

# Sustainability Report 2018





|                           |          |                           |           |  |           |   |           |                              |            |                     |            |
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\*This report includes the same content as the 2018 Mexichem Sustainability Report



# 1 About Orbia

Orbia, legally known as Mexichem S.A.B. de C.V., is a global provider of products and solutions inspired to enhance the way we live and work. Through our market-leading brands sold in more than 100 countries, we support multiple industries including construction, infrastructure, agriculture, health, transportation, data communications, energy and petrochemicals. Over more than 50 years of innovation and acquisition, we have grown to become one of the largest global companies headquartered in Latin America, with a strong record of sustainable value creation. We are traded on the Mexican Stock Exchange (BMV) and included in the BMV Sustainability Index as well as the FTSE4Good Emerging Index.

# Business Profile



Operations in  
**41**  
countries

Sales in more than  
**100**  
countries



**+22,000**  
employees



**2**  
Fluorspar  
mines



**19**  
R&D  
labs



**137**  
Production  
plants



**US \$7.2**  
**billion**  
Consolidated annual  
revenues

Note: all figures as of December 31, 2018.

## Our Market-Leading Brands and Products

One of the **most cost-efficient PVC** producers in the world and the fifth largest producer of PVC resin worldwide.

One of the world's **largest specialty PVC resins** producers.



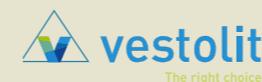
Owner of Las Cuevas mine in San Luis Potosi, Mexico, the **biggest single producer of fluorspar** in the world.

One of the world's largest producers of **plastic pipes and fittings**.



A global leader in **precision irrigation and digital farming**.

A **leading producer of conduits** for data and pressure pipes in the USA.



## Our Mission and Vision

### Vision

To be respected and admired globally as a leading industrial company that delivers maximum positive impact by contributing to progress and improving people's lives.

### Mission

We transform chemicals and materials into innovative products, services and solutions for diverse sectors. By focusing on operational excellence and market needs, we generate ongoing Total Value for customers, employees, partners, shareholders and the communities in which we operate.

## Our Values

### Safety

The health and safety of our people are our priority. We strive to ensure safety at our facilities, in the communities in which we operate, and for the environment.

### Innovation

We seek to continually drive innovation with our products, processes and solutions and generate a positive impact on the market and industry.

### Responsibility

We act responsibly and fairly in the communities where we do business.

### Commitment

We are dedicated to teamwork and a focus on achieving shared goals in order to exceed the expectations of our clients and maintain our commitments to our partners, employees, and the communities of which we are part and in which we operate.

### Integrity

We are committed to being an ethical, honest, and trustworthy company that treats employees in an appropriate and respected manner.

### Results

We believe that operational and financial efficiency and excellence are the foundation of our ability to deliver positive results, sustainable growth and products that make a difference.

## Message from the Chairman

Dear Stakeholders,

I am pleased to report that last year our company not only continued to grow profitably, but to evolve in ways that I am confident will make our strong, profitable growth sustainable well into the future.

The year 2018 was dynamic and historic for Orbia, starting with an unexpected, but ultimately smooth, and very successful, transition to a new CEO. The selection of Daniel Martínez-Valle, formerly the CEO of Kaluz, demonstrates both the depth of our talent pool and the efficacy of our governance process. That we executed the management transition while closing the largest acquisition in Orbia's history, of the Israel-based Netafim, reveals the underlying strength of the company.

As Chairman, one of my most important responsibilities is assuring we sustain world-class governance, starting with the best people we can attract to our boards. We continued to strengthen Orbia's board by adding Alma Rosa Moreno, Mexico's former ambassador to the United Kingdom and Head of the Federal Tax Authority; and María Teresa Arnal, former CEO of Twitter Latin America and current CEO of Google Mexico. We also added to our Netafim board, welcoming our new partners from Kibbutz Hatzerim in Israel:

Eli Bensimon, Tzvika Barkai, and Gilad Winkler, and adding independent directors Jean Carlos Angulo, formerly with Lafarge; and Anil Menon, formerly with Cisco. These appointments were designed to enhance the diversity of thought, experience, capabilities and professional networks that are needed to guide our company.

When Daniel became our CEO, he launched a collaborative exercise among our company's leadership to decode and express our purpose and values; not just who we are, but who – and what – we want to be in the coming decades. Because we have evolved so rapidly over the last years, we needed to step back and carefully assess the risks and opportunities in our portfolio and in our organization.

By year's end, the exercise positioned us to better align our possibilities with our aspirations and to understand more clearly our strategic options. We want to help make the world more sustainable and more livable, while consistently creating value for our shareholders. I am now even more confident that we can do both.



## About Orbia ▶

### Message from the Chairman

One specific result of the work Daniel guided last year was to reorganize the company into five businesses, each with a clear mission, and each with the resources to become more focused, more nimble and closer to our customers. The results are already evident: we are developing new products and solutions, expanding into frontier regions, enhancing our resiliency, and improving our health and safety performance.

At the same time, we remain committed to our investment grade rating, having strengthened our already solid balance sheet and enhanced our capacity to generate free cash flow.

As a global company, Orbia lives and operates in an ever more complex, intertwined marketplace. The very nature of our business requires us to understand risk and manage uncertainty - and to do so with our eyes wide open, with a constant assessment of strategies, scenarios and opportunities, while striding forward to become purpose-driven and future fit.

From a worldly perspective, these are unusual times. On the one hand, global growth has been substantial (led by U.S. GDP growth in 2018 of more than 3%), interest rates remain near historic lows and inflation is quiescent.



\*Business groups included as "Fluent" for reporting purposes.

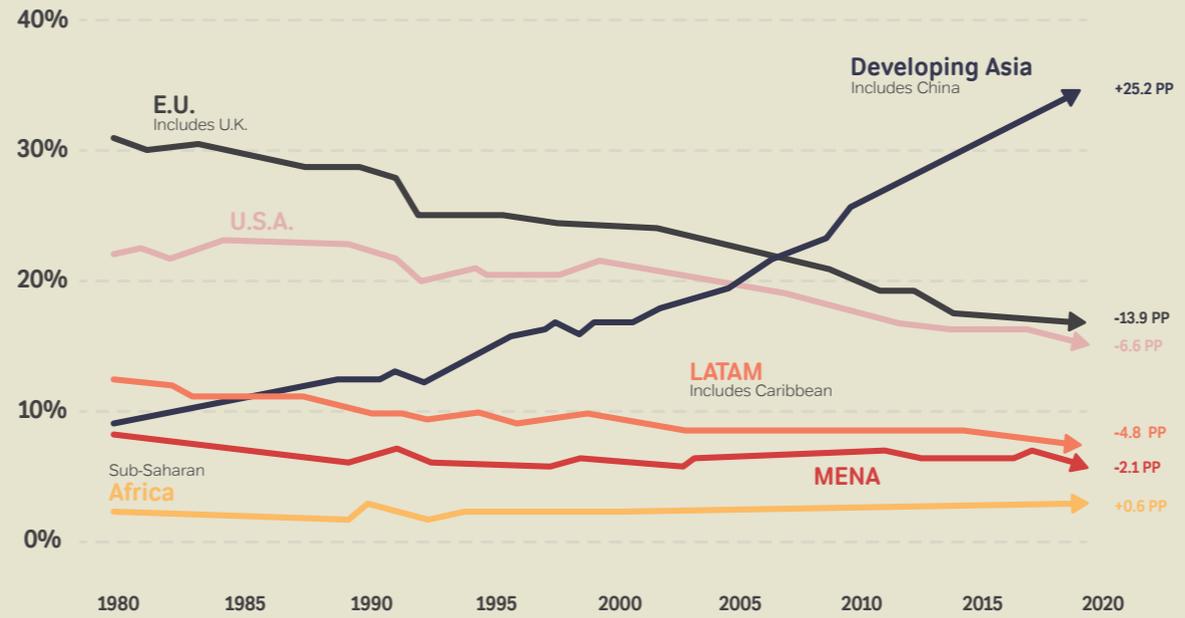
On the other hand, political uncertainties make it difficult to project economic and social policies, while trade policy swings tend to unsettle financial as well as goods markets. What is more, central banks seem increasingly nervous about the coming years.

In too many countries, the politics of extremes have squeezed the center. This has contributed to societal discomfort in France, a drag on the UK economy from Brexit reactions, the empowerment of new parties in many European countries, and the election of presidents in the U.S., Mexico and Brazil who came from outside the traditional policy consensus. Only time will tell whether new approaches, particularly in the Americas, will do a better job of creating the sustainable, equitable growth that our societies need.

Meanwhile, Asia as a whole continues to power ahead, even as China adjusts to a lower-than-historical growth path. While that country needs to cope creatively with the pressures of too much debt, top heavy public enterprises, and trade and investment pressures from the U.S. and Europe, the odds are high that the region in its entirety will continue to drive global economic growth in the coming years. That has practical implications for our company. We need to expand our presence in Asia.

Almost every Chairman believes that their stock price is undervalued, and I am no exception.

**Global share (%) of GDP PPP**  
Sources: IMF, Standard Chartered



Led by China's meteoric growth, Asia's share of the global economy has rocketed up to 34%. With countries like India and Indonesia rapidly urbanizing, this trend is likely to continue.

The U.S. and E.U. accounted for more than half of the global economy in 1980. Today, they combine for 31%.

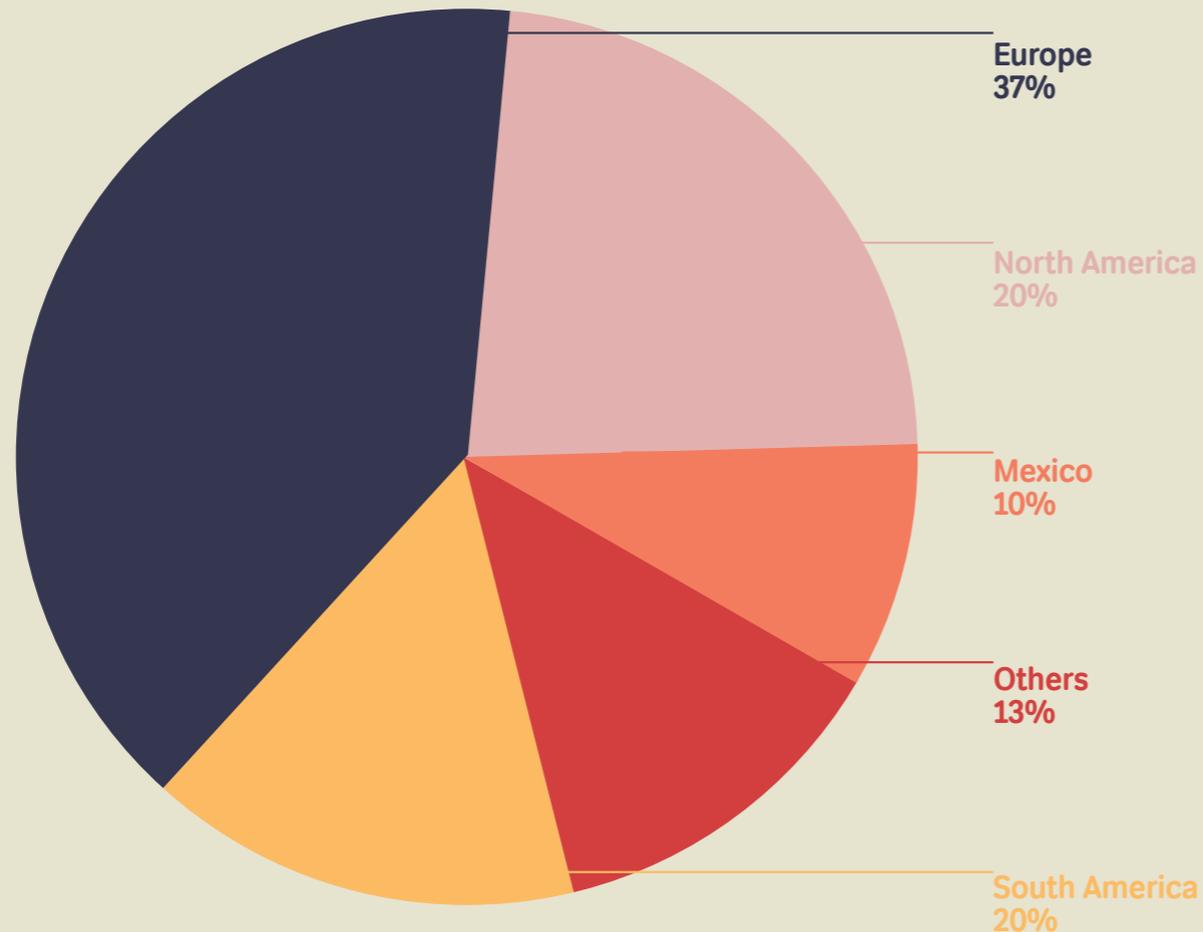
In my judgement, there is misperception about our exposure to non-specialty plastics, and to Mexico.

In fact, we are quite diversified. In 2018, 90% of our sales and 80% of our EBITDA were produced and sold outside of Mexico while non-specialty plastics accounted for 13% of total revenues.

We can and will do a better job of simplifying and explaining our business, but communication is only part of the solution. It is our responsibility to evaluate alternatives to unlock underappreciated value, and we are continually doing so.



## Sales by region 2018



Finally, I want to thank the entire Orbia team for their dedication, drive, commitment and openness to new ideas. Our people are the foundation of our culture and the embodiment of our values. Together, we are building a company that has the capacity and the will to address some of the world's greatest challenges in ways that will benefit all our stakeholders.

I would also like to thank our investors and all our stakeholders. Your trust, support and constancy over the years have helped us become the company we are today, and the company we can surely be tomorrow.

**Juan Pablo del Valle Perochena**  
Chairman of the Board



Photo courtesy of Expansión magazine

## Message from the CEO

Dear Stakeholders,  
Reflecting on my first year as CEO, I want to thank you for your commitment and investment in Orbia. We are extremely proud of what we have accomplished in this time and we have never been more optimistic about the future of our Company.

A top our list of goals is to align our businesses to address many of the world's biggest challenges, such as ensuring sufficient water and food resources. As an example, our Netafim business won four major community irrigation projects in India, which will bring precision irrigation for the first time to 60,000 farmers in more than 100 villages and will cover more than 55,000 hectares. Without these projects in place, two and a half times more water would be needed to produce the same crop yield. This kind of water savings from just four community irrigation projects is equivalent to the yearly water consumption of half a million people.

We are also proud of how we help manage and supply water both above and below ground in cities, reducing leakages, and in turn, making buildings more sustainable. We also make buildings safer by being the world leader in flame retardant solutions for building wire and cables. In data communications, our conduits carry fiber optic cables as part of the expansive

rollout in the U.S. of 5G data to the home. In addition, we are developing a new generation of flexible PVC resins that are safer, longer-lasting and use less energy to produce end products. And some 100 million asthmatics breathe easier now thanks to the use of our fluorine-based propellants in medical inhalers. The trust of our customers is fueling results of our own.

For 2018, we're very proud to highlight our four consecutive quarters of double-digit growth in revenue and consolidated net and majority income. For the full year, revenue increased 24% year over year from \$5.8 billion to \$7.2 billion and EBITDA increased 26% year over year from \$1.1 billion to \$1.4 billion. As a result of our strategy over the past few years, our return on invested capital (ROIC) now exceeds our weighted average cost of capital (WACC) and continues its positive trend, reaching 9.2% at year's end from 6.5% in 2015 (adjusted for continuing operation in order to make it comparable with the 2018 ROIC). We also continue to show a solid balance sheet and strong cash generation, which increases our confidence in the resilience of our business model.

Also in 2018, the Ingleside Cracker operated for its first full year. Envisioned more than five years ago, the strategic project pushes us to the left of the PVC global supply curve.

The 50/50 JV with OxyChem was ready on time and on budget.

This year, we added sales revenue of Israeli company Netafim into our consolidated numbers, which significantly contributed to both our top and bottom line. It has truly proven to be a transformational acquisition for us and has significantly increased our portfolio of specialty products. It has also expanded our global footprint by strengthening Orbia’s presence in key growth markets such as the U.S. and India, while opening up new markets including the Middle East and Africa.

In all our businesses, we are transitioning to a returns-driven model from a history of mergers and acquisitions, and from a manufacturing-focused company to one that is much more customer-centric. These moves should continue to drive better ROE and ROIC going forward.

One of the greatest privileges I have as CEO is witnessing firsthand the incredible impact our solutions are having on people and organizations around the world, from the individual farmer who is able to apply precision agriculture to increase crop yields, to entire cities like Cape Town in South Af-

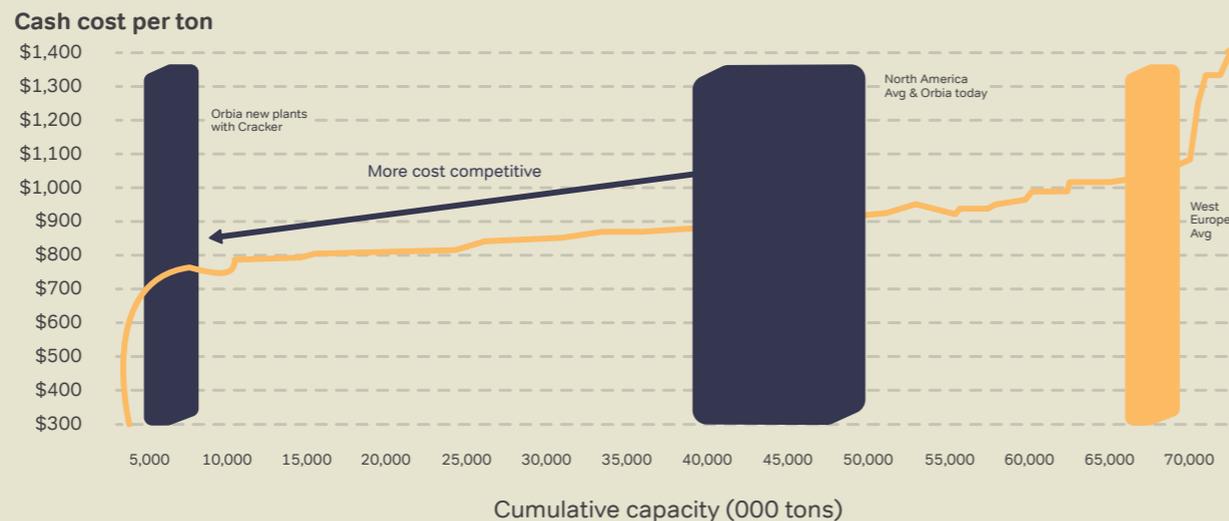
rica that have embraced our water management solutions to help adapt to a changing climate.

Increasingly, our solutions incorporate real-time data. Launched in May, NetBeat™ by Netafim is an “all in one” platform that enables farmers to optimize their irrigation and fertigation, based on a sophisticated analysis of real-time data from sensors in the field, external sources and dynamic crop models. All this is done using an intuitive interface from the farmer’s smartphone or tablet.

PlasticRoad by Wavin is the world’s first bicycle path made of recycled plastic. Piloted in September in the Netherlands, the pathway features sensors that monitor temperature, usage and durability. While tested for cyclists, we are considering far broader commercial applications such as parking lots. The innovative material is expected to be three times as durable as asphalt and 70 percent faster to install.

Along our own path to become a purpose-driven, future fit organization, Orbia is giving back to the world in other ways as well. Sustainability is a critical goal, and we’re working with governments, the private sector and local nonprofits around the world to help bring about a more livable future. As an example, we are now reusing more than 75%

Estimated PVC Global supply cost curve



Source: Orbia internal analysis. Each point of the curve represents a plant of the global PVC production.



of our water at our plants and aim to boost that to 87% by 2020. In 2018, we joined the UN Global Compact, which encourages businesses worldwide to adopt sustainable and socially responsible policies, and to report on their implementation.

The safety of our people is paramount to us. We are working globally and across all our businesses to ensure that every day, each one of our 22,000 Orbia employees returns home safely. Orbia is also fully committed to fostering a culture of integrity, transparency and compliance. We are launching a new, improved Whistleblower Line for managing effectively all concerns in our Company throughout the world. We are also dedicating resources to train our employees on global compliance issues such as data privacy, anti-bribery and anti-trust. This training not only aims to reduce risks, but to actually provide our employees with tools on how to deal with ethical dilemmas.

For more than five decades, our people have helped keep Orbia stay focused on serving customers and enriching people's lives. Recently, we surveyed our employees and results showed an impressive 86% of our employees feel "engaged, enabled and energized".

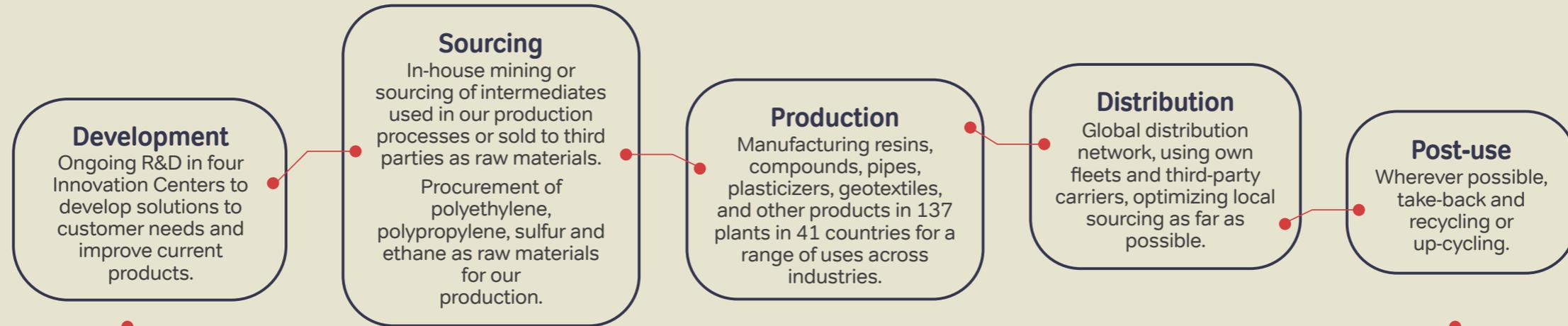
Having spent much of this past year traveling to meet with both customers and employees, I return at once energized and humbled. And I look forward to what we can do to keep having the positive impact we're having on the world – one project at a time.

**Daniel Martínez-Valle**  
CEO



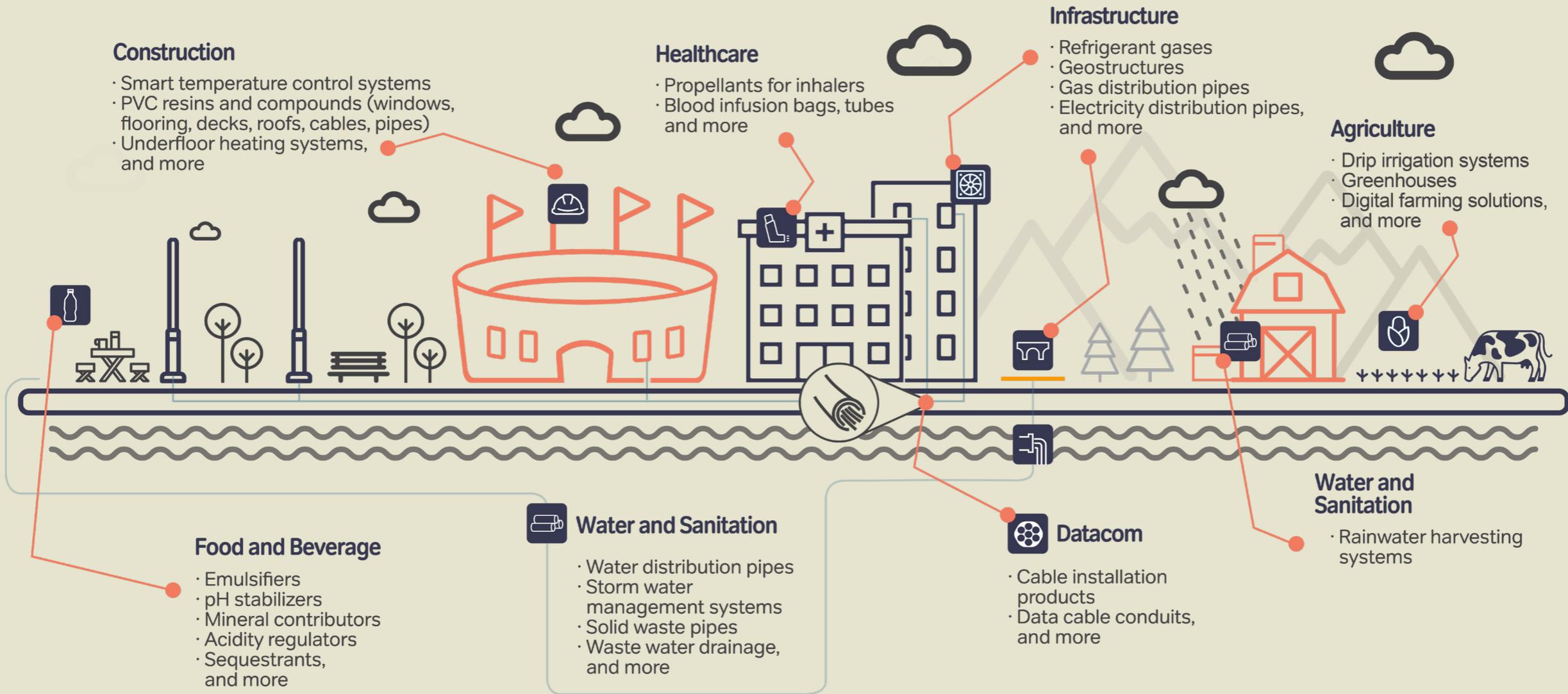
## Our Value Chain

Our value chain starts with product development and progresses through manufacturing and supply to our customers. We are seeking ways to increase the circularity of our products and services. Most of our raw materials are sourced through vertical integration, and our many factories around the world are in constant collaboration to optimize the flow of materials between plants.



**Applications in a range of Industry Sectors**







**2**  
**Our**  
**Impact**

## Financial and Sustainable Solutions Highlights:



Revenues increased **24%** year over year, to **\$7.2 billion**

We met our EBITDA guidance with an increase of **26%** vs 2017 to

**\$1.4 billion**



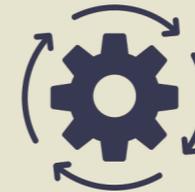
EBITDA margin increased **43 basis points** vs 2017 to **19.4%**

Our ROIC of **9.2%** is at historic levels

Operating cash flow before **CAPEX and financing activities** increased by **18%** vs 2017

### Solutions:

We invested more than **\$41 million**



in applied Research & Development

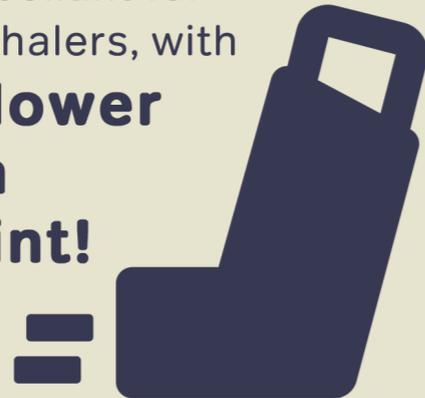
We manufactured **400 million meters of conduit for datacom** – enough to circle the globe 10 times, enabling connectivity all over the world

We introduced **Sentio & Calefa**, new systems for smart domestic heating, enabling significant energy savings



## Advancing HFA 152a-

a new propellant for medical inhalers, with a **90% lower carbon footprint!**



Successfully piloted **PlasticRoad** – a bicycle path made from 70% post-consumer recycled plastic



### Introduced NetBeat™

from Netafim - the first ever digital solution to enable intelligent automated irrigation, fertigation and crop protection



Our rainwater catchment systems in Central America

**provided people with 80 million liters of water for home use**

## Sustainable Business Highlights:



**87%**  
**of employees**

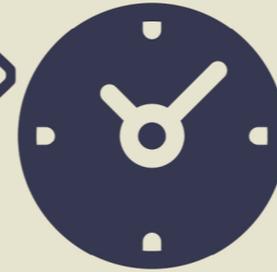
declared they identify with our strategic goals in our 1<sup>ST</sup> global Engagement Survey

**7,700+**

employees spent **more than 20,000 hours** volunteering in our communities



Invested more than  
**473,000**  
**hours** of training for employees across our business



A record of 2,850 employees from

**20** countries

donated to support disaster relief efforts in Guatemala.

**Orbia**

and employees **donated a total of \$90,000**



The **accident rate** across the company has **dropped by 53%** since 2016

We achieved a rate of **water reuse of 81%**

Orbia and our employees donated

**\$1.2**  
**million**

to support the earthquake recovery efforts in Mexico



Overall, **we invested \$3.7 million** in community and social development around the globe



We invested in **5 Water Funds across Latin America** to support conservation of water resources expected to benefit

**42 million people**



## Business Performance

## Our Business Strategy

Orbia's business strategy emphasizes the importance of being a vertically integrated company, with a focus on specialty products. Our aim is to reduce the volatility of our raw materials, enabling us to focus on manufacturing and marketing products, services and solutions with greater profitability and added value for our customers.

Orbia has grown through strategic acquisitions, enabling us to consolidate and expand our leadership across our value chain and maintain a presence in international markets, closer to our customers around the world. Orbia is driving a global growth model that will help consolidate the global competitiveness of our Fluor and Vinyl Business Groups and boost our Fluent Business Group through sector-driven specialization in Building and Infrastructure (Fluent Europe and Fluent LatAm -Wavin and Amanco-), Datacom (Dura-Line) and Precision Agriculture (Netafim).

Our intent is to maximize capacity to improve margins and boost organic growth, as well as develop new markets.

With an emphasis on driving collaborative developments and synergies across our businesses, optimizing the way we utilize our resources, including recent acquisitions, we expect to be in a stronger position to establish stronger, long-term relationships with strategic customers and meet their product needs effectively.



## Business Performance

In 2018, Orbia started its transformation to become a more customer-centric organization. This shift will be an important component of Orbia's business operations in 2019.

Throughout 2018, Orbia's 22,000 employees have collaborated with our customers to address some of the world's most pressing challenges. We continue to seek new opportunities to deliver business growth while helping improve the quality of life for millions of people around the world.

We recently celebrated the anniversary of Orbia's game-changing acquisition of Netafim and continue to appreciate the value this new business brings to our group. Today, Netafim is an integral part of Orbia's Precision Agriculture Business, helping farmers maximize crop yields while reducing the consumption of resources with its digital farming solutions. Orbia's Precision Agriculture business also partners with governments to help improve the livelihoods of rural farmers with the latest in smart drip and micro-irrigation technologies.

Orbia's EBITDA grew by 26% in 2018, fulfilling our commitment to secure EBITDA growth between 25-30% at year-end on a reported basis. We remain

strongly committed to our investment-grade rating, and through a continued effort to strengthen our balance sheet, have been executing our deleveraging strategy, reaching 2.05x net debt to EBITDA ratio at the end of Q4 2018.

During 2018, Orbia's Fluent Europe (Building and Infrastructure - Wavin), and U.S. & Canada (Datacom - Dura-Line) divisions exceeded expectations, and although Fluent LATAM faced market challenges -mainly in Colombia- we have been seeing signs of recovery in Brazil and Mexico, at a time when we continue to successfully integrate Netafim. In early 2019, Orbia's Vinyl business is expected to continue working in an environment with a constrained ethane supply and an excess supply of caustic soda, while year-to-date PVC prices have been increasing. Orbia's Fluor business expects a moderate growth path after an extraordinary 2018. During 2019, Orbia Fluor will experience a more challenging year, with the stabilization of the refrigerant markets in Europe associated with difficult market conditions, affecting the supply-demand dynamics of the F-gas quota system, and better market conditions in our upstream businesses.



### Net Sales

In 2018, consolidated sales increased by 24% compared to 2017, to \$7.2 billion. This increase was mainly the result of (1) integration of Netafim into the consolidated results, (2) higher prices of refrigerant gases and (3) healthy sales growth in the Fluent Business Group in the U.S. and Canada.

### Cost of Sales

Our cost of sales increased by 20%, from \$4.4 billion in 2017, to \$5.3 billion in 2018. This increase was mainly the result of the integration of Netafim in the consolidated results of Orbia, as well as higher volumes of sales in our Fluor Business Group and Fluent U.S. and Canada (Datacom) and Fluent Europe (Building and Infrastructure -Wavin-) business units.

### Gross Profit

Our gross profit increased by 33% from \$1.5 billion in 2017, to \$1.9 billion in 2018. Our gross margin, which is calculated by dividing gross profit by net sales, increased from 25% in 2017, to 27% in 2018. This expansion was mainly generated in our Fluor Downstream Business Unit.

### Operating Expenses

Our operating expenses increased by 35% from \$745 million in 2017, to \$1 billion in 2018. This increase is the result of (1) integration of Netafim in the consolidated numbers of Orbia, (2) provision

of CADE and (3) expenses related to the acquisition of Netafim Ltd. Our operating expenses represented 14% of our net sales during 2018, compared to 13% in 2017.

### Net Financial Expenses and Variation in the Exchange Rate

Our net financial expenses and variation in the exchange rate increased by 62%, from \$176 million in 2017, to \$284 million in 2018. The increase is due to (1) an increase in interest expenses main-

ly related to the issuance of the \$1 billion bond in September 2017 to finance the acquisition of Netafim, as well as consolidated interest in 2018, (2) integration of Netafim in the consolidated numbers of Orbia, (3) a negative effect on the monetary position from our Venezuelan operation, and (4) an impact related to the valuation at market prices of a financial instrument associated with the acquisition of Netafim.

|   | 2018  | 2017  | Variation |
|---|-------|-------|-----------|
| (Figures in USD million)                                  |       |       |           |
| Net Sales   | 7,198 | 5,828 | 24%       |
| Cost of sales   | 5,261 | 4,375 | 20%       |
| Gross profit  | 1,937 | 1,453 | 33%       |
| Operating expenses  | 1,002 | 745   | 35%       |
| Operating income  | 935   | 708   | 32%       |
| Net financial expenses and variation in the exchange rate | 284   | 176   | 62%       |
| Income tax  | 195   | 178   | 10%       |
| Income from continuing operations                         | 460   | 357   | 29%       |
| Consolidated net income                                   | 483   | 214   | 126%      |



### Income Tax

Our income taxes amounted to an expense of \$195 million in 2018 compared to \$178 million in 2017. This increase was mainly due to a change in the mix of Orbia subsidiaries that generate profits and those that generate fiscal losses. This effect was offset by the deferred tax benefit caused mainly by the reduction in local tax rates in our most relevant markets.

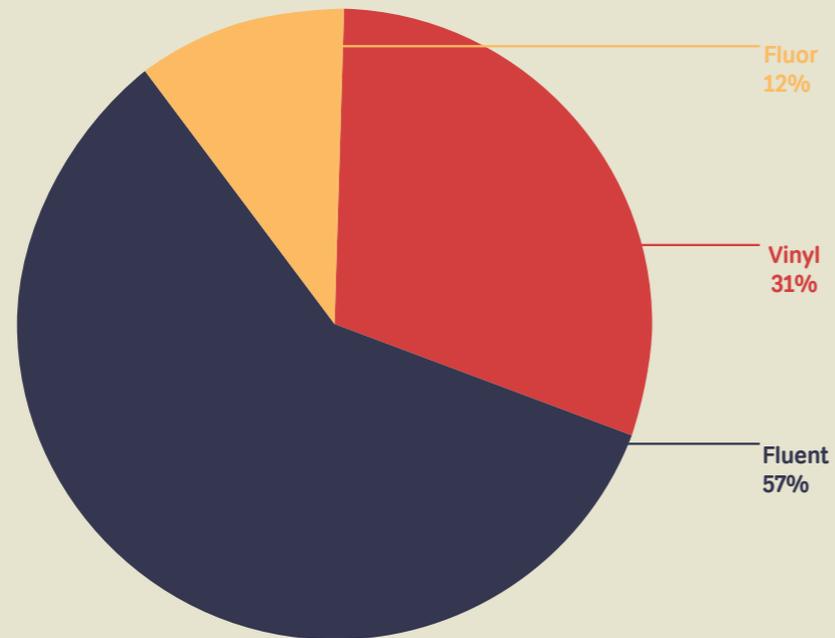
### Consolidated Net Income

Consolidated net income increased by 126% from \$214 million in 2017, to \$483 million in 2018, due to the factors described above. When we adjust for discontinued operations in the PMV operation, net profit grows by 29% from \$357 million in 2017, to \$460 million in 2018. Majority net income increased by 83%, from \$194 million in 2017 to \$355 million in 2018, when we adjust for the participation of Orbia (55.91%) in the discontinued operation in PMV, the majority net profit would have grown 25% from \$274 million in 2017 to \$342 million in 2018.



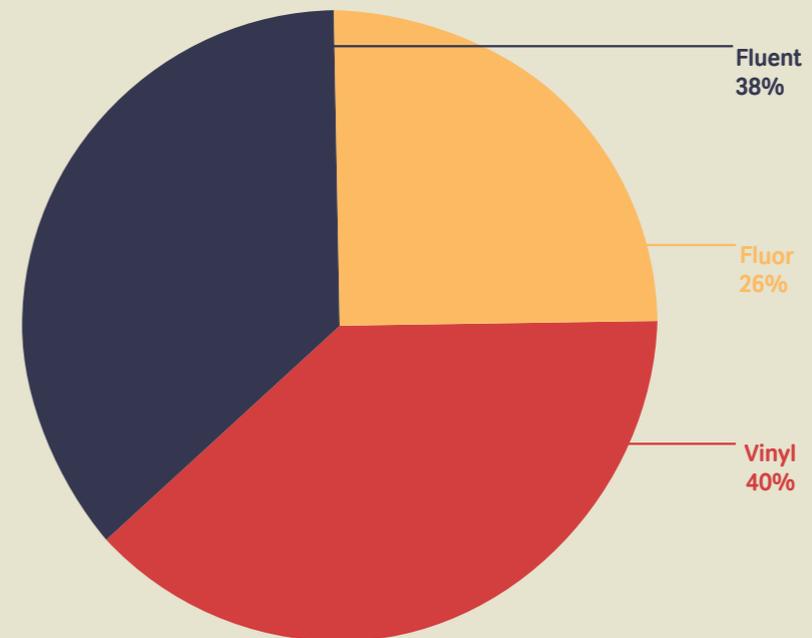
## Results by Business Group

Sales by Business Group\*



\*After eliminations (eliminations were 176 million in the Vinyl BG)

EBITDA\*



\*Figures are before intercompany eliminations.

## Results by Business Group

### Vinyl Business Group

In 2018, Vinyl Business Group sales increased by 6% from \$2.3 billion in 2017 to \$2.5 billion in 2018, reflecting favorable market price conditions during the first nine months of the year in both PVC and caustic soda, mainly due to the increase in oil prices and supply (environmental) restrictions in Europe and Asia, when comparing 2018 to 2017.

EBITDA increased 10% to \$557 million from the \$507 million reported in 2017, with an EBITDA margin growth of 74 bps to 22.6% from 2017's 21.9%.

### Fluent Business Group

In 2018, sales reached \$4.1 billion, an increase of 35% compared to the same period last year. Key factors contributing to this growth include the consolidation of Netafim, double-digit growth in the U.S., Canada and AMEA (Datacom – Dura-Line), and mid-single digit growth in Europe (Building and Infrastructure – Wavin). EBITDA increased by 37% in 2018 to \$527 million, with an implied EBITDA margin of 12.9%.

Vinyl

Sales increased by 6% from \$2.3 billion in 2017 to **\$2.5 billion** in 2018

Fluent

Sales reached **\$4.1 billion** an increase of 35% compared to the same period last year

Fluor

Increased sales by 23% to **\$837 million** in 2018 compared to \$681 million in 2017

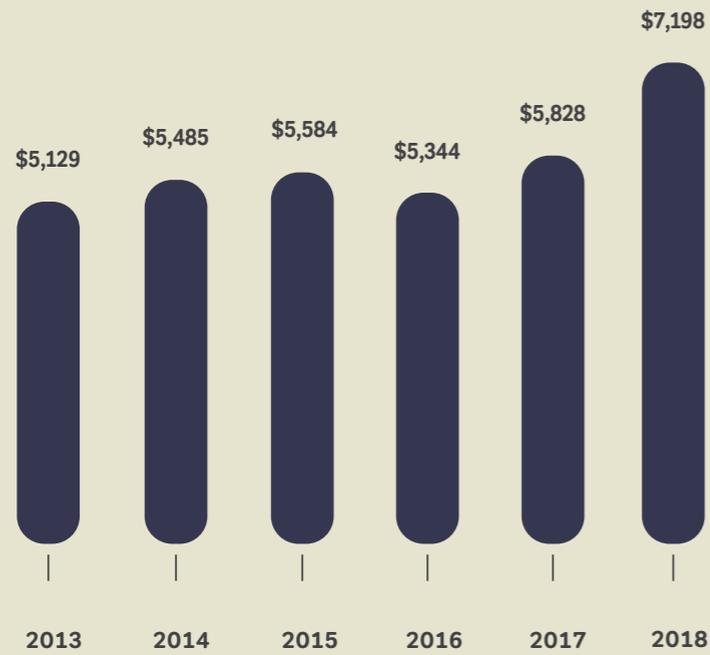
### Fluor Business Group

Net sales increased 23% to \$837 million in 2018 compared to \$681 million in 2017. This increase was mainly the result of higher prices of refrigerant gases in the U.S. and Europe. EBITDA increased by 40% in 2018 to \$362 million, with an implied EBITDA margin of 43.3%.

# Growth and Profitability, Part of our Business Strategy

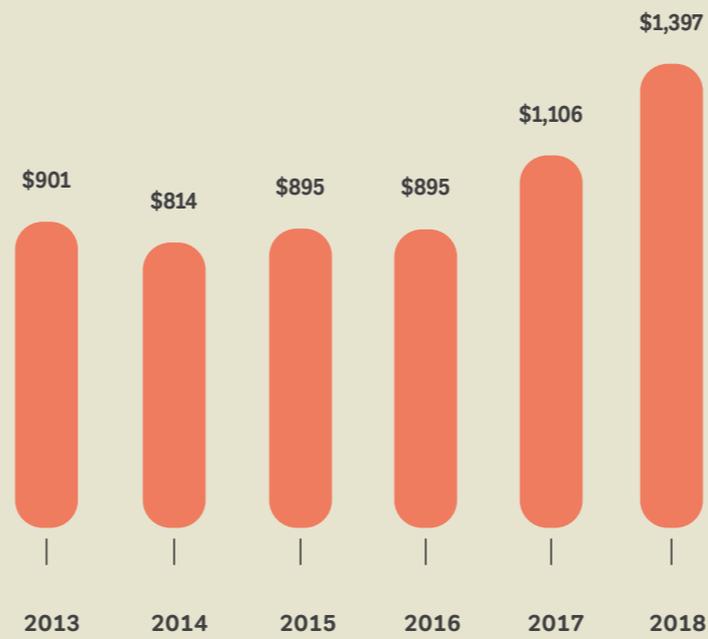
## Revenues

USD million

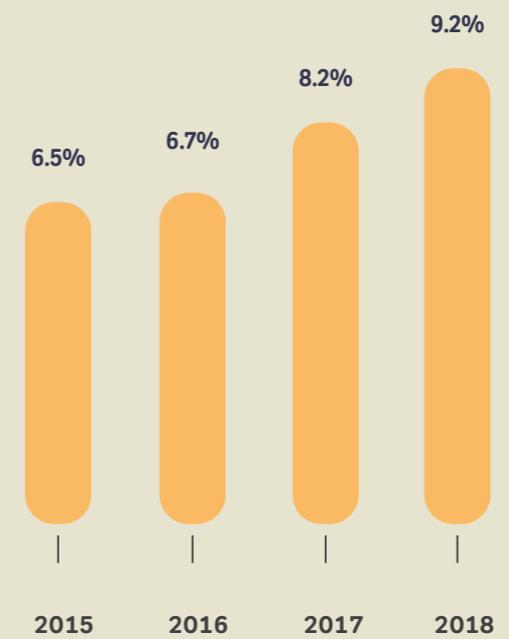


## EBITDA

USD million



## ROIC





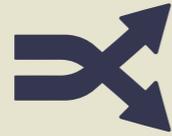
## Sustainability Framework

In 2018, we developed an overarching Sustainability Policy that confirms our commitment to sustainable value creation and details our commitments in the areas of our operations, products, people and communities. [View our policy here.](#)

### **Sustainable Business Strategy**

We have identified several macro-economic and social trends that define the current and future markets in which we operate. We prioritize solutions that leverage our extensive technical skills and expertise to deliver a response to these trends.

Macrotrends



- Urbanization
- Population growth
- Water scarcity
- Digitalization
- Food shortages
- Climate change

Orbia Solutions



- Sustainable construction
- Broadband internet
- Healthcare
- Energy Efficiency
- Water management:
  - Access
  - Irrigation
  - Resiliency

The Core Principles that Drive our Strategic Approach are:



Platform for Value-Added Growth

We leverage our size and global presence to provide value-added solutions in growing markets.



People

Our more than 22,000 employees around the world are our most valuable competitive advantage, and it is through them that the company operates and transforms every day. They make it possible to achieve our objectives, and their professional development is essential for a business that requires a highly qualified workforce, adaptability to change and constant reinvention.



Customer-Centricity

We understand our clients' changing needs and priorities, and work together to evolve our range of solutions and capabilities.



Responsibility

We create value providing a safe and empowering environment for our employees, being good stewards of our products and of shared natural resources, working as a force for good in the communities in which we operate and creating financial returns for our shareholders.



Innovation

Innovation is key to guaranteeing our future growth, maintaining our leadership position in the industry and opening new markets.





### Global Social and Environmental Needs

The United Nations Sustainable Development Goals (SDGs) represent a comprehensive set of global social and environmental challenges we must all address to achieve global, inclusive prosperity by 2030. The SDGs, which were ratified by the UN General Assembly in September 2015, represent a roadmap for action by governments, businesses and communities. At Orbia, we have identified six out of the 17 goals which we can have the greatest impact in helping achieve, thanks to our global footprint and business expertise.

### Responsible Approach to Business

At Orbia, we have always striven to do business in an ethical and responsible manner. In the second half of this report, we provide examples of activities we undertook in 2018 that were designed to guarantee that this will remain the case. In 2018 we became a signatory to the United Nations Global Compact (UNGC), committing to uphold the Compact's 10 principles of responsible business. While these principles are not new to Orbia,

our UNGC membership publicly demonstrates our commitment and reinforces our actions.

Our Sustainability Policy reflects our commitments to lead and support responsible value chains that work together to build a sustainable world. We wish to deliver profitable, long term business performance while optimizing the use of natural resources so we can do more with less, promoting innovation for safe and valuable product development, fostering a customer-centric approach and investing in our people and the communities in which we operate.

**What we are doing**

**Read more in these sections**



Our major contribution to advancing global food security is through our drip irrigation systems that allow farmers to grow more with less. Through our Precision Agriculture business, we are the leading global provider of drip irrigation solutions that help grow more food more efficiently, using less water and other scarce resources.

**Precision agriculture for greater yields**



We are a global provider of solutions to the healthcare sector. Our fluorine-based products supply most of the world's propellant gases for metered dose inhalers, and our PVC resins are used in applications across the full spectrum of healthcare devices, infrastructure and facilities.

**Everywhere in healthcare**

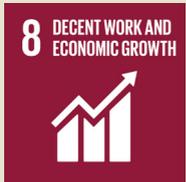


Our extensive portfolio of products, services and technology for the planning, design, construction, monitoring and maintenance of water management and sewerage systems guarantee the most efficient use and distribution of water for residential, industrial, and municipal use. We develop innovative solutions for urban drainage and rainwater harvesting that enable better adaptation to climate change. We engage in social responsibility projects with our communities through initiatives such as Water Funds in Latin America, which seek to protect and preserve water sources and river basins. We have adopted efficient water consumption practices in our operations and reuse 81% of our water.

**Future fitting to support urbanization  
Helping solve water challenges**

**What we are doing**

**Read more in these sections**



We are a fair and decent employer to around 22,000 direct employees around the world. We offer employment opportunities to members of communities where we operate, seeking to improve their quality of life and contributing to economic development in the communities where our plants are located. We also provide our employees with the conditions and environment that they need to reach their potential through our talent development and leadership programs.

**Empowering our people**



Our products contribute to the development of reliable, resilient, and quality infrastructure that promotes economic development and human wellbeing. We offer soil management solutions for the structural improvement of road infrastructure works, which significantly reduce the use of inert materials, such as mined gravel, and increase the quality and lifecycle of projects.

**Innovating our innovation  
Future fitting to support urbanization**



We produce the materials that contribute to better buildings. PVC, with its strength and durability, is a long-life, low-maintenance building material. We offer solutions for intracity and intercity fiber optic cable installation, connecting the world and improving access to high-speed information and high-performance technologies.

**Future fitting to support urbanization  
Mitigating climate change**



## Sustainability Priorities

We have identified **14 material priority impacts** that inform our sustainability approach and provide the basis for our sustainability reporting. These topics were identified through analysis of a range of factors including:

- A review of global priorities expressed in the **UN Sustainable Development Goals**
- **The 10 United Nations Global Compact Principles**
- Our **business strategy and goals**
- The expectations of our **primary stakeholders**, as expressed in our interactions with them throughout the year

Following this analysis, the following list of material topics was reviewed and approved by our Senior Executive team.

### Product Safety

| Material Topic             | GRI Standard                             | Disclosure | More details / Page number      |
|----------------------------|--|------------|---------------------------------|
| Sustainable innovation     | GRI 203: Indirect economic impacts 2016  | 203-2      | Innovating our innovation / 38  |
| Customer health and safety | GRI 416: Customer health and safety 2016 | 416-1      | Maintaining product safety / 73 |
| Product transparency       | GRI 417: Marketing and labeling 2016     | 417-1      | Maintaining product safety / 73 |

### Environmental Sustainability

| Material Topic         | GRI Standard                      | Disclosure                        | More details / Page number      |
|------------------------|-----------------------------------|-----------------------------------|---------------------------------|
| Energy consumption     | GRI 302: Energy 2016              | 302-1, 302-3                      | Protecting the environment / 85 |
| Water management       | GRI 303: Water 2016               | 303-1, 303-2                      | Protecting the environment / 85 |
| Biodiversity           | GRI 304: Biodiversity 2016        | 304-2, 304-3, 304-4               | Protecting the environment / 85 |
| Reduction of emissions | GRI 305: Emissions 2016           | 305-1, 305-2, 305-4, 305-6, 305-7 | Protecting the environment / 85 |
| Waste management       | GRI 306: Effluents and waste 2016 | 306-1, 306-2, 306-3, 306-5        | Protecting the environment / 85 |



## Employees and Communities

| Material Topic                                | GRI Standard                                  | Disclosure   | More details / Page number     |
|---|---|--------------|--------------------------------|
| Organizational culture and social development | GRI 404: Training and education 2016          | 404-1, 404-2 | Empowering our people / 76     |
| Diversity and equal opportunities             | GRI 405: Diversity and equal opportunity 2016 | 405-1        | Empowering our people / 76     |
| Occupational health and safety                | GRI 403: Occupational health and safety 2016  | 403-1, 403-2 | Empowering our people / 76     |
| Social investment                             | GRI 413: Local communities 2016               | 413-1        | Programs for local impact / 94 |
|   | GRI 203: Indirect economic impacts 2016       | 203-1        | Programs for local impact / 94 |

## Governance and Risk Management

| Material Topic                  | GRI Standard                       | Disclosure | More details / Page number                     |
|---------------------------------|------------------------------------|------------|--|
| Ethical behavior and compliance | GRI 205: Anti-corruption 2016      | 205-2      | Upholding governance, compliance & ethics / 69 |
| Climate change risk             | GRI 201: Economic performance 2016 | 201-2      | GRI Content index / 111                        |





### 3 Sustainable Solutions

At Orbia, we aim to deliver services that address our customers' needs so that, together, we can contribute to making life better while solving today's unique social and environmental challenges. **We offer a wide range of value-added materials, finished products and solutions that contribute to the success of our clients,** improve people's lives and build a more sustainable world.



**We help deliver fresh water** where people need it with state-of-the-art water management solutions for homes and buildings, as well as rainwater, wastewater, sanitation and drainage systems for cities.



**We play a critical role in increasing the world's connectivity** through advanced data transfer systems that deliver more information at higher speeds.



**We help farmers grow more food with less water** with intelligent irrigation solutions and farm-management techniques.



**We advance access to healthcare** through life-supporting PVC-based products for essential use in hospitals, clinics and healthcare centers, and propellant gases for inhaler products used by millions of patients around the world.



**We create new possibilities to make living and working easier** and better through our flexible, versatile, specialty vinyl derivatives that touch the lives of people everywhere through the thousands of consumer, household and industrial product developments our materials enable.

Operating from 19 Research and Development facilities around the world, we invest significantly in innovation processes with our teams that include more than **250 scientists, engineers and agronomists**. In 2018, our investment in R&D was **\$41 million**.



## Innovating our Innovation

At Orbia we recognize the importance of innovation to secure our growth, maintain leadership in our industries and engage in new markets - and in doing so, enhance the quality of life.

Innovation at Orbia has been achieved through the acquisition of new companies and technologies as well as through our in-house research and development processes, proprietary to our each of our operating companies, with their unique areas of expertise.



The combination of acquired and developed innovation has led us to develop solutions for the construction, services, civil infrastructure, water conduction, basic sanitation, transport, energy and telecommunications industries. Please read about some of our recent innovative solutions in the following pages of this report. However, as we grow, we see the need to innovate even our own innovation process. We aim to better leverage our scale, share knowledge within our different business groups and operating units, and develop new ideas and applications for existing technology. To achieve this, we are establishing an innovation ecosystem comprised of:



**Lighthouse:** an innovation lab that will provide dedicated teams for top priority projects.



**Corporate venture capital:** seeking new technologies and investing in promising opportunities.



**Open innovation:** engaging and partnering with startups to advance early-stage technologies that hold strategic promise.



**In-house innovation:** empowering employees to suggest ideas and developing a robust platform to coach these ideas all the way to commercialization.

Additionally, we have taken steps to create a global innovation platform across all Orbia R&D units to encourage a culture of innovation. We are looking to establish a framework that all our businesses can apply to accelerate the pace of innovation in a clear and structured process. To get things moving, we created a Global Innovation Forum to establish the way forward as a global team.





## Future-Fitting to Support Urbanization

Today, 55% of the world's population lives in urban areas. By 2050, it is forecast that 68% of the global population will be city-dwellers. The migration of millions to cities carries far-reaching social and environmental implications, not least of which is the need for the development of sustainable infrastructure and construction that aligns with the vision of long-term global prosperity and planetary stewardship.



**At Orbia, we offer a wide range of sustainable solutions for building and construction, as well as city infrastructure.** As a leading manufacturer of polyvinyl chloride (PVC), we supply the third most popular plastic in the world and a very widely used material in the building and infrastructure market. As one of the largest global suppliers of conduits for fiber-optic and other cables, we play a strong role in equipping city infrastructure for data, water, power and other smart network systems that form the backbone of city life. As an innovative manufacturer of sewerage solutions, we help cities manage the increasingly concerning problems of drainage and wastewater removal that are exacerbated as population density grows. At Orbia, we are playing a part in the urban revolution through hundreds of ways that city-dwellers don't realize

while they enjoy the benefits of modern living, and those in developing countries gain first-time access to new services that improve their lives.

**By providing a range of sustainable solutions that support building and infrastructure, we play an important role in advancing the United Nations Sustainable Development Goal #11: Make cities and human settlements inclusive, safe, resilient and sustainable; as well as Sustainable Development Goal #6: Ensure availability and sustainable management of water and sanitation for all.**



## Cycleways of the Future



In 2018, we piloted the first-ever **cycle path made of recycled plastic**, offering the promise of a revolution in cycleway construction to enhance urban efficiency, sustainability and to ease the complexities of managing road transportation infrastructure.

The cycle path was first piloted in Zwolle in the Netherlands in September 2018 and more than 124,000 cycles used the road during the pilot phase. **PlasticRoad showed stability at temperatures from 20° to minus 5° Celsius with no wear or tear.** A second pilot in the town of Giethoorn, also in the Netherlands, confirmed our findings. Our next pilot in 2019 will be in a parking lot, to test the PlasticRoad under more challenging conditions.

As we continue to develop PlasticRoad and test its viability for more forms of urban transportation, we



see potential uses in smart city applications, incorporating sensors for assessing traffic congestion, road use and weather conditions. The road could also be used in parking spaces and even to providing charging points for electric vehicles. We are excited about the potential of our PlasticRoad to future fit cities for sustainable living and growth.

PlasticRoad is a prefabricated, modular and hollow bicycle path built of recycled plastic.

Its benefits include:

- **Faster and more efficient construction** and maintenance compared to traditional road structures due to prefabrication, light weight and modular design
- **The ability to store**, move and infiltrate water to prevent flooding during heavy rainfall
- **A significantly smaller carbon footprint** than traditional road structures thanks to the circularity of plastics, the longer lifespan of the road and an 85% reduction in logistics involved in its installation

PlasticRoad was developed by a trio of leaders in their respective fields:

- **KWS, a VolkerWessels company**, a market leader in road construction in the Netherlands
- **Total**, an integrated global energy producer and provider, and **Orbia's Wavin**, the European market leader in the field of plastic pipe systems and solutions for sustainable rainwater management



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“So far, PlasticRoad has drawn interest from all over the world and captured the attention of many municipalities. City-leaders want to contribute to making the world greener and are looking for solutions for the challenges of the future. The PlasticRoad bike path is the first step in the ongoing journey towards building sustainable roads and we are proud to be part of it.”

**Maarten Roef**

President, Building and Infrastructure

”



**PlasticRoad is fully recyclable.** New PlasticRoad can be produced from old PlasticRoad, although the road's lifetime is expected to be three times that of an asphalt road so it might be some time before there is old PlasticRoad available to recycle!

**Around 70% of the plastic** used to produce PlasticRoad currently **comes from recycled post-consumer plastics**, and we are working towards sourcing 100% fully recycled plastic to produce the road in the future.

#### **PlasticRoad Awards**

In 2018, **PlasticRoad won the Cobouw Award in the 'best product' category.** Cobouw is a renowned Dutch publication for the construction and infrastructure sector.

In 2019, PlasticRoad won the **InfraTech Innovation Prize 2019** by the Dutch Ministry of Infrastructure and Public Works.

Read more about our innovative PlasticRoad here: [www.plasticroad.eu/en](http://www.plasticroad.eu/en)

## A Road Gully to Solve an Urban Challenge



Urbanization brings new challenges for city planners. Ageing sewerage infrastructure, modern urban planning and other environmental considerations have led to some acute issues in water drainage in cities. Some gullies cannot drain the rainwater away fast enough and will therefore bubble up and overflow into the street – creating stagnant water. Blocked gullies create unsafe road conditions, yet unblocking or repairing them is costly and inconvenient. This poses a serious problem for municipalities and residents.

Following consultation with municipalities, sewer maintenance companies and contractors to understand their challenges and needs, **Orbia designed a road gully to overcome the dual challenges of improving safety while reducing repair costs.** The gully was launched in 2018.

By providing this new solution, we address the connected challenges posed by flood waters, climate change and urban development, helping improve the quality of life for city-dwellers.

### Our Future-Fit Road Gully



#### The road gully:

- **Provides access** to manholes and inspection chambers
- **Is made from post-consumer materials** (recycled polypropylene) from the automotive industry for gravity sewage systems and a special piping for pressure systems
- **Is easy to install** - twice as fast as regular gullies and with just one operator, without the need for lifting equipment
- **Needs less maintenance** through its lifecycle
- Offers strong hydraulic performance
- **Is compliant** with different local standards for European countries

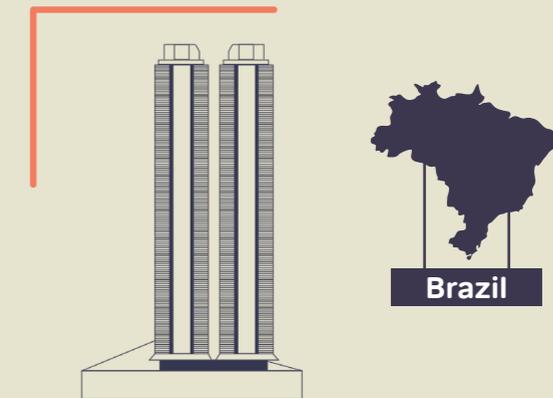
## Construction for Better Living and Working

Orbia solutions are widely used in some of the most prestigious and ambitious construction projects in the world, providing new living, working or recreational spaces to improve the lives of local citizens and create attractive urban landscapes.

In El Salvador, we supported work on the most modern building in the country, the Insigne building by Calidad Inmobiliaria in San Salvador. Insigne has 21 floors of office space and was built using our Amanco solutions for drinking water, drainage, and storm water, as well as utilizing our pumps and valves throughout the building. Use of Building Information Modeling (BIM) technology enabled the most efficient design and optimal use of materials which achieved **50% reduction in construction waste**. **Trenchless installation of pipes helped avoid disruption to the local area during construction.**

In Brazil, we continue to support construction of what at 275 meters will be Brazil's tallest skyscraper: the Yachthouse in Balneario Camboriu,

scheduled for completion in 2020. The Yachthouse includes two 81-floor residential towers. Our Building and Infrastructure group is providing the hot and cold-water, sewerage, rainwater drainage and fire protection systems through the Amanco brand.



### Yachthouse

We provided the internal infrastructure including hot and cold water systems.



### Insigne

Use of 3D Building Information Modeling (BIM) technology enabled the most efficient design and optimal use of materials.

## Protecting Critical Oil Supplies



Among the special uses of our uniquely designed conduits is our collaboration in Canada with Hifi Engineering, a leading provider of sensing and monitoring technology for oil and gas pipelines, including other applications. A key priority for pipeline operators is to ensure the pipes do not suffer damage or leakage of any kind. Hifi Engineering's sensing technology is deployed via fiber optic cable carried in Orbia's Dura-Line conduits adjacent to the pipelines. This system offers unprecedented protection for oil and gas pipelines and **provides real-time information about the integrity of the installed pipes, giving operators the ability to prevent potentially catastrophic environmental damage.** We have worked with HiFi engineering for more than a year to develop this solution, now deployed in Canada and other countries.



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“We are excited about helping scale this technology to further support city infrastructures and environmental protection. For this reason, we became members of the Fiber Optic Sensing Association, working with other industry players to develop innovative technical solutions and support changes in public policy to enable their more extensive deployment.”

**Tim Grimsley**

Vice President, Global Customer Engagement, Datacom

”

## Going to the Opera? Soon to be Better in Prague



Madame Butterfly would have been delighted! Our renovations of the State Opera House in Prague are recreating the glory of this iconic theater. The opera house, which opened in 1888, is in dire need of renovation. The biggest issues with the historic building are the distribution systems – particularly the wiring, water and waste. Orbia was thrilled to accept the challenge of helping restore this UNESCO-protected building, while deploying the most advanced solutions for water, waste and drainage that we can offer.

Using advanced Building Information Modeling technology, BIM Revit, the entire internal building structure was scanned and demolished digitally. Then, Orbia developed plans to reconstruct the State Opera House **to provide highly efficient hot and cold water, and soil and waste piping installations. The solution uses Wavin-brand silent systems which limit noise from drainage, a significant feature to such a building.**

While extensive remodeling is in progress, the antique artwork and historic façade of the building remain untouched and intact. Renovation work is scheduled to be completed in 2019, enabling the thousands of visitors to the State Opera House each year to enjoy a cultural experience in a historic, yet efficient and climate-friendly building.



## Connectivity is a Way of Life



Connectivity is transforming the world, and it is doing so at an increasingly rapid pace. Within the next few years, 5G will transform internet capabilities and the Internet of Things (IOT) will connect billions of intelligent devices. In the near future, unlimited streaming, autonomous cars, remote open-heart surgery, infinite e-commerce, global online education and unprecedented deployment of technology affecting every facet of our lives will be our new reality. The hardware and networks required to support this change are now being developed. Our Orbia Datacom business **supports the connectivity infrastructure solutions that underpin the scaling of 5G and IOT.**

One of the biggest limitations to the growth of fiber optic data transport solutions for 5G is the pace of upgrade of existing cable systems. New fiber optic installations are costly and time consuming in a period where all providers are racing to expand their services using new technology. Our solution, FuturePath Hybrid™, launched in 2018, goes a long way to solving these issues. Offering a combination of three standard ducts and three micro ducts in one single conduit, customers can install one line and obtain six new pathways for fiber optic cables. **With half the time required to install and double the amount of data transport space in one conduit,** we offer service providers a route to faster, more efficient, less costly and fully reliable 5G-ready service.



In **2018** we manufactured more than **400 million** meters of conduit – enough to circle planet Earth 10 times.

**Orbia's Datacom group is the only global manufacturer of communications conduit,** the largest conduit company in North America, and has worked hand-in-hand with some of the largest communications service providers for over two decades.



“We know for a fact that economies that make best use of technology are more competitive and offer a higher standard of living for their citizens. At Orbia, the sheer scale and global presence of our datacom offerings positions us at the heart of economic growth. All new technological developments need connectivity. Our products help service providers build their basic connectivity layer. We are playing a significant role in the spread of technology to all corners of the world, and I am proud of that.”

**Peter Hajdu**  
President, Datacom



## Everywhere in Healthcare

If you are one of the 100 million people in all corners of the world who uses an inhaler to control your asthma, chances are that a Orbia propellant is what delivers you with a perfect dose of medication straight to the lungs. If you have ever had a blood infusion, or a saline drip, there's a high probability that the medical bag was made using our polyvinyl chloride (PVC). One in every five fluorine atoms used around the world come from our company.

**3** GOOD HEALTH  
AND WELL-BEING



We remain committed to supporting global healthcare services with day-to-day products used in routine and specialist healthcare that are essential for many medical interventions and treatments. With an everincreasing population that the United Nations estimates will reach 9 billion in 2050 (of whom more than 2 billion will be over the age of 60), the demand for healthcare services will continue to grow. By providing a range of sustainable solutions that support healthcare, we play an important role in advancing the United Nations Sustainable Development Goal #3: Ensure healthy lives and promote well-being for all at all ages.

In the healthcare industry, there are hundreds of uses for PVC, and this versatile, affordable, recyclable product has become a material of choice in hospitals, clinics and other treatment facilities. This is true both for medical equipment as well for the internal fittings in healthcare facilities, where PVC offers major advantages in maintaining hygienic and sterile conditions. The special qualities of PVC make it an optimal choice for all forms of cables, pipes, floorings, window fittings and other fixtures in health centers. At Orbia, our significant support for the healthcare industry contributes to the efficiency of health services around the world. In other words, it's good for our health!

Post-use medical grade **PVC is fully recyclable!**

The two main applications for medically approved PVC compounds are **flexible containers and flexible medical tubing.**

**Orbia is a member of the PVCMed Alliance** representing all parts of the PVC medical industry chain advancing PVC-based products and applications to provide top quality healthcare while being environmentally sustainable. <https://pvcmed.org>

PVC is widely used in the construction of medical facilities such as hospitals and clinics. In flooring, ceiling and wall coverings, **PVC reduces cleaning and prevents the spread of infection with its smooth hygienic surface.**



**Medical grade PVC is used in approximately 40% of all plastic-based medical devices** around the world.

**Fluor-based medical grade propellant** produced by Orbia is used in around **75%** of metered dose inhalers manufactured by pharmaceutical companies for **100 million users around the world.**



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“Vinyl and vinyl compounds are among the most versatile building blocks of so many of the consumer, household and industrial products we use every day around the world, in healthcare and construction, automotive, electronics, textiles and much more. At Orbia, one of the largest providers of vinyl resins and compounds in the world, we thrive on playing a significant role contributing to the efficiency of several industry sectors.”

**Carlos Manrique Rocha**  
President, Vinyl

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## Low-Carbon Treatment for Asthma



At Orbia, we seek to blend science with social and environmental benefit. An estimated 235 million people suffer from asthma globally, according to the World Health Organization, and many use Metered Dose Inhalers (MDIs) powered by propellant gas. Orbia currently supplies around 75% of the leading propellant gas (R134a) for global medical inhaler needs.

We are now working with the healthcare industry to promote the adoption of a next-generation propellant that meets all medical performance requirements while offering a much lower carbon footprint than current propellants.

After significant development efforts, driven by a desire to reduce the global warming impact of MDIs, Orbia Fluor was able to confirm that a hydrofluorocarbon compound, 1,1-difluoroethane, known as HFA-152a, does the job. The global warming potential of HFA-152a is 90% lower than current propellants, meaning MDIs powered by Orbia HFA-152a can lead to a significant reduction in greenhouse gas emissions.



“We are progressing development of HFA 152a with several pharmaceutical companies and expect to introduce Zephex® 152a once all necessary performance, regulatory, quality and safety testing is completed. In this way, we can help people obtain the necessary healthcare treatment while reducing the carbon footprint of the healthcare sector overall. We are proud to be part of a greener propellant future!”

**Sameer Bharadwaj**  
President, Fluor and Compounds



## This One is for Animal Lovers



Orbia cares about health beyond humans. We leverage, as well, our ingenuity to create solutions that support animal wellbeing and sustainable animal agriculture. A specific solution we offer to customers around the world **is a bio-based compound that protects animals from harmful parasites.** Our product, SuperKleen, sold as a PVC dry-blend carrier, is infused with controlled levels of pest or insect repellents according to customer requirements. It is used as an ear tag for livestock to protect them from infestation by parasites or inserted into hives to protect honeybee colonies.

SuperKleen meets the U.S. Environmental Protection Agency (EPA) regulations for products used in animal agriculture, as it is a naturally-derived product that is attractive due to its versatility. In fact, in 2018, we saw several requests from Taiwan and other parts of China with customers looking to use bio-based PVC compound SuperKleen in applications for humans

such as face mask cushions and medical tubing. This just goes to show that caring for animals is always a good thing to do.

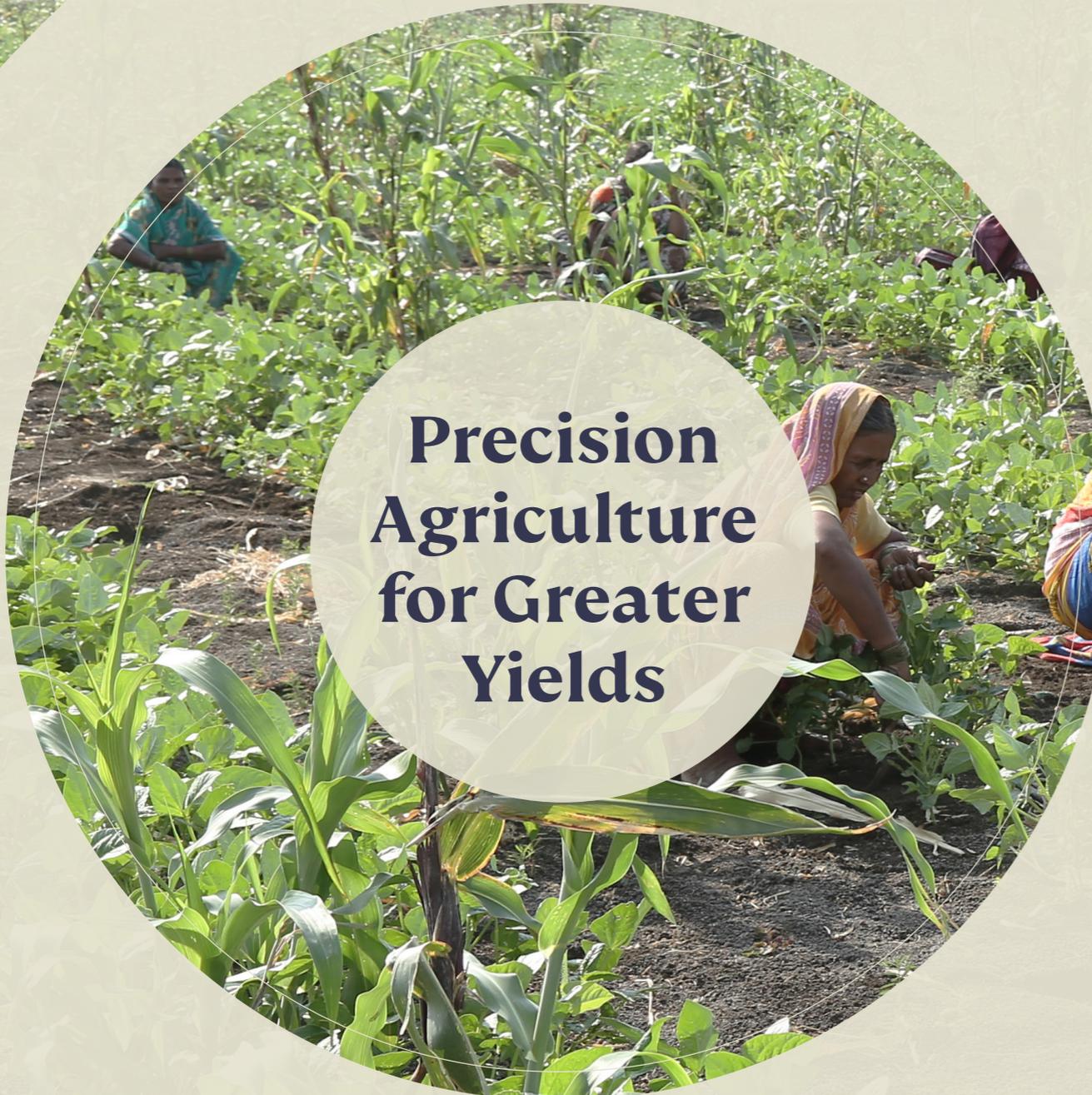


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“We are a specialty polymer compound solutions provider with a diverse portfolio addressing challenging applications at the forefront of materials technology. Our solutions involve working closely with customers to develop proprietary solutions. As we do this, we pay close attention to safety at our manufacturing sites and the impact our manufacturing processes and our material solutions have on the environment. Our goal and commitment is to be a responsible player in this space.”

**Gautam Nivarthi**  
Vice President and General Manager,  
Compounds

”



## Precision Agriculture for Greater Yields

Agriculture is the main source of nutrition for the world's growing population, but it is also a significant source of environmental degradation, with intensive water use, greenhouse gas emissions, waste, deforestation and more. According to Climate Watch (published by the World Resources Institute), 10% of global GHG emissions come from agriculture. **The improvement of agricultural practices, with science-based technology and innovative solutions, can double or triple agricultural yields, halve the energy, water and chemicals used in agriculture and advance the livelihoods of smallholder farmers, who supply more than 80% of the world's agricultural output, helping future generations of farmers prosper.**

2 ZERO  
HUNGER





Orbia's Netafim is the global leader in precision agriculture and sustainable farming practices based on drip irrigation. Drip irrigation allows farmers to improve their yields and income. In emerging economies, many farmers are women, whose empowerment through greater income contributes to the growth and resilience of entire communities. **Netafim-brand solutions advance sustainable productivity by enabling growers to cost-efficiently produce better and higher yields, while using less water, land, nutrients and energy.** Delivering state-of-the-art technology, deep agronomic expertise and training, Orbia is dedicated to helping farmers achieve their goals by growing more with less. By supporting the development of precision agriculture through drip irrigation systems, we play an important role in advancing the United Nations

Sustainable Development Goal #2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture.

Netafim precision irrigation solutions have demonstrated their efficacy with hundreds of food crops in varying climatic and soil conditions. A development focus in recent years has been commodity crops such as corn, sugarcane and rice, which are global food staples. Low margins on these crops have been a barrier to drip irrigation uptake. However, tirelessly working to advance mass adoption of drip irrigation with its proven benefits, Netafim offers tailored solutions and agronomic support for essential commodity crops with positive results for global food security.



“Beyond our unique and advanced products, the precise agriculture solutions we provide include services and solutions such as design, agronomic and technical support, digital farming technology of analysis, monitoring and control systems. These support the company's core purpose of helping the world grow more with less. That adds up to improved food security while saving a significant amount of water and generating economic development for many communities and a major contribution to mitigating climate change.”

**Ran Maidan**  
President, Precision Agriculture



## Irrigation by Collaboration



In 2016, we concluded a multi-year collaborative flagship project that Netafim had supported as a founding partner over several years. The Ramthal Community Drip Irrigation Project in Karnataka, a state in southwestern India, **is the world's largest, fully automated, community-based drip irrigation project.** The project was financed by the Indian government, and included the design, supply and installation of fully automatic irrigation systems, as well as the formation of 23 water user associations and 230 water user groups to secure and regulate efficient use of irrigation water and equitable distribution, based on approved irrigation scheduling and automation.

Netafim India installed drip irrigation systems across 11,700 hectares with fully automated scheduling and a full crop management package, including training for locals on how to use the equipment to cultivate the most profitable crops and optimize land and equipment use. In Octo-



ber 2017, **farmers saw the first monsoon crops in several years** – thanks to drip irrigation that enables crop cultivation when monsoon rains in the Karnataka region are not sufficient to provide water for a full growing cycle.

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“Before drip irrigation we used to get good returns only if it rained well. When rain failed, we lost investment on seeds, fertilizer and labor costs. With no other option, we were forced to sell our land to repay our loans. Now, we have gained good farming skills and experience from Netafim.”

**Woman farmer**  
from the Karnataka region

”



Want to know more?  
[Click here to watch our video](#)



In 2018, the Precision Agriculture business group embarked upon a social impact assessment to monitor the success of the project. Two thirds of the farmers that participated in the project were surveyed. Socio-economic factors such as age, education level, access to banking and mobile phone usage, were measured. Agricultural information such as plot size, irrigation type, mechanization and types of crop was gathered as well. This data will serve as a baseline for further monitoring of yields, crop income and changes in the socio-economic status of the farming communities in the region and provide valuable information on how improvements can be made in Karnataka and similar initiatives identified elsewhere.

### Ramthal Community Irrigation Project



**2,200 km**  
bulk water pipes



**22**  
villages



**7,000**  
farmers



**77,000 km**  
drip irrigation lines



**1.74**  
hectares average farmer plot size



# Irrigation by Artificial Intelligence



Netafim is no stranger to the use of technology in agriculture. Our brand has been steadily enhancing digital offerings and technologies such as cloud computing, big data, the Internet of Things and Artificial Intelligence continue to evolve. Building on these platforms, Netafim leads sustainable agricultural transformation. Digital farming supports leading-edge solutions to global challenges such as food security, water scarcity, land availability and climate change mitigation. Digital farming technologies include irrigation monitoring, water and nutrient control, and real-time adjustments for optimum yields with fewer resources.

In 2018, following three years of development and numerous field trials, Netafim introduced NetBeat™, the first ever digital solution to enable automated irrigation, fertigation and crop protection. Combining everything into one closed-loop platform, **NetBeat enables farmers to monitor, analyze and control irrigation systems remotely.** In addition, NetBeat features crop models for 15 different crops, incorporating 50 years of amassed data and agronomic and hydraulic experience at Netafim. It also uses the input of 150 in-house agronomists and other industry best practice and statistics. NetBeat calibrates itself using these combined data inputs to provide farmers with growing models that are crop, geography, climate and weather-specific. Once in the field, NetBeat continually collects weather, soil and plant conditions, data through sensors and weather stations, comparing live data with the crop growth protocol and making automatic irrigation adjustments.

Since the launch of NetBeat, farmers in **15 countries including India, Brazil, Australia and Japan have installed the system** and are starting to evaluate the benefits. As the main growing seasons are through the spring and summer, we expect to have detailed results through 2019.



“NetBeat is the first system in the world that provides a solution for all elements together: monitoring field conditions, collecting and analyzing data, delivering recommendations for irrigation and fertigation, and automated control of the full growing cycle. Results we have seen across the world are truly incredible. This is just the start of our digital farming revolution.”

**Guy Leventon**  
Head of Digital Farming,  
Precision Agriculture

“We were pleased to be an early adopter of NetBeat technology. We are firm believers in the power of technology to transform the way we live and work, so farming should be no exception. We find NetBeat easy to use and far less energy-intensive than our previous irrigation systems!”

**Farmer in Japan**

## Irrigation DripByDrip



In 2018, our Netafim brand continued its engagement with multinational life sciences company Bayer, through its Crop Science Division, on a new crop protection approach called “DripByDrip”. DripByDrip is the targeted application of Bayer’s crop protection products through Netafim’s irrigation systems, enabling direct, controlled administration of crop protection to specific parts of the plant roots. A very important advantage of the new system is its high safety level for the farmer. It is a closed transfer system, so that the farmer does not touch, smell or have any direct contact with the crop protection product. DripByDrip also **minimizes quantities of crop protection products leaching into the ground and contaminating subsurface soil and water, as well as reducing chemical residues on fruit and vegetables.**



In joint trials of DripByDrip, **yields increased, and net revenues rose due to improved quality crops**, and the number of crop protection product applications was reduced by up to 53%.





## Mitigating Climate Change

The construction and infrastructure sectors consume a large part of the world's energy and contribute to global climate change through greenhouse gas emissions. Estimates are that building construction and renovations account for 40% of energy consumption in developed economies. The latest special report from the Intergovernmental Panel on Climate Change (IPCC) - the United Nations body for assessing the science related to climate change – sets the ambitious goal of capping global warming at 1.5°C above pre-industrial levels. Achieving this goal will require major changes in the way industry consumes energy.

**At Orbia, we offer a wide range of Smart energy-saving solutions, recycling and construction optimization technology.** In this way, Orbia is contributing to advancing Sustainable Development Goal #9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation, as well as Sustainable Development Goal #11: Make cities and human settlements inclusive, safe, resilient and sustainable.

11 SUSTAINABLE CITIES AND COMMUNITIES



9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



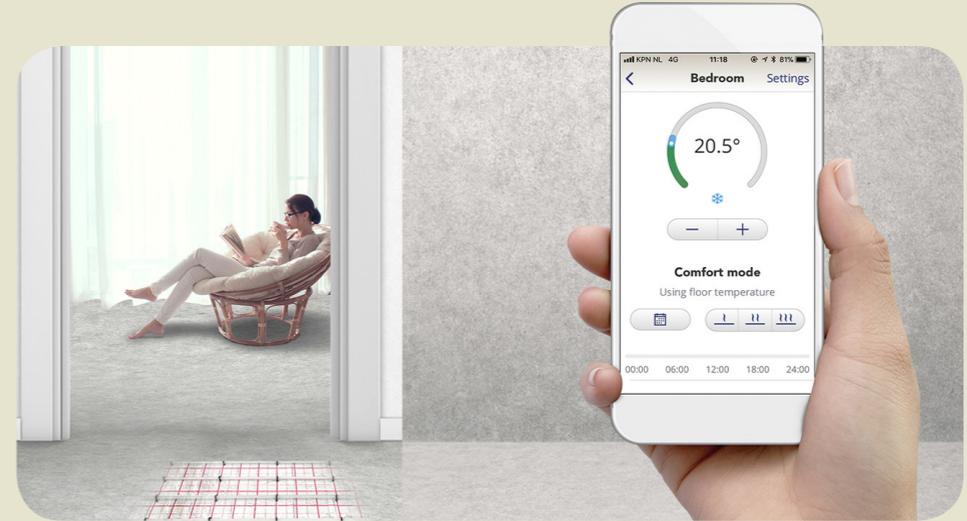


## Effortless Indoor Climate Control



Indoor climate control is a major focus of the construction industry to help gain energy efficiencies and reduce the environmental footprint of homes and buildings. To support this ambition, in 2018, we introduced Wavin Sentio - a simple to install, smart, indoor climate control system for room-by-room heating and cooling. Smart “zone heating” can reduce energy consumption by up to 21% compared to use of single thermostat control. This is because **Wavin Sentio allows the user to control heating in each room, instead of using a single system to cover the entire home.**

The Sentio system includes the Central Control Unit (CCU), extension units, room thermostats and sensors, an intuitive App and an LCD touch screen, delivering underfloor comfortable heating and cooling solutions that are very straightforward to install and use. Throughout the innovation process, we involved installers from various European countries who tested Sentio extensively and reached out to customer end users for their feedback. By taking the effort out of temperature management, **we enable installers and users to save energy and resources.**



“We utilize Sentio controls on several projects due to its sleek design and easy control of the system via an app. Its integration with smartphone technology has been positive for our clients. For us, it is also a lot easier to install and the wiring has become a lot simpler than other systems.”

**AD Mechanical, UK**



**Smart zone heating can reduce by up to 21%** of energy consumption compared to use of single thermostat control.



**The Smart Indoor Climate Market grew 48%** in 2018 and is expected to reach €6 billion in Europe alone in 2019.





## Making Heating Sustainable



Reducing global energy consumption in cities is crucial to achieving global energy reduction and climate change goals. A key solution to reducing the energy dependency and costs of municipalities is district heating, which is a lower-cost option than batteries for storing energy.

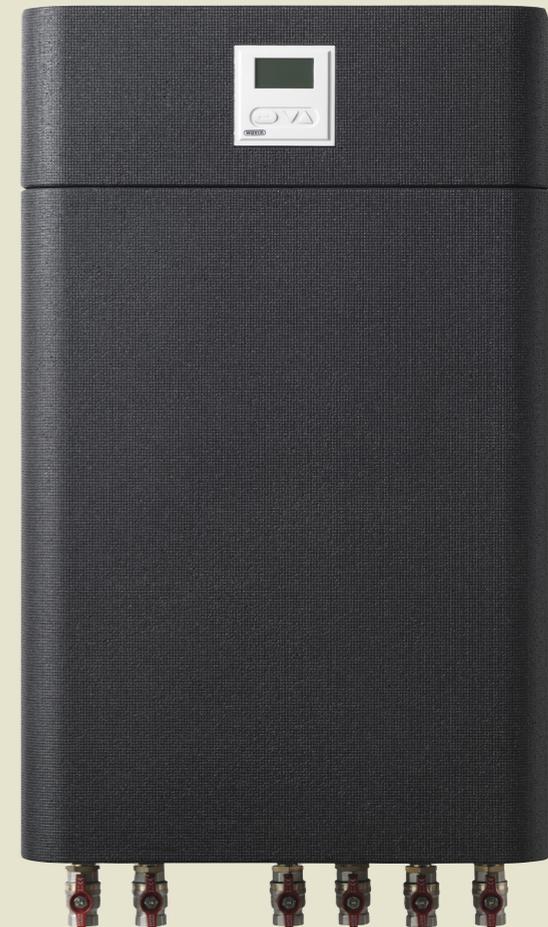


A recent report by Heat Roadmap Europe suggested that the EU should move from 10% to 50% use of district heating by 2050 to meet its energy efficiency goals.

In 2018, Orbia introduced Calefa, a digital heat interface unit for end-users in district heating systems. Installed in homes or offices, **Calefa enables savings of 40% or more on standard energy bills.** Calefa operates intuitively and, once accustomed to users' needs, self-adjusts for optimum energy without user intervention. It also enables limited circular flow of hot water in the secondary pipes to keep them warm enough for an almost immediate hot water flow upon demand, reducing water heating requirements and water waste.



District heating is based on centralized heat generation with a flexible heat source. **Different energy types are combined, switching from one to another for optimum efficiency. Energy types could include low carbon options such as waste combustion, biomass, solar panels and natural gas.** Typically, such systems are 100 times cheaper than battery-stored energy.





## Recycling Refrigerants



Japan

Orbia in Japan has pioneered a recycling initiative to help reduce the global warming impact of older generation refrigerants.

In 2018, Orbia established a new facility for refrigerant recycling and infrastructure. Within the first year of operation, **Orbia recycled 479 metric tons of propellants, avoiding more than 1 million tons of greenhouse gas emissions.**

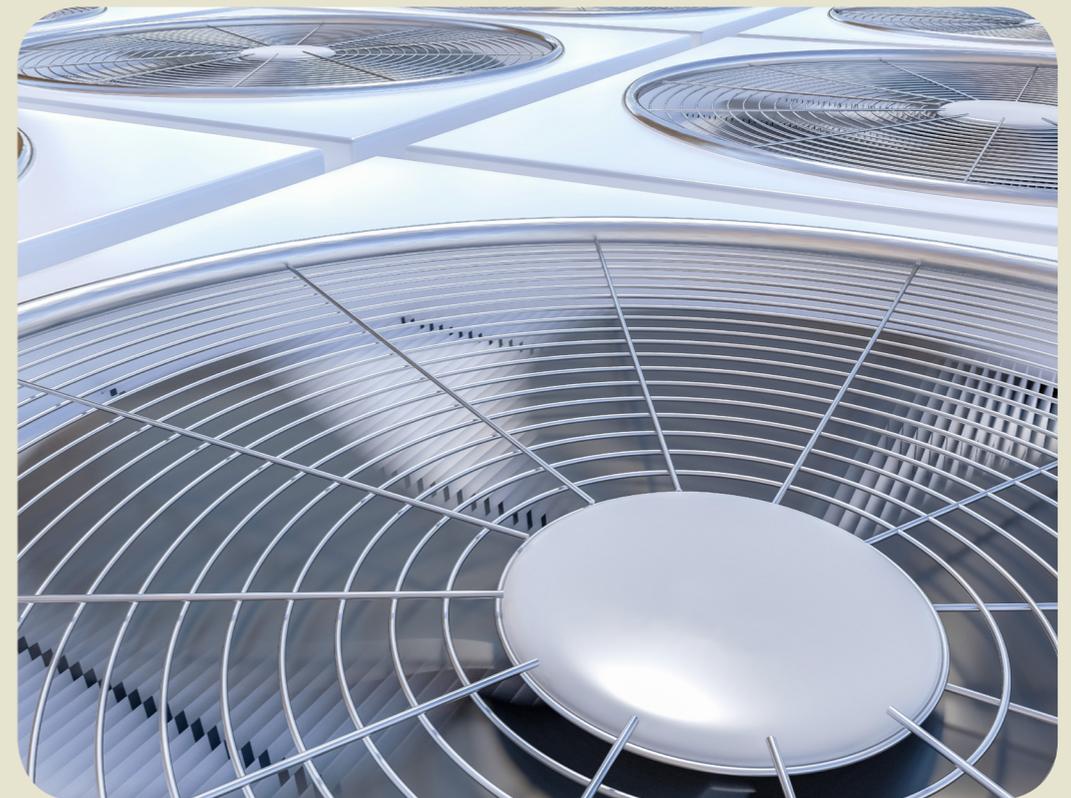
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“We expect the refrigerant recycling demand to become massive in Japan and in other countries. This is recognized by the government of Japan as a business which contributes to the Japanese objective of reducing high global warming substances”.

**Gregg Smith**

Vice President and General Manager,  
Fluor

”



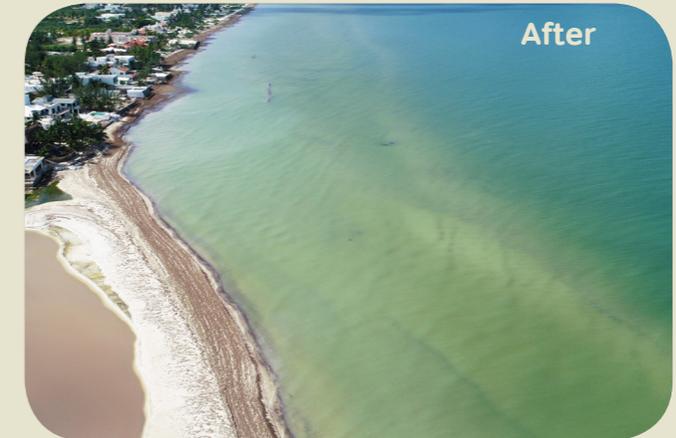
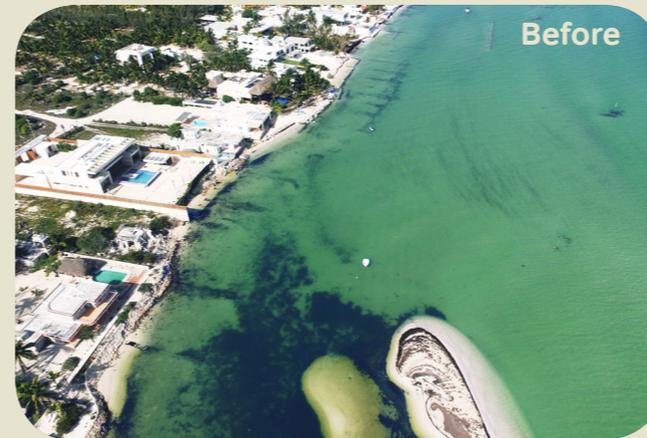


## Protecting the Coastline in Mexico



Coastal erosion was threatening waterfront properties on Mexico's Yucatan peninsula until an innovative Orbia solution helped restore the beach and protect homes. At the beachside resort town of Chicxulub, tidal movements and extreme weather conditions are changing the local geography. The nearby Progreso pier, at 6.5 km, is mostly solid construction and therefore blocks the natural passage of sediment, accelerating erosion and threatening beachfront properties along the coastline.

A Orbia geostructure, consisting of a 20 meter-long tube of woven geotextile made from polypropylene, was placed near the tideline and filled with water and sand. After the water filtered out, a solid breakwater of hard-packed sand was left. Over the weeks that followed, **the natural tide action helped fill the area between the geotextile and the shore, creating a new beach to welcome locals and tourists to the area.**



“

“This solution is not only impressive, it's permanent. With the geotextile tube in place, only very rare and strong phenomena – like a Category 5 hurricane – will be able to erode the beach, and even then, it will recover.”

**Rodrigo Pinzón**  
General Director Geosynthetics,  
Building and Infrastructure

”



## Helping Solve Water Challenges

In 2015, 29% of people lacked safely-managed drinking water supplies, and 61% were without safely-managed sanitation services. While these statistics, published by the United Nations, may have improved over the past few years, much remains to be done to provide universal access to water and sanitation. In fast-growing cities, water stress comes in different forms, ranging from a lack of infrastructure needed to maintain supply of potable water to all inhabitants, to the need for efficient drainage and the optimization of systems to prevent water leakage and waste.

**Orbia offers a range of water-related solutions to some of the most pressing water challenges around the world including renovation of aging water-delivery infrastructure, urban drainage management, rainwater capture and storage for use in dry areas, and detection technology for water leaks in buildings.** In this way, we support and advance progress towards Sustainable Development Goal #6: Ensure availability and sustainable management of water and sanitation for all.

For example, Compact Pipe is a proven system for the efficient repair of leaks. Compact Pipe is easily installed within existing pipelines without the need for costly and disruptive trench excavation in busy city streets. With over 1.5 million meters installed worldwide, Orbia's flexible Compact Pipe offers an efficient solution to fix old and leaky pipes, and has a service life of more than 80 years, meaning minimal maintenance and replacement costs.

6 CLEAN WATER  
AND SANITATION





## Keeping Cape Town from Running Dry



South Africa

In 2018, the city of Cape Town in South Africa was on the verge of running out of water, following three years of drought and an aging infrastructure that was very complex to maintain. It was estimated that up to a third of city water was wasted through leakage, especially in old steel pipes. To address this issue, our team in Johannesburg responded to the city's water challenge by installing our Compact Pipe within existing infrastructure so as to cause minimum disruption to the city. **We installed six 200-meter sections of Compact Pipe, each of which – weather permitting – was completed in a day with no road closures.**





## Letting no Raindrop go to Waste



Many parts of rural Central America lack access to water through traditional systems. In 2013, Orbia and Care International, in a program funded by the Canadian government, joined forces to develop a technological solution for rainwater catchment in the south of Honduras where annual rainfall occurs principally over a two-month period. A new rainwater catchment system was developed as a simple and inexpensive method for the collection, storage and distribution of water in the home, using geomembrane – a 1 mm thick polyethylene membrane with UV protection. The rain harvest tank is made of this geomembrane and represents the most inexpensive way to store water. Each system can also become a wireless station for collection of local data, with links to rain alerts and other tools such as irrigation software, sewer and drainage maps, virtual flood simulators and more, which can support water or sanitation projects.

Since 2013, **storage systems that can hold more than 80 million liters of rainwater have been installed in Central America using Orbia geomembrane technology**, contributing not only to water conservation but also better hygiene and efficient water management to improve the lives of all those living in the region.

- |                           |                       |
|---------------------------|-----------------------|
| 1 PVC channels or gutters | 6 Geomembrane bag     |
| 2 Sediment filter         | 7 Manual pump         |
| 3 Flowlines               | 8 Elevated tank       |
| 4 Mesh or sieve filter    | 9 Eco-friendly filter |
| 5 Air valve               | 10 Irrigation kit     |





## Water Leaks that Whistle – a World First!

How do you test for leaks after you have finished your water system installation on the building site? To date, you would pressurize your system with water and trace a leak by looking for water dripping from the pipes. But now, there is a cleaner, easier, safer and quicker way! It's one of Orbia's latest innovations, introduced to the market in 2018. It's the world's first acoustic leak alert, based on testing with air, rather than water. The fittings whistle when air escapes through an accidentally unpressed fitting. Just follow the sound and the fitting is found.

Developed as a response to customer needs, in a targeted design process, the **acoustic leak alert transforms construction work, enabling leaks to be detected rapidly, thereby conserving water** and allowing construction plans to proceed without disruption. Initial reactions from our customers are very positive – some have even given an approving whistle!



“When testing with air, the pressure test is no longer a hiccup in the installation phase, as there is no dependency on early water supplies at the building site. An air pressure test can be executed during winter time without the risk of freezing pipes. And leak testing with air has several other advantages; there is no risk of bacterial growth due to water stagnation, it is efficient, and it is ideal for testing prefabricated installations.”

**Ruurd Van Leeuwen**

Wavin European Product Manager  
(Hot & Cold), Building and Infrastructure





**4**  
**Sustainable  
Business**



## **Upholding Governance, Compliance & Ethics**

Our stakeholders expect robust corporate governance, consistent compliance and ethical conduct at all times, and we aim to conduct business to these high standards. From our Board of Directors through our Chief Executive Officer and all our employees, we operate in a culture of the highest standards of legal and ethical behavior and personal accountability.



## Board of Directors

At the end of 2018, Orbia's Board of Directors consisted of 13 members, including non-executive Chairman Juan Pablo del Valle Perochena. Five Board members were independent and two were women.

The Board of Directors maintains three Board Committees:

- **Corporate Practices Committee:** provides opinions and assistance to the Board of Directors in reviewing important reports and transactions; calling shareholder meetings; and in requesting and obtaining opinions from independent third-party experts
- **Audit Committee:** supervises external auditors, analyzes their reports and reports back to the Board of Directors, among other duties
- **Finance Committee:** supports the Board of Directors in fulfilling its responsibilities to shareholders regarding the policies, practices and strategies related to managing financial affairs
- **The Board of Directors receives regular reports on aspects of our sustainability practices from the Chief Executive Officer,** as well as updates relating to current and emerging sustainability risks and opportunities. The Board of Directors provides input and guidance on sustainability matters as needed





## Compliance

We aim for full compliance with applicable laws and regulations in every area of our business and maintain a strong corporate legal and compliance team consisting of 18 in-house lawyers and more than 20 auditors.

Our annual training program is designed to provide all employees with up-to-date training in general compliance topics. In 2018, we completed our compliance training reaching all available employees which we estimate was more than 95%. Our Board of Directors approved our compliance program in 2018.

**Our compliance training pays particular attention to issues related to anti-corruption and antibribery, foreign trade, anti-trust matters, prevention of money laundering, respect for human rights and prevention of modern slavery, as well as compliance in all functional areas of the business including labor practices, health and safety, and environmental law.** Those in specialized, higher-exposure roles received additional training. We maintain a team of more than 100 qualified in-house compliance training specialists from different functional areas in the business who ensure compliance training is conducted throughout the organization.



## Ethical Conduct

Our Code of Ethics guides our company and is a binding requirement for all our Directors, executives and employees. Our global Ethics Committee, made up of senior executives at group level, meets at least once a month to review all ethical issues that arise and to consider responses to emerging issues. In 2019, we plan to reinforce this structure by adding a Business Ethics Committee in each Business Group. These committees will become formal points of accountability for upholding ethical conduct and ensuring training is conducted by Business Group.

We train new employees in our Code of Ethics and provide annual refresher training for current employees. Approximately 25% of employees complete this training online, while other employees participate in classroom training conducted by our in-house team.

Orbia is firmly committed to the **Universal Declaration of Human Rights** adopted by the United Nations and condemns all forms of human rights abuse, as stated in our Human Rights Policy. Our decision to confirm our support for the United Nations Global Compact in 2018 is evidence of our ongoing respect for human rights and responsible conduct.

We operate a whistleblowing mechanism for all reports of breaches or suspected breaches of our Code of Ethics or any other violation of laws and regulations. Anyone may report such breaches without fear of retaliation, including reporting anonymously. All reports are investigated thoroughly and actions, disciplinary if necessary, are taken accordingly.



## Maintaining Product Safety

Product safety is a key concern for our customers and therefore a top priority for Orbia. We comply with all laws and regulations governing product safety and transparency and ensure we provide our customers with all the information they need to safely deploy and where relevant, safely dispose of our products. We also promote the reduction, replacement, or elimination of hazardous materials where feasible. We maintain regular safety reviews of all our products and assess them for potential safety improvements.

**Orbia supports the Strategic Approach for International Chemical Management (SAICM) from the United Nations Environmental Program (UNEP), whose goal is that: “By 2020, chemicals are used and produced in ways that lead to the minimization of significant adverse effects on human health and the environment.”**



## Operating to Globally Recognized Standards

### REACH:

We comply with the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH) requirements for all substances produced or imported in Europe for all relevant operations.

### SAICM:

We support and adhere to The Strategic Approach for International Chemicals Management (SAICM) of the United Nations Environmental Program (UNEP) which promotes the transparent exchange of data and information using a life-cycle approach.

### OECD:

The Organization for Economic Cooperation and Development actively seeks to harmonize the international classification of hazardous chemical products. The classification divides the chemical substances and mixtures into different categories by their physical properties and the risks they pose to health and the environment.





## Embracing a Life-Cycle Perspective

We recognize the importance of identifying and managing the impacts of our products throughout their lifecycle. We perform a toxicological evaluation, when pertinent, of products that we develop, in order to prevent potential negative effects on health and the environment both in the production process as well as during their use. Orbia adopts the precautionary principle for products intended for the medical and food industries through the validation of new raw materials by the U.S. Food and Drug Administration (FDA) based on a range of safety tests.

### Lifecycle Analysis of PVC Resins

In 2018, Orbia performed a Life Cycle Assessment (LCA) to baseline and benchmark our specialty polyvinyl chloride (PVC) resin products and to understand the environmental impacts from cradle to gate, or from raw material extraction to the point of shipment from our facilities. The LCA was conducted according to ISO 14040 and 14044 and was scientifically and critically reviewed.

The key findings were:

1. The raw material and extraction phase, specifically the vinyl chloride monomer (VCM) production, is the key contributor of environmental impacts for PVC resin products.
2. Manufacturing is a secondary major contributor, whereby energy consumption (electricity, natural gas and coal) accounts for the majority of the impacts.

In addition to the efforts listed on the right, we communicated the completion of the LCA to customers through a detailed fact sheet for full transparency.

Furthermore, we conducted additional LCAs for different products and we continue to evaluate the potential opportunities for improvement, based on the outcomes of these analyses.

Considering these findings, we took the several steps to reduce the footprint of our PVC products, including the following:

1. Prepared to change our specialty resins operations in the USA to **renewable electricity**.
2. Diverted capital expenditure towards energy saving initiatives such as **energy-efficient motors, lighting and more**.
3. Increased our focus on **waste minimization** at manufacturing plants to include enhanced monitoring of material produced, off-grade resin use, and resin waste.



## Empowering our People

At Orbia, we aim to create an empowering workplace, driven by people's passion to be creative in delivering solutions to every-day problems and broader social and environmental needs. We cultivate a working environment that promotes innovation and creativity, and we encourage our employees to share in creating value for all those we serve across many industries, communities and societies around the world.



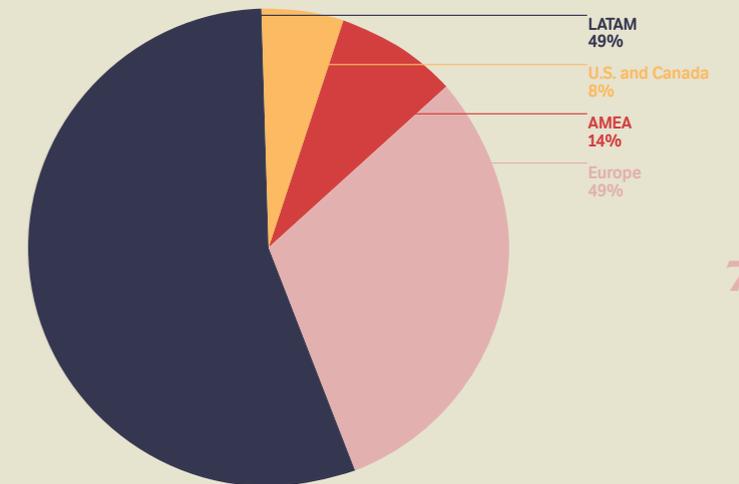
We aim to provide workplace conditions that are attractive, safe and rewarding, offering opportunities for personal growth and development while establishing accountability for meeting goals and targets. We believe in open and often informal channels of communication where all employees can hear and be heard, and all voices are valued. By providing a positive work environment, **Orbia is contributing to advancing Sustainable Development Goal #8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.**

Having grown in recent years through acquisition, we are continuing our journey as a leading global corporation with an objective to align our international workforce behind a single clear identity, with an inspiring shared purpose and collective values. In 2018, we examined our organization across several dimensions and started to map the processes we must put in place to create a future-fit organization and culture to attract, retain, develop and reward our people in a way that aligns with our business strategy, our values, and society's pressing challenges.

During 2018, we defined people development as one of the key strategic pillars of our corporate strategy, supporting our transformation journey in four critical ways:

- **Engage our employees** in the evolution of Orbia's purpose and values
- **Build an environment** to promote a positive employee experience
- **Ensure that employees have the right capabilities** and competencies to be successful
- **Redefine our employer brand** to support our business transformation. Additionally, in 2018 we concluded the implementation of a new technological platform to manage all key Human Resources processes. This initiative, M'People, is transformational in terms of global talent management and serves as a basis for many future people development programs

- At the end of 2018, there were **22,000+** Orbia employees working in more than 40 countries, representing more than 60 nationalities
- **17% of employees** in 2018 were women
- Our people **spent more than 473,000 hours learning new leadership**, professional and technical skills in 2018





# Employee Engagement

In 2018, we conducted Orbia's first global employee engagement survey. The objectives of the survey were to assess the connection of our people to our company's purpose and values and understand to what extent they feel engaged, enabled and energized.

Overall, employee feedback demonstrated a high level of sustainable engagement at 86%, which means employees feel engaged, energized and enabled to do their job. By way of comparison, high-performance companies in our vendor's sample have 89% sustainable engagement. Following the survey, we communicated the results to our employees at all levels and created an action plan to improve our engagement results worldwide. Implementation started in 2018 and will continue through 2019.



## Professional Development

We know that a future-fit organization will require talented and competent people at all levels of the organization, so we invest in creating a workforce that has the skills to perform today and the potential to lead tomorrow. We aim to provide our people with the necessary knowledge and skills to perform their current roles effectively, while offering personal opportunity to enhance leadership and management skills. In this way, we create a platform for our people to progress and achieve their potential while contributing to advancing Orbia's strategic goals.

### Advancing Global Leadership

In 2018, we launched a Global Leadership Program with a recognized business school in the United States, aiming to advance a common global mindset and business language, strengthen leadership skills and capabilities, and improve networking and communication among Orbia's top leaders from different businesses and countries. Our goal is to provide all top leaders with the opportunity to participate in this program in the coming years. One cohort, commenced



in 2018 with 30 participants, and a second will start in 2019.

### Shaping Future-Fit Leaders

As a result of our focus on developing future leaders, we created the e<sup>xp</sup> program, a unique opportunity for international career development that will contribute to the development of talented employees into future-fit leaders.



In 2018, we invested more than **473,000 hours** training employees, equivalent to **22 hours** of training per employee per year.



The program focuses on three areas:

**Experience, exposure and education:** During this 1-year program, participants gain experience and exposure by leading two strategic six-month projects at an international location. They also participate in formal Leadership Programs with Harvard Business Publishing and Harvard Business School Online.

e<sup>xp</sup> Participants are guided by a strong network of support from our current leadership:

**Project Leaders** guide participants in completion of the assigned project.

**Subject Matter Experts** are available to share expertise and advise on specific challenges.

**Mentors** provide year-long support for e<sup>xp</sup> participants, mainly focused on the development of specific competencies.

In 2018, 14 participants from Mexico, Brazil, Ecuador, Peru, Colombia, UK, U.S., Israel and India representing different Business Groups were selected for this transformational program.

We believe this will accelerate their personal and professional growth, creating a cadre of capable young leaders who will play a significant role in Orbia's future, and a positive contribution to society.

### Promoting Digital Learning

We are committed to continuous employee learning and development, and provide tools to facilitate and promote self-development. Our Digital Learning Platform is a way to broaden access and accelerate learning at Orbia.

In 2018, we launched a new Digital Learning Platform with more than 40 initial training modules, including a wide range of topics from leadership to communications, time management to teamwork to finance, compliance and project management, and many more.

**More than 5,000 managers and employees benefited from the Digital Learning Platform in 2018.**

### Performance Management

We promote a high-performance culture that values the professional development of our employees. We have developed a harmonized

performance management process, which in 2018 was implemented globally using our talent management system M'People. For the first time, 100% of our employees in professional positions used the platform to set annual goals, review progress, document formal feedback and conclude the performance review cycle.



## Diversity and Inclusion

We aim to create an organization that embraces diversity and inclusion and offers everyone the chance to advance. Where possible, we encourage the inclusion of local employees, as part of our commitment to strengthening local communities and taking an active part in local social and economic development. In each region of operation, we seek to understand the local fabric of society and aim to reflect it in our own operations.

In 2018, we created a new Diversity and Inclusion Policy that was communicated to all employees with a requirement for adoption throughout our organization and the establishment of KPIs to track progress. [See the policy on our website here.](#)



“Orbia respects values and celebrates the unique attributes, characteristics and mindsets that make each person who they are. We consider diversity and inclusion a driver for purpose-driven organization. We are committed to creating an inclusive working environment. In which employees are able to fulfill their potential and maximize their contribution. We recognize and value the creative potential that individuals of different backgrounds and abilities bring to their work.”

**Orbia Diversity and Inclusion Policy**  
2018



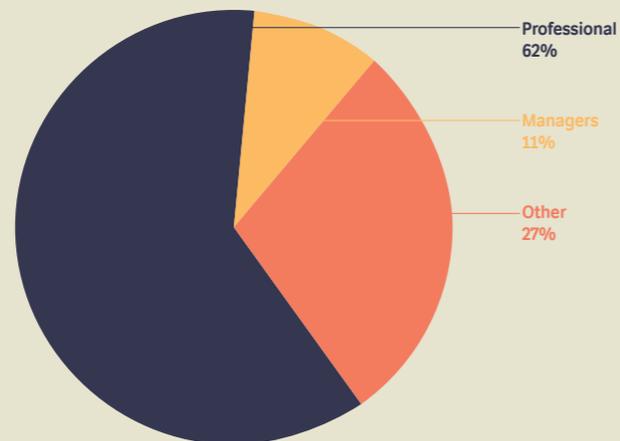


### Women at Orbia

We aim to provide ample opportunity for women to join our business and offer development channels so that they may grow professionally. **Overall, 17% of employees are women** and we aim to increase the proportion of women in coming years. However, 73% of women at Orbia are employed in management or professional roles, demonstrating that women are assuming roles of responsibility and advancing in our companies around the world.

In 2018, we also launched a suite of work-life balance policies to help take the stress out of meeting multiple responsibilities at home and at work and, encourage inclusion of all genders.

Distribution of roles of women at Orbia 2018



### Our Skilled Local Workforce in Colombia

In Orbia's manufacturing operations in Guachene, Colombia, we have always invested in the local community by hiring local and providing them with the skills they need to perform operations in our factory, as well as enabling them to learn a profession that makes them employable in the wider market. We partner with government entities, municipalities and labor organizations to reach potential employees. In 2018, the plant was recognized as an inclusive employer by ANDI (the National Business Association of Colombia) for providing quality employment opportunities.

Today, 92% of the plant workforce of 380 employees are locals and the plant in Guachene is considered a model of ethnic integration in Orbia. We have also created the first generation of engineers, employed in a range of roles in production as well as in supervisory and management roles.

### Welcoming Refugees in Sweden

Our plant in Eskilstuna, Sweden saw an opportunity to support the integration of Syrian refugees, helping advance a culture of solidarity with our community, while addressing our own recruitment needs for our manufacturing facility which employs around 100 people.

We provided roles in our factory for 13 refugees, starting with a six-month trial period of internship where they learned about our operations and new skills to help them play a full role in our plant.

**All 13 refugees are now part of our permanent workforce and most have been able to bring their families into Sweden.** Other Orbia manufacturing operations as well as other local businesses have shown interest in this model and may replicate such a program in their own operations.



## Employee Wellbeing, Health and Safety

We aim to provide a caring, and safe working environment for all our employees, so they can feel empowered to contribute at their best. We do so with a supportive and inclusive organizational culture and human resources policies and frameworks that provide employees with the tools and flexibility to be at their most productive. In 2018 we introduced new policies to enable employees in most of our locations to adopt flexible work hours (job requirements permitting) and to enable remote work within an agreed framework.

### Process Safety Management

We continue to engage our employees in process safety improvements to minimize risk in our manufacturing operations. All our operations have been assessed for process safety risks and we took a systematic approach to resolving all risks and hazards identified. We established an internal audit team with a specific focus on Process Safety Management (PSM) to support the creation of revised safety KPIs and monitor implementation progress at our sites. We revised safety process

management standards for our chemical facilities and **18 out of 19 Orbia chemical facilities already have PSM implementation schedule.** More than 300 employees received training in PSM in 2018 (a 50% increase from 2017).

A worst-case risk scenario analysis was completed for 16 Orbia sites, providing opportunities to implement safeguards for potential safety hazards.

For the first time in 2018, we formally included contractor management in our PSM assessments and standards. We communicated these standards to our strategic contractors and have developed an audit plan to be implemented from 2019.

### Occupational Health and Safety

We invest in occupational health and safety (OHS) and ensure robust processes are in place, always in compliance with legal requirements, and often beyond compliance. We aim to create an uncompromising culture of safety to prevent accidents

and injuries, but if they occur, we examine each case thoroughly and implement corrective actions to prevent recurrence.

Several of our sites are certified to OHSAS standards, while others implement the same degree of care.

**In 2018, 30 Orbia operations were certified to OHSAS Standard.**

Across our operations, we implement the International Safety Rating System (ISRS) and have aligned our global safety management systems to this standard, verified by Norske Veritas. We have been implementing ISRS on a phased basis with a plan to certify all sites by 2020.

**By the end of 2018, 78 sites or 71% of our total operations were ISRS certified.**

We have been working for several years to improve our safety results and set a target to achieve



a 50% reduction of our global accident rate by 2020 (from 2016 levels).

**In 2018, for Orbia legacy operations, we exceeded our target two years ahead of schedule, achieving a 53% reduction versus 2016 (and a 39% reduction versus 2017).**

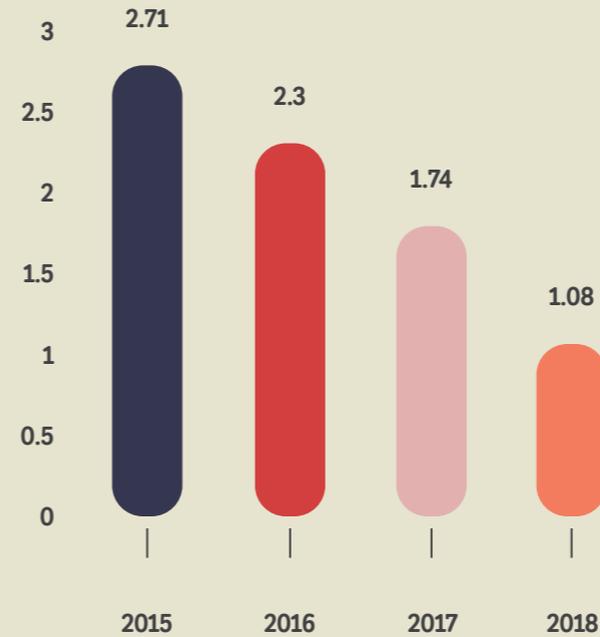
This is a testament to the dedication of our safety leaders and all employees, supported by strong safety programs and continuous training.

However, this performance is not the whole story. In 2018, we were seriously troubled by fatalities in our operations. A Orbia employee died when struck by a forklift truck in our factory in Finland. In addition, three contracted drivers died in road accidents while transporting materials in different parts of our operations. We deeply regret the loss of life while providing a service for our company.

These fatal incidents were investigated by our operations and safety teams and actions were taken to reinforce safety practices and prevent recurrence. We communicated the details of these incidents to our employees and third-party contractors, and intensified communication and training, including a special focus on road safety.

We also communicated to road transport suppliers our expectations that they help keep their employees safe and ensure that all drivers involved in supporting our business are fully trained in all safety matters.

### TRIR\* (Total Recordable Injury Rate)



\*Note: TRIR above refers to employees only and excludes Netafim.



## Protecting the Environment

We believe in a shared future in which we not only minimize our negative effects on the environment, but where we, as a large global business, have a regenerative effect. In other words, at Orbia, we aspire to contribute in a positive way to our shared future and prosperity on the planet. That's why, we integrate sustainable elements into decision making throughout our entire value chain and risk management processes.

Many of our products and services contribute to advancing life while caring for the planet.

For example, our drip irrigation systems help save energy and water, reduce the need for fertilizers that can leach into soil or runoff into rivers, prevent deforestation and more. Our innovative conduits and pipes, water and waste systems improve infrastructure and construction efficiently and sustainably. In all that we do, we aim to demonstrate environmental consciousness.

In addition to our approach to product development, we aim to deliver optimum environmental efficiencies in our own operations around the world. Our environmental management systems in each business unit provide a framework for action and support our quest for continuous improvement. Our Environmental Management System is supported through a range of formal standards and certifications in 18 countries. **In 2018, 60 plants had a valid ISO 14001 certification.**

In 2018, our sites were audited 48 times by external bodies representing standards institutions, customers and other parties, and 39 times by our internal auditors.



Orbia also submits an annual report to CDP (formerly the Carbon Disclosure Project), the largest climate change database in the world.



**The year 2017 was one of the three warmest on record and was 1.1 degrees Celsius above the pre-industrial period.**

In October 2018, the Intergovernmental Panel on Climate Change (IPCC) released a Special Report on Global Warming, determining that achieving a target of 1.5° Celsius rise in temperature above pre-industrial levels will require deep reductions of greenhouse gas emissions and rapid, far-reaching and unprecedented changes in all aspects of society.

**Sustainable Development Goal #13** requires us to take urgent action to combat climate change and its impacts.

**In 2018, Orbia invested \$41 million in environmental control projects, consisting mainly:** optimization and energy saving, water treatment systems, protection against chemical spills, noise reduction and industrial waste management.



## Environmental Goals and Targets

In 2018, we summarize our performance against multi-year energy, greenhouse gas emissions and waste reduction, as well as water reuse targets. **The chart on the following page shows our cumulative performance against these targets, which expired in 2018.**

As can be seen, we have failed to meet our energy target. There are multiple reasons for this, including the considerable degree of change in our business over the past 10 years, with several mergers and acquisitions, changes in manufacturing plants and processes, and a very different overall product mix and volume by product – all of which influence energy efficiencies on a per-ton of product basis. Notwithstanding, we sincerely regret that we have under-delivered against this commitment to our stakeholders.

In 2018, we undertook a robust review of our long-term energy and climate strategy as part of our business transformation. We analyzed the environmental impacts of our current operation-

al landscape in detail (now including Netafim, our most recent acquisition in 2018). We also subjected our sustainability performance data to rigorous external assurance in order to confidently establish a new baseline. Our CEO and Business Group leaders are firmly committed to driving energy and emissions reductions in the coming years, and, as we define new multi-year targets, we are establishing robust controls and more frequent internal reporting and review mechanisms in order to ensure we remain on track to meet renewed commitments. We will establish new targets for 2030.

**We are pleased to report that we not only met our water and waste targets in 2018, but substantially exceeded them.** In these areas, we have analyzed our performance in line with changes in the business over the past 10 years, and are in the process of establishing plans to improve even further in coming years.



# Performance Against 2018 Targets





## Improving Energy Efficiency

We support global efforts to mitigate climate change and continue to deliver energy efficiencies and reduce greenhouse gas (GHG) emissions throughout our operations. Some examples of continued improved energy performance in 2018 include:

- Installation of **highly energy-efficient engines** for pumping equipment in four vinyl manufacturing plants in Latin America
- Installation of **new speed controllers** in engines in Mexico
- Installation of **PVC resin drying equipment with increased energy efficiency** in two vinyl manufacturing plants
- Installation of **chilled water pipes in Mexico to reduce energy** required for cooling
- Improved **control of downtime in the PVC pipe production** process in Colombia



## A Smart Lighting Solution

In 2018, we piloted a smart lighting solution in Germany: lighting as a service (LaaS). This enables our plant to procure lighting, rather than purchasing lightbulbs. With LaaS, our service provider installs and maintains all the necessary lighting solutions

in our facility. **The pilot proved itself even beyond expectation with a 78% reduction in lighting energy consumption** over a period of six months. We expect to seek opportunities to scale this approach at other plants in Europe and beyond.



## Moving Towards Renewable Energy

In 2018, we laid the foundation for significant adoption of renewable energy to support low-carbon manufacturing in the UK. **Our Wavin UK operation contracted renewable energy specialists Ørsted to supply natural gas and 100% renewable electricity from April 2019.** The renewable electricity will come from Ørsted's 11 operational wind farms in the UK and is certified by REGOs (Renewable Energy Guarantees of Origin), which guarantee that energy is provided from a renewable source. The renewable energy supply will reduce our GHG emissions in the UK by almost 14,000 metric tons per year.

## Reusing Steel to Avoid Landfill

We aim to prevent all waste at source and divert waste from landfill as much as possible through recycling, composting and other means. Dura-Line, our datacom conduit manufacturing arm, is the leader in this product category in the U.S. market. To serve our many customers at thousands of locations, we ship datacom conduits on large reels for use at the customer location.

For years we have maintained an active return program that enables reels to be reused rather than sent to landfill. **In 2018, our customers returned more than 85,750 reels for reuse, representing almost 7,500 tons of waste avoided.**



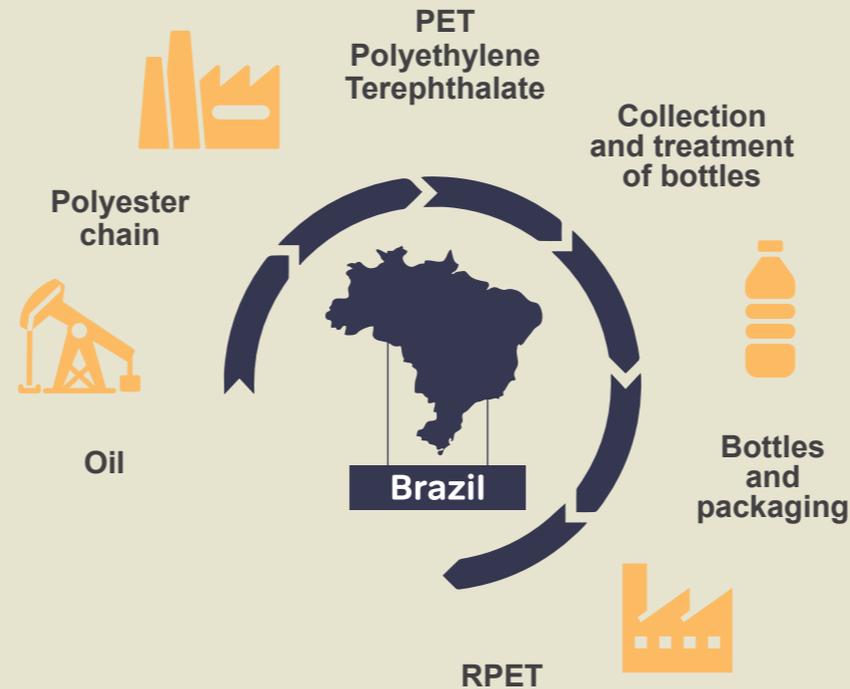


## Recycling as a Priority



We continue to place emphasis on recycling as a way of conserving resources and reducing our impact on the environment. For example, our facility in Sao Jose dos Campos in Brazil manufactures polyester non-woven geotextiles, and over 20 years ago, we incorporated recycled polyethylene (RPET) bottles in our manufacturing process.

In Ecuador, in 2018 we commenced a pilot program for securing increased recyclable content for our manufacturing processes. **We connected to a recycling organization that includes a local network of more than 5,000 microentrepreneurs**, many of whom are in the vicinity of our manufacturing operations. We developed the specification for our plastic compound using collected recycled materials to be used in our production of molded and extruded products. During 2019, we are conducting extensive testing and expect to commercialize in 2020, selling PVC products with greater recycled content.



**In Brazil, we have recycled more than 120 million PET bottles** for use in our manufacturing facility over the past 20 years.

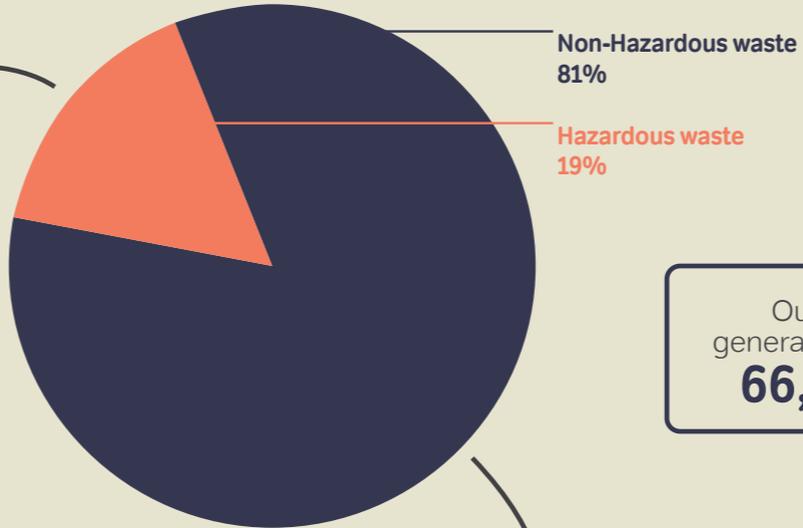
**Our geotextile manufacturing operation in Brazil uses 100% post-consumer recycled plastics.**



In our Chinley facility in the UK, we operate a recycling plant capable of recycling 9,000 tons PVC products per year. To source raw material for recycling, we maintain a collection network with PVC window fabricators around the UK, placing cages for disposal of their window profile offcuts. We source approximately 1,200 tons of plastic per year this way. **Our plant recycles these offcuts to deliver a high-quality powder ready for direct sale or use in PVC compounds that we manufacture.** In 2018, recycled products represented 4.2% of our sales of compounds.

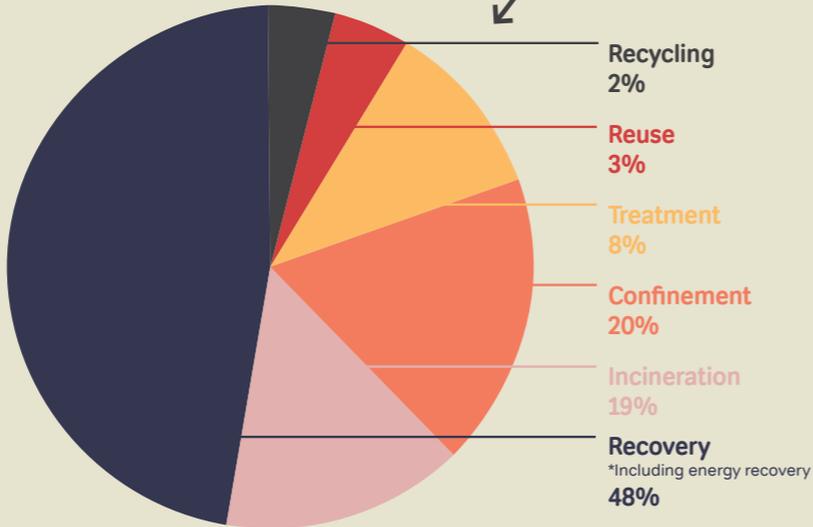


### Total waste

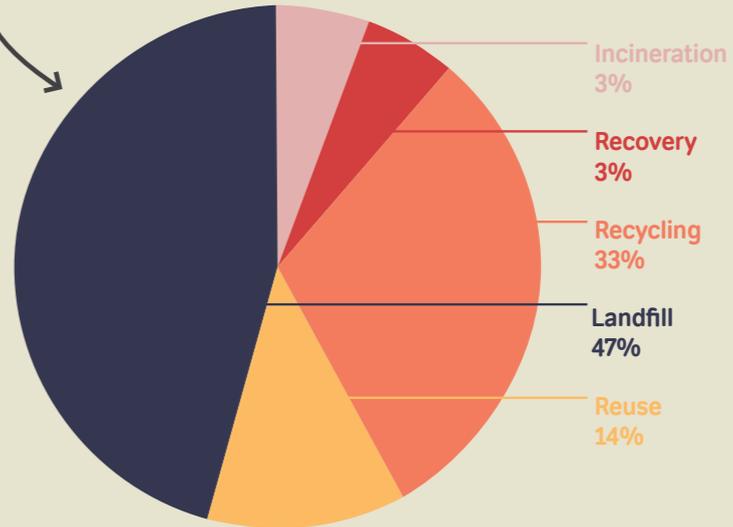


Our total waste generation in 2018 was **66,833 tons**

### Hazardous waste by type of disposal



### Non-Hazardous waste by type of disposal





## Protecting Biodiversity

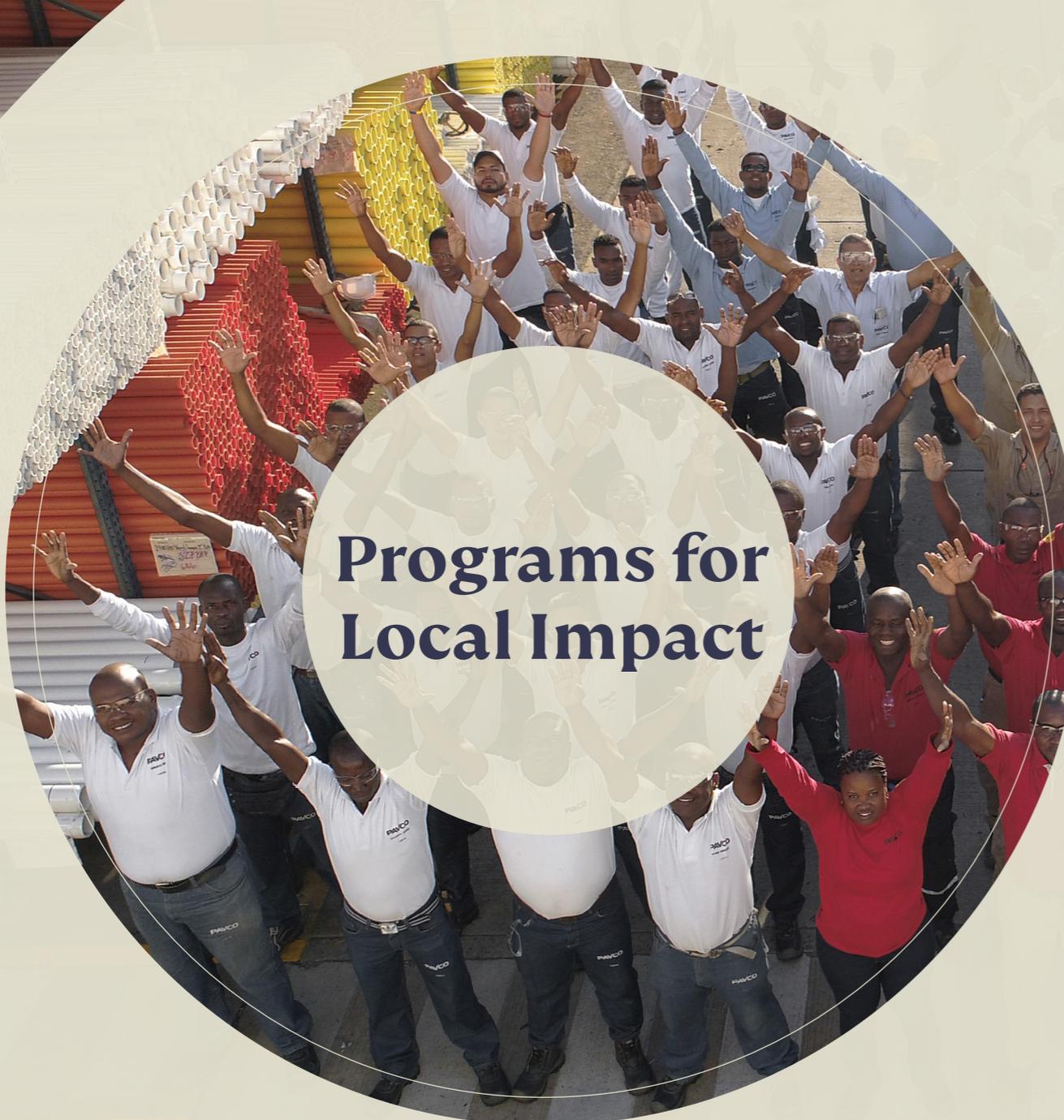
Our most significant impacts on biodiversity are related to our fluorspar mining operation in San Luis Potosi, Mexico. We maintain a strategy to protect biodiversity, including restoration of the natural habitats, relocation of species, reforestation and compensation for adverse effects based on the findings of environmental impact studies.

We work closely with the National Forestry Commission of Mexico (CONAFOR) and provide shared funding for environmental programs in the region of our mines. In 2018, this includes support for a broad range of initiatives, including:

- Rehabilitation of five kilometers of firewall protection and adding almost 16 kilometers of firewall
- Provision of cameras for photo trapping and monitoring of animal species and vegetation
- Purchase of equipment for radio communication, forest fire-fighting, six kilometers of fencing for conservation of forest areas and more
- Conservation and maintenance of 12.8 kilometers of roads

**We also maintain our program for the rescue and relocation of affected species of forest vegetation and wild fauna, minimizing impacts and preserving the abundance and diversity of the region and its natural ecosystem.**





## Programs for Local Impact

Wherever we are at Orbia, across our 137 plants in 41 countries around the world, **we aim to be a positive force in our communities, contributing to economic development, social empowerment and community solidarity.** We believe this is the right way to do business, both considering the needs of our local communities and supporting them with our hearts and minds and our personal and company resources. We have a long tradition of philanthropy, community volunteering and business development that helps improve the quality of life in the communities we serve.

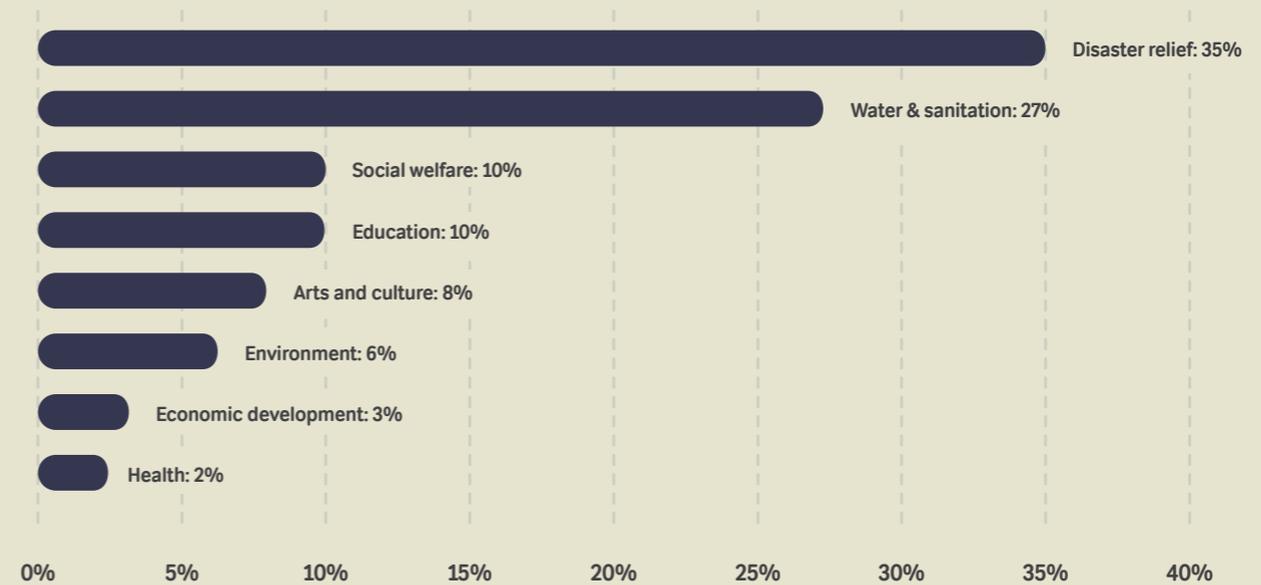


Our approach to community investment is twofold:

- **At a corporate level**, we provide humanitarian assistance, working in partnership with nonprofits, to strengthen the fabric of our communities. Typically, this involves donations, multi-year strategic community projects that align with areas of our core business expertise and disaster relief
- **At a corporate level**, we engage directly with communities, often through our employees who are closest to the local needs and engage with social programs, providing cash donations and employee volunteering or other technical support where required to help address the more complex challenges our communities face. Our employees volunteer in community activities in dozens of projects covering a wide range of needs, cleaning beaches in Peru; supporting the recovery and conservation of watersheds in Colombia; training community members in business management in San Luis Potosi, Mexico; and working with schools to cultivate community gardens in Israel



### Community contributions by cause, 2018



In 2018, Orbia invested \$3.71 million in communities around the globe. In addition, almost 8,000 employees spent more than 20,000 hours volunteering in our communities.



## Supporting Conservation in Latin America

Founded in 2011, The Latin America Conservation Council (LACC) is a group of global leaders who advise on and invest in innovative solutions to the planet's most pressing challenges at the intersection of people and nature: water security, sustainable food, and smart infrastructure. Orbia's Chairman of the Board, Juan Pablo del Valle Perochena, cochairs the LACC, working in collaboration with The Nature Conservancy to **protect and restore nearly 107 million hectares of land to date and 16,000 kilometers of rivers in Latin America by 2020**. In addition to providing leadership and funding, Orbia plays an active role in the LACC.

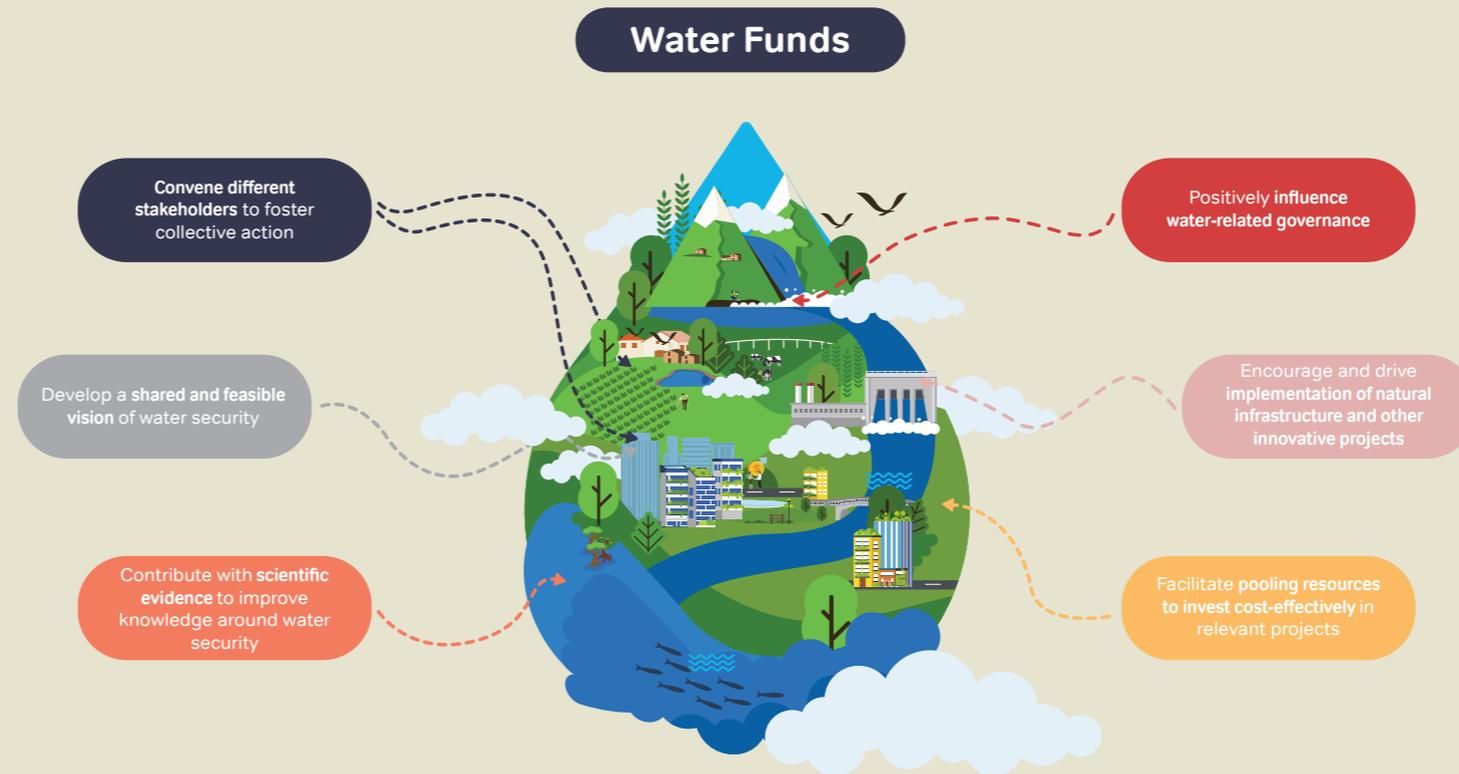




## Water Security with Water Funds

Latin America has a population of around 650 million people, mainly living in cities. Water is a critical resource for the region. Continuous action is urgently needed to restore water sources and develop further mechanisms to conserve water so that the people of the region can enjoy access to water today, without compromising access to water for future generations.

In order to address this critical issue, the Water Funds model was developed. Water Funds are supported by the Latin American Water Funds Partnership, an agreement between the Inter-American Development Bank (IDB), FEMSA Foundation, the Global Environment Facility (GEF), The Nature Conservancy (TNC), and the International Climate Initiative (IKI). The Partnership operates throughout the region and has developed local initiatives across several countries.



Water Funds are organizations that design and enhance financial and governance mechanisms that unite public, private and civil society stakeholders around a common goal to contribute to water security through nature-based solutions.

Since 2016, Orbia has partnered with the **Latin American Water Funds Partnership**, contributing funding, resources and expertise. Orbia has supported six of the 24 Water Funds in Latin America, focusing on those Water Funds in areas where Orbia has a manufacturing presence.



Water Funds supported by Orbia

| Region             | Country  | Potential Beneficiaries (Millions) | Planned Coverage (Hectares) |
|--------------------|----------|------------------------------------|-----------------------------|
| Mexico City Valley | Mexico   | 21                                 | 815                         |
| Cauca Valley       | Colombia | 1.2                                | 125,000                     |
| Bogota             | Colombia | 6.8                                | 150,000                     |
| Cartagena          | Colombia | 1                                  | *                           |
| Guayaquil          | Ecuador  | 3                                  | *                           |
| Lima               | Peru     | 9                                  | 450,000                     |

\*Information not currently available.

Our direct total investment in Water Funds in 2018 was \$172,685

According to the World Bank, Latin America's urban rivers and waterways are among the most polluted in the world, since **70% of the wastewater discharged in the region receives no treatment**. As a result, millions of people lack access to safe drinking water.

**More than 40% of water is lost in leaks in Mexico City.** 18% of the population gets just a few hours of water from their taps every week. The water extracted annually from the city's aquifers is more than double their recharge, according to Mexico's National Water Commission.

In 13 years, more than 9,000 hectares of forests and natural areas pertaining to the basins that supply water to the Valley of Mexico have been lost.

Every year, between 150 and 200 hectares of conservation land is lost in Mexico City.

The World Health Statistics 2018 report by the World Health Organization indicates that **only 43% of the population in Mexico uses safely managed drinking-water services**.



### Significant progress includes:

#### In Mexico City:

- Launched in April 2018
- **Agua Capital** aims to protect targeted watersheds and forests that are critical for aquifer recharge, as the main source of water in the Valley of Mexico
- Orbia's Chairman of the Board, Juan Pablo del Valle Perochena, chairs this new fund, and Orbia and other Board members have together contributed **\$1.7 million seed capital for the operation of the Water Fund**, including a conservation-restoration pilot in San Miguel Topilejo
- In 2018 progress under that pilot project included **90 hectares** of conservation and restoration, and **41 hectares of agricultural best practices with local farmers**

#### In the Cauca Valley:

- **Agua por la Vida y la Sostenibilidad** Water Fund has taught agroforestry and sustainable ranching practices to more than **2,536 rural families**. Due to better management, sediment runoff has been reduced, soil health has improved and natural habitats have been preserved
- Orbia has supported this fund in previous years and in 2018, more than **22,024 hectares were protected through conservation efforts, designed to benefit more than 3.5 million local inhabitants**



#### In Bogota:

- **Agua Somos** Water Fund aims to guarantee the effectiveness of the water ecosystem services in the city of Bogota and its neighboring municipalities
- Activities involve restoration of soil, landscape management, improving agricultural practices and protecting and restoring river water sources
- Orbia's support has allowed the installation of rainwater harvesting systems, drip-irrigation technology for vegetable gardens and workshops for the local population
- So far, around **1,300 hectares of land are under conservation**



## Good Neighbors in Mexico

Our main fluorine mine - established in 1957 - is located in the municipality of Zaragoza, in the state of San Luis Potosi, Mexico. Since day one, we have engaged with our local community around the mine and contributed to life in several ways. We have maintained trusting relationships with our neighbors, addressing concerns promptly. As an example, we revised the routes for trucks moving to and from the mines upon requests from those affected by their passing through the neighborhood.

In 2018, Orbia progressed several initiatives:

- **Supported the restoration of a historic building in the community**, and helped renovate two educational institutions
- **Maintained our Environmental Services program including installation of fire prevention structures**, flora and fauna monitoring, workshops for charcoal production and kiln construction, an ecotourism workshop and more
- **Volunteered to train the youth of the community in the use of fire extinguishers** and supported youth cleaning campaigns and volunteer camps
- **Supported a volunteer campaign “Fulfilling Wishes 2018”** for more than 80 elderly people
- **Helped bring the internet into many homes** for the first time
- **Invested in improving and maintaining roads** and other infrastructure
- **Mentored local farmers** to become food suppliers for our facility
- **Donated our limestone rock by product** for construction use in the community





## Rewarding Social Innovation

Every two years since 2011, in Colombia, our Pavco Water Awards seek solutions to challenges of water scarcity in the region through Recognition for initiatives that offer transformative, sustainable solutions for the use, protection and recovery of water. The Awards also seek to foster social innovation and entrepreneurship. We invite young people to submit their innovative ideas to compete for a grant that will help them realize their initiative.

Recent winning projects include a waterless toilet that generates compost, wetland recovery techniques and grey water recovery.

Between 2011 and 2018, we received

**210 proposals** from 17 districts of Colombia, and **awarded grants to 14 winning projects.**





## Helping Kids Get Healthier

As an organization committed to sustainable agriculture and advancing life, in Israel, we identified an opportunity to change the eating habits for better health, support food security and inspire young children to respect the land. The Arab city of Baqa al-Gharbiyye, less than 10 kilometers from our Magal factory in Israel, has 30,000 inhabitants. Life expectancy in Baqa al-Garbbiyye was estimated at 65 years, where in Israel, the average life expectancy is 80 years. The prevalence of obesity in kindergarten children in this city is very significant, increasing as they grow. Lifestyle and nutritional habits play a major role, so we sought a sustainable way to help our local community be healthier and live longer.

In 2014, our drip irrigation specialist, Netafim, joined forces with the local municipality, a local academic college and partnering nonprofits to establish a program of community vegetable gardens in local kindergartens.

Netafim provided the drip irrigation kits for the vegetable gardens and more than 60 employee volunteers supported the training of the kindergarten staff in their installation and use. Once



established, the children and their families tended the gardens to grow fresh produce. Parents were also offered training on healthy dietary habits for their children and for the entire family.

**By 2018, this collaborative community effort had yielded more than 80 community gardens, covering all the kindergartens in the city, benefiting more than 1,200 kindergarten children.**

A further outcome of this ongoing initiative is that, the local government now mandates that every new kindergarten established in the city will have a community vegetable garden. Netafim's Magal Plant was granted the Social and Environmental Leadership Award for this project by the Manufacturers Association in Israel.

“

“Drip irrigation is only about saving water. It's a way to transform the lives of entire communities, whether this is through sharing our knowledge with farmers to generate better yields and improve their livelihoods or teaching young children to cultivate vegetables that they can enjoy eating as part of a healthy diet. Our initiative in Baqa-al-Gharbiyye was also significant, bringing Arab and Jewish communities together in a collaborative, long term project that benefits us all.”

**Naty Barak**

Chief Sustainability Officer, Precision Agriculture

”



## Developing Local Tradespeople

An innovative way we support local economic development in our community is through supporting local tradespeople and businesses.

In 2018, Orbia continued to strengthen our ongoing Training Programs for Plumbers in several countries, including Ecuador, Colombia, Peru, Brazil and Turkey. As a leading provider of water and waste sanitation systems, we have a keen interest in contributing to the success of these skilled tradespeople who are involved in the deployment of our products. Many plumbers are independent tradespeople who did not complete elementary schooling and have had no formal business education.

The training program is tailored to different needs in each country, often in partnership with a local professional organization. It provides support in areas of business planning, customer service and efficient water management.

**By 2018, more than 11,600 plumbers had participated in the training program, supported by Orbia volunteers and our investment of more than \$300,000.**

In Colombia, we support small family-owned hardware stores where family members have not had formal training in business management or product trends. Competing with larger players in hardware supplies, these small stores need to manage their operations effectively to survive. Our Pavco brand in Colombia established a digital learning platform for store owners to provide education in marketing, inventory management, accounting and more. The menu of courses is available to all hardware store owners for them to use at their convenience. In 2018, we added four new courses to the program.

**Since 2016, 1,351 store-owners or family members have taken at least one course, more than 8,700 have visited the training website and 221 participants have received a certification showing they have completed a program of courses.**



## Supporting our Communities When Disaster Strikes



When disaster strikes, Orbia is there to offer immediate and critical assistance. We show our solidarity with our neighbors by acting quickly and without hesitation to provide funds, resources and in many cases, the volunteer efforts of our employees, in support of disaster relief efforts.

In Mexico, in 2018, we continued to support the ongoing community relief efforts following the 8.1° magnitude earthquake that struck off the Mexican coast in late 2017. Over 200 people were killed in the earthquake which was the second-most devastating earthquake in Mexico since 1985. Two weeks later another earthquake hit central Mexico. As a result of these two disasters, tens of thousands of people and their families lost their homes and entire villages were wiped out.



Following this crisis, our parent company Kaluz, and its charitable foundation, Fundación Kaluz, rapidly established the Reconstructing Mexico Initiative (Iniciativa Reconstruyendo México), to provide a framework for all our group companies to provide immediate and medium-term relief.

**This initiative was the largest charitable effort in the history of our company, with a total donation of more than \$1.26 million, of which more than \$38,000 was donated by 2,107 Orbia employees from 24 countries.**

For more info visit: <https://fondodereconstruccion.mx/en/>

During 2018, as part of this initiative, and together with key partners:

- **6 schools** were rebuilt, **7** more are in progress
- **2,200** elementary and junior high students returned to their classrooms
- A health and a community center were rebuilt, benefitting more than **300 children** per year. An additional community center will be ready in 2019
- Soft skills for **resiliency** were taught in 16 schools to 7,400 children
- Orbia and its employees contributed **\$1.2 million\*** to the fund. Together with Kaluz, the initial seed capital leveraged funds from others to a total of **\$4.1 million\***
- Thanks to strategic partnerships, projects undertaken represent over **\$13 million\*** in infrastructure

\*All figures as of Dec. 31, 2018. Peso/dollar exchange rate, used for information purposes only, is 18.00 MXP per USD.



Guatemala

After the eruption of the Fuego Volcano in Guatemala left almost 200 dead and thousands more displaced, we swiftly joined forces with the humanitarian assistance organization CADENA to support the people in need. **More than 2,850 employees from 20 countries donated funds which were matched by Orbia to reach a total value of \$90,000 which was used by CADENA to support local medical, water, sanitation and other reconstruction needs.**

CADENA also provided medical consultations and individual and group psychological sessions, benefiting more than 1,500 people, helping them cope with the anxiety and stress associated with this disruption to their lives.





**5**  
**About this**  
**Report**



This is Orbia's 10<sup>th</sup> annual Sustainability Report covering the role we play in society as a global business and our impacts on people, communities and the environment. Data in this report relates to the 2018 calendar year. Our last report was published in 2018 covering 2017 performance. The scope of information in this report is all global business under Orbia's operational control. For the first time, our data also includes Netafim (unless otherwise specified), acquired by Orbia and consolidated for the first full year into Orbia's operations in 2018.

All monetary figures in this report are expressed in USD unless otherwise specified.

This report has been prepared in accordance with the GRI Standards: Core option. The selection of

content for this report was informed by a set of material topics developed by our global leadership and through feedback and expectations gained through ongoing engagement with a wide range of stakeholders. During 2018, we have been refreshing our business and sustainability strategy, and we plan to revise our material focus in the coming year in line with our new strategy and business realignment.

This report was assured by an independent third party, and the assurance statement can be found in the following pages of this report.

We welcome your feedback, queries and suggestions. Please contact:

**Cristina Gil White**  
Vice President of Corporate Affairs  
Orbia  
[sustainabilitySDR@orbia.com](mailto:sustainabilitySDR@orbia.com)



## UN Global Compact Commitment

Orbia, legally known as Mexichem, S.A.B de C.V., became a signatory to the United Nations Global Compact (UNGC) at the participant tier level in July 2018, with a letter of commitment signed by our Chief Executive Officer, Daniel Martínez-Valle. This is our first Communication on Progress, in line with our commitment as a UNGC signatory to report on our progress annually. We will continue to uphold and promote UNGC principles within our spheres of influence.

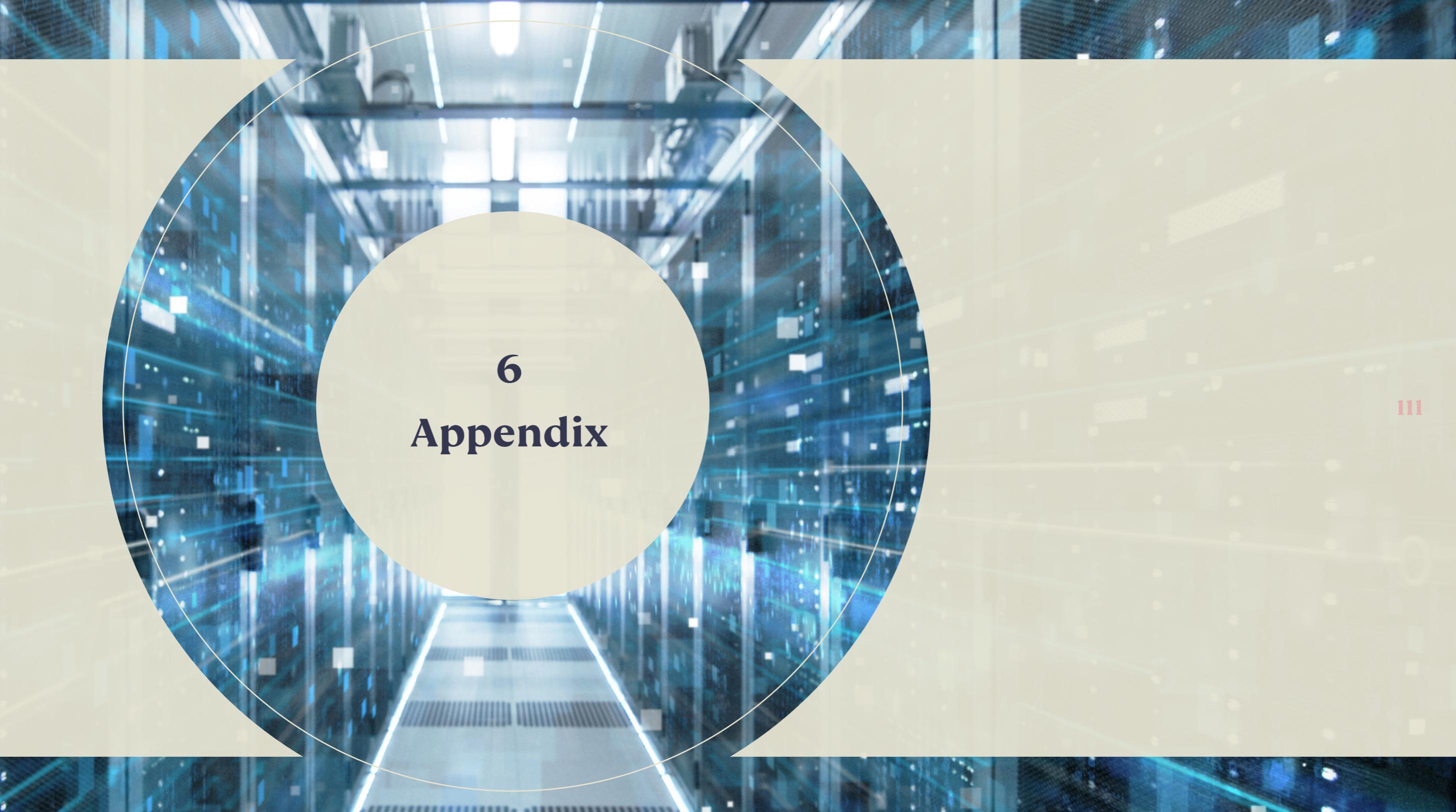
The tables on the next two pages show the correlation of our GRI disclosures with the UNGC principles.



| Global Compact Principles  | GRI Standards   | Our Commitment   |
|--|---|--|
| Businesses should support and respect the protection of internationally proclaimed human rights.                         | •Human Rights   | At Orbia, we acknowledge, respect and uphold human rights. <u>Our Code of Ethics</u> binds all employees around the world to the highest ethical standards and we reinforce ethical practices with communication, training and immediate attention to ethical issues as they arise. We maintain a <u>Human Rights policy</u> with specifically commits us to the Universal Declaration of Human Rights and other universally accepted standards. We drive similar standards throughout our supply chain. |
| Businesses should make sure that they are not complicit in human rights abuses.  | •Human Rights<br>Local Communities<br>Aspects   |  |
| Businesses should uphold the freedom of association and the effective recognition of the right to collective bargaining. | •Freedom of Association and Collective Bargaining<br><br>•Labor/ Management Relations | We respect the rights of employees to freedom of association and collective bargaining. We aim to maintain collaborative, open and positive relationship with employees and address issues relating to their rights in a positive manner. We drive similar standards throughout our supply chain.  |
| Businesses should support the elimination of all forms of forced and compulsory labor.                                   | •Forced and Compulsory Labor  | We do not engage in any practice which could be construed as forced labor. All Orbia employees are legally employed and join our business of their own free will. We drive similar standards throughout our supply chain.  |
| Businesses should support the effective abolition of child labor.  | •Child Labor  | We respect and support the rights of all children, and we are committed to preventing harm and actively safeguarding their interests. We do not employ children in any part of our business. We drive similar standards throughout our supply chain.   |



| Global Compact Principles  | GRI Standards                      | Our Commitment  |
|--|------------------------------------|---|
| Businesses should support the elimination of discrimination in respect of employment and occupation. | •Labor Practices and Decent Work   | We maintain a policy of equal opportunity and enjoy a high level of diversity among our workforce around the world. Recruitment and human resources policies are designed to nurture inclusive practices for new and current employees in all matters relating to their employment with Orbia.  |
| Businesses should support a precautionary approach to environmental challenges.                      | •Environment                       | Many of Orbia's products are designed to minimize environmental impacts, and provide benefits to our consumers, and to support sustainable construction, smart cities, sustainable agriculture, water conservation and waste reduction. In our own operations, we work to drive down our carbon and water footprints and act as environmental stewards in all that we do. |
| Businesses should undertake initiatives to promote greater environmental responsibility.             | •Environment                       |   |
| Businesses should encourage the development and diffusion of environmentally friendly technologies.  | •Environment                       |   |
| Businesses should work against corruption in all its forms, including extortion and bribery.         | •Anti-Corruption<br>•Public Policy | We are committed to behaving with integrity and acting against all forms of corruption. Our Code of Ethics and our Integrity and Anticorruption Handbook guide our actions binding all employees to uphold these policies.  |

The background of the page is a server room with blue lighting and a large circular graphic overlay. The circular graphic is a light beige color with a thin white border. Inside the circle, the text "6 Appendix" is centered. The number "6" is in a large, bold, black serif font, and the word "Appendix" is in a smaller, bold, black serif font below it. The server room background shows rows of server racks with blue lights and a perspective view of the aisle.

**6**  
**Appendix**

# GRI Content Index

| GRI 102: General Disclosures 2016 |                                    | Page/Response   |
|-----------------------------------|------------------------------------|---|
| 102-1                             | Name of the organization           | Page 3  |
| 102-2                             | Activities, products, and services | Page 5  |
| 102-3                             | Location of headquarters           | Page 3  |
| 102-4                             | Location of operations             | Page 4  |
| 102-5                             | Ownership and legal form           | Page 3  |
| 102-6                             | Markets served                     | Page 4  |
| 102-7                             | Scale of the organization          | Page 4  |
| 102-8                             | Information on employees           | Page 118  |
| 102-9                             | Supply chain                       | Page 15   |
| 102-10                            | Significant changes                | There are no significant changes in boundary since our 2017 Sustainability Report, beyond regular merger and acquisition activity, notably the inclusion of Netafim in 2018 |
| 102-11                            | Precautionary principle            | Page 75   |
| 102-12                            | External initiatives               | Page 119  |
| 102-13                            | Membership of associations         | Page 120  |



| GRI 102: General Disclosures 2016                     | Page/Response  |
|---|--|
| 102-14 Statement from senior manager                  | Page 11  |
| 102-16 Values, principles, standards                  | Page 6   |
| 102-18 Governance structure                           | Page 70  |
| 102-40 List of stakeholder groups                     | Page 122-124   |
| 102-41 Collective bargaining agreements               | Page 119   |
| 102-42 Identifying and selecting stakeholders         | Page 122-124   |
| 102-43 Stakeholder engagement                         | Page 122-124   |
| 102-44 Key topics and concerns raised                 | Page 122-124   |
| 102-45 Entities included                              | Page 106   |
| 102-46 Report content and topic Boundaries            | Recently acquired company Netafim is included in certain data for the first time in 2018 |
| 102-47 List of material topics                        | Page 33-35   |
| 102-48 Restatements of information                    | Pages 125-133 Noted where relevant   |
| 102-49 Changes in reporting                           | None   |
| 102-50 Reporting period                               | Calendar year 2018   |
| 102-51 Date of most recent report                     | 2017   |
| 102-52 Reporting cycle                                | Annual   |
| 102-53 Contact point                                  | Page 106   |
| 102-54 Reporting in accordance with the GRI Standards | Page 106   |
| 102-55 GRI Content Index                              | Page 112   |
| 102-56 External assurance                             | Page 137   |



| Material Topic             | Standard                                 | Disclosure   | Page/Response | Omission |
|----------------------------|--|--|---------------|----------|
| Sustainable innovation     | GRI 203: Indirect Economic Impacts 2016  | 203-2 Significant indirect economic impacts  | 38-67         |          |
| Customer Health and Safety | GRI 416: Customer Health and Safety 2016 | 416-1 Assessment of the health and safety impacts of product and service categories                              | 136           |          |
|                            |  | 416-2 Incidents of non-compliance concerning the health and safety impacts of products and services              | None          |          |
| Product Transparency       | GRI 417: Marketing and Labeling 2016     | 417-2 Incidents of non-compliance concerning product and service information and labeling                        | None          |          |
| Energy consumption         | GRI 302: Energy 2016                     | 302-1 Energy consumption within the organization   | 125           |          |
|                            |  | 302-3 Energy intensity   | 126           |          |
|                            |  | 302-4 Reduction of energy consumption  | 87-88         |          |
| Water management           | GRI 303: Water 2016                      | 303-1 Water withdrawal by source   | 126           |          |
|                            |  | 303-3 Water recycled and reused  | 126           |          |
| Biodiversity               | GRI 304: Biodiversity 2016               | 304-2 Significant impacts of activities, products, and services on biodiversity                                  | 93            |          |
|                            |  | 304-3 Habitats protected or restored   | 93            |          |
|                            |  | 304-4 IUCN Red List species and national conservation list species with habitats in areas affected by operations | 127           |          |



| Material Topic  | Standard                                      | Disclosure  | Page/Response                     | Omission   |
|---|---|---|-----------------------------------|--|
| Reduction of emissions  | GRI 305: Emissions 2016                       | 305-1 Direct (Scope 1) GHG emissions  | 128                               |  |
|   |   | 305-2 Energy indirect (Scope 2) GHG emissions   | 128                               |  |
|   |   | 305-4 GHG emissions intensity   | 129                               |  |
|   |   | 305-5 Reduction of GHG emissions  | 87-89                             |  |
|   |   | 305-6 Emissions of ozone-depleting substances (ODS)   | 130                               |  |
|   |   | 305-7 Nitrogen oxides (NO <sub>x</sub> ), sulfur oxides (SO <sub>x</sub> ), and other significant air emissions | 130                               |  |
|   |   | Waste management  | GRI 306: Effluents and Waste 2016 | 306-1 Water discharge by quality and destination                   |
| 306-2 Waste by type and disposal method                       | 132   |   |                                   |  |
| 306-3 Significant spills                                      | 132   |   |                                   |  |
| 306-5 Water bodies affected by water discharges and/or runoff | None  |   |                                   |  |
| Organizational Culture and People Development                 | GRI 404: Training and Education 2016          |   |                                   | 404-1 Average hours of training per year per employee              |
|   |   | 404-2 Programs for upgrading employee skills and transition assistance programs                                 |                                   |  |
| Diversity and Equal Opportunities                             | GRI 405: Diversity and Equal Opportunity 2016 | 405-1 Diversity of governance bodies and employees  | 135                               | Full data on Board diversity and minority groups are not available |



| Material Topic                  | Standard                                     | Disclosure   | Page/Response | Omission  |
|---------------------------------|--|--|---------------|---|
| Occupational Health and Safety  | GRI 403: Occupational Health and Safety 2016 | 403-1 Workers representation in formal joint management-worker health and safety committees  | 133           |   |
|                                 |  | 403-2 Types of injury and rates of injury, occupational diseases, lost days and absenteeism, and number of work-related fatalities | 133           | Absenteeism, occupational diseases are not reported |
| Social Investment               | GRI 413: Local Communities 2016              | 413-1 Operations with local community engagement, impact assessments, and development programs                                     | 94-105        |   |
|                                 | GRI 203: Indirect economic impacts 2016      | 203-1 Infrastructure investments and services supported  | 96-99         |   |
| Ethical Behavior and Compliance | GRI 205: Anti-corruption 2016                | 205-2 Communication and training about anti-corruption policies and procedures   | 71            |   |
| Climate Change Risk             | GRI 201: Economic                            | 201-2 Financial implications and other risks and opportunities due to climate change   | 124           |   |



**GRI Data  
Tables**

# GRI Data Tables

## 102-8 Information on employees

| Category                         |            | 2018          |        |        |       |        |
|----------------------------------|------------|---------------|--------|--------|-------|--------|
|                                  |            | U.S. & Canada | Latam  | Europe | AMEA  | Total  |
| Employees by gender              | Women      | 242           | 1,860  | 1,202  | 385   | 3,689  |
|                                  | Men        | 1,459         | 8,910  | 4,918  | 2,749 | 18,036 |
|                                  | Undeclared | 48            | 5      | 117    | 5     | 175    |
|                                  | Total      | 1,749         | 10,775 | 6,237  | 3,139 | 21,900 |
| Employees on permanent contracts | Women      | 241           | 1,824  | 1,166  | 360   | 3,591  |
|                                  | Men        | 1,458         | 8,841  | 4,848  | 2,506 | 17,653 |
|                                  | Undeclared | 48            | 5      | 116    | 5     | 174    |
|                                  | Total      | 1,747         | 10,670 | 6,130  | 2,871 | 21,418 |
|                                  | Overall    | 100%          | 99%    | 98%    | 91%   | 98%    |
| Employees on full-time contracts | Women      | 238           | 1,805  | 1,055  | 370   | 3,468  |
|                                  | Men        | 1,456         | 8,863  | 4,792  | 2,723 | 17,834 |
|                                  | Undeclared | 48            | 5      | 115    | 5     | 173    |
|                                  | Total      | 1,742         | 10,673 | 5,962  | 3,098 | 21,475 |
|                                  | Overall    | 100%          | 99%    | 96%    | 99%   | 98%    |
| Non-payroll workers              | Total      | 82            | 636    | 607    | 799   | 2,124  |
|                                  | Overall    | 4.5%          | 5.6%   | 8.9%   | 20.3% | 8.8%   |

Note: All disclosures and data below reference GRI Standards 2016.



**GR 102-41 Employees with collective bargaining agreements**

| Category  |         | 2018          |       |        |      |       |
|---|---------|---------------|-------|--------|------|-------|
|   |         | U.S. & Canada | Latam | Europe | AMEA | Total |
| Employees with collective bargaining agreements | Total   | 21            | 4,083 | 1,896  | 186  | 6,186 |
|   | Overall | 1.2%          | 38%   | 30%    | 6%   | 28%   |
|   |         |               |       |        |      |       |

**102-12 External initiatives**

The following are key global or regional initiatives we subscribe to. There are several additional initiatives on a country-by-country basis.

| Initiative   | Country              |
|--|----------------------|
| The UN Global Compact                                      | Global               |
| Green Building Council                                     | Brazil & El Salvador |
| World Business Council for Sustainable Development (WBCSD) | Ecuador & Colombia   |
| IQNet Association  | Switzerland          |
| Responsible Care   | Mexico & Colombia    |
| VinylPlus  | Europe               |

**102-13 Membership of associations**

The following are key global or regional associations we are members of or significantly support. There are several additional memberships we maintain on a country by country basis.

| Association  | Country         |
|--|-----------------|
| Cámara Minera de México (Caminex)  | Mexico          |
| Asociación Nacional de la Industria Química (ANIQ)                                       | Mexico          |
| Comisión de la Industria del Plástico, Responsabilidad y Desarrollo Sustentable (CIPRES) | Mexico          |
| Cámara Nacional de la Industria de la Transformación (CANACINTRA)                        | Mexico          |
| Asociación Mexicana de Industrias Plásticas A.C. (AMITUP)                                | Mexico          |
| Consejo Mexicano de Negocios   | Mexico          |
| The International Council of Chemical Associations (ICCA)                                | U.S.A. & Canada |
| Plastic Pipe Institute (PPI)   | U.S.A.          |
| FFTH COUNCIL EUROPE (Fiber to the Home)  | Czech Republic  |
| The Vinyl Institute  | U.S.A.          |
| The Chlorine Institute   | U.S.A.          |
| NSF Internacional  | U.S.A.          |
| Acoplásticos   | Colombia        |
| Asociación Nacional de Industriales de Colombia (ANDI)                                   | Colombia        |
| Consejo Colombiano de la Construcción Sostenible   | Colombia        |
| CECODES – Consejo Empresarial Colombiano para el Desarrollo Sostenible                   | Colombia        |
| Camacol, Cámara Colombiana de la Construcción  | Colombia        |
| Instituto Brasileiro do PVC.   | Brazil          |
| ABIPLAST: Associação Brasileira da Indústria do Plástico                                 | Brazil          |
| Abramat: Associação Brasileira da Indústria Materiais de Construção                      | Brazil          |



Association

- Consejo Empresarial para el desarrollo sostenible- Ecuador
- Asociación Ecuatoriana de Plásticos (Aseplas)
- SNI- Sociedad Nacional de Industrias de Perú
- Cámara Guatemalteca de la Construcción
- Cámara de Industria de Guatemala
- Cámara Salvadoreña de la Construcción, CASALCO
- Asociación Salvadoreña de Industriales.
- Cámara Hondureña de la Industria de la Construcción
- Cámara Nicaragüense de la Construcción
- Cámara Costarricense de la Construcción
- Cámara Panameña de la Construcción
- Asociación Salvadoreña de Energía Renovable (ASER)
- Asociación Costarricense de la industria del plástico, ACIPLAST

Country

- Ecuador
- Ecuador
- Peru
- Guatemala
- Guatemala
- El Salvador
- El Salvador
- Honduras
- Nicaragua
- Costa Rica
- Panama
- El Salvador
- Costa Rica

**102-42 Identifying and selecting stakeholders**

**102-43 Stakeholder engagement**

**102-44 Key topics and concerns raised**

Stakeholders are individuals or groups who are affected by and influence our business operations. We engage with representatives of a wide group of stakeholders in order to gain the greatest insight that will help us minimize risk to our business, understand and benefit from new opportunities and address stakeholder concerns and expectations. Our ongoing stakeholder consultations have influenced the development of our sustainability policy and approach and our priority sustainability issues.

**Primary Stakeholder Interactions**

|                  | Who  | What   | How  |
|------------------|--|--|--|
| <b>Customers</b> | Thousands of customers around the world in different business sectors. | Customer service, quality and compliance, competitive pricing, overall value chain efficiency.               | <ul style="list-style-type: none"> <li>• Satisfaction surveys</li> <li>• Client meetings</li> <li>• Industry meetings and conferences</li> <li>• Digital portals</li> <li>• Joint projects including workshops, training and education programs, and field trials</li> </ul> |
| <b>Employees</b> | Approx. 22,000 direct employees in our businesses around the world.    | Professional development, fair compensation and benefits, a safe and healthy workplace, and meaningful work. | <ul style="list-style-type: none"> <li>• Satisfaction surveys</li> <li>• Performance reviews</li> <li>• Internal communications</li> </ul>   |



Primary Stakeholder Interactions

|                            | Who   | What   | How   |
|----------------------------|---|--|---|
| Investors                  | Current shareholders and institutional investors, investment analysts and stock exchange.   | Return on investment through constant and sustainable growth, robust governance, transparency.   | <ul style="list-style-type: none"> <li>• Annual sustainability report</li> <li>• Financial reports</li> <li>• Investor meetings, roadshows and presentations</li> <li>• Notifications through the Mexican Stock Exchange and the National Securities Commission</li> </ul>  |
| Communities and NGOs       | Local communities close to our factories and broader national, regional and global NGOs with interests relating to economic development, social or environmental needs. | Contribution and partnership long-term to deliver value that benefits communities and societies in general, engagement to understand community needs and responsiveness, and upholding human rights. | <ul style="list-style-type: none"> <li>• Partnerships to improve socio-economic and environmental conditions</li> <li>• Meetings with community leaders</li> <li>• Workshops with communities and local governments</li> <li>• Meetings with non-profit organizations</li> <li>• Reputation surveys in communities</li> <li>• Socio-economic analysis and impact assessments</li> </ul> |
| Suppliers and Distributors | A wide range of thousands of suppliers across all our business sectors in several countries.  | Long-term commercial partnerships, fair dealing, opportunities for diverse suppliers, support where needed, fair and open negotiations.  | <ul style="list-style-type: none"> <li>• Supplier evaluation systems</li> <li>• Supplier meetings</li> <li>• Conferences and tradeshows</li> <li>• Joint projects</li> </ul>  |
| Regulators                 | National governments, regional councils and local municipalities in all the countries in which we operate.  | Trusting relationships based on compliant and ethical conduct and respect for human rights, transparency and timely reporting, collaboration to advance public policy.                               | <ul style="list-style-type: none"> <li>• Public-private partnerships for social benefit</li> <li>• Industrial guilds and associations</li> <li>• Discussion forums on sector and social policies</li> <li>• Government reviews and audits</li> <li>• Reporting on corporate performance</li> </ul>  |
| Academia                   | Universities and research institutions in our areas of expertise.   | Support research initiatives and inclusive career opportunities and advance vocational study opportunities.  | <ul style="list-style-type: none"> <li>• Academic forums on innovation, technology and sustainable development</li> <li>• Engagement with Research Centers</li> <li>• Academic programs supported by Orbia</li> <li>• Job fairs and hiring practices</li> </ul>   |





**GRI 201: Economic Performance**

**201-2 Financial implications and other risks and opportunities due to climate change**

The potential effects of climate change on Orbia's operations include desertification and drought, rising sea levels, changes in rainfall patterns, decrease in water availability, deforestation and diseases, as well as changes in regulation to address climate risks.

These changes could generate a rise in operational costs due to business disruption or need for additional protection of our facilities against extreme climate effects. Similarly, regulated carbon taxes or other product requirements governed by regulation could increase costs.

On the other hand, we see opportunities for green chemistry and more environmentally favorable products, such as our new PlasticRoad development which that could become significant new revenue streams for our businesses around the world.

Ways of mitigating these risks include the development of business continuity plans for each operating division, as well as targeted innovation that includes new eco-friendly products. Several of these are described in this Sustainability Report.

Detailed cost implications and budgets allocated to mitigate climate risk, in addition to disclosed environmental expenditure, are not yet available.

## GRI 302: Energy

## 302-1 Energy consumption within the organization

## Energy Consumption

| Direct energy (Scope1)          | Units      | 2015             | 2016             | 2017             | 2018             |
|---------------------------------|------------|------------------|------------------|------------------|------------------|
| Natural Gas                     | MWh        | 2,709,492        | 2,526,510        | 2,450,339        | 2,112,939        |
| Gasoline                        | MWh        | 9,911            | 7,821            | 12,394           | 12,874           |
| Diesel Fuel                     | MWh        | 55,243           | 60,467           | 78,805           | 78,895           |
| LPG                             | MWh        | 119,105          | 113,434          | 112,891          | 123,464          |
| Butane                          | MWh        | NA               | NA               | NA               | 11,710           |
| Propane                         | MWh        | NA               | NA               | NA               | 1,567            |
| Coal                            | MWh        | NA               | 192,298          | 198,269          | 183,184          |
| Scope 1 (fuel and gas mix)      | MWh        | 2,893,751        | 2,900,530        | 2,852,698        | 2,524,633        |
| Scope 2 (purchased electricity) | MWh        | 2,680,079        | 2,445,311        | 2,457,173        | 2,723,899        |
| <b>Total energy consumption</b> | <b>MWh</b> | <b>5,573,830</b> | <b>5,345,841</b> | <b>5,309,871</b> | <b>5,248,532</b> |

## Notes:

- Purchased electricity includes some elements of renewable energy in the national mix.
- Netafim data included for the first time in 2018 - electricity only which represents 98% of Netafim's energy source. Netafim's impact on total energy use is less than 2%.
- NA: data not available for those years.
- For natural gas, 2015, 2016 and 2017 data was restated due to change in calculation methodology revealing some inaccuracies, now corrected.
- For natural gas consumption conversion to MWh, we apply the same heating power for all sites. We are improving our calculation methodology to increase data accuracy.

**302-3 Energy intensity**

| Energy per ton of product     | Units                   | 2015        | 2016        | 2017        | 2018        |
|-------------------------------|-------------------------|-------------|-------------|-------------|-------------|
| Scope 1                       | (MWh / ton sold)        | 0.66        | 0.68        | 0.64        | 0.54        |
| Scope 2                       | (MWh / ton sold)        | 0.61        | 0.58        | 0.55        | 0.58        |
| <b>Total energy intensity</b> | <b>(MWh / ton sold)</b> | <b>1.28</b> | <b>1.26</b> | <b>1.19</b> | <b>1.12</b> |

**Notes:**

- Netafim data included for the first time in 2018 – on the basis of product manufactured, not product sold. Intensity for Orbia legacy sites is calculated on the basis of product sold per year.
- Due to restatements in energy consumption, intensity data for Scope 1 from 2015 to 2017 has been updated.

**GRI 303: Water****303-1 Water withdrawal by source****303-3 Water recycled and reused**

| Water withdrawal                          | Units                    | 2015              | 2016              | 2017              | 2018              |
|---|--------------------------|-------------------|-------------------|-------------------|-------------------|
| Surface water                             | m <sup>3</sup>           | 12,752,919        | 8,171,187         | 8,670,527         | 8,262,661         |
| Ground water                              | m <sup>3</sup>           | 3,799,653         | 4,937,316         | 5,177,875         | 5,340,727         |
| Potable water                             | m <sup>3</sup>           | NA                | 459,492           | 422,519           | 569,176           |
| Municipal water                           | m <sup>3</sup>           | NA                | 2,435,233         | 2,057,008         | 1,580,702         |
| <b>Total water withdrawal</b>             | <b>m<sup>3</sup></b>     | <b>16,552,572</b> | <b>16,003,228</b> | <b>16,327,929</b> | <b>15,753,266</b> |
| Water recycled and reused                 | m <sup>3</sup>           | 11,425,139        | 11,202,637        | 11,306,072        | 12,682,334        |
| % Water recycled/reused                   | %                        | 69%               | 70%               | 69%               | 81%               |
| Water withdrawal m <sup>3</sup> /ton sold | m <sup>3</sup> /ton sold | 3.7               | 3.8               | 3.7               | 3.4               |

**Notes:**

- Netafim data included for the first time in 2018.
- 2016 and 2017 data was restated due to change in calculation methodology revealing some inaccuracies, now corrected.



**GRI 304: Biodiversity**

**304-4 IUCN Red List species and national conservation list species with habitats in areas affected by operations**

| IUCN Red List species and national conservation list species with habitats in areas affected by operations | Units        | 2018 |
|--|--------------|------|
| Critically endangered  | # of species | 0    |
| Endangered   | # of species | 1    |
| Vulnerable   | # of species | 1    |
| Near threatened  | # of species | 2    |
| Least concern  | # of species | 2    |

Notes: This data refers to our fluorite mine in San Luis Potosi, Mexico, which is where we have our most significant impact on biodiversity.

**GRI 305: Emissions****305-1 Direct (Scope 1) GHG emissions****305-2 Energy indirect (Scope 2) GHG emissions****Greenhouse Gas Emissions**

| Greenhouse gas emissions         | Units                  | 2015             | 2016             | 2017             | 2018             |
|----------------------------------|------------------------|------------------|------------------|------------------|------------------|
| GHG Emissions Scope 1            | Tons CO <sub>2</sub> e | 605,166          | 613,004          | 587,487          | 575,204          |
| GHG Emissions Scope 2            | Tons CO <sub>2</sub> e | 1,157,574        | 1,061,637        | 1,173,202        | 1,215,035        |
| <b>Total Scope 1 and Scope 2</b> | Tons CO <sub>2</sub> e | <b>1,762,740</b> | <b>1,674,641</b> | <b>1,760,689</b> | <b>1,790,239</b> |

Basis for reporting on greenhouse gas emissions.

**Notes:**

- Gases included are carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>) and nitrous oxide (N<sub>2</sub>O).
- Netafim data included for the first time in 2018 (Scope 2 only).
- Greenhouse Gas emissions (GHGs) are calculated using various standardized emissions calculation methodology and factors, including the World Resources Institute (WRI) and World Business Council on Sustainable Development (WBCSD), Greenhouse Gas Protocol Version 4.1, emission Factor of the National Electric System from the Energy Regulatory Commission (ERC) 2018 established in the Mexico and the International Energy Agency (CO<sub>2</sub> Emissions from Fuel Combustion 2013 Edition). Emissions in Israel used the Israel Electric Company factors.
- 2015, 2016 and 2017 data was restated due to change in calculation methodology revealing some inaccuracies, now corrected.
- Orbia generates a small number of fugitive emissions (Scope 1) from refrigerants (with and without ozone depleting potential), whose emissions in 2018 amounted to less than 48,000 tons CO<sub>2</sub> in total. These emissions are not included in the total above for comparability reasons.



### 305-4 GHG emissions intensity

| GHG emissions intensity          | Units                                | 2015        | 2016        | 2017        | 2018        |
|----------------------------------|--------------------------------------|-------------|-------------|-------------|-------------|
| Scope 1                          | Tons CO <sub>2</sub> e/ton sold      | 0.14        | 0.14        | 0.13        | 0.12        |
| Scope 2                          | Tons CO <sub>2</sub> e/ton sold      | 0.27        | 0.25        | 0.26        | 0.26        |
| <b>Total Scope 1 and Scope 2</b> | <b>Tons CO<sub>2</sub>e/ton sold</b> | <b>0.40</b> | <b>0.39</b> | <b>0.39</b> | <b>0.38</b> |

**Notes:**

- Netafim data included for the first time in 2018 – on the basis of product manufactured, not product sold. Intensity for Orbia legacy sites is calculated on the basis of product sold per year.

### Intensities per ton produced 2018

| Total Energy Consumption (MWh)/ton produced | Total GHG emissions (tons CO <sub>2</sub> e)/ton produced | Total Water Withdrawal (m <sup>3</sup> )/ton produced |
|---|---|---|
| 0.65  | 0.22  | 1.96  |

**Notes:**

- Going forward, intensities will be calculated per ton produced.
- Total tons produced in 2018: 8,022,976.



**305-6 Emissions of ozone-depleting substances (ODS)**

| Emissions of ozone-depleting substances (ODS) | Units               | 2018         |
|---|---------------------|--------------|
| R-22  | Tons CFC-11e        | 0.047        |
| R-141b  | Tons CFC-11e        | 0.004        |
| <b>Total</b>                                  | <b>Tons CFC-11e</b> | <b>0.051</b> |

**305-7 Nitrogen oxides (NO<sub>x</sub>), sulfur oxides (SO<sub>x</sub>), and other significant air emissions**

| NO <sub>x</sub> , SO <sub>x</sub> , and other significant air emissions | Units       | 2015         | 2016         | 2017         | 2018         |
|---|-------------|--------------|--------------|--------------|--------------|
| Nitrogen Oxides (NO <sub>x</sub> )                                      | Tons        | 793          | 760          | 779          | 689          |
| Sulfur Oxides (SO <sub>x</sub> )  | Tons        | 1,250        | 1,309        | 1,257        | 1,355        |
| Volatile Organic Compounds (VOC)  | Tons        | NA           | NA           | 83           | 108          |
| <b>Total other air emissions</b>  | <b>Tons</b> | <b>2,043</b> | <b>2,069</b> | <b>2,119</b> | <b>2,152</b> |

**Notes:**

- Data excludes Netafim.
- 2015 to 2017 data was restated due to change in calculation methodology revealing some inaccuracies, now corrected.
- VOC data not available for 2015-2016.



**GRI 306: Effluents and Waste**  
**306-1 Water discharge by quality and destination**

| Water discharge                    | Units                | 2015              | 2016              | 2017              | 2018              |
|------------------------------------|----------------------|-------------------|-------------------|-------------------|-------------------|
| Wastewater to sewer                | m <sup>3</sup>       | NA                | NA                | NA                | 2,276,618         |
| Wastewater to nature (surface)     | m <sup>3</sup>       | NA                | NA                | NA                | 8,257,152         |
| Wastewater to nature (underground) | m <sup>3</sup>       | NA                | NA                | NA                | 6,087             |
| <b>Total water discharge</b>       | <b>m<sup>3</sup></b> | <b>12,045,298</b> | <b>11,171,897</b> | <b>11,037,340</b> | <b>10,539,857</b> |

Notes:

- Data excludes Netafim.
- Data breakdown is not available between 2015 and 2017.

| Water discharge quality         | Units       | 2018       |
|---------------------------------|-------------|------------|
| Total Suspended Solids (TSS)    | Tons        | 117        |
| Chemical Oxygen Demand (COD)    | Tons        | 384        |
| Biochemical Oxygen Demand (BOD) | Tons        | 116        |
| Total Organic Carbon (TOC)      | Tons        | 136        |
| <b>Total solids</b>             | <b>Tons</b> | <b>753</b> |

Notes: Data excludes Netafim. Prior years not available.

**306-2 Waste by type and disposal method**

| Non-hazardous waste                  | Units       | 2018          |
|--------------------------------------|-------------|---------------|
| Landfill                             | Tons        | 25,259        |
| Reuse                                | Tons        | 7,825         |
| Recycling                            | Tons        | 17,766        |
| Recovery (including energy recovery) | Tons        | 1,833         |
| Incineration                         | Tons        | 1,724         |
| <b>Total non-hazardous waste</b>     | <b>Tons</b> | <b>54,407</b> |

| Hazardous waste                      | Units       | 2018          |
|--------------------------------------|-------------|---------------|
| Landfill                             | Tons        | 7             |
| Reuse                                | Tons        | 319           |
| Recycling                            | Tons        | 314           |
| Recovery (including energy recovery) | Tons        | 5,936         |
| Incineration                         | Tons        | 2,334         |
| Treatment                            | Tons        | 979           |
| Confinement                          | Tons        | 2,537         |
| <b>Total hazardous waste</b>         | <b>Tons</b> | <b>12,426</b> |

|  | Units | 2018 |
|--|-------|------|
| Percentage of total waste recycled/reused  | %     | 39%  |
| Percentage of total waste sent to landfill | %     | 38%  |

|                              | Units       | 2015          | 2016          | 2017          | 2018          |
|------------------------------|-------------|---------------|---------------|---------------|---------------|
| <b>Total waste generated</b> | <b>Tons</b> | <b>56,695</b> | <b>56,928</b> | <b>72,710</b> | <b>66,833</b> |

**306-3 Significant spills**

There was just one spill in 2018, of approximately one cubic meter of hydraulic liquid. No harm was caused to people or the environment.





**GRI 403: Occupational Health and Safety**

**403-1 Worker representation in formal joint management-worker health and safety committees**

More than 90% of our manufacturing sites have safety committees to represent the safety of all people on site.

**403-2 Types of injury and rates of injury, occupational diseases, lost days, absenteeism, and number of work-related fatalities**

| <b>Global employees</b>   | <b>U.S. &amp; Canada</b> | <b>LatAm</b> | <b>Europe</b> | <b>AMEA</b> | <b>Total</b> |
|---------------------------|--------------------------|--------------|---------------|-------------|--------------|
| Injuries (TRIR)           | 2.05                     | 0.89         | 1.17          | 0.90        | 1.08         |
| Lost days rate (severity) | 17.08                    | 15.89        | 16.77         | 17.73       | 16.44        |
| Fatalities                | 0                        | 0            | 1             | 0           | 1            |

| <b>Supervised contractors</b> | <b>U.S. &amp; Canada</b> | <b>LatAm</b> | <b>Europe</b> | <b>AMEA</b> | <b>Total</b> |
|-------------------------------|--------------------------|--------------|---------------|-------------|--------------|
| Injuries (TRIR)               | 1.81                     | 0.25         | 1.61          | 1.01        | 0.69         |
| Lost days rate (severity)     | 0.00                     | 0.71         | 9.82          | 14.13       | 5.01         |
| Fatalities                    | 0                        | 0            | 0             | 0           | 0            |

**Notes:**

- Safety rates are per 100 employees, using actual work hours.
- Injury rate is the Total Recordable Injury Rate (TRIR) and Lost day rate is the Severity Rate.
- Netafim data includes manufacturing and warehousing operations only and only for direct employees, not contractors.
- Data by gender is not available at this time.
- Data for occupational diseases and absenteeism is not consolidated at group level.
- Contractor data excludes Netafim.

**GRI 404: Training and Education**  
**404-1 Average hours of training per year per employee**

| <b>Employee training<br/>(number of training hours)</b> | <b>U.S. &amp; Canada</b> | <b>LatAm</b>   | <b>Europe</b> | <b>AMEA</b>   | <b>Total</b>   |
|---|--------------------------|----------------|---------------|---------------|----------------|
| Managers/ professionals                                 | 10,577                   | 128,366        | 46,558        | 10,563        | 196,063        |
| Others  | 24,268                   | 162,052        | 29,855        | 61,520        | 277,696        |
| <b>Total</b>  | <b>34,845</b>            | <b>290,418</b> | <b>76,413</b> | <b>72,083</b> | <b>473,759</b> |
| <b>Average per employee</b>                             | <b>20</b>                | <b>27</b>      | <b>12</b>     | <b>23</b>     | <b>22</b>      |



**GRI 405: Diversity and Equal Opportunity**  
**405-1 Diversity of governance bodies and employees**

| <b>Employees by level and age</b>                     |           | <b>U.S. &amp; Canada</b> | <b>LatAm</b> | <b>Europe</b> | <b>AMEA</b> | <b>Total</b> |
|---|-----------|--------------------------|--------------|---------------|-------------|--------------|
| <b>Managers</b>                                       | < age 30  | 8                        | 40           | 20            | 44          | 112          |
|   | age 30-50 | 91                       | 518          | 407           | 426         | 1,442        |
|   | >age 50   | 111                      | 223          | 244           | 97          | 675          |
| <b>Professional employees</b>                         | < age 30  | 77                       | 954          | 346           | 483         | 1,860        |
|   | age 30-50 | 265                      | 2,232        | 1,297         | 1,131       | 4,925        |
|   | >age 50   | 191                      | 525          | 722           | 194         | 1,632        |
| <b>Other employees</b>                                | < age 30  | 268                      | 1,423        | 530           | 299         | 2,520        |
|   | age 30-50 | 473                      | 3,782        | 1,495         | 376         | 6,126        |
|   | >age 50   | 265                      | 1,078        | 1,176         | 89          | 2,608        |
| <b>All employees</b>                                  | < age 30  | 353                      | 2,417        | 896           | 826         | 4,492        |
|   | age 30-50 | 829                      | 6,532        | 3,199         | 1,933       | 12,493       |
|   | >age 50   | 567                      | 1,826        | 2,142         | 380         | 4,915        |
| <b>All employees by percentage of total employees</b> | < age 30  | 2%                       | 11%          | 4%            | 4%          | 21%          |
|   | age 30-50 | 4%                       | 30%          | 15%           | 9%          | 57%          |
|   | >age 50   | 3%                       | 8%           | 10%           | 2%          | 22%          |



| Women in Orbia   | U.S. & Canada | LatAm        | Europe       | AMEA       | Total        |
|------------------|---------------|--------------|--------------|------------|--------------|
| Managers         | 32            | 173          | 119          | 64         | 388          |
| Professional     | 146           | 1,121        | 763          | 264        | 2,294        |
| Others           | 64            | 566          | 320          | 57         | 1,007        |
| <b>Total</b>     | <b>242</b>    | <b>1,860</b> | <b>1,202</b> | <b>385</b> | <b>3,689</b> |
| <b>Overall %</b> | <b>14%</b>    | <b>17%</b>   | <b>19%</b>   | <b>12%</b> | <b>17%</b>   |

**GRI 417: Marketing and Labeling**

**417-1 Requirements for product and service information and labeling**

Our products are used in several industries, most of which are strictly regulated in terms of product raw materials, components, safety data, use and disposal. In several cases, we are required to comply with specific regulation by country or by region. With very few exceptions, we are required to label our products in accordance with regulation or customer requirements. We therefore estimate our labeling requirement to cover more than 90% of our products.

Our Quality Assurance procedures in each operating unit regularly assesses conformance with these requirements as part of our ongoing quality processes and adherence to standards such as ISO 9001.



**Assurance  
Statement**



# Deloitte.

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## Independent assurance report on the 2018 Annual Report to Mexichem, S.A.B. de C.V., to the Management of Mexichem.

### Responsibilities of Mexichem and independent reviewer

The Management of Mexichem is responsible for the elaboration of the 2018 Sustainability Report (SR) for the period from January 1st to December 31st, 2018, as well as ensuring its content, definition, adaptation and maintenance of the management systems and internal control from which the information is obtained, and which is also free of material misstatement due to fraud or error. Our responsibility is to issue an independent report based on the procedures applied during our review.

This report has been prepared exclusively in the interest of Mexichem in accordance with the terms of our agreement letter dated September 25th, 2018, therefore we do not assume any responsibility to third parties and is not intended to be nor should it be used by someone other than the Management of Mexichem.

### Scope of our work

The scope of our assurance was limited which is substantially lower than a reasonable assurance scope, therefore the assurance provided is also lower. This report in no case can be understood as an audit report.

We conducted the 2018 SR review under the following conditions and/or criteria:

- a) The review of the GRI Standards disclosures in accordance with the reporting requirements as specified in the GRI Content Index of the 2018 SR.
- b) The data consistency between the information included in the 2018 SR with supporting evidence provided by the Management.

We have complied with the independence and ethics requirements of the Code of Ethics for Professional Accountants issued by the International Ethics Standards Board for Accountants (IESBA Code) based on integrity, objectivity, professional competence and due care, confidentiality and professional behavior principles.

### Assurance standards and procedures

We have performed our work in accordance with the International Auditing Standard ISAE 3000 Revised Assurance Engagements other than Audits or Reviews of Historical Financial Information issued by the International Auditing and Assurance Standards Boards (IAASB) of International Federation of Accountants (IFAC).

Our review work included the formulation of questions to the Management as well as various departments of Mexichem that have participated in the elaboration of the 2018 SR and the application of certain analytical and sample screening tests procedures that are described below:

- a) Meetings with staff of Mexichem to learn the principles, systems and applied management approaches.
- b) Two visits to the sites of Mexichem Resinas Altamira I and Mexichem Resinas Colombia for direct information collection and analysis.
- c) Analysis of the process to collect, validate and consolidate the data presented in the 2018 SR.
- d) Analysis of scope, relevance and integrity of the information included in the 2018 SR in terms of the understanding of Mexichem and of the requirements that stakeholders have identified as material aspects.
- e) Selected sample review from the evidence that supports the information included on the 2018 SR.
- f) Quality assurance by an independent partner of the project that verifies consistency between this report and the proposal, as well as work process quality and deliverables.

The following table details the revised contents according with the Sustainability Reporting Standards Guideline:

|        |        |        |                    |       |       |
|--------|--------|--------|--------------------|-------|-------|
| 102-16 | 102-42 | 102-47 | 303-3              | 305-4 | 403-1 |
| 102-17 | 102-43 | 302-1  | 304-2              | 305-5 | 403-2 |
| 102-18 | 102-44 | 302-3  | 304-4              | 305-7 | 404-1 |
| 102-22 | 102-45 | 302-4  | 305-1 <sup>1</sup> | 306-1 | 413-1 |
| 102-40 | 102-46 | 303-1  | 305-2              | 306-2 | 416-1 |

<sup>1</sup> The values that were reviewed included only the emissions of the two sites that were visited.

These indicators were selected for the independent review in accordance with the following criteria:

- a) Materiality of Mexichem referred in the 2018 SR.
- b) Information provided during the meetings and site visits with the interviewed staff.
- c) Review of the evidence provided by Mexichem staff of this project.

### Conclusion

Based on our work described in this report, the performed procedures and the evidence obtained, nothing comes to our attention that could make us believe that the indicators and disclosures reviewed in the 2018 SR contain significant errors or have not been prepared in accordance with the reporting requirements established in the GRI Standards. For those GRI Standards disclosures and indicators of the Disclosure Sector where Mexichem did not report in quantitative terms (numeric) the independent reviewer reviewed the qualitative information, which includes procedures, policies, evidence of the activities performed, among others.

### Action alternatives

Deloitte has provided Mexichem a report with the most significant action alternatives for future reporting, which do not modify the conclusions expressed in this independent review report.

Deloitte Asesoría en Riesgos, S.C.

Deloitte Touche Tohmatsu Limited affiliate Firm

*Rocio Canal Garrido*

Rocio Canal Garrido  
Director of Deloitte Asesoría en Riesgos, S.C.  
May 07th, 2019



Report and information available at  
<http://www.orbia.com/en/Sustainability/Policies-and-Guidelines/>

