Just Breathe! Sustainable Initiatives Beyond the Green Transition

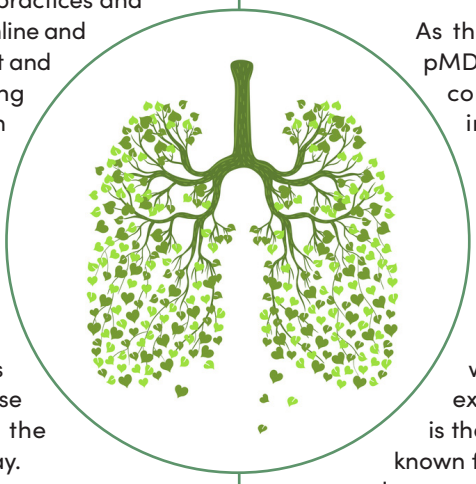
In 2026, sustainability is more than a 'buzzword'. It is a core strategic expectation essential for longevity and a robust value chain. Looking beyond the carbon footprint of manufacturing, a holistic approach to sustainability considers the environmental and social impacts across every stage of the value chain. Embedding sustainable business practices across the industry is both challenging and essential to building long-term resilience in a rapidly evolving market. Leveraging its position as a trusted market leader in pressurised Metered Dose Inhaler (pMDI) products and components, Bespak® is committed to growing responsibly, decarbonising its operations, and supporting the transition to low carbon pMDIs, supporting a more sustainable future for patients, customers and the wider industry.



A 'Greener Tomorrow' Starts Today

pMDIs are life-saving pharmaceutical devices used in the treatment of asthma, Chronic Obstructive Pulmonary Disease (COPD) and other chronic lung conditions. They are significant contributors to the healthcare-related carbon footprint, making up 3% of the UK's National Health Service's overall carbon emissions.[1] Transitioning to low Global Warming Potential (GWP) propellants HFA-152a and HFO-1234ze(E), to reduce pMDI-associated emissions is an industry priority and Contract Development and Manufacturing Organisations (CDMOs) like Bespak have become increasingly essential in facilitating this shift.

As the specialist inhalation CDMO, Bespak is committed to ensuring it has the capabilities, business practices and dedicated infrastructure in place to streamline and accelerate low carbon pMDI development and commercialisation, without compromising quality or continuity of care for patients. Ten years on from the Kigali Amendment to the Montreal Protocol, which sets phasedown targets for greenhouses gases, Bespak has cemented its leadership of the green transition, with a recently-announced commitment to supply the world's first approved HFA-152a pMDI, building on its existing role in the supply of the world's first approved HFO-1234ze(E) pMDI – These milestones serve to demonstrate that the transition is both achievable and underway.



Building upon these momentous achieve-ments, the path forward has never been clearer. Industry-wide sustainability requires a multi-faceted approach and collective effort in making small actions that compound to bring about a positive difference. As the industry begins to look beyond the immediate transition to low GWP propellants, pharmaceutical developers must holistically assess their portfolios and operational practices to identify opportunities for meaningful change. Bespak is working to establish tools and services to help make this process easier and to support its customers in their mission to meet evolving patient needs.

Regulatory Confidence Through Iterative Optimisation

Achieving sustainability is an ongoing, iterative process requiring consistent planning, action and adjustment of strategy. Bespak is continuously striving to improve and sustainability metrics of the pMDI components, devices, and drug-device combination products it offers – but never at the expense of performance or quality. As switching propellants can affect formulation behaviour and dose delivery, component performance must be assessed with low GWP propellants in order to maintain quality and reliability of delivered dose.

As the producer of almost half the world's pMDI valves, Bespak has dedicated itself to combining its specialist knowledge with innovative technologies to help pMDI developers achieve their sustainability goals with regulatory confidence. Leveraging advanced in silico modelling techniques, digital engineering processes and in-house validation studies, Bespak continually is assessing the performance of its critical components when used with HFA-152a and HFO-1234ze(E). For example, the Bespak BK357 pMDI valve is the industry's most trusted metering valve, known for its consistency in quality, performance and compatibility with a wide range of traditional hydrofluoralkane propellant formulations. By simulating *in vitro* aerosolisation performance and characterising real-time fill behaviour experimentally, Bespak was able to optimise the valve design to limit propellant leakage and moisture ingress. This led to successful, and even improved, performance compared to traditional propellants. Backed by data-driven enhancements, the BK357 valve is now the first valve approved for use in low carbon pMDIs. By accelerating the early stages

of formulation feasibility with its proven components and digital engineering capabilities.Bespak is supporting its customers in their transition to low GWP propellants and helping to put low carbon, life-saving medicines into the hands of patients faster.

Sustainability as a Design Parameter

Bespak is also actively exploring solutions for carbon reduction beyond the propellant switch, having recently completed its first Life Cycle Assessments for the BK357 valve, and other critical pMDI components such as its range of actuators, to better understand their carbon impact and identify emissions hotspots. Building on this, and using a digital-first approach, Failure Mode and Effects Analysis (FMEA) to find and fix design flaws before production, and fit-and-function frameworks, we are actively reducing reliance on the iterative, resource-hungry testing associated with reformulation or platform redesign. Bespak has also been working on tackling common challenges which can be difficult to predict but can significantly impact a product's carbon footprint, such as manufacturing variability. Recent advancements in tolerance analysis allowed Bespak to map the design space of critical pMDI components and successfully identify opportunities for waste reduction. This knowledge directly benefits the customers who have access to Bespak's rapid prototyping facility and other design services working to cut emissions across the full product lifecycle while ensuring quality and performance. By using environmental performance and eco-friendly manufacturing as non-negotiable parameters, Bespak has identified opportunities for wider device-level decarbonisation across raw material use, manufacturing, and performance testing. In conjunction with stringent process controls and raw material usage efficiency, these design considerations help Bespak to follow a 'Right First Time' framework. In 2025, Bespak produced over 690 million devices with a 99.65% manufacturing yield and no major deviations or product recalls.

Bespak is dedicated to steering positive change and laying the groundwork for future advancements beyond next generation propellants. From cross-industry knowledge sharing for data-led design modifications, to implementing decarbonisation initiatives across the value chain, Bespak is already enacting meaningful change for patients and the environment. By supporting its customers in the development of targeted strategies for decarbonisation and reducing waste, Bespak helps them to progress their own sustainability ambitions while staying ahead of emerging regulatory requirements.

Cutting Carbon Collaboratively

Industry-wide sustainability requires collective effort. While individual organisations need to do their part, collaboration allows for complex challenges to be tackled that cannot be addressed alone. CDMOs can act as strategic partners for pMDI developers, providing the technical expertise and infrastructure necessary to help navigate changing market needs and future-proof upcoming commercial initiatives. To support its partners and the wider industry as global demand increases, Bespak has expanded its GMP facilities at its Holmes Chapel site, with fully operational commercial-scale filling lines for HFO-1234ze(E) and clinical-scale filling for HFA-152a (with full commercial-scale readiness on track for 2027). By targeting investment into its capabilities and manufacturing capacity, Bespak is strengthening its position as the long-term innovation partner and sustainability leader in inhaled and nasal drug delivery.

Bespak has also recently expanded its partnership with the Chiesi Group. The award-winning enhancement at the Holmes Chapel site directly supports Chiesi's Carbon Minimal Inhaler (CMI) programme and wider goal to reach Net Zero by 2035. The CMI programme aims to reduce the carbon footprint of pMDIs by up to 90% to reduce environmental impact without impacting established treatment options and continuity of care. Reinforcing a trusted relationship, the expanded collaboration leverages Bespak's specialist knowledge and leadership in low GWP pMDI manufacturing to help deliver lower carbon inhaled therapies at scale, and strengthen Chiesi's supply chain resilience, responsibly and with confidence. Both companies are committed to addressing climate change through measurable, science-based action, and this collaboration will help both partners make tangible progress towards their individual and collective sustainability ambitions.

The expansion of the Holmes Chapel manufacturing site also firmly establishes Bespak as part of a collaborative network of experts who are collectively leading global pMDI development. This specialist pMDI hub in the Northwest of England consolidates the pMDI supply chain, mitigating collective risk and reducing transport carbon costs through the pooling of capabilities, manufacturing equipment and resources locally. Bespak's improved manufacturing capacity that more customers now have access to its HFA-152a and HFO-1234ze(E) capabilities, supporting them in their propellant transition and helping to ensure robust global supply. But, building upon this, we remain is committed to solidifying our position as an industry pacesetter, and will continue to seek out opportunities for collaboration and cross-industry knowledge sharing, to augment this global centre of excellence and encourage the co-creation of green solutions for collective advancement.

Beyond the Green Transition – Next Steps for a Low-Carbon Future

In September 2025, the Science Based Targets initiative (SBTi) validated Bespak's near-term target to reduce Scope 1 and 2 greenhouse gas (GHG) emissions by 54.6%, and its long-term net-zero target to reduce Scope 3 emission intensity by 97% by 2050. Facilitating the shift to next generation propellants is a key strategic priority for Bespak, with 75% of its Scope 3 decarbonisation potential directly linked to the transition. Focusing initially on the most emission-intensive areas of its carbon footprint, such as the use-phase of sold products, purchase of capital goods and services, and upstream transportation and distribution, Bespak is prioritising data-driven strategies and targeted engagement with the wider supply network to achieve these targets. As of 2025, landfill avoidance remained a consistent strength despite operational growth. Bespak maintained its near-zero waste-to-landfill and 82% recycling rate, demonstrating its continued progress towards a circular resource economy. We also reported a 20% reduction in Scope 3 upstream emission intensity compared to the 2023 baseline.

Although significant achievements, this is just the beginning – sustainability requires looking beyond the propellant transition



and embedding sustainable business practices into the fabric of all operations, from material choice to packaging configurations and transport logistics. Following the publication of its first biodiversity report, Bespak is holistically assessing the ecological impact of its sites and the wider supply chain to enable the conscious implementation of initiatives reducing environmental impact. Additionally, as part of its strategic roadmap, Bespak developed a sustainability charter to help align and formalise carbon reduction objectives across the value chain. Requiring credible decarbonisation and compliance commitments from suppliers, the charter sets out clear expectations for responsible sourcing, communication, and transparent reporting to help monitor collective progress towards whole-network decarbonisation. Bespak is committed to delivering on its sustainability pledge as it grows responsibly in line with increasing global demand and is working to drive long-term positive change that empowers and enriches its customers, workforce and the local community.

REFERENCES

1. NHS (2020). Delivering a 'Net Zero' National Health Service

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