

Climate Report

2021



Aligned to the Task Force on
Climate-related Financial
Disclosures (TCFD)

orbia



Contents

Introduction	3
Climate action framework	
1. Governance	6
1.a. Board's oversight of climate-related risks and opportunities	
1.b. Management's role on climate-related risks and opportunities	
2. Strategy	9
Scenario analysis	
2.a. Climate-related risks and opportunities identified in the short, medium and long term	
2.b. Impact on the organization's business, strategy and financial planning	
2.c. Resilience of the organization's strategy considering climate-related scenarios	
3. Risk Management	19
3.a. Processes for identifying and assessing climate-related risks	
3.b. Processes for managing climate-related risks	
3.c. Integration of processes for identifying, assessing and managing climate-related risks	
4. Metrics and Targets	23
4.a. Metrics used to assess risks and opportunities	
4.b. Disclosure of scope 1, 2 and 3 GHG emissions	
4.c. Targets used and performance	

The Climate (TCFD) Report is part of Orbis's annual reporting suite, available at orbis.com, including:



[Annual Report 2021](#)



[Sustainability Report 2021](#)



[Sustainable Solutions Report](#)



[ESG Databook 2021](#)



Introduction

At Orbis, we recognize that climate change is one of the greatest challenges of our time, but it also represents the greatest opportunity we see on our horizon and the greatest responsibility of our generation: the decarbonization of our economy and enabling climate resilience. With sustainability-minded industry initiatives, Orbis aims to be a leader in innovation on long-term climate change solutions. At Orbis, we address climate-related issues within our company and along our value chain together with our customers, employees, suppliers, partners, communities, and our industry to achieve positive impacts.

Orbis has been an official supporter of the Task Force on Climate-related Financial Disclosures (TCFD) since 2019, and we have established ambitious climate commitments to contribute to the decarbonization of the planet. Building on our 2019 climate risk assessment, this is Orbis's second comprehensive TCFD-aligned report, and includes updates of our climate-related efforts across our organization and our value chain. This report also details Orbis's progress towards adopting TCFD recommendations and incorporating climate-related risks and opportunities in our strategic decisions.

Using our Climate Action Framework as a guide, we prioritize climate actions and implement key performance indicators (KPIs) based on our climate goals and defining purpose: to advance life around the world. Our progress towards our goal to achieve net zero emissions (scope 1 & 2) by 2050 and related Science Based Targets (aligned to a 1.5° scenario) to 2030, along with other climate-related metrics, are publicly disclosed annually.

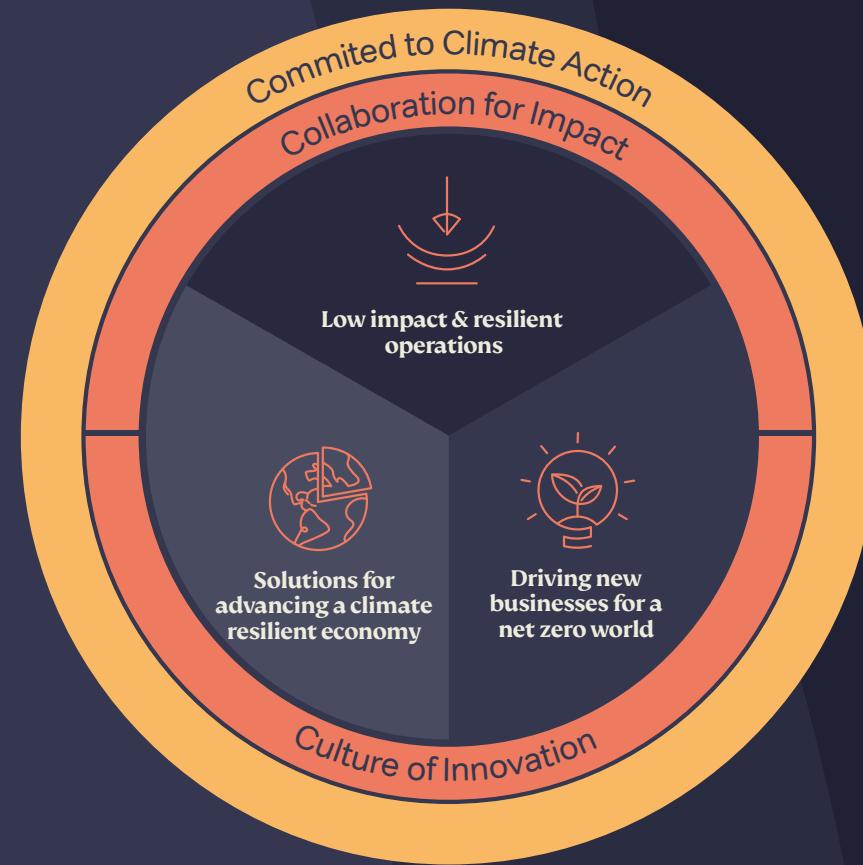


Climate Action Framework

Our commitment to Climate Action is embedded throughout the organization as we believe that we have a role to play in reaching a net zero world. Within Orbia, we demonstrate our commitment with fully engaged and accountable leadership at all levels in the company.

In line with our values, Orbia fosters a robust and dynamic culture of innovation, and we use this as the springboard to advance life around the world. We succeed when we strengthen our relationships and work together with suppliers, communities, governments, and customers to achieve long-term positive impact. A strong culture and collaboration create the foundation for us to achieve meaningful Climate Action across three fronts: low impact and resilient operations, solutions for advancing a climate resilient economy, and driving new businesses for a net zero world. This framework is based on our understanding of physical and transition climate change risks and how Orbia's business strategy embraces new opportunities. Our Climate Action Framework guides us, providing a collective focus when tackling climate change.

It is clear to us that accelerating our Climate Action strategy will allow us to realize our defining purpose: to advance life around the world.





Low impact & resilient operations

We are continuously identifying ways to decarbonize through optimizing manufacturing processes, transitioning to low-carbon and renewable energy sources, and exploring opportunities in carbon capture and hydrogen. In parallel, our sites are adapting to physical climate change risks, including risks associated with changing weather and their resulting disruptions.



Solutions for advancing a climate resilient economy

Orbia's business groups are constantly developing products and services with improved environmental performance that support our customers and suppliers in making measurable progress against their own climate goals. Our solutions contribute to urban and rural resilience and support the transition to a low carbon and circular economy. These include materials and products that advance alternative energy, resource efficiency, green buildings, data connectivity and health.

Further details are available in our [Orbia Sustainable Solutions Report](#).



Driving new businesses for a net zero world

Both within existing businesses and through corporate venture capital, our culture encourages exploring new technologies and strategic acquisition opportunities, investing human and financial capital to support new business models that will have a positive impact in the longer term. Climate Tech is a focus area of strategic investments made through [Orbia Ventures](#), our corporate venture capital fund.



Governance





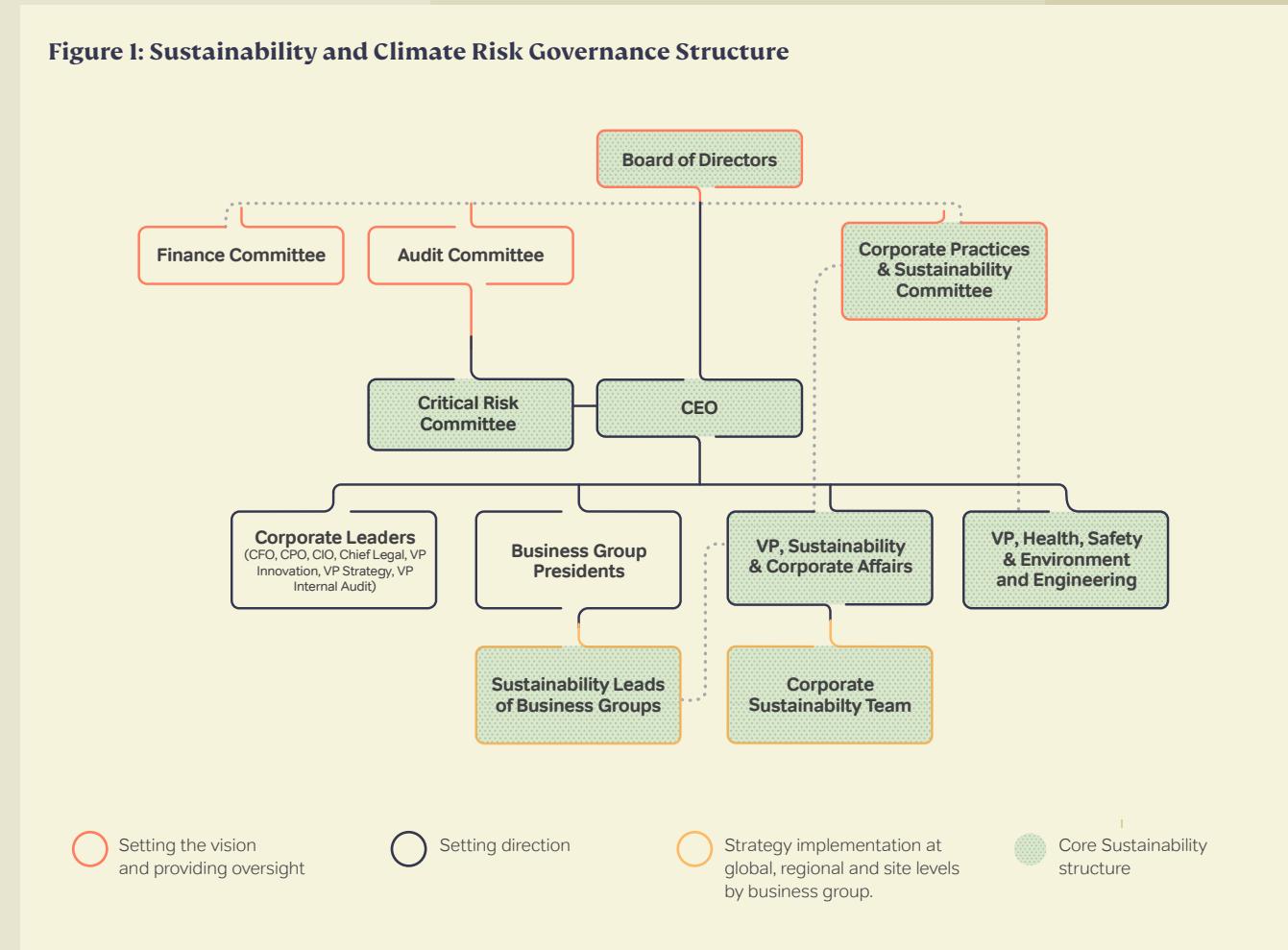
1.a Board oversight on climate-related risks and opportunities

Orbia's Board of Directors continues to drive our climate action strategy forward to meet the challenges ahead. To ensure implementation and encourage collaboration across business groups, the Board oversees and provides guidance on Orbia's ESG strategy previously reviewed by the Corporate Practices & Sustainability Committee. For example, the Board has overseen Orbia's commitment to set Science-Based Targets and achieve net zero carbon emissions (scope 1 & 2) by 2050. The Committee supports the Board of Directors by, among others, overseeing Orbia's overall sustainability strategy, shaped in part by climate-related issues. Our Vice President (VP) of Sustainability briefs and updates the Committee regularly, while providing progress on our targets and climate-related goals on a quarterly basis.

As shown in Figure 1, our sustainability governance structure is organized so that the Board of Directors sets the direction while strategy setting is incorporated and led on the global, regional, and local levels.

In addition to our Corporate Practices & Sustainability Committee, Orbia established a Critical Risk Committee (CRC), which supports the Board in identifying and assessing our risks. See the [Risk Management section](#) for further details.

Figure 1: Sustainability and Climate Risk Governance Structure





1.b Management's role on climate-related risks and opportunities

Orbia manages sustainability efforts (including climate-related aspects) through a matrix structure, with leadership and functional specialties held at global and corporate levels. Orbia's VP of Sustainability is a member of the Leadership Team along with the Business Presidents, CFO and other key functional leaders.

The VP and the Corporate Sustainability team work directly with presidents of the business groups to identify climate risks and opportunities and embed climate considerations into decision-making and business strategy. We base much of this work on the 2019 TCFD-aligned risk analysis and company-wide risk processes. We have set Science-Based Targets (which will be submitted for approval to the Science-Based Targets Initiative (SBTi) in 2022) for Scope 1, 2 and 3 emissions and other climate-related goals (which include zero waste to landfill targets). Additionally, each business group has a dedicated sustainability lead and team responsible for the development of the business-specific sustainability strategies and oversight. Climate-related performance data is reported in ODISEO, our centralized sustainability reporting platform.

In 2021, we established the Sustainability Council composed of sustainability leads from all our business groups and operational experts to construct, implement and take ownership of Orbia's sustainability strategy. The Council is informed by internal and external best practices, and leverages opportunities for cross-business cooperation where performance improvement can be accelerated and new ideas can be developed effectively.

The Sustainability Council is currently comprised of thematic sub-groups, two of which are focused on decarbonization and circularity. These groups identify ways to incorporate impactful sustainability strategies across the business groups, support the management of climate-related initiatives and opportunities for the business groups, and report on their progress to the Sustainability Council. Orbia's Council is continuously identifying innovative opportunities to enable decarbonization and increase the resilience of Orbia's business model. This allows the selection of cost-effective and impactful emission-reduction tools appropriate for specific markets and regions.

From 2021, an ESG performance modifier funds up to +/- 10% of the annual bonus of senior management, based upon achievement of defined ESG metrics across 4 areas. Annual goals for metrics in these areas are reviewed and approved by the Board of Directors every year, and include two climate-related metrics: greenhouse gas (GHG) emissions and waste sent to landfill.

For further information:

 [Corporate Governance](#)

 [Orbia executive compensation structure](#)



Introduction

Governance

Strategy

Risk Management

Metrics and Targets

Strategy





At Orbis, strategy and sustainability go hand-in-hand, with sustainability considerations now integrated into our capital allocation decision-making process. Most importantly, Orbis's businesses are committed to addressing some of the most pressing challenges the world is facing today, including ensuring food security, reducing water scarcity, reinventing the future of cities and homes, connecting communities with data and information services, and expanding access to health and well-being by providing advanced materials, specialty products and innovative, human-centered solutions. As Orbis transforms into a low impact and resilient set of businesses, climate change continues to represent a core challenge. Each business group regularly develops and adapts their strategy to ensure Orbis's products and solutions address risks and opportunities related to climate change.

Scenario analysis

Scenario analysis is a growing, critical tool that companies use to test both the resiliency of their business models and adapt strategic planning to reflect emerging realities in the marketplace. Through scenario analysis, our business planning can take variables such as carbon taxes, disruptive technologies, changing customer preferences, government policies, and other micro- and macro-economic factors into account.

In our 2019 climate risk analysis, both physical and transition scenarios were used as inputs to establish a suite of projected future changes in climate that illustrate the possibilities that may lie ahead.

As part of our continuous improvement processes, we are collaborating with different areas of our organization to strengthen our scenario analysis capability. We will analyze new scenarios in 2022, in line with the most recent available information.



Our healthy balance sheet allows us to take advantage of investment opportunities for the decarbonization of our operations as well as capitalize on new business opportunities for climate resilience. Sustainability considerations are a key component of our capital expenditure and growth project approval processes.”



Jim Kelly
Orbis Chief Financial Officer

Type of Risk	Horizon	Scenario used
Physical risk	2030	Intergovernmental Panel on Climate Change (IPCC)'s RCP 8.5 scenario
Transition risk	2030	2018 International Energy Agency (IEA)'s Sustainable Development Scenario (SDS)



2.a Key climate-related risks and opportunities identified in the short, medium, and long term

As part of our business planning processes, we continually identify physical and transition risks as well as opportunities that may arise due to climate change. All risks and opportunities are evaluated within certain thresholds and boundaries, including potential financial impacts and time horizons. We prioritize actions related to the higher financial impact risks.

See [Table 1](#) and [2](#) for details of key risks and opportunities identified.

Financial impacts

We have five levels to define substantive financial impact:

Time horizons

We have categorized time horizons into three ranges:

1. High:	\$50 or greater USD	Short-term:	Up to 1 year
2. Medium - High:	\$37.5 - \$50 USD	Medium-term:	1 - 4 years
3. Medium:	\$22.5 - \$37.5 USD	Long-term:	5 years and above
4. Medium - Low:	\$7.5 - \$22.5 USD		
5. Low:	Less than \$7.5 USD		

(In \$Millions)

Note: impact range labels are aligned with categories used in CDP (Carbon Disclosure Project) reporting and Orbia's risk management processes.



Table I: Key climate-related risks identified

Time Horizon	Risk Type	Classification	Risk Description	Magnitude of Financial Impact
Short-term	Physical	Chronic	Increased water stress and drought leading to reduced capacity resulting in decreased revenues.	Low
	Transition	Policy and Legal	Carbon pricing mechanisms leading to increased direct costs.	Low
	Transition	Policy and Legal	Mandates on and regulation of existing products and services (e.g., The AIM Act, which was signed into law on Dec. 27, 2020, and directs EPA to establish limits to production and consumption of HFCs in line with the Kigali amendment), leading to reduced demand for products and services leading to decreased revenues from HFCs.	Medium-Low
Medium-term	Physical	Acute	Increased severity and frequency of cyclones and floods, leading to reduced capacity, decreased production and revenues.	Medium-Low

To determine physical and transition risks, Orbia conducted a vulnerability screening of its portfolio, followed by a detailed Climate Risk Assessment on 12 of its most vulnerable sites, including four from Fluorinated Solutions, seven from Polymer Solutions and one from Building & Infrastructure. This assessment has provided input into both the prevention of physical risks and increased innovation for new ways of doing business.

Scenarios will be reviewed in 2022 to include longer-term time horizons and beyond Business-As-Usual models.

For further information:



[CDP Climate Change Response](#)
(Section 2.3)



[2020 Annual Filing to Mexican Stock Exchange \(BMV\)](#)
(Pages: 22, 26, 27, 35, 36, 74, & 115)



Table 2: Key climate-related opportunities identified

Time Horizon	Classification	Opportunity Description	Magnitude of Financial Impact	Potential Financial Impact
Medium-term	Products and Services	Climate-adaptation, resilience, and risk solutions, including: <ul style="list-style-type: none">• Stormwater and indoor climate solutions• Precision agriculture solutions e.g., opportunity to reduce agriculture's carbon footprint in rice fields• Low climate-impact solutions e.g., low global warming potential (GWP) propellants and refrigerant	High	Increased revenues resulting from increased demand for products and services.
		Development of new products or services through R&D and innovation. e.g., PlasticRoad; fossil-free PVC; startup partnerships and investments in climate tech through Orbia Ventures		
	Energy Source	Use of lower-emissions sources of energy	Medium-Low	Reduced direct costs and taxes (including potential carbon taxes)
Long-term	Markets	Innovative technologies for emerging sectors and industries including: <ul style="list-style-type: none">• Public-Private Partnerships to support small scale farmers with precision agriculture solutions and technologies• Next-generation battery technologies to enable storage innovations	High	Increased revenues through access to new and emerging markets.

The table includes key initiatives in response to climate-related identified opportunities.

For further information:

 [CDP Climate Change Response](#)
(Section 2.6)

 [Orbia Sustainable Solutions Report](#)



2.b Impact on the organization's business, strategy and financial planning

The results of our climate risk and opportunity assessments have triggered internal initiatives to place climate change at the center of the challenges our business groups pursue as we continue to evolve into a low carbon and resilient business. Our Corporate Practices & Sustainability Committee, our thematic and multi-disciplinary working groups, and our businesses analyze how these challenges, and their potential financial implications, may affect the organization's business and strategy. For example, carbon taxes and future increases in energy prices are now part of our financial planning. We also analyze how our solutions contribute to the mitigation and/or adaptation to climate-related challenges. The examples provided below illustrate how we respond to some of the risks and opportunities identified ([described in 2.a](#)), in line with our climate action framework.



Solutions for advancing a climate resilient economy

All of Orbia's businesses continuously invest in developing innovative low carbon products and solutions that enable resilience against climate change, as well as in integrating recycled content and recyclability criteria from the product design stage.

Polymer Solutions

vestolit alphagary

are developing bio-based PVC options to supply customers around the world with clean water, sanitation and other essential elements for good health. They are also deploying renewable energy, bringing emissions from chlorine production closer to net zero.

Fluorinated Solutions

Koura

is expanding its portfolio of low global warming potential (GWP) next-generation refrigerants and propellants, and energy storage technologies that will drive a decarbonized future.

Building and Infrastructure

wavin

is growing its offering in segments including stormwater management, indoor climate systems, and green building solutions for urban and rural resilience.

Precision Agriculture

NETAFIM™

has increased integrated precision irrigation offerings and moved into turnkey greenhouse solutions.

Data Communications

dura-line

has been investing in large-scale fiber optics and conduit projects to improve connectivity while minimizing environmental impacts.



Driving new businesses for a net zero world

We are also investing in the development of solutions, such as energy storage innovations, which enable the transition to a low carbon economy. In addition, Orbia Ventures has defined climate tech as one of its focus areas, and successfully completed seven out of eight transactions carried out in 2021 to promote this strategic objective.

orbia ventures

Exploring new opportunities: carbon capture and hydrogen technology

Orbia has made a first investment in [Verdagy](#), a company innovating on water electrolysis technology for large-scale production of green hydrogen. Orbia Ventures also invested in [Osmoses](#), a startup developing advanced molecular filters for chemical separations, which can be applied to carbon capture and blue hydrogen production in a cost-effective manner.



The following examples demonstrate how some of our products are contributing to climate resilience:

Smart StormHarvester making cities resilient

The central square of Assen, in the Netherlands, often gets flooded when heavy rainfall occurs. The municipality decided to redesign it, and Wavin offered the solution to mitigate flooding and water shortages during dry periods.

Regular attenuation systems sit empty most of the time and infiltration systems are only possible with the right soil conditions. Wavin's StormHarvester, using AquaCell® units, is now changing the rules of the game. When rain is forecast, the system's predictive technology automatically adjusts the water level within the tank, to ensure it has sufficient capacity for rainwater retention. This ensures that the tanks always have capacity to capture stormwater and enables the city to reuse the water continuously for green areas and to combat heat stress.

Circular Solutions for Dairy Farms

Netafim has developed an award-winning technology reducing the environmental impact of dairy farms. Netafim's subsurface drip irrigation (SDI) system recycles organic waste generated by dairy cows, optimizing levels of fresh water to fertilize and irrigate feed crops while eliminating the need for chemical fertilizers. This innovative technology benefits the environment in numerous ways: healthier soil and root environment; concurrent conservation of water, nutrients and energy; GHG emissions reduction, and improved crop yield.

Applied in pilot projects in Italy and the United States, this solution represents a major achievement for advancing circularity in the agricultural industry, reducing CO₂e emissions of dairy operations by 47% compared to traditional methods.

Li-Ion Battery Performance and Circularity

Koura continues to advance its comprehensive energy materials strategy, including development of next-generation electrolyte additives and co-solvents under the Koflyte® brand. Milestones in 2021 include the acquisition of battery tech start-up [Silatronix](#) and investment in [Ascend Elements](#), a closed-loop lithium-ion battery recycler.

Next-Generation Refrigerants

Following the launch of Klea® 473A, Koura continued to revolutionize the refrigerant gas space with the launch of another of its next-generation refrigerants, Klea® 456A. This lower global-warming-potential (GWP) refrigerant presents an alternative to R-134a for automotive air conditioning systems. Klea® 456A refrigerant is non-flammable and has a GWP 46% lower when compared to R-134a.

For further information:

 [Orbia Sustainable Solutions Report](#)

 [Orbia 2021 Sustainability Report](#)



Low impact & resilient operations

Decarbonizing our operations

Each Orbia business group has targets to improve efficiency and transition to cleaner or renewable sources of energy and obtain or maintain a certified environmental management system. Related strategies include several plants, which have developed plans to adapt to potential extreme weather events. Climate-related risks have influenced our global targets to become carbon neutral by 2050 (reducing Scope 1 and 2 emissions by 47% by 2030, pending validation by the SBTi) and to have all plants certified as ISO-14001 or equivalent by 2025.

Transitioning to renewable and lower carbon energy sources

Our renewable energy consumption increased by 28% in 2021, driven by key projects across most of our business groups. As an example, our Dura-Line plant in Goa, India, formalized a Power Purchasing Agreement (PPA) to acquire 1,000 MWh per year of solar power from the second semester of 2021. This represents 12-15% of Goa's annual electrical load. Our Wavin operations increased use of renewables by 43% in 2021. Wavin sites in Europe aim to source 100% of their electricity consumption from renewable sources by 2025, a 4% reduction of Orbia's total GHG emissions.

Our Alphagary's Melton Mowbray site signed an agreement with a UK utility facility that supplies renewable electricity, reducing CO₂ emissions by 3,000 tons.

A trigeneration plant initiated operations in our Vestolit Altamira I site. From 2021, yearly carbon emissions are expected to decline by almost 20,000 tons of CO₂e, which would equate to removing over 4,500 cars from the road.

Optimizing processes, improving efficiencies

At Vestolit's Altamira site, technology adaptations and investments in additional condensers allowed the site to replace chilled water by cooling water in the PVC process. The projected energy consumption reduction is 50 KWh per ton of PVC produced and 8,000 tons of CO₂e in 2021.

Process improvements also include Alphagary's Altamira I plasticizers plant, where installation and commissioning of an alcohol stripping column resulted in an 83%-time reduction, obtaining low alcohol concentrations in plasticizers in less than 40 minutes and a reduction of steam consumption of 20% compared with the previous process. As a result, Alphagary will stop consuming 5,500 ton/year of steam, which translates to a reduction of 1,000 tons CO₂e/year.

Additionally, Dura-Line joined the U.S. Department of Energy's Better Plants Program to improve energy productivity by 25% over a ten-year period. The first assessments conducted in 2021 revealed the opportunity to reduce nearly 1 million KWh through plant improvements. The teams will implement these robust energy improvements and system optimizations in 2022.



Low impact & resilient operations

Mitigating our impact across the supply chain

As part of Orbia's goals to reduce emissions from fossil fuels, our procurement and logistics teams continually pursue options to deploy energy efficient technologies and transportation alternatives. These opportunities include: switching from road to rail transport, introducing take-back programs, and sourcing recycled or bio-based materials when available.

Increase in post-consumer recycled content

Wavin aims to increase the use of post-consumer recycled plastics up to 25% by 2025 to reduce dependence on virgin raw materials and consequently reduce carbon emissions in their value chain. The company has also set a goal of increasing the recyclability of its products by 90% by 2025. Similarly, Netafim has a target of increasing recycled content in drip lines up to 45% by 2030. These are key targets for integrating circularity into our business strategy. Purchased goods and services (category 1) represent around 6% of Orbia's total Scope 3 emissions.

Take-back programs

Dura-Line and Netafim have been operating take-back programs for a number of years. In 2021, Netafim expanded its program from four to eight countries (U.S., Australia, Israel, France, Spain, Turkey, Peru and Mexico), with approximately 13,000 tons of end-of-life driplines collected globally for reuse. In 2021, Dura-Line's take-back program repurposed 1,754 reels and diverted a quarter million pounds of scrap tape to be recycled.

Refrigerant recovery

Koura's refrigerant recovery plant in Japan increased its processing capacity in 2021. The Mihara plant continues to implement this successful recovery technology and practices to further reduce global warming impacts. During 2021, approximately 900 tons of refrigerants were recovered, avoiding around 1.7 million tons of GHG emissions. The site has plans to further grow its recovery capacity in 2022.



2.c Orbis resilience considering climate-related scenarios

As demonstrated in our 2019 climate risk assessment, both physical and transition scenarios were used to analyze our resilience to climate change.

For physical risks, we utilized IPCC's RCP 8.5 scenario to assess the impact of water stress and drought, cyclones, extreme heat and cold, flooding, landslides and wildfires. For transition risks, we considered climate-related financial implications associated with carbon taxes, utility costs, and mandates on and regulation of existing products and services. This ensures our operations fully address the risks and opportunities of climate change.

Additionally, we are conducting a more detailed analysis at operational sites, such as our Cartagena facility, that have been affected by shifting rainfall patterns and its proximity to the sea. Cartagena collaborated with hydrology and rainfall experts to develop a 50-year pattern analysis to incorporate the preventative and adaptive measures necessary to guarantee operational continuity. This will enable us to provide uninterrupted product supply to customers in the case of extreme rain events in the future. The time horizon considered was 25-50 years, relevant for the life of capital assets.

Orbia acknowledges the ever-changing landscape of climate science and how it influences our business strategies. In order to better assess the challenges ahead of us, we plan to update our previous climate risk analysis during 2022 with state-of-the-art scenarios incorporating new information, expanding our time horizon and scope, beyond Business-As-Usual models, to test and continuously improve our resilience to climate change.

The output of this first analysis showed that none of the evaluated sites have a high risk of being affected by physical changes in climate to 2030.



Risk Management





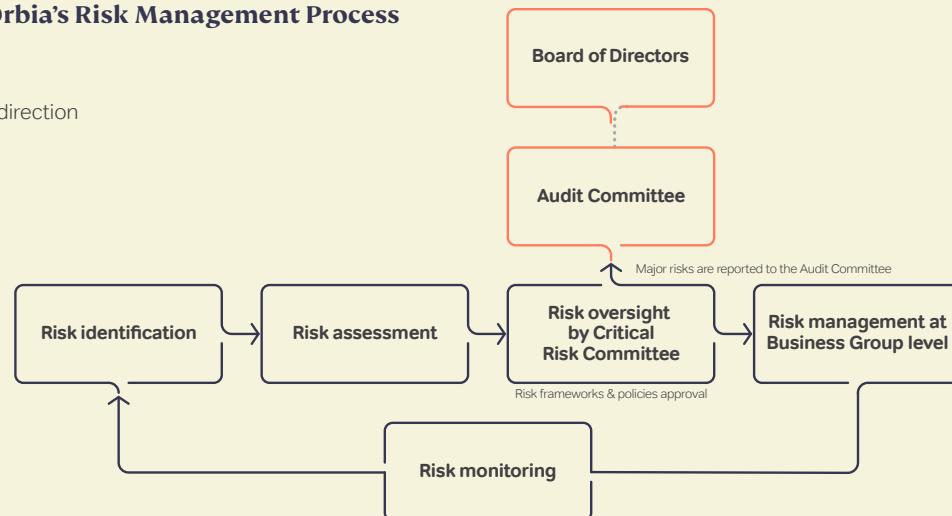
3.a Process for identifying and assessing climate-related risks

Orbia's risk management process is a systematic approach across Orbia's corporate and business units. The focus is on both strategic and operational issues, and changes in risk status are promptly communicated to decision makers. Our risk profile, that includes short, medium, and long-term risks, is reviewed every few years.

In order to identify and manage all materially relevant risks, Orbia has developed the following structured process:

Figure 2. Orbia's Risk Management Process

Setting direction



Orbia's Critical Risk Committee (CRC) oversees four primary risks to the Company: Strategic/Business, Financial, Operational, and Reputational. Climate risks have been integrated into these multi-disciplinary company-wide risk management processes since 2020.

The CRC, chaired by our Chief Executive Officer (CEO), is comprised of our Chief Financial Officer (CFO), General Counsel, Internal Audit Vice President (VP), Health, Safety, Environment & Engineering VP, Chief Information Officer, Sustainability VP, and Presidents of the five business groups. The CRC meets quarterly and is responsible for identifying and assessing enterprise risks (including climate risks), evaluating the appropriate risk profile for the enterprise, developing risk mitigation plans, and overseeing their implementation.

In addition, the CRC assists the Board of Directors and Audit Committee in fulfilling its oversight responsibilities related to:



Risk identification and assessment



Risk management: exposures and profile



Risk mitigation: actions and continuous monitoring of mitigation plans



Assessment and approval of the effectiveness of the three lines of risk defense



Effective management and assurance of risk policies and strategies

Likelihood and potential impact of material risks are identified and prioritized based on their timeframe and relevance to Orbia's strategic objectives. The results of these assessments are aggregated to form a Risk Register, reviewed and approved by the CRC.

In 2019, we also formally identified climate-related risks across the business through a specific climate risk assessment aligned with TCFD recommendations. This process allowed us to assess both physical and transition risks, quantifying their potential financial impact based on their time horizon, as detailed in [section 2.a](#). We plan to update our 2019 climate risk analysis in 2022 with refined scenarios.



3.b Process for managing climate-related risks

Since 2020, Orbis's Enterprise Risk Management (ERM) function and business groups have developed work streams to integrate climate-related risks alongside other enterprise risks and to track the progress of our actions. Risk Registers are managed at business group level and a mitigation strategy with a specific action plan and risk owner is defined for each risk.

Orbis's risk management model establishes three lines of defense that support the risk management process (including climate-related aspects). These three lines of defense include:



Risk owner at business group level responsible for identifying and controlling risks



ERM & Compliance function at Orbis level to ensure communication to relevant committees



Internal Audit to improve internal controls

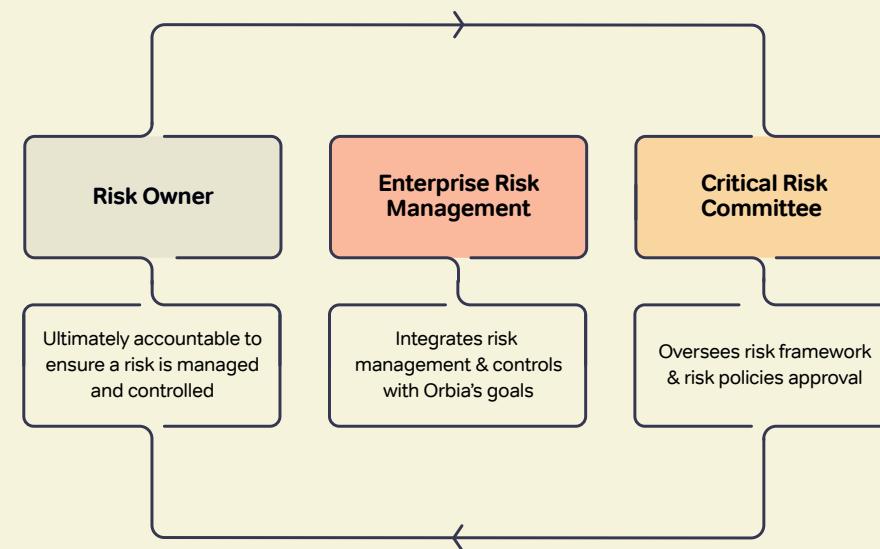
In line with Orbis's risk management process, material risk developments are continuously monitored through a variety of sources at the corporate and business group level. Changes in risk status are promptly communicated to decision makers.



3.c Integration of climate-related risks into overall risk management processes

Orbia's ERM program is embedded into the company culture. The CRC's primary responsibility is to assist the Board of Directors in formulating Orbia's risk management practices and overseeing their implementation, including climate-related risks. Figure 3 illustrates the interaction between key risk management roles: the CRC, the ERM program and the risk owner.

Figure 3: CRC & ERM Interaction Model



The different management tools used to manage risks (including climate risks) across Orbia include:

- ERM framework
- Risk assessment and risk register
- Root-cause analysis with risk owner
- Probability vs impact metrics
- Key process indicators
- Global H&S measures
- Global compliance metrics and policies
- Internal audits
- Risk monitoring and evolution reports
- External risk reports

Also, Orbia has engaged with compliance world leader, ENHESA, to identify applicable and emerging regulatory requirements stemming from climate change. Orbia uses ENHESA's compliance intelligence services to ensure all manufacturing sites comply with applicable regulations in their specific jurisdictions, including climate-related regulations. By the end of 2021, following self-assessments by all sites, 70% of all applicable regulatory requirements had been reviewed for compliance. Regulatory compliance monitoring will continue on an ongoing basis and is a key indicator of quality site performance, thus mitigating possible regulatory risks. We will continue to use available tools and capabilities to strengthen our compliance processes across all jurisdictions.



Metrics and Targets

4





4.a Metrics used to assess risks and opportunities

Orbia has defined key metrics to measure and manage climate-related risks and opportunities. These include:

- Reduction of Scope 1, 2 and 3 GHG emissions
- Achieving Zero Waste to Landfill at all sites
- Procurement of post-consumer and post-industrial recycled raw materials
- Revenues generated from sustainable solutions

4.b Disclosure of scope 1,2 and 3 Greenhouse Gas Emissions (GHG)

As disclosed in previous reports, Orbis continues to measure Scope 1, 2 and 3 GHG emissions and communicates progress towards GHG emission targets. In addition, our GHG emissions reporting is assured by an independent third-party (assurance statement available in our [2021 ESG Databook](#)).

	Definitions: ¹	Methodology:
Scope 1:	Direct emissions from sources owned or controlled by the company.	Calculated with average fuel CO ₂ emission factors published by DEFRA and EPA.
Scope 2:	Electricity, heating, steam and cooling indirect emissions from upstream sources not owned or controlled by the company.	Calculated with both location-based and market-based electricity emission factors from the International Energy Agency (IEA), where supplier emission factors are not available. ²
Scope 3:	Other indirect, upstream and downstream emissions from sources not owned or controlled by the company.	All data was calculated using our internal database to assess the consumption of the different raw materials and other purchased goods and services. Emission factors were sourced from public databases and specialized consultancy services. The calculations were done following the GHG Protocol "Technical Guidance for Calculating Scope 3 Emissions", considering Categories 11 (Use of Sold Products) and 12 (End-of-Life Treatment of Sold Products) as the most significant for the organization (around 90% of total scope 3 emissions).

1. [The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard \(Revised Edition\). PDF.](#)

2. Orbis is not using any residual emission factor values. However, 77% of our scope 2 emissions are calculated using supplier-specific emission factors.



4.c Targets used and performance

Orbia's current climate-related goals include our net zero carbon ambition, our Scope 1, 2 and 3 absolute targets, as well as our zero waste to landfill goal.

Table 3: Orbia's climate-related targets and performance

Impact area	Goal	Target year	Baseline (2019)	Performance in 2021
GHG Emissions	Achieve net zero carbon emissions (scope 1 & 2)	2050	2.00 million tons CO ₂ e	1.81 million tons CO ₂ e
	Reduce Scope 1 and 2 GHG emissions by 47%	2030	2.00 million tons CO ₂ e	1.81 million tons CO ₂ e
	Reduce Scope 3 GHG emissions by 30%	2030	90 million tons CO ₂ e	82.4 million tons CO ₂ e
Waste	100% plants will send zero waste to landfill	2025	24% plants	39% plants

We work to achieve results against our goals by implementing key actions as described in [section 2.b](#).

For additional sustainability goals, refer to our [2021 Sustainability Report](#).

Materials and Buildings Group supplemental metrics

In 2021, Orbia selected metrics applicable to our business in line with "The Supplemental Guidance for Non-Financial Groups" under the TCFD Recommended Disclosures. While we have complete information for key metrics, we are in the process of assessing others to enhance our disclosures in future reports.

See [Table 4](#) in following page for details.



Table 4: Metrics from TCFD materials and buildings supplementary guidance

	Metric	Units	2019	2020	2021
Greenhouse Gas Emissions	Scope 1 emissions	Tons CO ₂ e	645,300	603,969	624,317
	Scope 2 emissions	Tons CO ₂ e	1,354,235	1,262,425	1,180,795
	Scope 3 emissions	Tons CO ₂ e	89,933,000	85,377,000	82,439,000
Waste	Waste sent to landfill (incl. incineration without energy recovery)	Tons	29,022	27,205	22,136
Materials and Buildings Group supplement metrics					
Energy and fuel consumption by source	Natural Gas	MWh	2,519,303	2,512,007	2,695,655
	Gasoline	MWh	10,324	9,174	9,862
	Diesel	MWh	98,929	75,539	82,565
	LPG Derived Gases	MWh	130,179	106,963	124,689
	Mineral Coal	MWh	169,816	127,836	73,953
	Purchased electricity	MWh	2,580,558	2,486,917	2,590,547
	Scope 1 & 2 (Energy) - non renewable	MWh	5,509,109	5,318,436	5,577,271
	Renewable Energy Generated	MWh	1,773	3,587	2,347
	Renewable Energy Purchased	MWh	81,890	130,983	169,451
	Biofuels	MWh	696	765	859
Total energy intensity	Scope 1 & 2 (Energy) - renewable	MWh	84,359	135,335	172,657
	by tons of product	MWh/ton	0.9	0.87	0.88
Water	Percent of fresh water withdrawn in regions with high or extremely high baseline water stress	%	47%	49%	47%
Risk Adaptation & Mitigation	Revenues from low carbon and climate resilience solutions	mUSD	1,331	1,522	1,984
	Expenditures (OpEx) (for operational footprint improvements)	kUSD	25,336	25,398	26,248
	Investment (CapEx) (for operational footprint improvements)	kUSD	10,218	9,302	13,293

New Scope 3 emission figures reflect improvements in our inventory completeness

For additional metrics and further details on methodology, please refer to our [2021 ESG Databook](#)

