

Responsible Care case studies

Factory of the future – developing the largest state-of-the-art biomanufacturing facility in Ireland

How WuXi Biologics manufacturing facility in Dundalk is designed, built and operated under the greenest standards

WuXi Biologics' investment in Ireland has been a welcome addition to Ireland's growing number of next-generation biopharmaceutical companies. Not only has the site generated jobs locally, but their facility in Dundalk is one of the first and largest greenfield pharmaceutical projects by a top global CRDMO (contract research development manufacturing organisation) in Ireland.

WuXi Biologics leverages its technologies and expertise to provide customers with efficient and cost-effective biologics discovery, development and manufacturing solutions in a sustainable and responsible way.

Brendan McGrath, Ireland Site Head, VP of Manufacturing for WuXi Biologics, says, "Our Dundalk site was awarded the 'Facility of the Year' in the operations category for new facilities from the International Society for Pharmaceutical Engineering in 2023, which we were delighted to have won.

"It's one of the largest single-use bioreactor capacities of its kind globally. The plant uses 6x1K litre single-use bioreactors for perfusion and 12x4K litre single-use bioreactors for fed-batch processes instead of stainless-steel vessels and kilometres of pipework, which require extensive cleaning and sterilisation using water, steam, detergents and energy."

Single-use bioreactors are containers in which cells are grown to produce biological products. Brendan says, "Single-use bioreactors contain all the elements for cell growth within. Because it is a fully enclosed system, when we harvest the product from the single-use bag, we do not have to clean down the system. Instead, the bag is removed, processed through a dedicated waste stream and incinerated to produce energy in a process that uses less energy and avoids cross-contamination risk."

Brendan adds, “The single-use bioreactors are used to manufacture biologic drug substances on a round-the-clock basis and can be quickly adapted for different processes or scales. This reduces downtime between production runs and accelerates the overall production timeline. Along with reducing water and energy consumption, single-use bioreactors are more efficient in terms of productivity and pose lower safety risks.”

Environmental excellence

When setting up in Ireland, WuXi Biologics was conscious of its carbon and resource footprint. Its ambition was to create a state-of-the-art facility that excels in environmental leadership, with the goal to reduce 50% carbon intensity by 2030 and to achieve net-zero GHG emissions by 2050.

James Atherton, Utilities Lead for WuXi Biologics Ireland and Chair of its Sustainability Committee, says, “We continually assess risks and opportunities arising from the impacts of climate change. We optimise greenhouse gas (GHG) emissions and energy management systems, as well as implement environmentally friendly and low-carbon innovative technologies and processes.

“Energy usage is always our main focus. We use LED lights and motion control sensors, and maximise the use of glass to harness daylight, to reduce energy consumption.”

James continues, “The manufacturing process involves growing cells that require consistent food, heat and light with an uninterrupted electricity supply. Our electricity supply is 100% renewable sourced and the security building is carbon neutral with 100% energy supplied by on-site solar panels. We introduced hydrotreated vegetable oil (HVO) on-site for our emergency generator biofuel and rainwater harvesting system, with 1,943m³ of water usage reduced per year.”

In 2023, the Dundalk site achieved a total reduction of 6.5GWh of energy, compared to the previous year (4.8GWh of natural gas and 1.7GWh of electricity). “We also have zero waste to landfill, 100% hazardous waste is recovered, and 100% non-hazardous waste is recycled.”

Next-generation goals

In addition, the Dundalk site has developed several ESG initiatives, which Xiaoyu Xie, PR Lead for WuXi Biologics Ireland and member of their Sustainability Committee, says are crucial in establishing WuXi Biologics as a responsible company. “Such initiatives that integrate employee wellbeing and diversity are instrumental in building a resilient and agile workforce, prepared for future challenges.”

Xiaoyu adds, “Ireland is emerging as a leader in sustainable biopharmaceutical and chemical manufacturing. However, to maintain and enhance this leadership position, continued investment in innovative technologies, fostering a skilled workforce in sustainable practices, and strengthening regulatory frameworks for environmental protection are essential.”

“WuXi Biologics’ goals for the future focus on safe, responsible, and sustainable manufacturing, as we continue to integrate next-generation biomanufacturing technologies and clean-energy sources.”

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