions**

Energy consumption by onsite boilers at tire production sites

**Verified**

Yes

**Allocation method**

Allocation based on mass of products purchased

**Please explain how you have identified the GHG source, including major limitations to this process and assumptions made**

The sources of emissions identified are the sources over which the company has financial control. Within this boundary CO2 emissions from tire distribution centers were excluded as they represent less than 3% of total emissions (for this reason, and consistent with legal requirements for reporting Group-wide extra-financial information under French law, this source is not included in the Group's consolidated annual report). Using "The Green House Gas Protocol: A Corporate Accounting and Reporting Standard" methodology, and with the help of an external consultant, the sources of our scope 1 emissions were identified and emissions calculated on the basis of the raw data available and modeling assumptions specific to each category. The level of uncertainty for each category was determined by the quality of the raw data used and the degree to which extrapolations and/or hypotheses were required to compensate for availability or quality of primary data.
Standard methodology, our scope 1 emissions sources were identified. When calculating annual scope 1 emissions, there is a minor source of uncertainty: by the date we consolidate annual environmental results, energy consumption data for the month of December are still being collected at site level; thus the data related to CO2 emissions may be estimated in some cases. Our calculations were based on an Emission Factor method. The figure provided is based on the mass of products purchased in 2016. Scope 1, 2 and 3 calculations for customer supply chain purposes are determined on a 3-year cycle for 2 reasons: 1) the high level of uncertainty of Scope 3 emissions (+/- 30%) does not allow for annual changes (+/-) in total CO2 emissions to be statistically significant; 2) despite the fact that the uncertainty of Scope 1 and 2 emissions is very low (+/- 2%), the combined emissions represent less than 3% of the total Scope 1+2+3), rendering an annual update insignificant compared to the total with its high level of uncertainty.

Requesting member
Volkswagen AG

Scope of emissions
Scope 2

Emissions in metric tonnes of CO2e
26539

Uncertainty (±%)
2

Major sources of emissions
Net purchased electricity and steam for tire production sites

Verified
Yes

Allocation method
Allocation based on mass of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made
The sources of emissions identified are the sources over which the company has financial control. Within this boundary CO2 emissions from tire distribution centers were excluded as they represent less than 3% of total emissions (for this reason, and consistent with legal requirements for reporting Group-wide extra-financial information under French law, this source is not included in the Group’s consolidated annual report). Using “The Green House Gas Protocol: A Corporate Accounting and Reporting Standard” methodology, our scope 2 emissions sources were identified. When calculating annual scope 2 emissions, there is a minor source of uncertainty: by the date we consolidate annual environmental results, energy consumption data for the month of December are still being collected at site level; thus the data related to CO2 emissions may be estimated in some cases. Our calculations were based on the market-based approach, following the “GHG Protocol Scope 2 Guidance: an amendment to the GHG Protocol Corporate Standard”, 2015. The figure provided is based on the mass of products purchased in 2016. Scope 1, 2 and 3 calculations for customer supply chain purposes are determined on a 3-year cycle for 2 reasons: 1) the high level of uncertainty of Scope 3 emissions (+/- 30%) does not allow for annual changes (+/-) in total CO2 emissions to be statistically significant; 2) despite the fact that the uncertainty of Scope 1 and 2 emissions is very low (+/- 2%), the combined emissions represent less than 3% of the total Scope 1+2+3), rendering an annual update insignificant compared to the total with its high level of uncertainty.

Requesting member
Volkswagen AG

Scope of emissions
Scope 3

Emissions in metric tonnes of CO2e
2073629

Uncertainty (±%)
30

Major sources of emissions
Use phase: fuel consumed by the vehicle to overcome the tires’ rolling resistance

Verified
Yes

Allocation method
Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Using “The Green House Gas Protocol: A Corporate Accounting and Reporting Standard” methodology, and with the help of an external consultant, the sources of our scope 3 emissions were identified and emissions calculated on the basis of the raw data available and modeling assumptions specific to each category. The level of uncertainty for each category was determined by the quality of the raw data used and the degree to which extrapolations and/or hypotheses were required to compensate for availability or quality of primary data. The predominate Scope 3 category is the use phase, which represents 86% of all Scope 3 emissions. Methodology for the use phase: 1/ a 2016 scenario of tank-to-wheel CO2 emissions for road transport was built, based on data for the year 2015 in IEA database “Mobility Model” (2017 version), the contribution of tires to vehicular CO2 emissions and Michelin's share of the 2016 tire market. 3/ Average tire rolling resistance for passenger car/light vehicles and for trucks was applied to determine the percentage share of the tire's contribution to vehicular CO2 emissions. Rolling resistance performances of specific tire types and models were not taken into account. 4/ The influence on CO2 emissions of different types of vehicle engine technologies in use during 2016 has not been taken into account, since the most updated Mobility Model data available at the time of calculation was from 2015. 5/ The number of Michelin tires on the road was based on 2016 market share, and did not take into account tires sold in previous years and that were used during 2016. The figure provided is based on the mass of products purchased in 2016. Scope 1, 2 and 3 calculations for customer supply chain purposes are determined on a 3-year cycle for 2 reasons: 1) the high level of uncertainty of Scope 3 emissions (+/-30%) does not allow for annual changes (+/-) in total CO2 emissions to be statistically significant; 2) despite the fact that the uncertainty of Scope 1 and 2 emissions is very low (+/-2%), the combined emissions represent less than 3% of the total Scope 1+2+3), rendering an annual update insignificant compared to the total with its high level of uncertainty.
Emissions in metric tonnes of CO2e
17438

Uncertainty (±%)
2

Major sources of emissions
Net purchased electricity and steam for tire production sites

Verified
Yes

Allocation method
Allocation based on mass of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

The sources of emissions identified are the sources over which the company has financial control. Within this boundary CO2 emissions from tire distribution centers were excluded as they represent less than 3% of total emissions (for this reason, and consistent with legal requirements for reporting Group-wide extra-financial information under French law, this source is not included in the Group's consolidated annual report). Using "The Green House Gas Protocol: A Corporate Accounting and Reporting Standard" methodology, our scope 2 emissions sources were identified. When calculating annual scope 2 emissions, there is a minor source of uncertainty: by the date we consolidate annual environmental results, energy consumption data for the month of December are still being collected at site level; thus the data related to CO2 emissions may be estimated in some cases. Our calculations were based on the market-based approach, following the "GHG Protocol Scope 2 Guidance: an amendment to the GHG Protocol Corporate Standard", 2015. The figure provided is based on the mass of products purchased in 2016. Scope 1, 2 and 3 calculations for customer supply chain purposes are determined on a 3-year cycle for 2 reasons: 1) the high level of uncertainty of Scope 3 emissions (+/- 30%) does not allow for annual changes (+/-) in total CO2 emissions to be statistically significant; 2) despite the fact that the uncertainty of Scope 1 and 2 emissions is very low (+/- 2%), the combined emissions represent less than 3% of the total Scope 1+2+3), rendering an annual update insignificant compared to the total with its high level of uncertainty.

Requesting member
Fiat Chrysler Automobiles NV

Scope of emissions
Scope 3

Emissions in metric tonnes of CO2e
1362500

Uncertainty (±%)
30

Major sources of emissions
Use phase: fuel consumed by the vehicle to overcome the tires' rolling resistance

Verified
Yes

Allocation method
Allocation based on mass of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Using "The Green House Gas Protocol: A Corporate Accounting and Reporting Standard" methodology, and with the help of an external consultant, the sources of our scope 3 emissions were identified and emissions calculated on the basis of the raw data available and modeling assumptions specific to each category. The level of uncertainty for each category was determined by the quality of the raw data used and the degree to which extrapolations and/or hypotheses were required to compensate for availability or quality of primary data. The predominate Scope 3 category is the use phase, which represents 86% of all Scope 3 emissions. Methodology for the use phase: 1/ a 2016 scenario of tank-to-wheel CO2 emissions for road transport was built, based on data for the year 2015 in IEA database "Mobility Model" (2017 version), the contribution of tires to vehicular CO2 emissions and Michelin's share of the 2016 tire market. 3/ Average tire rolling resistance for passenger car/light vehicles and for trucks was applied to determine the percentage share of the tire's contribution to vehicular CO2 emissions. Rolling resistance performances of specific tire types and models were not taken into account. 4/ The influence on CO2 emissions of different types of vehicle engine technologies in use during 2016 has not been taken into account, since the most updated Mobility Model data available at the time of calculation was from 2015. 5/ The number of Michelin tires on the road was based on 2016 market share, and did not take into
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**Requesting member**
Honda of the UK Manufacturing Ltd

**Scope of emissions**

**Scope 1**

**Emissions in metric tonnes of CO2e**
13881

**Uncertainty (±%)**
2

**Major sources of emissions**
Energy consumption by onsite boilers at tire production sites

**Verified**
Yes

**Allocation method**
Allocation based on mass of products purchased

**Please explain how you have identified the GHG source, including major limitations to this process and assumptions made**
The sources of emissions identified are the sources over which the company has financial control. Within this boundary CO2 emissions from tire distribution centers were excluded as they represent less than 3% of total emissions (for this reason, and consistent with legal requirements for reporting Group-wide extra-financial information under French law, this source is not included in the Group’s consolidated annual report). Using “The Green House Gas Protocol: A Corporate Accounting and Reporting Standard” methodology, our scope 1 emissions sources were identified. When calculating annual scope 1 emissions, there is a minor source of uncertainty: by the date we consolidate annual environmental results, energy consumption data for the month of December are still being collected at site level; thus the data related to CO2 emissions may be estimated in some cases. Our calculations were based on an Emission Factor method. The figure provided is based on the mass of products purchased in 2016. Scope 1, 2 and 3 calculations for customer supply chain purposes are determined on a 3-year cycle for 2 reasons: 1) the high level of uncertainty of Scope 3 emissions (+/- 30%) does not allow for annual changes (+/-) in total CO2 emissions to be statistically significant; 2) despite the fact that the uncertainty of Scope 1 and 2 emissions is very low (+/- 2%), the combined emissions represent less than 3% of the total Scope 1+2+3), rendering an annual update insignificant compared to the total with its high level of uncertainty.

**Requesting member**
Honda of the UK Manufacturing Ltd

**Scope of emissions**

**Scope 2**

**Emissions in metric tonnes of CO2e**
16323

**Uncertainty (±%)**
2

**Major sources of emissions**
Net purchased electricity and steam for tire production sites

**Verified**
Yes

**Allocation method**
Allocation based on mass of products purchased

**Please explain how you have identified the GHG source, including major limitations to this process and assumptions made**
The sources of emissions identified are the sources over which the company has financial control. Within this boundary CO2
emissions from tire distribution centers were excluded as they represent less than 3% of total emissions (for this reason, and consistent with legal requirements for reporting Group-wide extra-financial information under French law, this source is not included in the Group's consolidated annual report). Using "The Green House Gas Protocol: A Corporate Accounting and Reporting Standard" methodology, our scope 2 emissions sources were identified. When calculating annual scope 2 emissions, there is a minor source of uncertainty: by the date we consolidate annual environmental results, energy consumption data for the month of December are still being collected at site level; thus the data related to CO2 emissions may be estimated in some cases. Our calculations were based on the market-based approach, following the "GHG Protocol Scope 2 Guidance: an amendment to the GHG Protocol Corporate Standard", 2015. The figure provided is based on the mass of products purchased in 2016. Scope 1, 2 and 3 calculations for customer supply chain purposes are determined on a 3-year cycle for 2 reasons: 1) the high level of uncertainty of Scope 3 emissions (+/- 30%) does not allow for annual changes (+/-) in total CO2 emissions to be statistically significant; 2) despite the fact that the uncertainty of Scope 1 and 2 emissions is very low (+/- 2%), the combined emissions represent less than 3% of the total Scope 1+2+3), rendering an annual update insignificant compared to the total with its high level of uncertainty.

**Requesting member**
Honda of the UK Manufacturing Ltd

**Scope of emissions**
Scope 3

**Emissions in metric tonnes of CO2e**
1275421

**Uncertainty (±%)**
30

**Major sources of emissions**
Use phase: fuel consumed by the vehicle to overcome the tires' rolling resistance

**Verified**
Yes

**Allocation method**
Allocation based on mass of products purchased

**Please explain how you have identified the GHG source, including major limitations to this process and assumptions made**
Using "The Green House Gas Protocol: A Corporate Accounting and Reporting Standard" methodology, and with the help of an external consultant, the sources of our scope 3 emissions were identified and emissions calculated on the basis of the raw data available and modeling assumptions specific to each category. The level of uncertainty for each category was determined by the quality of the raw data used and the degree to which extrapolations and/or hypotheses were required to compensate for availability or quality of primary data. The predominate Scope 3 category is the use phase, which represents 86% of all Scope 3 emissions. Methodology for the use phase: 1/ a 2016 scenario of tank-to-wheel CO2 emissions for road transport was built, based on data for the year 2015 in IEA database "Mobility Model" (2017 version), the contribution of tires to vehicular CO2 emissions and Michelin's share of the 2016 tire market. 3/ Average tire rolling resistance for passenger car/light vehicles and for trucks was applied to determine the percentage share of the tire's contribution to vehicular CO2 emissions. Rolling resistance performances of specific tire types and models were not taken into account. 4/ The influence on CO2 emissions of different types of vehicle engine technologies in use during 2016 has not been taken into account, since the most updated Mobility Model data available at the time of calculation was from 2015. 5/ The number of Michelin tires on the road was based on 2016 market share, and did not take into account tires sold in previous years and that were used during 2016. The figure provided is based on the mass of products purchased in 2016. Scope 1, 2 and 3 calculations for customer supply chain purposes are determined on a 3-year cycle for 2 reasons: 1) the high level of uncertainty of Scope 3 emissions (+/- 30%) does not allow for annual changes (+/-) in total CO2 emissions to be statistically significant; 2) despite the fact that the uncertainty of Scope 1 and 2 emissions is very low (+/- 2%), the combined emissions represent less than 3% of the total Scope 1+2+3), rendering an annual update insignificant compared to the total with its high level of uncertainty.

**Requesting member**
CNH Industrial NV

**Scope of emissions**
Scope 1

**Emissions in metric tonnes of CO2e**
12987

**Uncertainty (±%)**
Major sources of emissions
Energy consumption by onsite boilers at tire production sites
Verified
Yes
Allocation method
Allocation based on mass of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made:
The sources of emissions identified are the sources over which the company has financial control. Within this boundary CO2 emissions from tire distribution centers were excluded as they represent less than 3% of total emissions (for this reason, and consistent with legal requirements for reporting Group-wide extra-financial information under French law, this source is not included in the Group’s consolidated annual report). Using "The Green House Gas Protocol: A Corporate Accounting and Reporting Standard" methodology, our scope 1 emissions sources were identified. When calculating annual scope 1 emissions, there is a minor source of uncertainty: by the date we consolidate annual environmental results, energy consumption data for the month of December are still being collected at site level; thus the data related to CO2 emissions may be estimated in some cases. Our calculations were based on an Emission Factor method. The figure provided is based on the mass of products purchased in 2016. Scope 1, 2 and 3 calculations for customer supply chain purposes are determined on a 3-year cycle for 2 reasons: 1) the high level of uncertainty of Scope 3 emissions (+/- 30%) does not allow for annual changes (+/-) in total CO2 emissions to be statistically significant; 2) despite the fact that the uncertainty of Scope 1 and 2 emissions is very low (+/- 2%), the combined emissions represent less than 3% of the total Scope 1+2+3), rendering an annual update insignificant compared to the total with its high level of uncertainty.

Requesting member
CNH Industrial NV

Scope of emissions
Scope 2

Emissions in metric tonnes of CO2e
15272

Uncertainty (±%)
2

Major sources of emissions
Net purchased electricity and steam for tire production sites
Verified
Yes
Allocation method
Allocation based on mass of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made:
The sources of emissions identified are the sources over which the company has financial control. Within this boundary CO2 emissions from tire distribution centers were excluded as they represent less than 3% of total emissions (for this reason, and consistent with legal requirements for reporting Group-wide extra-financial information under French law, this source is not included in the Group’s consolidated annual report). Using "The Green House Gas Protocol: A Corporate Accounting and Reporting Standard" methodology, our scope 2 emissions sources were identified. When calculating annual scope 2 emissions, there is a minor source of uncertainty: by the date we consolidate annual environmental results, energy consumption data for the month of December are still being collected at site level; thus the data related to CO2 emissions may be estimated in some cases. Our calculations were based on the market-based approach, following the "GHG Protocol Scope 2 Guidance: an amendment to the GHG Protocol Corporate Standard", 2015. The figure provided is based on the mass of products purchased in 2016. Scope 1, 2 and 3 calculations for customer supply chain purposes are determined on a 3-year cycle for 2 reasons: 1) the high level of uncertainty of Scope 3 emissions (+/- 30%) does not allow for annual changes (+/-) in total CO2 emissions to be statistically significant; 2) despite the fact that the uncertainty of Scope 1 and 2 emissions is very low (+/- 2%), the combined emissions represent less than 3% of the total Scope 1+2+3), rendering an annual update insignificant compared to the total with its high level of uncertainty.
CNH Industrial NV

Scope of emissions
Scope 3

Emissions in metric tonnes of CO2e
1193285

Uncertainty (±%)
30

Major sources of emissions
Use phase: fuel consumed by the vehicle to overcome the tires' rolling resistance

Verified
Yes

Allocation method
Allocation based on mass of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made
Using "The Green House Gas Protocol: A Corporate Accounting and Reporting Standard" methodology, and with the help of an external consultant, the sources of our scope 3 emissions were identified and emissions calculated on the basis of the raw data available and modeling assumptions specific to each category. The level of uncertainty for each category was determined by the quality of the raw data used and the degree to which extrapolations and/or hypotheses were required to compensate for availability or quality of primary data. The predominate Scope 3 category is the use phase, which represents 86% of all Scope 3 emissions. Methodology for the use phase: 1/ a 2016 scenario of tank-to-wheel CO2 emissions for road transport was built, based on data for the year 2015 in IEA database "Mobility Model" (2017 version), the contribution of tires to vehicular CO2 emissions and Michelin's share of the 2016 tire market. 3/ Average tire rolling resistance for passenger car/light vehicles and for trucks was applied to determine the percentage share of the tire's contribution to vehicular CO2 emissions. Rolling resistance performances of specific tire types and models were not taken into account. 4/ The influence on CO2 emissions of different types of vehicle engine technologies in use during 2016 has not been taken into account, since the most updated Mobility Model data available at the time of calculation was from 2015. 5/ The number of Michelin tires on the road was based on 2016 market share, and did not take into account tires sold in previous years and that were used during 2016. The figure provided is based on the mass of products purchased in 2016. Scope 1, 2 and 3 calculations for customer supply chain purposes are determined on a 3-year cycle for 2 reasons: 1) the high level of uncertainty of Scope 3 emissions (+/- 30%) does not allow for annual changes (+/-) in total CO2 emissions to be statistically significant; 2) despite the fact that the uncertainty of Scope 1 and 2 emissions is very low (+/- 2%), the combined emissions represent less than 3% of the total Scope 1+2+3), rendering an annual update insignificant compared to the total with its high level of uncertainty.

Requesting member
Wal-Mart Stores, Inc.

Scope of emissions
Scope 1

Emissions in metric tonnes of CO2e
587

Uncertainty (±%)
2

Major sources of emissions
Energy consumption by onsite boilers at tire production sites

Verified
Yes

Allocation method
Allocation based on mass of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made
The sources of emissions identified are the sources over which the company has financial control. Within this boundary CO2 emissions from tire distribution centers were excluded as they represent less than 3% of total emissions (for this reason, and consistent with legal requirements for reporting Group-wide extra-financial information under French law, this source is not included in the Group's consolidated annual report). Using "The Green House Gas Protocol: A Corporate Accounting and Reporting
Standard methodology, our scope 1 emissions sources were identified. When calculating annual scope 1 emissions, there is a minor source of uncertainty: by the date we consolidate annual environmental results, energy consumption data for the month of December are still being collected at site level; thus the data related to CO2 emissions may be estimated in some cases. Our calculations were based on an Emission Factor method. The figure provided is based on the mass of products purchased in 2016.

Scope 1, 2 and 3 calculations for customer supply chain purposes are determined on a 3-year cycle for 2 reasons: 1) the high level of uncertainty of Scope 3 emissions (+/- 30%) does not allow for annual changes (+/-) in total CO2 emissions to be statistically significant; 2) despite the fact that the uncertainty of Scope 1 and 2 emissions is very low (+/- 2%), the combined emissions represent less than 3% of the total Scope 1+2+3), rendering an annual update insignificant compared to the total with its high level of uncertainty.

**Requesting member**
Wal-Mart Stores, Inc.

**Scope of emissions**
Scope 2

**Emissions in metric tonnes of CO2e**
691

**Uncertainty (±%)**
2

**Major sources of emissions**
Net purchased electricity and steam for tire production sites

**Verified**
Yes

**Allocation method**
Allocation based on mass of products purchased

**Please explain how you have identified the GHG source, including major limitations to this process and assumptions made**
The sources of emissions identified are the sources over which the company has financial control. Within this boundary CO2 emissions from tire distribution centers were excluded as they represent less than 3% of total emissions (for this reason, and consistent with legal requirements for reporting Group-wide extra-financial information under French law, this source is not included in the Group's consolidated annual report). Using "The Green House Gas Protocol: A Corporate Accounting and Reporting Standard" methodology, our scope 2 emissions sources were identified. When calculating annual scope 2 emissions, there is a minor source of uncertainty: by the date we consolidate annual environmental results, energy consumption data for the month of December are still being collected at site level; thus the data related to CO2 emissions may be estimated in some cases. Our calculations were based on the market-based approach, following the "GHG Protocol Scope 2 Guidance: an amendment to the GHG Protocol Corporate Standard", 2015. The figure provided is based on the mass of products purchased in 2016. Scope 1, 2 and 3 calculations for customer supply chain purposes are determined on a 3-year cycle for 2 reasons: 1) the high level of uncertainty of Scope 3 emissions (+/- 30%) does not allow for annual changes (+/-) in total CO2 emissions to be statistically significant; 2) despite the fact that the uncertainty of Scope 1 and 2 emissions is very low (+/- 2%), the combined emissions represent less than 3% of the total Scope 1+2+3), rendering an annual update insignificant compared to the total with its high level of uncertainty.

**Requesting member**
Wal-Mart Stores, Inc.

**Scope of emissions**
Scope 3

**Emissions in metric tonnes of CO2e**
53967

**Uncertainty (±%)**
30

**Major sources of emissions**
Use phase: fuel consumed by the vehicle to overcome the tires' rolling resistance

**Verified**
Yes

**Allocation method**
Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Using "The Green House Gas Protocol: A Corporate Accounting and Reporting Standard" methodology, and with the help of an external consultant, the sources of our scope 3 emissions were identified and emissions calculated on the basis of the raw data available and modeling assumptions specific to each category. The level of uncertainty for each category was determined by the quality of the raw data used and the degree to which extrapolations and/or hypotheses were required to compensate for availability or quality of primary data. The predominate Scope 3 category is the use phase, which represents 86% of all Scope 3 emissions. Methodology for the use phase: 1/ a 2016 scenario of tank-to-wheel CO2 emissions for road transport was built, based on data for the year 2015 in IEA database "Mobility Model" (2017 version), the contribution of tires to vehicular CO2 emissions and Michelin's share of the 2016 tire market. 2/ Average tire rolling resistance for passenger car/light vehicles and for trucks was applied to determine the percentage share of the tire's contribution to vehicular CO2 emissions. Rolling resistance performances of specific tire types and models were not taken into account. 3/ The influence on CO2 emissions of different types of vehicle engine technologies in use during 2016 has not been taken into account, since the most updated Mobility Model data available at the time of calculation was from 2015. 4/ The number of Michelin tires on the road was based on 2016 market share, and did not take into account tires sold in previous years and that were used during 2016. The figure provided is based on the mass of products purchased in 2016. Scope 1, 2 and 3 calculations for customer supply chain purposes are determined on a 3-year cycle for 2 reasons: 1) the high level of uncertainty of Scope 3 emissions (+/- 30%) does not allow for annual changes (+/-) in total CO2 emissions to be statistically significant; 2) despite the fact that the uncertainty of Scope 1 and 2 emissions is very low (+/- 2%), the combined emissions represent less than 3% of the total Scope 1+2+3), rendering an annual update insignificant compared to the total with its high level of uncertainty.

Requesting member
Wal Mart de Mexico

Scope of emissions
Scope 1

Emissions in metric tonnes of CO2e
408

Uncertainty (±%)
2

Major sources of emissions
Energy consumption by onsite boilers at tire production sites

Verified
Yes

Allocation method
Allocation based on mass of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

The sources of emissions identified are the sources over which the company has financial control. Within this boundary CO2 emissions from tire distribution centers were excluded as they represent less than 3% of total emissions (for this reason, and consistent with legal requirements for reporting Group-wide extra-financial information under French law, this source is not included in the Group's consolidated annual report). Using "The Green House Gas Protocol: A Corporate Accounting and Reporting Standard" methodology, our scope 1 emissions sources were identified. When calculating annual scope 1 emissions, there is a minor source of uncertainty: by the date we consolidate annual environmental results, energy consumption data for the month of December are still being collected at site level; thus the data related to CO2 emissions may be estimated in some cases. Our calculations were based on an Emission Factor method. The figure provided is based on the mass of products purchased in 2016. Scope 1, 2 and 3 calculations for customer supply chain purposes are determined on a 3-year cycle for 2 reasons: 1) the high level of uncertainty of Scope 3 emissions (+/- 30%) does not allow for annual changes (+/-) in total CO2 emissions to be statistically significant; 2) despite the fact that the uncertainty of Scope 1 and 2 emissions is very low (+/- 2%), the combined emissions represent less than 3% of the total Scope 1+2+3), rendering an annual update insignificant compared to the total with its high level of uncertainty.

Requesting member
Wal Mart de Mexico

Scope of emissions
Scope 2
Emissions in metric tonnes of CO2e
480
Uncertainty (±%)
2

Major sources of emissions
Net purchased electricity and steam for tire production sites

Verified
Yes

Allocation method
Allocation based on mass of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made
The sources of emissions identified are the sources over which the company has financial control. Within this boundary CO2 emissions from tire distribution centers were excluded as they represent less than 3% of total emissions (for this reason, and consistent with legal requirements for reporting Group-wide extra-financial information under French law, this source is not included in the Group’s consolidated annual report). Using "The Green House Gas Protocol: A Corporate Accounting and Reporting Standard" methodology, our scope 2 emissions sources were identified. When calculating annual scope 2 emissions, there is a minor source of uncertainty: by the date we consolidate annual environmental results, energy consumption data for the month of December are still being collected at site level; thus the data related to CO2 emissions may be estimated in some cases. Our calculations were based on the market-based approach, following the "GHG Protocol Scope 2 Guidance: an amendment to the GHG Protocol Corporate Standard", 2015. The figure provided is based on the mass of products purchased in 2016. Scope 1, 2 and 3 calculations for customer supply chain purposes are determined on a 3-year cycle for 2 reasons: 1) the high level of uncertainty of Scope 3 emissions (+/- 30%) does not allow for annual changes (+/-) in total CO2 emissions to be statistically significant; 2) despite the fact that the uncertainty of Scope 1 and 2 emissions is very low (+/- 2%), the combined emissions represent less than 3% of the total Scope 1+2+3), rendering an annual update insignificant compared to the total with its high level of uncertainty.

Requesting member
Wal Mart de Mexico

Scope of emissions
Scope 3

Emissions in metric tonnes of CO2e
37514
Uncertainty (±%)
30

Major sources of emissions
Use phase: fuel consumed by the vehicle to overcome the tires' rolling resistance

Verified
Yes

Allocation method
Allocation based on mass of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made
Using "The Green House Gas Protocol: A Corporate Accounting and Reporting Standard" methodology, and with the help of an external consultant, the sources of our scope 3 emissions were identified and emissions calculated on the basis of the raw data available and modeling assumptions specific to each category. The level of uncertainty for each category was determined by the quality of the raw data used and the degree to which extrapolations and/or hypotheses were required to compensate for availability or quality of primary data. The predominate Scope 3 category is the use phase, which represents 86% of all Scope 3 emissions. Methodology for the use phase: 1/ a 2016 scenario of tank-to-wheel CO2 emissions for road transport was built, based on data for the year 2015 in IEA database "Mobility Model" (2017 version), the contribution of tires to vehicular CO2 emissions and Michelin's share of the 2016 tire market. 3/ Average tire rolling resistance for passenger car/light vehicles and for trucks was applied to determine the percentage share of the tire's contribution to vehicular CO2 emissions. Rolling resistance performances of specific tire types and models were not taken into account. 4/ The influence on CO2 emissions of different types of vehicle engine technologies in use during 2016 has not been taken into account, since the most updated Mobility Model data available at the time of calculation was from 2015. 5/ The number of Michelin tires on the road was based on 2016 market share, and did not take into
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Requesting member
Toyota Motor Corporation

Scope of emissions
Scope 1

Emissions in metric tonnes of CO2e
25448

Uncertainty (±%)
2

Major sources of emissions
Energy consumption by onsite boilers at tire production sites

Verified
Yes

Allocation method
Allocation based on mass of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made
The sources of emissions identified are the sources over which the company has financial control. Within this boundary CO2 emissions from tire distribution centers were excluded as they represent less than 3% of total emissions (for this reason, and consistent with legal requirements for reporting Group-wide extra-financial information under French law, this source is not included in the Group’s consolidated annual report). Using “The Green House Gas Protocol: A Corporate Accounting and Reporting Standard” methodology, our scope 1 emissions sources were identified. When calculating annual scope 1 emissions, there is a minor source of uncertainty: by the date we consolidate annual environmental results, energy consumption data for the month of December are still being collected at site level; thus the data related to CO2 emissions may be estimated in some cases. Our calculations were based on an Emission Factor method. The figure provided is based on the mass of products purchased in 2016. Scope 1, 2 and 3 calculations for customer supply chain purposes are determined on a 3-year cycle for 2 reasons: 1) the high level of uncertainty of Scope 3 emissions (+/- 30%) does not allow for annual changes (+/-) in total CO2 emissions to be statistically significant; 2) despite the fact that the uncertainty of Scope 1 and 2 emissions is very low (+/- 2%), the combined emissions represent less than 3% of the total Scope 1+2+3), rendering an annual update insignificant compared to the total with its high level of uncertainty.

Requesting member
Toyota Motor Corporation

Scope of emissions
Scope 2

Emissions in metric tonnes of CO2e
29925

Uncertainty (±%)
2

Major sources of emissions
Net purchased electricity and steam for tire production sites

Verified
Yes

Allocation method
Allocation based on mass of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made
The sources of emissions identified are the sources over which the company has financial control. Within this boundary CO2
emissions from tire distribution centers were excluded as they represent less than 3% of total emissions (for this reason, and consistent with legal requirements for reporting Group-wide extra-financial information under French law, this source is not included in the Group’s consolidated annual report). Using "The Green House Gas Protocol: A Corporate Accounting and Reporting Standard" methodology, our scope 2 emissions sources were identified. When calculating annual scope 2 emissions, there is a minor source of uncertainty: by the date we consolidate annual environmental results, energy consumption data for the month of December are still being collected at site level; thus the data related to CO2 emissions may be estimated in some cases. Our calculations were based on the market-based approach, following the "GHG Protocol Scope 2 Guidance: an amendment to the GHG Protocol Corporate Standard", 2015. The figure provided is based on the mass of products purchased in 2016. Scope 1, 2 and 3 calculations for customer supply chain purposes are determined on a 3-year cycle for 2 reasons: 1) the high level of uncertainty of Scope 3 emissions (+/- 30%) does not allow for annual changes (+/-) in total CO2 emissions to be statistically significant; 2) despite the fact that the uncertainty of Scope 1 and 2 emissions is very low (+/- 2%), the combined emissions represent less than 3% of the total Scope 1+2+3), rendering an annual update insignificant compared to the total with its high level of uncertainty.

---

**Requesting member**

Toyota Motor Corporation

**Scope of emissions**

Scope 3

**Emissions in metric tonnes of CO2e**

2338218

**Uncertainty (±%)**

30

**Major sources of emissions**

Use phase: fuel consumed by the vehicle to overcome the tires' rolling resistance

**Verified**

Yes

**Allocation method**

Allocation based on mass of products purchased

---

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Using "The Green House Gas Protocol: A Corporate Accounting and Reporting Standard" methodology, and with the help of an external consultant, the sources of our scope 3 emissions were identified and emissions calculated on the basis of the raw data available and modeling assumptions specific to each category. The level of uncertainty for each category was determined by the quality of the raw data used and the degree to which extrapolations and/or hypotheses were required to compensate for availability or quality of primary data. The predominate Scope 3 category is the use phase, which represents 86% of all Scope 3 emissions. Methodology for the use phase: 1/ a 2016 scenario of tank-to-wheel CO2 emissions for road transport was built, based on data for the year 2015 in IEA database "Mobility Model" (2017 version), the contribution of tires to vehicular CO2 emissions and Michelin's share of the 2016 tire market. 3/ Average tire rolling resistance for passenger car/light vehicles and for trucks was applied to determine the percentage share of the tire's contribution to vehicular CO2 emissions. Rolling resistance performances of specific tire types and models were not taken into account. 4/ The influence on CO2 emissions of different types of vehicle engine technologies in use during 2016 has not been taken into account, since the most updated Mobility Model data available at the time of calculation was from 2015. 5/ The number of Michelin tires on the road was based on 2016 market share, and did not take into account tires sold in previous years and that were used during 2016. The figure provided is based on the mass of products purchased in 2016. Scope 1, 2 and 3 calculations for customer supply chain purposes are determined on a 3-year cycle for 2 reasons: 1) the high level of uncertainty of Scope 3 emissions (+/- 30%) does not allow for annual changes (+/-) in total CO2 emissions to be statistically significant; 2) despite the fact that the uncertainty of Scope 1 and 2 emissions is very low (+/- 2%), the combined emissions represent less than 3% of the total Scope 1+2+3), rendering an annual update insignificant compared to the total with its high level of uncertainty.

---

SC1.2
Where published information has been used in completing SC1.1, please provide a reference(s).

Scope 1 and 2 emissions are published in the Michelin Group’s annual report “2016 Registration Document”, pages 189-190, available on the corporate internet site (http://www.michelin.com). Scope 3 emissions for each relevant category in 2016 have been publicly reported to the CDP in 2017 and 2018, and all published sources for these calculations are cited in the replies concerning methodology.

SC1.3

What are the challenges in allocating emissions to different customers, and what would help you to overcome these challenges?

<table>
<thead>
<tr>
<th>Allocation challenges</th>
<th>Please explain what would help you overcome these challenges</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diversity of product lines makes accurately accounting for each product/product line cost ineffective</td>
<td>The main challenge in allocating emissions to different customers is that, as the emissions associated with tires are strongly dependent on the type of tire involved, the allocation of emissions depends on the dimensions of tires they buy. Several factors make it challenging to refine the allocation per customer: first, we have not been able to take into account the carbon sink associated with natural rubber plantations, as the accounting method is not yet established, and to incorporate this into the customer allocation based on the type of tires purchased and their natural rubber content; second, the manufacturing phase takes place at plants that typically produce at least two major lines of tires (e.g., passenger car and truck tires), as well as a variety of semi-finished products to be used at other plants. The breakdown at plant level of CO2 emissions associated with the production of one type of tire is not currently possible with our data reporting systems. This makes it complex, at a global level, to allocate a specific quantity of emissions to a specific customer. However, it must be kept in mind that the overwhelming contribution to the carbon footprint allocated to a given customer stems from the rolling resistance of the tires in their use phase, which represent between 85 and 90% of Scope 1, 2 and 3 emissions combined. Our aim is continue to refine our methodology for calculating Scope 3 use phase emissions by general product category, namely passenger car tires and truck tires. Other, please specify (Scope 3 emissions: use phase)</td>
</tr>
</tbody>
</table>

SC1.4

Do you plan to develop your capabilities to allocate emissions to your customers in the future?

Yes

SC1.4a

Describe how you plan to develop your capabilities.

Our main focus will be on the Scope 3 category “Purchased Goods and Services”. Our aim is to collect more primary data from our suppliers to 1) better understand the CO2 efficiency of categories of raw materials, and 2) reduce the uncertainty of the calculation of both total and customer-allocated CO2 emissions.

SC2.1

Please propose any mutually beneficial climate-related projects you could collaborate on with specific CDP Supply Chain members.

**Requesting member**

BMW AG

**Group type of project**

New product or service
Type of project
New product or service that reduces customers products / services operational emissions

Emissions targeted
Other, please specify (Own/customer Scp 3 Use of sold products)

Estimated timeframe for carbon reductions to be realized
3-5 years

Estimated lifetime CO2e savings

Estimated payback
0-1 year

Details of proposal
1/ Since 1992 Michelin has been continually reducing rolling resistance and believes itself to be the most advanced tire manufacturer based on total performance. Michelin proposes to pursue efforts with BMW to develop tires with lower rolling resistance while maintaining longevity and other key performances to satisfy the end user and optimize the use of materials for the next generation of vehicles. 2/ Michelin also proposes to work with BMW on reducing vehicle weight by eliminating the spare wheel and developing a low rolling resistance standard & extended tires. Michelin strongly supports BMW’s approach to have only Label A tires starting in 2020 to improve overall fleet consumption.

Requesting member
BMW AG

Group type of project
Relationship sustainability assessment

Type of project
Assessing products or services life cycle footprint to identify efficiencies

Emissions targeted
Other, please specify (Own/customer Scp 3 Use of sold products)

Estimated timeframe for carbon reductions to be realized
3-5 years

Estimated lifetime CO2e savings

Estimated payback
0-1 year

Details of proposal
1/ Michelin proposes to demonstrate to BMW its ambition to continue reducing the life cycle environmental footprint of its tires. Two key examples are through: a) a joint venture with the Barito Group and partnership with WWF to produce sustainable natural rubber in Indonesia and reduce deforestation; b) the Biobutterfly project, which is aimed at producing synthetic rubber from biomass instead of fossil fuel sources. 2/ During the BEV i20 quotation process, Michelin demonstrated future tire technologies’ potential to significantly reduce the CO2 footprint through main three levers: - materials sourcing: use of renewable biomass to produce synthetic rubber (Biobutterfly, see above) and increased use of steel from recycled feed stock. - tire production: already today the electricity used for tire production in the European plants is from 100% renewable sources. - the product itself that offers homogeneous tire performances throughout its life time (“long lasting performance (LLP)”: related studies prove that LLP tires have the best sustainable footprint.

Requesting member
BMW AG

Group type of project
Other, please specify (Sustainable mobility advocacy)

Type of project
Other, please specify (industry and automotive conferences)

Emissions targeted
Other, please specify (Scope 3 Use of sold products)

Estimated timeframe for carbon reductions to be realized
3-5 years

Estimated lifetime CO2e savings
Estimated payback
0-1 year

Details of proposal
Michelin proposes to continue working together with BMW to promote the importance of sustainability at industry and automotive conferences, such as at Movin'On in 2017 and 2018 and or during the BMW Sustainability Day in 2015.

Requesting member
Ford Motor Company

Group type of project
New product or service

Type of project
New product or service that reduces customers products / services operational emissions

Emissions targeted
Other, please specify (Own/customer Scp 3 Use of sold products)

Estimated timeframe for carbon reductions to be realized
1-3 years

Estimated lifetime CO2e savings
5800000

Estimated payback
1-3 years

Details of proposal
Since 1992 Michelin has been continually reducing rolling resistance (RR) and believes itself to be the most advanced tire manufacture based on total performance. Michelin proposes to pursue efforts with Ford to develop tires with lower RR while maintaining longevity and other key performances to satisfy the end user and optimize the use of materials for the next generation of vehicles. Specifically, we propose working with Ford to reduce RR: a) in Europe for passenger cars down to have less than 5.0 kg/T (WLTP); b) in North America for light trucks down to 6.0 kg/T; and c) in China for passenger cars while maintaining the robustness required in that zone.

Requesting member
Ford Motor Company

Group type of project
relationship sustainability assessment

Type of project
Assessing products or services life cycle footprint to identify efficiencies

Emissions targeted
Other, please specify (Own/customer Scp 3 Use of sold products)

Estimated timeframe for carbon reductions to be realized
3-5 years

Estimated lifetime CO2e savings

Estimated payback
1-3 years

Details of proposal
Michelin proposes to demonstrate to Ford its ambition to continue reducing the life cycle environmental footprint of its tires. Two key examples are through: a) a joint venture with the Barito Group and partnership with WWF to produce sustainable natural rubber in Indonesia and reduce deforestation; b) the Biobutterfly project, which is aimed at producing synthetic rubber from biomass instead of fossil fuel sources. In addition to that, a LCA (Life Cycle Assessment) to identify the potential savings by using a best combination of low RR tires, wear and weight (especially with green electricity mix).

Requesting member
Nissan Motor Co., Ltd.

Group type of project
New product or service
Type of project
New product or service that reduces customers products / services operational emissions

Emissions targeted
Other, please specify (Own/customer Scp 3 Use of sold products)

Estimated timeframe for carbon reductions to be realized
3-5 years

Estimated lifetime CO2e savings

Estimated payback
3-5 years

Details of proposal
Michelin proposes to continue working with Nissan on advanced engineering projects to improve vehicle fuel efficiency (on previous projects Michelin has obtained an overall rating of 9.5 out of 10, and for “Good fuel economy” our rating was 3.5 out of 4) and reduce CO2 emissions. Such projects allow Michelin to optimize the three major tire parameters contributing to fuel consumption: rolling resistance, mass and aerodynamics. Michelin is committed to helping Nissan improve fuel efficiency while also maintaining balanced performances between longevity, traction, wear to ensure customer satisfaction.

Requesting member
General Motors Company

Group type of project
New product or service

Type of project
New product or service that reduces customers products / services operational emissions

Emissions targeted
Other, please specify (Own/customer Scp 3 Use of sold products)

Estimated timeframe for carbon reductions to be realized
1-3 years

Estimated lifetime CO2e savings
8990000

Estimated payback
1-3 years

Details of proposal
Michelin proposes to pursue two areas of collaboration with GM. The first is to further develop technologies to reduce vehicle CO2 emissions through low rolling resistance road maps created globally with GM to ensure best technology availability in all zones (EU, NA, CHN). The second is reduce vehicle mass by replacing the spare tire with run-flat, sealant solutions or advanced technologies.

Requesting member
General Motors Company

Group type of project
Relationship sustainability assessment

Type of project
Assessing products or services life cycle footprint to identify efficiencies

Emissions targeted
Other, please specify (Own/customer Scope 3)

Estimated timeframe for carbon reductions to be realized
3-5 years

Estimated lifetime CO2e savings

Estimated payback
1-3 years

Details of proposal
Michelin proposes to support GM efforts with WWF on tire sustainability, recyclability and materials development.

### Requesting member
General Motors Company

### Group type of project
Reduce Logistics Emissions

### Type of project
Other, please specify (Optimize logistics footprint)

### Emissions targeted
Other, please specify (Customer/own Scope 3 Transport)

### Estimated timeframe for carbon reductions to be realized
1-3 years

### Estimated lifetime CO2e savings

### Estimated payback
1-3 years

### Details of proposal
Michelin proposes to work with GM to optimize manufacturing locations within region which reduces logistics emissions.

---

### Requesting member
Jaguar Land Rover Ltd

### Group type of project
New product or service

### Type of project
New product or service that reduces customers products / services operational emissions

### Emissions targeted
Other, please specify (Own/customer Scp 3 Use of sold products)

### Estimated timeframe for carbon reductions to be realized
3-5 years

### Estimated lifetime CO2e savings

### Estimated payback
3-5 years

### Details of proposal
Since 1992 Michelin has been continually reducing rolling resistance (RR) and believes itself to be the most advanced tire manufacturer based on total performance. Michelin proposes to work with Jaguar Land Rover on improving rolling resistance on new vehicles (especially to meet WLTP regulations), while maintaining Michelin Total Performance (=keeping balanced performances between longevity, traction, wear and other key performances) to ensure customer satisfaction.

---

### Requesting member
Volkswagen AG

### Group type of project
New product or service

### Type of project
New product or service that reduces customers products / services operational emissions

### Emissions targeted
Other, please specify (Own/customer Scp 3 Use of sold products)

### Estimated timeframe for carbon reductions to be realized
3-5 years

### Estimated lifetime CO2e savings

### Estimated payback

---
Since 1992 Michelin has been continually reducing rolling resistance and believes itself to be the most advanced tire manufacturer based on total performance. Michelin proposes to pursue efforts with Volkswagen to develop tires with lower rolling resistance while maintaining longevity and other key performances to satisfy the end user and optimize the use of materials for the next generation of vehicles. Michelin also proposes to work with Volkswagen on reducing vehicle weight by eliminating the spare wheel and developing a low rolling resistance standard & extended tires. Michelin strongly supports Volkswagen’s approach to have mainly Label A tires starting in 2019 to improve overall fleet consumption.

**Emissions targeted**
Other, please specify (Customer/own Scope 3)

**Estimated timeframe for carbon reductions to be realized**
3-5 years

**Estimated lifetime CO2e savings**
3-5 years

**Details of proposal**
Michelin proposes to demonstrate to Volkswagen its ambition to continue reducing the life cycle environmental footprint of its tires. Two key examples are through: a) a joint venture with the Barito Group and partnership with WWF to produce sustainable natural rubber in Indonesia and reduce deforestation; b) the Biobutterfly project, which is aimed at producing synthetic rubber from biomass instead of fossil fuel sources.

---

**Emissions targeted**
Other, please specify (Own/customer Scp 3 Use of sold products)

**Estimated timeframe for carbon reductions to be realized**
1-3 years

**Estimated lifetime CO2e savings**
0-1 year

**Details of proposal**
Michelin proposes to work with Fiat Chrysler on improving rolling resistance on new vehicles (especially to meet WLTP regulations), while maintaining Michelin Total Performance (=keeping balanced performances between longevity, traction, wear and other key performances) to ensure customer satisfaction.
Other, please specify (Optimize loads and reduce trips)

**Emissions targeted**
Other, please specify (Customer/own Scope 3 Transport)

**Estimated timeframe for carbon reductions to be realized**
0-1 year

**Estimated lifetime CO2e savings**

**Estimated payback**
0-1 year

**Details of proposal**
At the logistics level, Michelin proposes to continue finding solutions for shipments that optimize loads and reduce trips, thereby reducing CO2 emissions (as Michelin has done for the new Wrangler programs, for which tire shipments will be all loose-laced, as opposed to bundled/banded like the current Wrangler).

---

**Requesting member**
Honda of the UK Manufacturing Ltd

**Group type of project**
New product or service

**Type of project**
New product or service that reduces customers products / services operational emissions

**Emissions targeted**
Other, please specify (Own/customer Scp 3 Use of sold products)

**Estimated timeframe for carbon reductions to be realized**
3-5 years

**Estimated lifetime CO2e savings**

**Estimated payback**
3-5 years

**Details of proposal**
Michelin proposes to work with Honda on 2 opportunities to reduce CO2 emissions. The first is to offer a low rolling resistance, robust tire for emerging markets with slim line & LRRRC design concept through co-development for new EVs in 2022, while maintaining Michelin Total Performance (=keeping balanced performances between longevity, traction, wear and other key performances) to ensure customer satisfaction. The second opportunity involves global mono specifications tire offer for the next generation of HR-V 2ZMY, specifically to integrate developed & emerging country specifications.

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**Requesting member**
Toyota Motor Corporation

**Group type of project**
New product or service

**Type of project**
New product or service that reduces customers products / services operational emissions

**Emissions targeted**
Other, please specify (Own/customer Scp 3 Use of sold products)

**Estimated timeframe for carbon reductions to be realized**
3-5 years

**Estimated lifetime CO2e savings**

**Estimated payback**
3-5 years

**Details of proposal**
Michelin proposes to work with Toyota on 2 opportunities to reduce CO2 emissions. The first is to offer low rolling resistance with "real world" situation using the APOE approach and try to manage Dry / Wet mu level. The second is to pursue improvements in aerodynamics by optimizing the combination of vehicular and tire aerodynamics.
Requesting member
CNH Industrial NV

Group type of project
New product or service

Type of project
New product or service that reduces customers products / services operational emissions

Emissions targeted
Other, please specify (Own/customer Scp 3 Use of sold products)

Estimated timeframe for carbon reductions to be realized
3-5 years

Estimated lifetime CO2e savings

Estimated payback
3-5 years

Details of proposal
For agricultural applications, Michelin has two proposals to work with CNH Industrial on reducing CO2 emissions. The first is to pursue implementation of CTIS (Central Tire Inflation System) systems on agricultural vehicles by using tires specifically designed to offer traction in field and the lowest possible rolling resistance on the road. Michelin has combined these technologies in the EvoBib tire, for example, which was awarded a SIMA Innovation Gold Medal in 2016. The potential of these combined technologies has generated much interest with OEMs, and Michelin would like to pursue their application with CNH Industrial products. The second is to further develop energy-efficient tires for longer road-travel needs. This has been a development priority for Michelin, as shown by the launch of the RoadBib. Michelin would like to explore with CNH Industrial how this type of road-travel need can be addressed with fuel-efficiency in mind. For truck applications, Michelin has two proposals to work with CNH Industrial on reducing CO2 emissions through long-lasting tire performance. The first is to address regional transport needs with low rolling resistance tires. The second is to explore opportunities for applying tire monitoring systems.

Requesting member
CNH Industrial NV

Group type of project
Relationship sustainability assessment

Type of project
Other, please specify (Optimize soil sequestration of CO2)

Emissions targeted
Other, please specify (Sequestration of CO2)

Estimated timeframe for carbon reductions to be realized
Other, please specify (>5 years for research and development)

Estimated lifetime CO2e savings

Estimated payback
Other, please specify (>5 years)

Details of proposal
This proposal to CNH Industrial involves better understanding the link between minimizing soil compaction in agricultural fields and the ability of those fields to sequester CO2. Improving this understanding could lead to interesting co-development projects.

Requesting member
Wal-Mart Stores, Inc.

Group type of project
Relationship sustainability assessment

Type of project
Assessing products or services life cycle footprint to identify efficiencies

Emissions targeted
Other, please specify (Customer/own Scope 3)

Estimated timeframe for carbon reductions to be realized

3-5 years

*Estimated lifetime CO2e savings*

*Estimated payback*
3-5 years

**Details of proposal**
Michelin proposes a collaborative project with Wal-Mart to explore together how technology can be used to increase transparency and supply chain accountability, one of the focuses of Wal-Mart's Gigaton project. Specifically, we would like to share approaches to deploying technology towards our common goal of zero deforestation. Michelin is particularly interested in the natural rubber supply chain, which could be a complement to Wal-Mart's efforts in the palm oil, soy, beef and pulp & paper sectors.

Background: In 2015, Michelin and World Wildlife Fund formed a partnership to transform the natural rubber market by instilling more sustainable practices. To support its "Natural Rubber Procurement Policy" published in 2015 (attached below), the Group formalized its public commitments in a "Sustainable Natural Rubber Policy", which was drafted with input from stakeholders, particularly environmental and human rights NGOs, and is now a contractual reference document for suppliers. Downloadable from the Michelin purchasing website, the policy precisely defines the conditions for farming natural rubber, both in terms of the environment (zero deforestation, protection and preservation of peatlands, High Conservation Value areas and High Carbon Stock areas), and in terms of social responsibility and human rights (working conditions, free, prior and informed consent of the local communities, etc.). Michelin developed a mobile application in 2016 to enable actors across the natural rubber supply chain (small farmers, large plantations, brokers and direct suppliers) to input their CSR data, which can then be analyzed on a web platform. We would like to share approaches to deploying technology towards our common goal of zero deforestation.

---

**Requesting member**
Wal Mart de Mexico

**Group type of project**
Reduce Logistics Emissions

**Type of project**
Other, please specify (Optimize loads and distances)

**Emissions targeted**
Other, please specify (Customer/own Scope 3 Transport)

**Estimated timeframe for carbon reductions to be realized**
0-1 year

**Estimated lifetime CO2e savings**

**Estimated payback**
0-1 year

**Details of proposal**
Michelin proposes to work with Wal Mart de México on reducing the CO2 emissions and associated with the delivery of tires to Wal Mart's distribution centers. The idea is to arrange direct deliveries to the final sales points, which will reduce the overall distances traveled by delivery trucks and optimize tire loads on each truck. An additional benefit would be to eliminate the plastic packaging waste currently generated at Wal Mart distribution centers.

---

**SC2.2**

(SC2.2) Have requests or initiatives by CDP Supply Chain members prompted your organization to take organizational-level emissions reduction initiatives?  
No

**SC3.1**

(SC3.1) Do you want to enroll in the 2018-2019 CDP Action Exchange initiative?  
No
SC3.2

(SC3.2) Is your company a participating supplier in CDP’s 2017-2018 Action Exchange initiative?
No

SC4.1

(SC4.1) Are you providing product level data for your organization’s goods or services, if so, what functionality will you be using?
Yes, I will provide data

SC4.1a

(SC4.1a) Give the overall percentage of total emissions, for all Scopes, that are covered by these products.
94

SC4.2a
(SC4.2a) Complete the following table for the goods/services for which you want to provide data.

**Name of good/service**
Passenger car tires

**Description of good/service**
Thick elastic rubber ring, filled with air, fitted around the outer edge of the wheel of a car, allowing the vehicle to stick to the road surface and to travel over the ground more easily, increasing safety and facilitating driving.

**Type of product**
Final

**SKU (Stock Keeping Unit)**
Single 11.56-kg tire

**Total emissions in kg CO2e per unit**
961

**±% change from previous figure supplied**
-0.4

**Date of previous figure supplied**
July 26 2016

**Explanation of change**
The figure reported is for the year 2016. This minor change reflects a reduction in carbon intensity in the manufacturing phase in 2016 compared to 2015. Because the calculation method is simplified to represent an average Michelin passenger car tire, improvements to energy efficiency from reduced rolling resistance and mass across different product lines has not been included in the figure reported here. The current simplified calculation will be refined over time in line with advancements in our life cycle analyses.

**Methods used to estimate lifecycle emissions**
Other, please specify (Internal: based on IPCC 2007 factors)

---

**Name of good/service**
Truck tires

**Description of good/service**
Thick elastic rubber ring, filled with air, fitted around the outer edge of the wheel of a car, allowing the vehicle to stick to the road surface and to travel over the ground more easily, increasing safety and facilitating driving.

**Type of product**
Final

**SKU (Stock Keeping Unit)**
Single 62-kg tire

**Total emissions in kg CO2e per unit**
12643

**±% change from previous figure supplied**
-0.04

**Date of previous figure supplied**
July 26 2016

**Explanation of change**
The figure reported is for the year 2016. This minor change reflects a reduction in carbon intensity in the manufacturing phase in 2016 compared to 2015. Because the calculation method is simplified to represent an average Michelin passenger car tire, improvements to energy efficiency from reduced rolling resistance and mass across different product lines has not been included in the figure reported here. The current simplified calculation will be refined over time in line with advancements in our life cycle analyses.

**Methods used to estimate lifecycle emissions**
Other, please specify (Internal: based on IPCC 2007 factors)
**SC4.2b**

(SC4.2b) Complete the following table with data for lifecycle stages of your goods and/or services.

<table>
<thead>
<tr>
<th>Name of good/service</th>
<th>Passenger car tire</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Please select the scope</strong></td>
<td>Scope 1 &amp; 2</td>
</tr>
<tr>
<td><strong>Please select the lifecycle stage</strong></td>
<td>Manufacturing</td>
</tr>
<tr>
<td><strong>Emissions at the lifecycle stage in kg CO2e per unit</strong></td>
<td>11</td>
</tr>
<tr>
<td><strong>Is this stage under your ownership or control?</strong></td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Type of data used</strong></td>
<td>Primary</td>
</tr>
<tr>
<td><strong>Data quality</strong></td>
<td>Results come from an assessment which includes the energy used to manufacture tires (data from Ecoinvent database). Data are valid for an average Michelin tire used in a European market.</td>
</tr>
</tbody>
</table>

**If you are verifying/assuring this product emission data, please tell us how**

<table>
<thead>
<tr>
<th>Name of good/service</th>
<th>Passenger car tire</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Please select the scope</strong></td>
<td>Scope 3</td>
</tr>
<tr>
<td><strong>Please select the lifecycle stage</strong></td>
<td>Other, please specify (Distribution and customer use)</td>
</tr>
<tr>
<td><strong>Emissions at the lifecycle stage in kg CO2e per unit</strong></td>
<td>937</td>
</tr>
<tr>
<td><strong>Is this stage under your ownership or control?</strong></td>
<td>No</td>
</tr>
<tr>
<td><strong>Type of data used</strong></td>
<td>Primary and secondary</td>
</tr>
<tr>
<td><strong>Data quality</strong></td>
<td>Data are valid for an average Michelin tire used in European market, during 40,000 km, taking into account driving behaviors and type of tires. As in previous studies, the main impact is due to tires rolling resistance when fitted on the vehicles.</td>
</tr>
</tbody>
</table>

**If you are verifying/assuring this product emission data, please tell us how**

<table>
<thead>
<tr>
<th>Name of good/service</th>
<th>Passenger car tire</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Please select the scope</strong></td>
<td>Scope 3</td>
</tr>
<tr>
<td><strong>Please select the lifecycle stage</strong></td>
<td>Other, please specify (End-of-life, waste, recycling)</td>
</tr>
<tr>
<td><strong>Emissions at the lifecycle stage in kg CO2e per unit</strong></td>
<td>0</td>
</tr>
<tr>
<td><strong>Is this stage under your ownership or control?</strong></td>
<td>No</td>
</tr>
</tbody>
</table>
Type of data used
Primary and secondary

Data quality
19 kg of CO2 emissions are avoided. This is a negative value due to emissions avoided such as by burning end-of-life tires instead of coal. Zero has been entered because it is not possible to enter a negative value.

If you are verifying/assuring this product emission data, please tell us how

Name of good/ service
Passenger car tire

Please select the scope
Scope 3

Please select the lifecycle stage
Other, please specify (Raw materials, transportation)

Emissions at the lifecycle stage in kg CO2e per unit
33

Is this stage under your ownership or control?
No

Type of data used
Primary and secondary

Data quality
Results come from an assessment which includes both raw materials and the energy necessary to transport and transform them (data from Ecoinvent database). Data are valid for an average Michelin tire used in a European market.

If you are verifying/assuring this product emission data, please tell us how

Name of good/ service
Truck tire

Please select the scope
Scope 3

Please select the lifecycle stage
Other, please specify (Raw materials, transportation)

Emissions at the lifecycle stage in kg CO2e per unit
278

Is this stage under your ownership or control?
No

Type of data used
Primary and secondary

Data quality
Results come from an assessment which includes both raw materials and the energy necessary to transport and transform them (data from Ecoinvent database). Data are valid for an average Michelin tire used in a European market.

If you are verifying/assuring this product emission data, please tell us how

Name of good/ service
Truck tire

Please select the scope
Scope 1 & 2

Please select the lifecycle stage
Manufacturing

Emissions at the lifecycle stage in kg CO2e per unit
57
Is this stage under your ownership or control?
Yes

Type of data used
Primary

Data quality
Results come from an assessment which includes the energy used to manufacture tires (data from Ecoinvent database). Data are valid for an average Michelin tire used in a European market.

If you are verifying/assuring this product emission data, please tell us how

Name of good/service
Truck tire

Please select the scope
Scope 3

Please select the lifecycle stage
Other, please specify (Distribution and customer use)

Emissions at the lifecycle stage in kg CO2e per unit
12397

Is this stage under your ownership or control?
No

Type of data used
Primary and secondary

Data quality
Data are valid for an average Michelin tire used in European market, taking into account driving behaviors and type of tires. As in previous studies, the main impact is due to tires rolling resistance when fitted on the vehicles.

If you are verifying/assuring this product emission data, please tell us how

Name of good/service
Truck tire

Please select the scope
Scope 3

Please select the lifecycle stage
Other, please specify (End-of-life, waste, recycling)

Emissions at the lifecycle stage in kg CO2e per unit
0

Is this stage under your ownership or control?
No

Type of data used
Primary and secondary

Data quality
89 kg of CO2 emissions are avoided. This is a negative value due to emissions avoided such as by burning end-of-life tires instead of coal. Zero has been entered because it is not possible to enter a negative value.

If you are verifying/assuring this product emission data, please tell us how

SC4.2c
**SC4.2c** Please detail emissions reduction initiatives completed or planned for this product.

<table>
<thead>
<tr>
<th>Name of good/service</th>
<th>Initiative ID</th>
<th>Description of initiative</th>
<th>Completed or planned</th>
<th>Emission reductions in kg CO2e per unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passenger car tires</td>
<td>Initiative 1</td>
<td>Since 1992, Michelin has been increasing the energy efficiency of vehicles by reducing the energy required for a vehicle to overcome rolling resistance. The figure reported at the right represents Michelin’s ambition for 2030 to achieve a reduction in CO2 emissions associated with the rolling resistance of a passenger car tire on a unit basis and over the course of one year. Much of Michelin’s progress to date stems from the efficient Energy™ Saver line, created in 1992 and now in its fifth generation. Energy™ Saver tires are delivering an improvement of up to 0.2 L/100 km (compared to the first generation), in an average, equivalent-size European car, for an average of 4 g/km reduction in CO2 emissions.</td>
<td>Ongoing</td>
<td>15.5</td>
</tr>
<tr>
<td>Truck tires</td>
<td>Initiative 2</td>
<td>Since 1992, Michelin has been increasing the energy efficiency of vehicles by reducing the energy required for a vehicle to overcome rolling resistance. The figure reported to the right represents Michelin’s ambition for 2030 to achieve a reduction in CO2 emissions associated with the rolling resistance of a truck tire on a unit basis and over the course of one year. In truck tires, the technological innovations collectively known as “Michelin Durable Technologies” offer a wide range of benefits, including a significant improvement in fuel efficiency and therefore also in CO2 emissions. These technologies also increase a truck’s load capacity and the tire’s total life-span, which has doubled since 1980.</td>
<td>Ongoing</td>
<td>95</td>
</tr>
<tr>
<td>Passenger car, truck, two-wheel, aviation, earth-movers and agricultural engines: Reducing the carbon emissions of our manufacturing plants.</td>
<td>Initiative 3</td>
<td>We are reducing the energy consumption in plants by extending the use of energy audits, sharing best practices and installing new equipment and processes. We are also developing the use of renewable energies, including solar installations, wind turbines and biomass heating boilers, as well as a green energy purchasing program. These are ongoing initiatives. Site-specific projects have been completed, others are in progress and more are being planned. The CO2 reduction is expressed in kg per ton of finished product in 2017 compared to 2016.</td>
<td>Ongoing</td>
<td>100</td>
</tr>
</tbody>
</table>

**SC4.2d**

(SC4.2d) Have any of the initiatives described in SC4.2c been driven by requesting CDP Supply Chain members?  
No

Submit your response

**In which language are you submitting your response?**  
English

**Please confirm how your response should be handled by CDP**

<table>
<thead>
<tr>
<th>Public or Non-Public Submission</th>
<th>am submitting to</th>
<th>Are you ready to submit the additional Supply Chain Questions?</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am submitting my response</td>
<td>Public</td>
<td>Investors Customers</td>
</tr>
</tbody>
</table>

**Please confirm below**

I have read and accept the applicable Terms