

IPI Speaks to Markus Laubscher, General Manager of Orbia Fluor & Energy Materials' Pharmaceutical Business Unit

Highlighting Innovations in Low-GWP Propellants for a Sustainable Respiratory Healthcare System

Orbia is a company driven by a shared purpose: to advance life around the world. Operating in multiple sectors (Polymer Solutions, Building & Infrastructure, Precision Agriculture, Connectivity Solutions, and Fluor & Energy Materials), Orbia has five business groups that have a collective focus on delivering essentials that positively change the way people experience life, work and the world.

Markus, could you please give us a brief overview of Orbia's history and how the company has developed since its founding?

Orbia has a history dating back to the 1960s and has gone through various transitions. From 2005 onwards, it was called Mexichem. During that time, Mexichem began entering the chemicals industry and, over the next 15 years, grew from a Mexican chemicals company into a broader international infrastructure company. It made various acquisitions across different areas connected through vertical integration of the value chain.

The real guiding principle of Orbia is to better serve customers through vertical integration, from basic materials to higher-end application areas. In 2019, the company underwent a significant change when it rebranded as Orbia. The name Orbia is a made-up word with two components: 'orb', Latin for sphere or globe, and 'ia', Greek for force. This reflects our purpose to advance life around the world.

After all the acquisitions and growth, it was important for us to define a clear purpose as a group of companies. This led to the new name we have used since 2019. Under this name, we operate various business groups focused on different market needs.

You described Orbia's purpose as to 'Advance life around the world'. Could you expand on this and describe what you would say are the key attributes of Orbia's work?

Our mission is to address these global challenges: water and food security,

decarbonisation and the energy transition, and data and connectivity.

Each of these challenges has a critical materials science component. This is where we focus, offering specialty materials that help solve these pressing issues.

Water and food security is a growing global concern, with climate change disrupting weather patterns, causing droughts in some regions and flooding in others. Orbia addresses this through three business groups focused on water transport and management, working across homes and buildings, cities, and agriculture.

In data and connectivity, we support the growing need for high-speed infrastructure through polymer conduits that house fibre optics. These are used by major telecom companies and hyperscalers such as Amazon and Google as they expand their data centres. Our solutions are designed to enable future upgrades without the need to dig up soil and lay new fibres.

The business group I am part of, Fluor and Energy Materials, focuses on decarbonisation and the energy transition. We take a mine-to-market approach built around fluorine, an essential element in many low-carbon technologies.

Fluorine is naturally found as calcium fluoride. Orbia operates one of the world's largest fluorine mines in Mexico, supplying about 20% of global demand. From there, we transform the mineral for a wide range of applications.

Another major industry we are investing in is battery materials. Fluorine is present in various binders and electrolytes within the battery. To support this fast-growing sector and the broader electrification of mobility and society, we are building new manufacturing facilities and technologies, especially in the US.

In pharma, which is my area of expertise, fluorinated materials are crucial for pressurised metered-dose inhalers, ensuring controlled medication delivery and long shelf life. Fluorinated gases have been used in

inhalers for decades. Our business supplies these gases to pharmaceutical companies, large and small, for the production of inhalers mainly used for asthma and COPD.

Can you tell us a bit more about Orbia's ImpactMark?

When we rebranded in 2019, we looked at how different companies showcase and track their impact as organisations. Our rebranding was driven by defining a joint purpose for all these diverse companies. To ensure we stay true to the progress and advancement of these goals, we recognised the need to measure impact.

We defined an impact metric made up of six components. To keep these metrics front and centre for both ourselves and our customers, we decided to include progress on all six in our logo.

If you look at the Orbia logo, you will see circles. These circles represent a stylised spider chart showing our progress on the six impact metrics. As we successfully advance, the circles become full.

These metrics include typical ESG parameters such as environmental, social, and governance factors.

Focusing specifically on Orbia Fluor & Energy Materials' Business Group, how does your mine-to-market approach also contribute to the development of more sustainable medical propellants?

There are several important aspects of the mine-to-market approach that enable a business to function effectively. It ensures supply security for customers because you have strong control over and operate the entire value chain. In situations like the Covid pandemic, this control allows you to continue serving customers without interruption.

From a sustainability perspective, the biggest advantage of mine-to-market is the ability to maximise efficiency across the entire chain to reduce carbon emissions. It is essential to avoid unnecessary transportation and minimise emissions from energy use and other operational sources.

Since all these emissions are within our control, our mine-to-market approach gives us the opportunity to significantly reduce them.

With regards to Orbia Fluor & Energy Materials' pharmaceutical business unit, how does your commitment to sustainability influence your approach to product development in the healthcare space?

At Orbia, we are a community of companies, each with a key sustainability value proposition that we bring to the market. It is very much a bottom-up approach, where all these businesses influence sustainability, and we aim to express and highlight this at the global Orbia level.

In the business group I am part of, Orbia Fluor and Energy Materials, our focus is on bringing new products and molecules to market that deliver the crucial functions we discussed earlier while minimising negative environmental impact. We achieve this through innovation and deep expertise in fluorinated compounds, including their chemistry, synthesis, and applications.

In my previous experience with other companies, if they made a gadget, sustainability often meant reducing packaging or recycling the product. At Orbia, it is very different because the product's core purpose is sustainability.

For example, the energy materials we develop are essential building blocks for electric mobility. Similarly, with inhalers, we are not just optimising margins; we are transforming the industry by introducing a new propellant that is radically more environmentally friendly than previous options.

Could you explain what investments Orbia Fluor & Energy Materials is pursuing in the development of low-GWP propellants for metered-dose inhalers, and how this will help reduce the environmental footprint of respiratory treatments?

Since Orbia Fluor & Energy Materials entered this space in the mid-1990s, following the phase-out of CFCs, we began investing in production facilities. At that time, we worked alongside our partner GSK to build capacity for supplying the global market with the new generation of propellants.

Over the years, we recognised early on that another transition was coming. Being

involved in various fluorinated gas industries, we had already seen regulations introduced and implemented in the refrigerants sector, with a phase-down underway.

Once we understood that a regulatory-driven phase-down would shape the industry and that innovation would be key to supporting it, we knew we had to develop the next generation of medical propellants.

About 12 years ago, we began this journey by evaluating our toolbox of potential molecules. Using our medical expertise and an elimination process, we identified the 152a molecule as the best candidate.

Since then, we have invested tens of millions of dollars or pounds to prove the absolute safety of this molecule for medical applications. We completed a rigorous 10-year toxicology programme to demonstrate its safety to pharmaceutical companies and regulators worldwide. This has been a major investment on our part.

In addition, we started investing in production because a good candidate is only useful if it is produced in sufficient quantities. In the early 2020s, we built a small-scale facility that went online to supply the volumes needed for medication registration, clinical trials, and regulatory approval.

By investing in production, we gave the industry the foundation to move forward. We started with the propellant, our pharma customers and partners took over with formulation work, and now it is up to us to take the next step.

Just last year, we announced plans to build a larger facility that will produce enough propellant for a global switch to 152a. Construction is underway, and the plant is expected to be operational in the second half of next year in Runcorn, UK.

What is the difference between using a CFC and a fluorocarbon as a propellant in inhalation devices? If Orbia sells environmentally friendly propellants for these devices, how do they differ from CFCs?

CFC stands for chlorofluorocarbon. It contains a chlorine atom in the molecule, which is responsible for breaking down the ozone layer. The Montréal Protocol, agreed upon by all countries, identifies CFCs as a major cause of ozone layer damage.

As a result, countries worldwide passed legislation to phase out these products.

This was the first major transition of propellants. Before this, all propellants were CFC-based because of their excellent chemical properties suitable for safe medical applications. However, their significant environmental harm led to their ban, and the industry was given time to transition to new solutions.

The new solutions are HFAs (Hydro-fluoroalkanes), which contain no chlorine. For Orbia, this transition marks the birth of our business. Although we were already a strong fluorine player, the transition led us to team up with one of the biggest customers and industry leaders, GSK. Together, we built the necessary infrastructure to produce a new non-chlorine-containing propellant, Zephex 134a, at medical grade quality and at large scale.

Alongside GSK, we built a facility to supply this propellant globally as the transition began around 30 years ago. We recently celebrated this 30th anniversary by bringing together major players committed to advancing the next generation of propellants. Today, 134a is the most widely used medical propellant in the world.

While the ozone layer started to recover quickly, the process is slow. The ozone layer has not yet fully recovered despite the 1990s phase-out, illustrating the long timeline. Meanwhile, the world switched to these fluorine-based, CFC-free propellants.

However, these propellants still have a high global warming potential. Although they do not damage the ozone layer, they contribute to the greenhouse effect. We are now in a period of the next transition, phasing down and phasing out existing propellants in favour of new ones with low global warming potential.

Please give us a brief insight into what is next to come for Orbia Fluor & Energy Materials?

Focusing on what's next for our pharma business, our priority is to ensure this transition happens much more smoothly than the one in the 1990s. Back then, issues across the whole supply chain resulted in some patients being left without medication. Orbia is doing its part to ensure this will not happen again, and we call on the whole pharma industry ecosystem to do theirs.

Today, our main focus is to continue to make this transition successful.

This transition means two things. First, it means having the new propellant available and providing the medication formulation support needed for our partners to produce their drugs. Second, it means ensuring the old propellant remains available as long as the market needs it, recognising that the speed of transition varies around the world. As a global player, we want to make sure no one is left behind. Therefore, we will continue to supply the existing 134a propellant as long as the market requires it.

Our number one priority is to manage and successfully complete this multi-year transition. Research, development, and innovation continue without pause. So far, our products have mainly focused on asthma and COPD, as have many pMDI producers. But we believe there are great opportunities ahead in new application areas for pMDIs.

We think that many treatments currently given by injection could potentially benefit from being delivered via inhalation. Areas such as hormone delivery, antibody delivery, and vaccines are ones we will actively explore. We intend to work with our partners to expand the scope of this delivery mechanism.

Where do you see the advantages of using inhalation devices to deliver medications such as vaccines, treatments for headaches, or painkillers? Why are these benefits significant?

The lung is the largest surface area in the whole body, making it a very important and favourable organ for getting medication

into the bloodstream. It also avoids the digestive system. Of course, the most direct method is injection, but that has significant disadvantages in terms of patient comfort and, consequently, consistency in taking medication.

The MDI combines two key benefits. It delivers drugs very directly into the blood, while also offering a convenient format that can be easily used anywhere. Patients can carry it with them and maintain better compliance with their medication.

How is the industry responding to the low-GWP propellant? Are they eager to adopt them or hesitant because of the costs and long development process?

There are two key factors. The driving force for this transition is the global regulatory framework. The Montreal Protocol and the Kigali Amendment are guidelines that everyone must comply with. Although there are different timetables in different regions, it is clear that the transition is necessary. You cannot avoid it. As a society, we have agreed to this.

The question is, how do you position yourself in this dynamic as a company? Do you want to be a front-runner or a laggard?

The partners who work with us today are front-runners. They believe they have a significant advantage in moving faster than others to the new propellants. This advantage comes from market recognition, potentially favourable treatment by regulatory bodies, and the ability to shape the market rather than be shaped by it.

We see this most clearly in Europe, where the transition is most urgent.

Another important dynamic in the pharma industry is the ongoing challenge between originators and generics. Generics have an opportunity to introduce new products with a new propellant but the same existing API. This allows them to position themselves as branded generics, which is a great way to gain a larger market share and achieve higher margins on their products. The new propellant can be a vehicle for that.

Given the current economic and political circumstances, do you see European companies as more open to these discussions?

European regulation is frontrunning, and companies that want to play in the European market need to be there and take action. These players are global companies, so they conduct their innovation and development work with Europe as the first launch market. After that, they prepare to launch in the US and other geographies, before eventually expanding into less profitable markets over time.

Is there anything else you would like to share?

I would like to share that, for me personally, it is very exciting to be in this role because my background has been in innovation and sustainability over the last 20 years. However, this is the first time I have had the chance to be in a space where we are actually implementing sustainability, where it's not just a vague concept.

Mainstreaming sustainability, I believe, is where many industries need to get to, and we have the privilege in this specific industry to be living that here and now. I feel extremely privileged to be part of that.

