



Towards 'net-zero'

Analysis shows significant variations in progress being made by tire manufacturers and rubber processors in delivering ambitious sustainability targets

The scale of the challenges facing tire & rubber-product makers setting out on the road to net-zero are highlighted in this review of the latest sustainability reporting by a selection of leading players.

From an industry-wide perspective, a particular challenge is transparency, in that a lack of common reporting makes it difficult to readily compare the performance of companies in the various sectors.

That said, the figures on the levels of greenhouse gas emissions and ener-

gy-consumption per tonne of product produced and/or sold do offer a useful general basis for comparison.

More broadly, the rate of improvement for the reporting year, mainly 2022, compared to preceding years as well as to baseline and target years, is also informative.

In this regard, the data presents a mixed picture of how well tire makers and rubber processors are faring in their quest to achieve net-zero carbon emissions by 2050.

Even where significant progress is being made, for example with transition-

ing to renewable energy, there is still some uncertainty over whether early momentum can be maintained.

Meanwhile, the need to replace fossil-based raw materials with recycled or renewable alternative – while maintaining end-product performance and safety characteristics – remains perhaps the biggest technical challenge for the industry.

It will be interesting to gauge companies' progress and momentum in these key areas as sustainability reports carrying data for 2023 start to emerge around the second quarter of this year.

Goodyear

In its latest sustainability report, Goodyear highlighted on its development of a roadmap to achieve 100% renewable electricity in its manufacturing facilities worldwide by 2030.

For instance, at the end of 2022, the Akron, Ohio-based tire maker procured 100% renewable electricity in all its manufacturing facilities across EMEA.

By purchasing close to

Global GHG emissions (Scope 1 and Scope 2)

	2020	2021	2022	Unit
Total GHG emissions	2.51	2.83	2.47	Million tonnes CO ₂ e
GHG emissions intensity	0.725	0.652	0.563	CO ₂ e tonnes/ton

Use of renewable materials

	2020	2021	2022
Renewable materials (including NR) used in products	23%	24%	23%
% of non-renewable and non-recycled materials used in products	77%	76%	77%
Percentage of recycled input materials used in products	0.18%	0.13%	0.13%

800,000 MWh of renewable electricity in 2022, Goodyear

said it can ensure its manufacturing plants in France,

Germany, Luxembourg, Poland, Slovenia, Turkey and The Netherlands reduce their Scope 2 emissions to zero.

Goodyear is also developing a long-term strategy to switch to renewable fuels and develop technologies for greater energy efficiency and electrification of processes.

“As new markets develop and mature for renewable fuels, Goodyear is preparing for these options when they become available,” the US tire maker stated.

Michelin

For 2022, Michelin reported that total CO₂ emissions from the group's production plants were down 21% compared with 2019. Meanwhile, the ratio of CO₂ emissions per tonne of output stood at 0.26, versus 0.32 in 2019.

These improvements, said the French group, were driven by a strategy to: a) reduce

energy use; and b) shift to a less carbon-intensive energy mix.

The first objective is being pursued through an energy-efficiency process in production plants, while the second is being met by activating both structural levers, to upgrade energy supply infrastructure to use less car-

Energy consumption and emissions intensity

	2022	2019	2022 vs 2019	2022	2019
Energy consumption (GJ/t of SF+FP)	4.35	4.40	-1.16%	39,039	40,303kJ
CO ₂ emissions (t/t of SF+FP)	0.26	0.32	-19.80%	2,304	2,919kt

Nokian Tyres

Nokian generates part of the energy needed in its own power stations excluding its factory in Finland. Therefore, the Finnish factory's direct GHG emissions are below those of the other factories.

In 2022, location-based

Scope 2 emissions from tire production were approximately 38,870 tons CO₂ eq. The emission calculation is based on the average emissions intensity of power grids in each of the production facility countries.

Direct greenhouse gas emissions, Scope 1, CO₂ eq t

	2015	2020	2021	2022
Nokia, Finland	1,500	310	360	310
Vsevolozhsk, Russia	62,500	68,000	71,690	56,220
Dayton, Ohio		3,200	5,620	6,010
Total	64,000	71,500	77,670	64,240

Pirelli

In 2022, Pirelli's absolute emissions came in 14% lower than its 2021 figure and 41% lower than the 2015 value – the year on which Pirelli's absolute emissions reduction target to 2025 is based.

Specific CO₂ emissions, weighed on tonnes of finished product, decreased by 13% in 2022 compared to the 2021 figure, due to the activation of new initiatives in the field of renewables.

This increased the share of electricity from renewable sources used by the group to over 74% of the total – compared to 62% the previous year and 52% in 2020.

With regard to all Pirelli's production sites in Europe, North America and Turkey, 100% of the electricity supply from the grid in 2022 was from certified renewable sources.

The portion of indirect emissions generated by main

Change in Scope 1 and 2 CO₂ emissions from manufacturing facilities*

2010 base	2020	2021	2022	2030 target
100%	-36.5%	-28.7%	-40.6%	-50%

Renewable or recycled materials used in tires

2020	2021	2022	2030 target
28%	29%	30%	40%

Environmental footprint of manufacturing facilities

2019 base	2021	2022	2030 target
100%	92.6%	88.8%	66.7%

Scope 1 and 2 CO₂ emissions (in millions of tonnes of CO₂, base 100 in 2010)

2010	2021	2022	2030 target
3.88	2.76	2.30	1.94
100%	71%	59%	50%

bon-intensive energies, and market levers to purchase less carbon-intensive energies.

In 2022, carbon emissions declined by 16.5% year-on-year, led by:

- A 5% decline in output,
- A 0.72% improvement in energy efficiency in processes

such as curing, compounding and building-air management,

- An increase in the share of electricity from guaranteed renewable sources in the power mix, from 42% to 52%.

Indirect greenhouse gas emissions (location based), Scope 2 CO₂ eq t

	2020	2021	2022
Nokia, Finland	18,000	19,490	12,430
Vsevolozhsk, Russia	22,200	29,830	19,820
Dayton, Ohio	2,000	2,590	6,620
Total	42,000	51,910	38,870

Energy intensity, GJ/production t

	2020	2021	2022
Nokia, Finland	13.9%	12.3%	9.8%
Vsevolozhsk, Russia	11.3	9.5	11.7
Dayton, Ohio	74.9	20.7	12.1

Percentage of renewable energy used by location

	2020	2021	2022
Nokia, Finland	86.2%	87.7%	49.9%
Vsevolozhsk, Russia	0.0	2.5	2.0
Dayton, Ohio	15.3	12.4	11.6

Greenhouse gas emissions

	2020	2021	2022	
Absolute emissions (market-based Scope 1 and Scope 2)	tonCO ₂ e	638,730	636,190	548,132
Scope 1 tonCO ₂ e	tonCO ₂ e	168,158	187,510	179,399
Scope 2 tonCO ₂ e (market-based)	tonCO ₂ e	470,572	448,680	368,733
Specific emissions (Scope 1 and Scope 2 market-based)	tonCO ₂ e	508,390	528,332	533,086
Specific emissions (Scope 1 and Scope 2 market-based)	tonCO ₂ e	1.037	0.824	0.719
Specific emissions (Scope 1 and Scope 2 market-based)	tonCO ₂ e/k€	1.27	0.78	0.56

“low carbon” projects reflected the procurement of electrical

energy from renewable sources and steam from biomass.

Birla Carbon

For its fiscal 2023, Birla Carbon reported GHG emissions (tonnes of carbon dioxide equivalent (CO₂-eq)) from production operations at 3.7 million (63% of overall total) for Scope 1 emissions and 0.08 million for Scope 2 emissions (just 1% of its overall total).

While acknowledging that it was behind schedule with plans to reduce direct CO₂

emissions intensity by more than 22% against the 2005 baseline, Birla noted that in fiscal 2023 emissions intensity decreased due to improvements in the efficiency of the company's processes.

Most of Birla's carbon footprint reductions "will come from our investments in advanced technologies to upgrade our sites. These will

GHG emissions from production operations in FY'23 (tonnes CO₂-eq)

Scope 1	3.7 million	63% of overall total
Scope 2	0.08 million	1% of overall total

Direct CO₂ emissions intensity vs 2005 baseline

FY'19	FY'20	FY'21	FY'22	FY'23	FY'30 target
91%	92%	92%	95%	94%	78%

target carbon capture and conversion, increasing use of bio-based feedstocks and advancing the production of more circular products."

The company added that it

will maintain "focus on lowering the direct and indirect emissions linked to our carbon conversion from feedstock and energy procurement processes."

Cabot Corp.

By the end of 2022, Cabot said it increased production of primary products by 4%, decreased absolute greenhouse gas (GHG) emissions by 342,370 MT and decreased GHG intensity by 11% – compared to a revised 2005 baseline.

The performance, it stated, reflected the achievement of 55% of a goal to reduce GHG intensity and included a nearly five-fold increase to

the 'emissions avoided' from energy-exports annually.

Given portfolio changes in 2022 and a corresponding reduced GHG intensity, Cabot is to reset the baseline year for its 2025 sustainability goals to 2022. It then aims to reduce market-based GHG intensity by 5% below 2022 levels by 2025.

Noting challenges on the path to decarbonisation, Cabot said its highly engi-

Absolute GHG emissions (MM MT CO₂e)

	2020	2021	2022
Scope 1	4.03	4.01*	3.38*
Scope 2	0.34	0.34*	0.31*

*market-based

GHG emissions intensity (MT CO₂e/MT production)

	2020	2021	2022
Scope 1	1.81	1.80	1.83
Scope 2	0.17	0.15	0.15

neered product grades tend to have a higher Scope 1 GHG intensity than many of its other products. The solution, so, is to "develop

highly engineered materials which have a broader life-cycle benefit to our value chain in our drive towards net zero."

Orion SA

Towards a target of reducing the intensity of its normalized Scope 1 emissions by 8% by the year 2029, Orion is concentrating capital expenditure on:

- Optimisation of existing facilities and adopting accessible technologies to reduce emissions from its operations
- Expansion of low emission

acetylene conversion technology

- Capitalisation on alternative and circular feedstocks

In its 2022 report, Orion said Scope 1 emissions at that stage accounted for slightly less than 60% of its total GHG emissions – across the scopes 1-3.

Also in 2022, Orion committed to eliminating Scope

Greenhouse gas emissions and intensity

	2019	2021	2022
Scope 1 KT	1,900	2,200	2,300
Scope 2 KT	170	159	166
Scope 1 Intensity MT GHG	2.4	2.4	2.5
Scope 2 Intensity MT GHG	0.2	0.2	0.2

2 emissions by 2030, by:

- Improved energy management, by increasing the amount and own use of emissions-free electricity generated through cogen units

- Expansion of renewable energy use in our operations from certified renewable sources whenever our power need cannot be addressed with power generated through cogen units.



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Hexpol

In its latest annual sustainability report, Hexpol said it reduced carbon emissions by about 33% year-on-year in 2022, helped by: increased fossil-free energy in the energy-mix in several countries; installing solar

Energy consumption intensity (GWh/net sales)		
2020	2021	2022
0.027	0.025	0.019

cells; and improving energy efficiency.

Such measures, it noted, included increased use of biofuels, increased purchases of fossil-free electricity and

Fossil-free electricity as a % of total electricity use		
2020	2021	2022
26%	31%	30%

energy-efficiency steps.

According to the report, about 32% of Hexpol's energy use, in the reporting year, consisted of fossil-free electricity and biofuels.

Recycled/bio-based polymeric raw materials (excluding natural rubber) as a % of total polymer use		
2020	2021	2022
8%	10%	16%

CO ₂ emissions/ ton sales		
2020	2021	2022
9.1	7.3	4.9

Hutchinson SA

Under a sustainability roadmap issued in March 2023, Hutchinson is rolling out energy-efficiency initiatives across its production base, comprising around 100 plants and 40,000 employees in 25 countries.

Among its strategic goals,

the French technical rubber products group aims to have 100% if its sites certified to ISO 50001 by 2025, up from 22% in 2022 and 9% in 2021.

Implementing the energy-management certification scheme, it noted,

Heading please				
	2019	2022	2023	2030
Scope 1	120kt	101kt	20% reduction in scope	20% reduction in scope
Scope 2	275kt	236kt	1 and 2 emissions	1 and 2 emissions

“starts with measuring our consumption, implementing [controls] and energy efficiency.”

As part of TotalEnergies, Hutchinson has access to

renewable power purchase agreements and also plans to install solar panels at its plants as well as progressing initiatives in the areas of biomethane and wind power.

Trelleborg

In 2022, total CO₂ emissions from continuing operations at Trelleborg came in at 109,019 tonnes, of which direct emissions amounted to 41,021 tonnes and indirect emissions 67,999 tonnes.

In terms of CO₂ emissions relative to sales, Trelleborg recorded a significant improvement to compared to the previous year, linked to a transition to renewable elec-

Three-year overview, continuing operations			
	2020	2021	2022
Total CO ₂ emissions (tonnes)	141,946	122,366	109,019
Direct CO ₂ emissions	35,467	38,976	41,021
Indirect CO ₂ emissions	106,479	83,390	67,999
CO ₂ emissions/ net sales (tonnes/SEK m)	6.6	5.2	3.6
Energy consumption in relation to net sales (GWh/SEK m)	0.024	0.024	0.019

tricity as well as lower energy consumption.

The emissions-intensity value in 2022 was 3.6 tonnes per SEK m, which corresponds to a 31% year-on-year

decrease and a significant reduction for the 2021-22 period, compared with the base year 2020.

Under its '50 by 25' target, Trelleborg aims to – by the end

of 2025 – further reduce direct and indirect carbon emissions (Scope 1 and 2) by at least 50% relative to sales compared with base year 2020.

According to the target, significant improvements should also be made in Scope 3 emissions along the value chain during the same period.

The 50% reduction in CO₂ emissions is to be delivered by: Transitioning to renewable/ fossil-free electricity supply; efficiency enhancements; local solar panel projects.



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