Report on Key Environmental Indicators - Tire Industry Project (TIP)

Over the period 2009-2015

Introduction

Formed in 2005, the Tire Industry Project (TIP) serves as a global, voluntary, CEO-led initiative, undertaken by 11 leading tire companies (Bridgestone Corporation, Continental AG, Cooper Tire & Rubber Company, The Goodyear Tire & Rubber Company, Hankook Tire Co., Ltd., Kumho Tire Company Inc., Compagnie Générale des Établissements Michelin, Pirelli & C., Sumitomo Rubber Industries, Ltd., Toyo Tire & Rubber Co., Ltd., and The Yokohama Rubber Co., Ltd.)[1] with an aim to anticipate, identify, analyze and address the potential human health and environmental impacts associated with tire development, use and management through end of life.

TIP is a proactive organization that operates under the umbrella of the World Business Council for Sustainable Development and is designed to advance sustainability throughout the industry. Together, TIP member companies work to anticipate, identify, analyze and collaborate on sustainability challenges facing the industry, improve understanding of and educate about these challenges, and develop potential solutions for a more sustainable future.

The tire industry leaders recognize that there are both opportunities and challenges associated with tire manufacturing and sustainable development.

Over the past two years, the WBCSD has commissioned an independent third party (Deloitte) to identify environmental key performance indicators (KPIs) that measure operational impacts of the tire industry related to industrial operations (energy consumption, CO_2 emissions, water intake, ISO 14001 certification) by means of interviews with TIP members and defined a common methodological framework for the collection and compilation of data over the period 2009-2015.

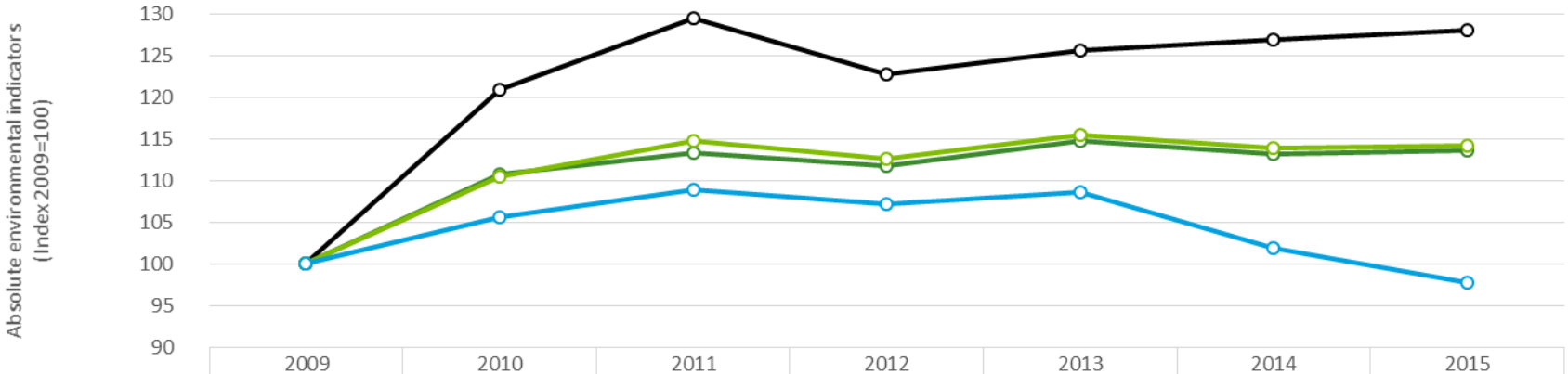
The purpose of this first report on environmental KPIs is to present the recent trends of the sector's environmental performance for its industrial operations by disclosing both absolute and intensity KPIs over the period 2009-2015.

By following these common KPIs, TIP established a common set of measurements to assist each company's efforts to help reduce carbon emissions, save energy and reduce water intake at their respective manufacturing facilities and improve the tire industry's environmental performance.

[1] http://www.wbcsd.org/Projects/Tire-Industry-Project

Summary of absolute KPIs

Absolute indicators
Index 100: *Year 2009 used as the basis (100)*



	2009	2010	2011	2012	2013	2014	2015
Production	100	121	130	123	126	127	128
Energy	100	111	113	112	115	113	114
CO2 emissions	100	110	115	113	115	114	114
Water	100	106	109	107	109	102	98

The graph above illustrates the overall trends of the different environmental KPIs with regards to the variations of the production level over the studied period. It is to be noted that 2009 was a year with record low global production levels and that production has increased by 28% by the year 2015. The environmental performance recorded for the year 2009 is therefore negatively impacted by the activities of the industrial sites which did not operate at their full nominal capacities, in particular for the largest companies. The production level strongly increased at the beginning of the period, peaked in 2011 and slightly increased from 2012 onwards. **Globally, the KPIs followed the same trends as the production level until 2013. In 2014 and 2015, energy consumption and CO_2 emissions remained stable despite the increase in production level, while water intake significantly decreased.**

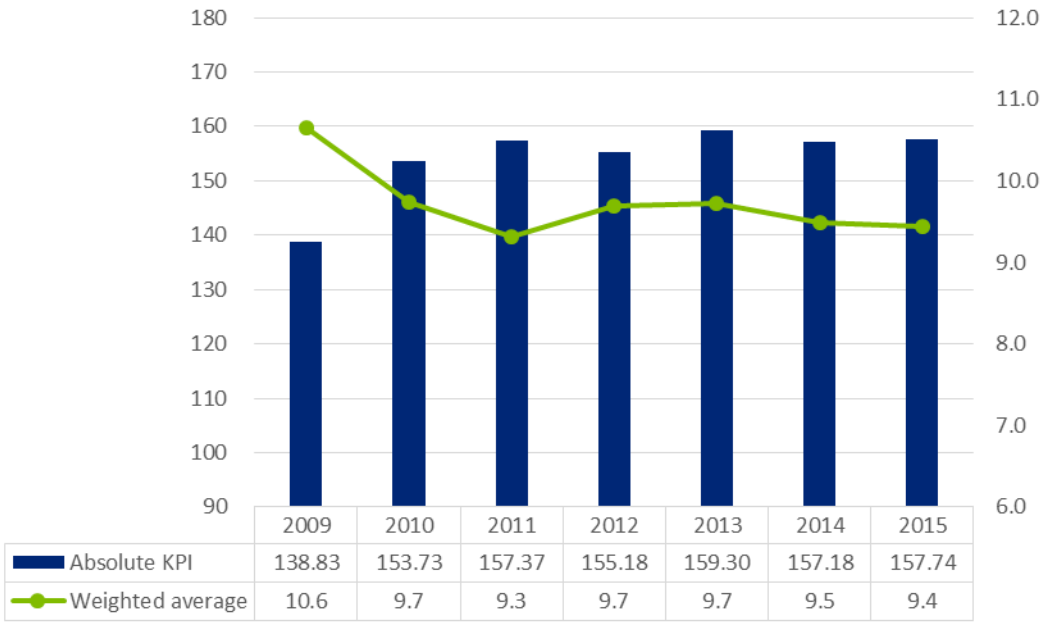
The industry managed to **maintain its energy consumption** with energy efficiency initiatives, to balance the effects of increasing production volumes and development of more energy intensive processes for higher performance products. The sector **CO_2 emissions are strongly correlated to its energy consumption**, showing the absence of any major change in terms of energy sources used or carbon mix over the studied period. Significant water intake reductions were recorded, in particular over the last two years (**10% decrease between 2013 and 2015**), reflecting the efficiency of water reduction programs implemented by the industry.

More detailed analysis can be found on the following pages.

Energy consumption

Total energy consumption
(PJ NCV) Peta Joules Net Calorific Value

Energy intensity
GJ/ton



	2009	2010	2011	2012	2013	2014	2015
Absolute KPI	138.83	153.73	157.37	155.18	159.30	157.18	157.74
Weighted average	10.6	9.7	9.3	9.7	9.7	9.5	9.4

Weighted average energy intensity: total energy consumption for 11 TIP members / total production volume of these companies.

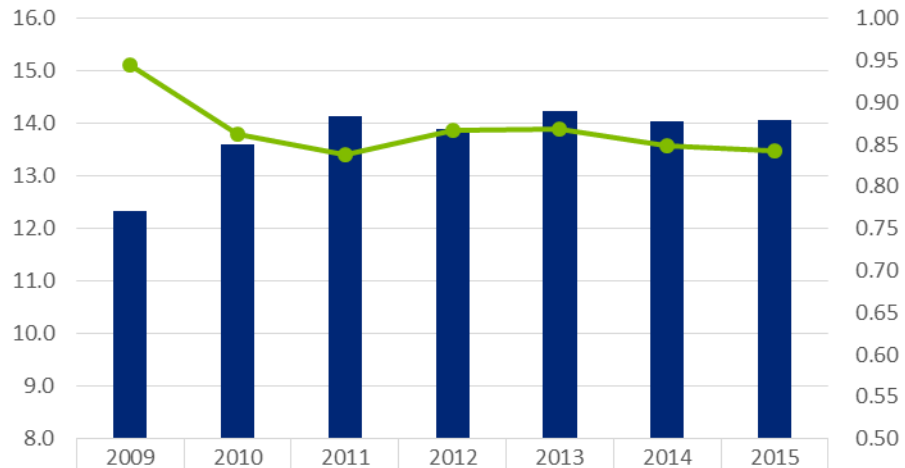
See more details on scope and definitions in the section "Methodological note"

- **Total energy consumption has significantly increased between 2009 and 2010, then stabilized over the period.**
- **Energy intensity significantly decreased between 2009 and 2010 benefiting from the capacity optimisation effect related to production increase, then followed by a period of stabilization.**
- The period of stabilisation however results from important efforts of the industry to improve the energy efficiency:
  - ✓ The industry has been actively engaged in energy efficiency initiatives such as: installation of new efficient facilities, heat recovery, predictive maintenance activities and LED lighting. However, the reduction in energy consumption was not always visible, as it was offset by other factors described below.
  - ✓ The production process has become more energy intensive over the period as the market is gradually switching to higher performance products which require more complex, small batch manufacturing processes. Other factors such as increased production line automation and deployment of environmental pollution prevention technologies can also lead to an increase in energy consumption.

CO_2 emissions

Total CO_2 emissions
Million t CO_2

CO_2 intensity
tCO_2/ton



	2009	2010	2011	2012	2013	2014	2015
Absolute KPI	12.32	13.61	14.15	13.88	14.22	14.04	14.06
Weighted average	0.94	0.86	0.84	0.87	0.87	0.85	0.84

- The sector CO_2 emissions are strongly correlated to the sector energy consumption, which means that **there was not any major change in terms of CO_2 content of the energy mix over the studied period.**
- However, the trend might change in the future, in the context of global commitment for low-carbon strategies. An important number of TIP members **are presently reviewing their energy procurement strategy**: securing low carbon electricity contracts with power companies, producing more electricity on site using solar power technologies, increased use of natural gas, etc.

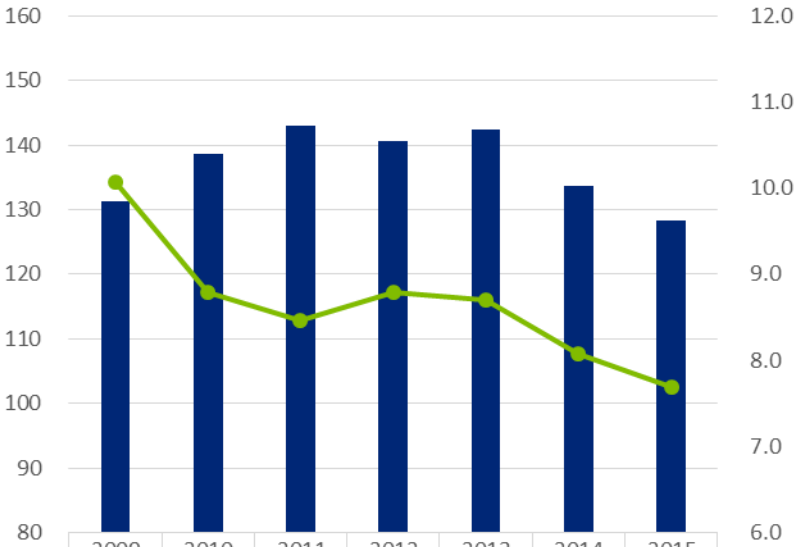
Weighted average CO_2 intensity: total CO_2 emissions for 11 TIP members / total production volume of these companies.

See more details on scope and definitions in the section "Methodological note"

Water intake

Total water intake
million m^3

Water intensity
m^3/ton



	2009	2010	2011	2012	2013	2014	2015
Absolute KPI	131.25	138.66	142.93	140.73	142.49	133.76	128.35
Weighted average	10.1	8.8	8.5	8.8	8.7	8.1	7.7

Weighted average water intensity: total water intake for 11 TIP members / total production volume of these companies.

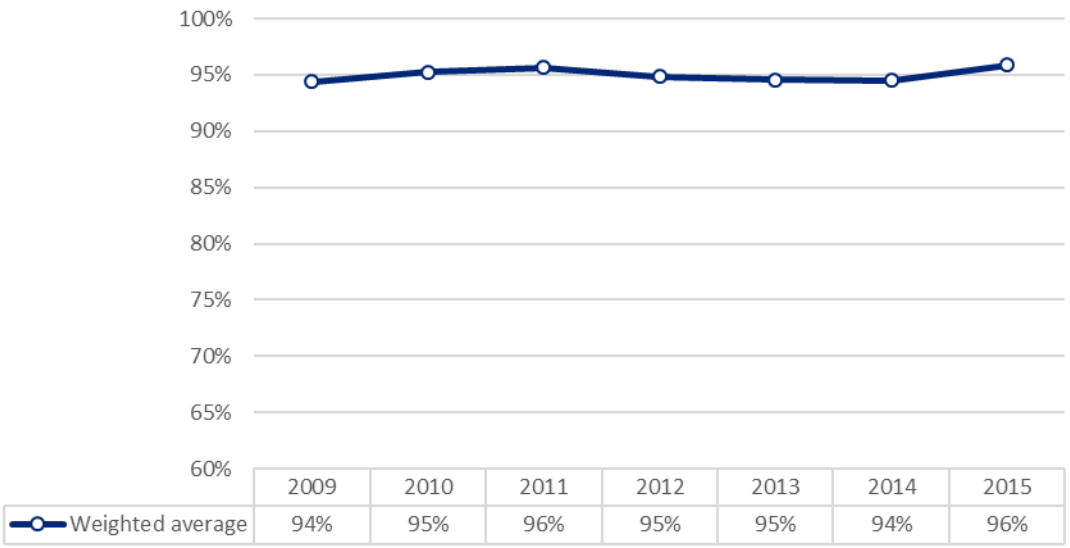
See more details on scope and definitions in the section "Methodological note"

- **The total water intake slightly decreased over the period.**
- **The weighted average water intensity decreased significantly: -12% between 2013 and 2015.**
- Almost all tire manufacturers managed to improve their performance by implementing efficiency improvement projects at their production facilities including: closed-loop systems, new design of machinery, internal plumbing refurbishment to reduce leaks or accept greywater, and behavioural change programs for employees.

ISO 14001

Certification rate

%



	2009	2010	2011	2012	2013	2014	2015
Weighted average	94%	95%	96%	95%	95%	94%	96%

- The percentage of ISO-certified sites among the total number of sites remained stable at between 94% and 96%.

Weighted average certification rate: number of ISO 14001 certified sites for 11 TIP members / total number of sites for these companies includes in the scope

See more details on scope and definitions in the section "Methodological note"

Methodological note

Methodological note

Entities and reporting scope

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

Indicator definitions

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

Energy consumption

The energy consumption is consolidated in Net Calorific Value (NCV). The electricity and steam sold to external third parties are deducted. Fuel consumption related to offsite transportation (employees, products) is excluded.

CO_2 emissions

Includes CO_2 emissions from energy consumption related to the tire manufacturing process and other facilities on the production sites. The energy sold to external third parties (electricity and steam) are not deducted for the CO_2 emission calculations. CO_2 emissions associated with fuel consumption related to offsite transportation (employees, products) are excluded.

Sources for emission factors:

- Scope 1 emission factors: 2006 IPCC (Intergovernmental Panel for Climate Change) Guidelines for stationary combustion in the manufacturing industry.
- Scope 2 emission factors associated with electricity purchases: IEA CO_2 Emissions from fuel combustion highlights (2015)

Water intake

Net volume of water entering the sites and withdrawn from any external source (pumping from natural resources, public networks, recycled water from external companies or from desalinization plants, steam purchases etc.).

ISO 14001

The certification rate has been calculated based on the total number of sites with ISO 14001 certification by the total number of sites. A site is recognized for ISO 14001 certification only if an external certificate is valid on the 31st of December.

Production

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

The published value for the intensity indicators is the weighted average for the eleven TIP members.