

# NOW & NEXT CARBON

We are accelerating decarbonisation for our 1.5°C science-based target to reduce emissions by 46 per cent by 2030. We are supporting our strategic suppliers to set their own science-based targets and together, we will reach Net Zero by 2050.

**In this section**

- Decarbonise our operations and value chain
- Reach Net Zero by 2050



# DECARBONISE OUR OPERATIONS & VALUE CHAIN



**How does this enable the circular economy?**  
 The circular economy reduces greenhouse gas emissions by increasing the effectiveness of resource utilisation and the use of renewable energy sources. Greenhouse gas reduction targets will be reached by addressing how we consume energy as well as changing the way society makes and uses products and grows its food. We play our part by designing out waste, keeping materials in circulation and investing in renewable energy solutions.

**Why does this matter?**  
 Decarbonising our operations and value chain is crucial to reduce the effects of climate change, which has significant impacts on natural ecosystems, air quality and human health. If we are to avoid the worst effects of climate change, global temperature increase must be kept within 1.5°C by 2100 compared to pre-industrial era levels.

**How does this contribute to the Sustainable Development Goals?**  
 Driving carbon reduction strengthens capacity on climate change mitigation, adaptation and impact reduction.

**Now**

- By 2030, reduce scope 1, 2 and 3 GHG emissions by 46 per cent compared to 2019
- By 2027, encourage 100 per cent of our strategic suppliers to set their own science-based targets

Our 1.5°C science-based target has been validated by the Science-Based Targets initiative (SBTi).

**Next**

- By 2050, reach Net Zero GHG emissions.

**Total Scope 1, 2 and 3 GHG emissions**

2022/23	7,391,418
2021/22	8,250,702
2020/21	8,373,310
2019/20	8,645,693

**Percentage of purchased goods and services emissions from suppliers with a science-based target**

2022/23	32%
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# DECARBONISE OUR OPERATIONS AND VALUE CHAIN

## By 2030, reduce Scope 1, 2 and 3 GHG emissions by 46 per cent compared to 2019

In 2022/23, our total GHG emissions were 7,391,418 tonnes CO<sub>2</sub>e (2021/22: 8,250,702 tonnes CO<sub>2</sub>e), which is a reduction of 15 per cent compared to the 2019/20 base year and 10 per cent compared to last year.

This was driven primarily as a result of lower production volumes compared to last year and a number of significant decarbonisation projects that began to deliver reductions, in addition to renewable electricity sourcing and a stronger focus on energy efficiency.

### Carbon reduction projects at our paper mills

This year was the first full year of the new E.ON owned and operated 'K4' Combined Heat and Power (CHP) plant in operation at Kemsley Mill. The CHP plant generates and delivers steam and electricity to the mill with a c. seven per cent efficiency improvement compared to its predecessor, contributing amongst other factors to a reduction in emissions of c. 43,000 tonnes CO<sub>2</sub>e compared to last year. The plant is a state-of-the-art energy facility, comprising a gas turbine, waste heat recovery boilers and a steam turbine, which work in tandem to generate more energy with less gas input compared to traditional plants.

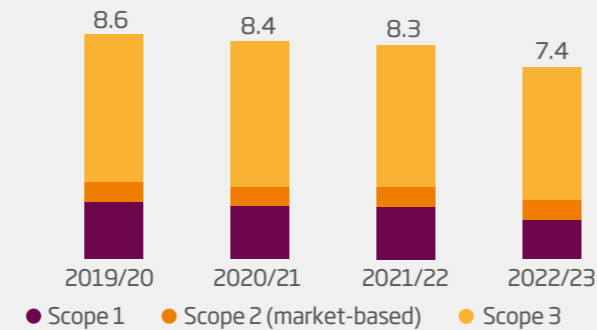
At Aschaffenburg, the process of transitioning the gas-fired CHP to generate energy partially from waste began. This will provide flexibility in energy supply and enable future emission reductions.

Other smaller scale initiatives were implemented during the year, such as heat capture at Lucca Mill.

Reading Mill and Zarnesti Mill obtained ISO 50001:2018 Energy Management System certifications.

We continued to develop our decarbonisation roadmap for our paper mills, optimising for best cost solutions and improving assessments relating to future alternative fuel availability.

Group greenhouse gas (GHG) emissions (million tonnes CO<sub>2</sub>e)



### Carbon reduction projects at our packaging plants

At our packaging plants, we progressed projects to upgrade equipment, from new corrugator machines and boilers to LED lighting, with significant energy efficiency benefits.

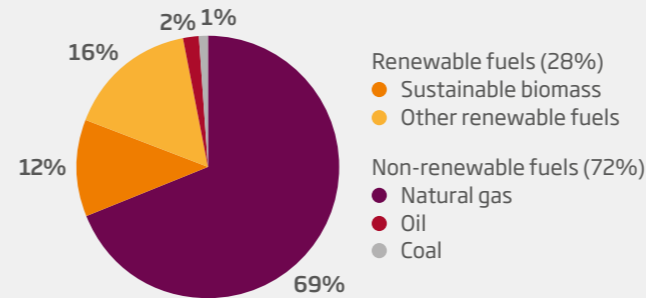
At the start of the year, several renewable electricity contracts and a power purchase agreement became active, including a 100 per cent renewable electricity tariff to cover all of our UK Packaging operations.

We launched several energy efficiency initiatives, including a new energy management checklist, case studies and workshops, delivered as part of our Group-wide ISO 50001:2018 energy management system at 100 per cent of our in-scope sites (covering 90 per cent of the Group's energy consumption).

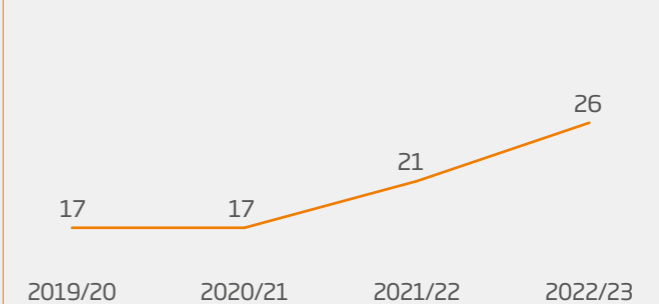
Throughout the year, we worked with a specialist energy consultancy to develop our plans to achieve our 2030 target, which included decarbonisation templates to be adopted by our packaging plants.

The templates identify the major technical solutions that will need to be implemented, including solar, heat pumps and biomass, in addition to green electricity sourcing and energy efficiency opportunities.

2022/23 Fuel consumption by source (%)



Energy consumption from renewable sources (%)



Case study (Investing in new technologies)

### Waste-to-energy at Aschaffenburg mill

Aschaffenburg Mill, founded in 1872, is one of Europe's oldest paper mills, recycling c. 440,000 tonnes of paper per year.

In partnership with E.ON, the energy supply at Aschaffenburg will be significantly upgraded by the end of 2025 to supplement natural gas with the incineration of materials that are collected for recycling but cannot be used for papermaking.

The integrated plant will feature a modern waste-to-energy boiler, a new fuel handling and storage system, a new back-pressure steam turbine and two updated gas-fired boilers, with added 'future-proofing' to enable later introduction of bio-based fuels.

At the heart of the system is an automated, digital controller that uses AI to optimise energy in real-time. It is expected that the new plant will eventually reduce the reliance on natural gas by c. 25 per cent and save c. 50,000 tonnes of CO<sub>2</sub>e per year. By generating energy from waste, the plant will support the circular economy.

DECARBONISE OUR OPERATIONS AND VALUE CHAIN CONTINUED

**By 2027, encourage 100 per cent of our strategic suppliers<sup>1</sup> to set their own science-based targets**

In 2022/23, we launched a programme to reduce our supply chain emissions in accordance with a 1.5°C trajectory.

Our 'Scope 3' value chain emissions comprise around two-thirds of our total emissions, including for example:

**Upstream emissions**

- Production of raw materials and fuels
- Manufacture of capital goods
- Third-party transportation and distribution

**Downstream emissions**

- Intermediate processing by our customers
- Consumer end of life disposal

We estimate that in 2022/23, 32 per cent of our Scope 3 Category 1 (Purchased Goods and Services) emissions were generated by suppliers who have set, or are in the process of setting, their own science-based target.

During the year, our Procurement and Paper Sourcing teams began to engage strategic suppliers to set science-based targets, deploying bespoke engagement mechanisms depending on supplier maturity.

We joined the Supplier Leadership on Climate Transition initiative, founded by some of our key customers, to support our least mature suppliers to calculate their carbon footprint, set a science-based target and begin reducing emissions.

Given that our strategic paper suppliers generate our largest source of upstream emissions, our Paper Sourcing team began to meet with them to review their progress, discuss their decarbonisation plans and identify opportunities to share knowledge.

Over the next year, we will engage a larger number of suppliers as a member of the CDP Supply Chain programme. We continue to assess the sustainability practices of our suppliers using EcoVadis, in addition to requiring that our suppliers adhere to our Global Supplier Standards.

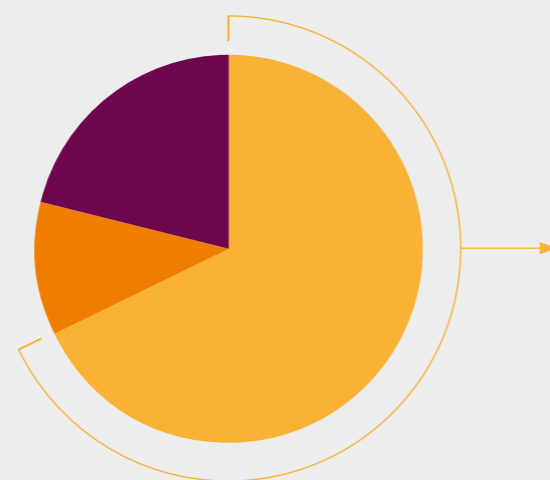
→ [Turn to page 67 for more information.](#)

**Our Scope 1, 2 and 3 greenhouse gas (GHG) emissions**

Our **Scope 1 'direct' emissions** are generated from the combustion of fuels in assets owned by DS Smith. Our **Scope 2 'indirect' emissions** include emissions generated during the production of electricity and steam that we import from others. Our **Scope 3 'indirect' emissions** include all other emissions generated throughout the value chain.

Although we do not own the businesses with activities that generate value chain emissions, we can exert influence over these emissions, for example through engagement with our suppliers, customers and policymakers.

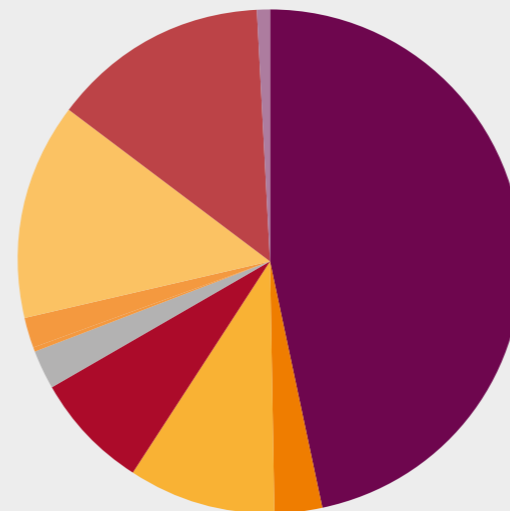
**2022/23 Total GHG emissions**



- **Scope 1** 1,542 Kt CO<sub>2</sub>e\*
- **Scope 2 (market-based)** 834 Kt CO<sub>2</sub>e\*
- **Scope 3** 5,015 Kt CO<sub>2</sub>e

→ [Turn to page 56 for our complete GHG emissions reporting and other environmental metrics, including the assurance statement for figures marked with an asterisk \(\\*\)](#)

**2022/23 Scope 3 GHG emissions**



- **Cat 1 Purchased Goods and Services** 2,342 Kt CO<sub>2</sub>e
- **Cat 2 Capital Goods** 161 Kt CO<sub>2</sub>e
- **Cat 3 Fuel and energy-related emissions** 471 Kt CO<sub>2</sub>e
- **Cat 4 Upstream transportation and distribution** 377 Kt CO<sub>2</sub>e
- **Cat 5 Waste generated in operations** 120 Kt CO<sub>2</sub>e\*
- **Cat 6 Business travel** 4 Kt CO<sub>2</sub>e
- **Cat 7 Employee commuting** 5 Kt CO<sub>2</sub>e
- **Cat 8 Upstream leased assets** 4 Kt CO<sub>2</sub>e
- **Cat 9 Downstream transportation and distribution** 109 Kt CO<sub>2</sub>e
- **Cat 10 Processing of sold products** 693.4 Kt CO<sub>2</sub>e
- **Cat 12 End of life processing of sold products** 693.0 Kt CO<sub>2</sub>e
- **Cat 15 Investments** 36 Kt CO<sub>2</sub>e



Case study (Investing in new technologies)

**Energy efficient plants in Italy and Poland**

During 2022/23, we expanded our presence in Italy and Poland, with new state-of-the-art, energy efficient Packaging plants in Castelfranco Emilia (Italy) and Belchatow (Poland).

Castelfranco Emilia is heated and cooled using a geothermal system which takes water from a 90 metre deep underground well, keeping the site warm in winter and cool in summer.

Belchatow utilises a range of new technologies, including a high-efficiency compressed air system.

Both sites will offer customers ways to explore sustainable packaging solutions and meet their recycling goals.

1. We define 'strategic suppliers' as companies with whom we have a long-term, mutually cooperative relationship with mutual commitment where significant and ongoing value is accrued to both parties through operational capabilities. Within our current Scope 3 inventory, we estimate that these companies generate c. 76 per cent of emissions in Scope 3 Category 1: Purchased Goods and Services. This figure may change as we adopt supplier-specific emission factors in our inventory.

# REACH NET ZERO BY 2050

## Engaging with others to reduce emissions across the value chain

Without significant 'systems-level' transformation within the industry and related industries, such as transportation and energy, reaching Net Zero will be difficult. We all have a role to play to ensure an affordable transition to Net Zero, with access to renewable fuels made available at scale.

### Reducing upstream value chain emissions

There are opportunities to work closely with suppliers of material, machinery and transportation, to enable them to achieve their own decarbonisation targets, develop energy efficient machinery and optimise logistics.

We need our waste, facilities and travel management providers to adopt carbon reduction strategies and encourage sustainable consumption patterns.

As part of our supplier engagement programme, we are encouraging our suppliers to set science-based targets, develop robust plans and take actions to reduce emissions.

### Reducing downstream value chain emissions

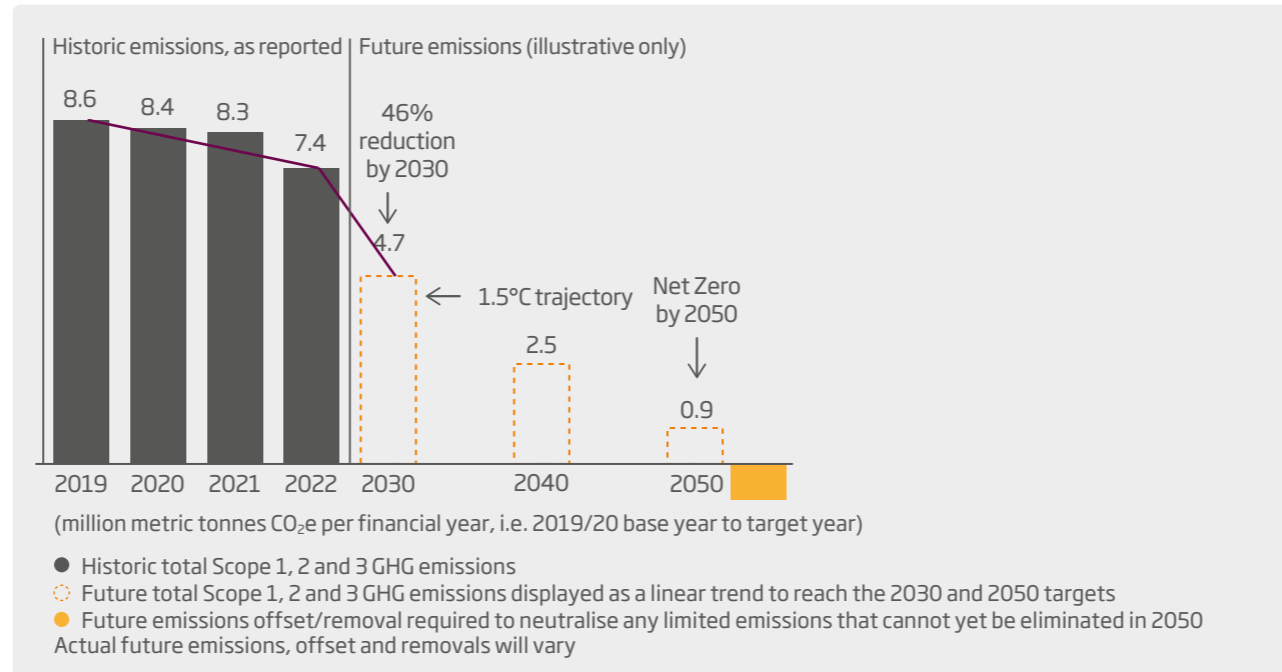
There are opportunities to work closely with our customers to enable them to make sustainable packaging choices by optimising specifications and supply chains to reduce the carbon footprint of their packaging.

Our customers are encouraged to reduce emissions through better-specified packaging and fibre optimisation (see the examples on pages 13-14).

In our policy efforts and through our customers, we are encouraging consumers to sort material for recycling and we call on governments to provide a predictable policy environment to enable long-term planning to achieve Net Zero.

### Activities across the entire value chain

Our stakeholder engagement across the value chain involves developing and promoting the circular economy, to eliminate waste and pollution, circulate products and materials and regenerate nature.



## Our plans to reach Net Zero

Our paper mills make the greatest contribution to our overall emissions, owed to the significant quantities of heat needed for pulp and paper drying.

Although the overall energy requirement for recycled paper production is less than primary paper production, unlike virgin paper, recycled production does not have by-product bioenergy readily available, and so relies on natural gas.

Our path to reach Net Zero is therefore focused predominantly on the decarbonisation of heat in the papermaking process, which constitutes around half of our total emissions, with externally purchased paper making up around one-third of our Scope 3 emissions and our own mills around 80 per cent of our Scope 1 and 2 GHG emissions.

## Decarbonisation levers

We have identified six main levers that we can use to drive down greenhouse gas emissions, with major projects and initiatives that utilise each lever actively underway.

From large-scale investments to energy procurement and process optimisation, we are implementing initiatives to deliver progress on our science-based target.

These initiatives include actions relating to:

- Investing in new technologies
- Upgrading equipment and driving energy efficiency
- Switching to renewable energy sources
- Sending zero waste to landfill by 2030
- Engaging with our suppliers and customers
- Optimising logistics.

## Task Force on Climate-related Financial Disclosures (TCFD)

We use the Task Force on Climate-related Financial Disclosure (TCFD) recommendations to evaluate the actual and potential impacts of climate-related risks and opportunities on our business.

Achieving our 1.5°C science-based target and reaching Net Zero by 2050 will help us to respond to climate change, mitigating the climate-related risks we have identified, whilst exploiting climate-related opportunities, including growth in demand for sustainable packaging.

## Our climate-related risks

- Increased spend on carbon taxes
- Increased cost of raw materials or threat to supply
- Increased severity of extreme weather events
- Increased likelihood of water stress

## Our climate-related opportunities

- Growth in demand for sustainable packaging
- Greater resource efficiency
- Use of lower emission sources

See pages 52 to 63 of DS Smith Annual Report 2023 for our complete TCFD disclosure

## REACH NET ZERO BY 2050 CONTINUED

## The six main decarbonisation levers that we will use to reduce greenhouse gas emissions and reach Net Zero

**Investing in new technologies**

We will invest in new technology, including in new capital goods, as well as in energy partnerships, that deliver lower carbon energy, including waste-to-energy solutions and efficient combined heat and power plants.

**Upgrading equipment and driving energy efficiency**

We will introduce modern, efficient boilers and corrugators which consume less energy as part of our asset renewal strategies, in addition to identifying opportunities to increase energy efficiency throughout our operations.

**Switching to renewable energy sources**

We will utilise more renewable fuels, such as biomass and biogas, as well as sourcing electricity and steam generated from renewable sources, such as solar and wind.

**Sending zero waste to landfill by 2030**

We will find ways to become more circular by promoting separation of materials and recovery to prevent waste to landfill, removing greenhouse gas emissions that are released as landfill waste decomposes.

**Engaging our suppliers and customers**

We will engage with our suppliers and customers to find emission reduction opportunities throughout the value chain, collaborating on projects, sharing expertise and promoting the adoption of science-based targets.

**Optimising logistics**

We will work with our logistics partners to increase truck-fill, optimise mileage and switch to low or zero emission transportation fuels.



Case study  
(Upgrading equipment and driving energy efficiency)

**Ambitious upgrade programme for Viana Mill**

Viana Mill, in northern Portugal, is already one of the most efficient virgin paper mills in Europe, with a production capacity of 425,000 tonnes per year.

In 2022/23, we announced an investment programme to include a brand new boiler and a rebuild of paper machine 'PM4', increasing both production speed and capacity.

The new boiler is set to increase steam efficiency by around 25 per cent, with excess steam recirculated back into the mill. This is expected to reduce emissions by around 10,000 tonnes CO<sub>2</sub>e per year.

This will ensure that Viana Mill continues to play a key role in supplying nearby packaging plants to meet the rising demand for plastic replacement solutions, with the rebuild allowing for the production of new and innovative papers.

This project is one of many examples in our roadmap that will utilise some of the most up-to-date papermaking machinery.

As we continue to develop our internal roadmap and plans to reach Net Zero, we will explore the best ways to utilise each of these decarbonisation levers, in addition to others that may be developed between now and 2050. We will reduce greenhouse gas emissions urgently and cost effectively, taking into consideration the likely future availability and viability of options.

## REACH NET ZERO BY 2050 CONTINUED

**Promoting the transition to Net Zero**

The transition to Net Zero and the circular economy will not happen overnight, nor will it be delivered by any given company operating in isolation.

In support of a 1.5°C Net Zero economy, we are committed to considering the Paris Agreement in our activities, including in our external engagement, as underpinned by the IPCC Sixth Assessment Report (AR6) and the IPCC Special Report on Global Warming of 1.5°C (SR1.5).

There are three significant policy issues in the EU and UK that are the focus of our participation in public policy development in these core markets.

**Decarbonisation of heat**

Governments should provide increased support for lower carbon energy sources and set out clear deployment timelines to enable industry to invest.

**Reuse and recycling**

Policy makers' overall objective should be to deliver the best outcome for the environment. In a circular economy, both multi-use and recyclable single-use packaging have a role.

**Extended producer responsibility (EPR)**

To achieve increased recycling targets set out by governments, EPR systems should fund improvements in recycling infrastructure and in separate collection of waste.

Our strategic engagement and advocacy in these three priority areas is helping to minimise risk and amplify opportunities in these areas for our business.

In our transition to Net Zero, we call upon policymakers to remove uncertainty through a predictable policy environment that enables long-term planning and investment to achieve the aim of the Paris Agreement under the United Nations Framework Convention on Climate Change.



Case study (Engaging our suppliers and customers)

**CDP Climate Change 'A' grade Supplier Engagement Rating**

In 2022/23, we maintained our overall A- CDP Climate Change score and earned the maximum 'A' grade in the Supplier Engagement Rating (SER).

The SER assesses supplier engagement using a company's response to selected questions in the CDP Climate Change questionnaire, including:

- Governance,
- Targets,
- Scope 3 emissions, and
- Value chain engagement.

With this, we obtained a place on CDP's exclusive Supplier Engagement Rating Leadership Board, joining an unique group of organisations on the path to meaningful environmental action.



Case study (Switching to renewable energy sources)

**A new, state-of-the-art and energy efficient Head Office**

This year, we relocated our Head Office to 1 Paddington Square, reflecting a new way of working in an international destination office that we choose to be located, because it motivates and inspires us.

Rated as BREEAM 'Excellent', the building utilises the latest renewable energy technologies, including heat pumps. It also includes:

- 100 per cent FSC® certified timber
- Stringent water savings
- Reused access flooring and other office features

Our new office space will be used to explore ideas, create, challenge and ensure that everyone feels a part of our dynamic, progressive and sustainable business.



Case study (Engaging our suppliers and customers)

**Reducing primary material emissions through the circular economy**

Keeping materials recirculating reduces the demand for primary virgin materials, which are more vulnerable to climate change.

**"Existing renewable technologies can only address 55 per cent of global greenhouse gas emissions. The remaining 45 per cent of emissions are a consequence of the way we make and consume materials, products and food."**

**Completing the Picture: How the circular economy tackles climate change, The Ellen MacArthur Foundation**

We are actively working with our customers to make more from less, with innovations in fibre development and supply chain optimisation to reduce primary material consumption.

## REACH NET ZERO BY 2050 CONTINUED

**Accountability for the delivery of our 1.5°C science-based target**

We have already begun to deliver our science-based target. In order to reduce our emissions further, we are beginning to execute our long term plans to reach Net Zero.

**Governance**

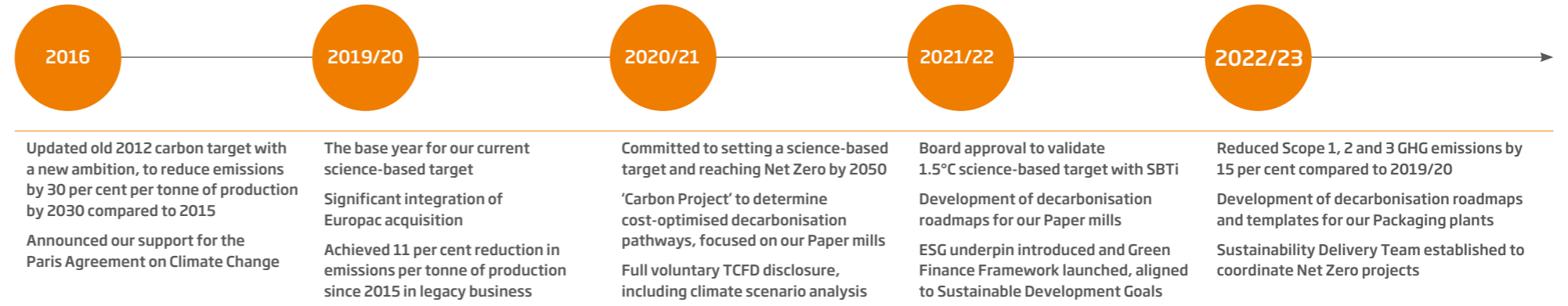
The Board approved the adoption of a 1.5°C science-based target in early 2022. The Board reviewed the delivery roadmap in spring 2023. The Health, Safety, Environment and Sustainability (HSES) Committee, a management committee of the Group Operating Committee (GOC), which is chaired by our Group Chief Executive, oversees the execution of our plan to reach Net Zero. This includes ensuring that the business has adequate access to resources to deliver the commitment. In 2022/23, a Sustainability Delivery Team, focused on the deployment of projects to deliver Net Zero was introduced. This team is responsible for developing and maintaining a detailed roadmap for carbon/energy, water and waste reduction, coordinating with divisional and site leaders on the design, planning and implementation required to reach Net Zero. Sustainability governance is described in greater detail on page 64.

**Climate-related remuneration**

The importance of ESG and sustainability, including climate change, continues to be emphasised by the use of a variety of ESG considerations as an underpin to the annual bonus.

In 2022/23, the three elements of the ESG underpin were met, including the programme of work for our sites to achieve the science-based target. When considering the application of discretion to override the formulaic outcome for the 2023/24 annual bonus, the Remuneration Committee will take into account, alongside other ESG factors, the roll out of the updated Now & Next Sustainability Strategy, which includes our approach to the delivery of science-based targets, taking into account updated actual performance and current customer / regulatory requirements.

For more information, see DS Smith Annual Report 2023, page 108.

**The evolution of our efforts to reduce our greenhouse gas emissions****Our plan to reach Net Zero**

Underpinning the delivery of our science-based target is a roadmap of key strategic projects that will reduce GHG emissions. This is aligned with our growth strategy and prioritises the greatest sources of GHG emissions, with site-level project plans and monitoring in place.

**Assumptions in our plan**

Assumptions made in our plans relate to, for example, discount rates, investment years and technical lifetimes, as well as cost assumptions (e.g. carbon and commodity prices). Forecasts considered the availability of biomass supply, as well as the availability of renewable energy sources to meet expected future energy demand. Fuel options, earliest investment times and technology solutions have been assumed, in addition to rates of energy efficiency and future product development and growth. For our supplier engagement target, we assume that c.76 per cent of our emissions covering purchased goods and services are 'strategic' suppliers and that these are the suppliers that will be encouraged to set a science-based target by 2027.

**Challenges and uncertainties**

There are inevitable challenges and uncertainties relating to our plan, which stem from planning far into the future. It is challenging to predict future availability and cost of commodities, as well as the future policy environment. Site space availability, permitting and the impact on site operations, such as increased traffic and site-level production growth, can be difficult to anticipate.

**Offsetting**

We intend to use high-quality offsets only as a last resort to balance a maximum of 10 per cent of remaining 'hard-to-abate' emissions through high-quality natural climate and technological solutions. We are monitoring the development of these solutions, including carbon capture, usage and storage (CCUS), and the role they may play in our plan.

**Target boundary, reporting and assurance**

We include 100 per cent of our GHG emissions across all three scopes, which are consolidated under a financial control approach and cover our global operations within the target boundary, which includes land-related emissions and removals from bioenergy feedstocks.

Performance is reported externally at least annually in the DS Smith Annual Report, Sustainability Report, and to reputable ESG ratings, such as CDP.

The reported figures for the 2019/20 base year have been independently verified to a limited level of assurance by Bureau Veritas.

For the 2022/23 and 2021/22 periods, Deloitte provided independent third-party limited assurance, in accordance with the International Standard for Assurance Engagements 3000 (ISAE 3000) and Assurance Engagements on Greenhouse Gas Statements (ISAE 3410) issued by the International Auditing and Assurance Standards Board (IAASB) for selected information marked with an asterisk on page 56.

Our Basis of Preparation, available from our online ESG Reporting Hub, includes a detailed methodology for how our ESG reporting is prepared. Assurance opinions, including details of the selected information assured may also be found on the ESG Reporting Hub.

DS Smith ESG Reporting Hub