

Responsible Care case studies

Full steam ahead – a sustainable heating strategy for pharma manufacturing

How Takeda's innovations in energy management are driving the rapid transition towards a net zero future

“Reaching sustainability goals isn't just something Takeda aspires to do,” says Michelle Farrell, EHS Head at Takeda Grange Castle. “Sustainability drives everything we do.”

Biopharmaceutical company Takeda has a history of over 240 years of providing leading innovation in medicine. The organisation's presence in Ireland was established in 1997 Bray, Wicklow, and in 2004, they set up their first state-of-the-art active pharmaceutical ingredient (API) facility outside Japan, in Grange Castle, Dublin.

Since beginning commercial operations in Ireland, Takeda Ireland has grown in strength. At the Pharma Industry Awards 2023, Takeda Ireland won the award for Sustainability Initiative of the Year.

Road to net zero

With sustainability, Michelle says Takeda has three main priorities: “To minimise the environmental impact of the products we produce, to decarbonise our operations and supply chain, and to empower our employees and our contractors to go above and beyond to conserve the world's natural resources. This starts right from the top of the business, at the leadership level.”

“All of our manufacturing locations have Climate Action Programmes (CAPS), focused on reducing the GHG emissions from our operations. Through CAPS, global EHS and Engineering leaders from across the world meet regularly to review where we are and what we can do better.”

Initially, Takeda had a target to achieve net zero greenhouse gas emissions before 2040. Recently, that target has been accelerated to 2035. Along with adopting measures including using 100% renewable electricity to achieve this target, one such unique project on the Grange Castle site is the installation of a 2.2MW electric element boiler.

Gavin McGlone, Project Engineer at Takeda Grange Castle, says, “We have two 4.2 tonne-per-hour gas work boilers, which are used to produce steam for heating within production buildings and in the production process. However, this represented around 70% of our gas usage on-site.

“To maintain continuity of supply, we’ve installed a 2.2MW electric element boiler to eventually replace one of the gas boilers. The electric element boiler produces steam at 95% efficiency using electricity from Eirgrid’s green energy supply.

Gavin explains the electric boiler will be run in a demand side unit, in line with an external utility provider, allowing the site to contribute load generated by steam production to the grid, helping to balance it during periods of high wind.

“During periods of high winds, the electric boiler is remotely switched on, and load is added to the grid. This helps ensure electricity consumption matches electricity production at any moment within the grid, and that continuity of supply at 50Hz is maintained.” says Gavin.



Purpose

Gavin says that running an electric boiler can be costly, “During the commissioning phase, we ran the e-boiler for four days, which resulted in increased operating expenses. However, we believe this is the right thing to do and an important step in reducing our carbon emissions.”

“If we run it with the demand side unit, which is operating around 1,000-1,200 hours per year, this will reduce our carbon gas emissions by 15%.”

“We are also implementing other measures to help reduce the usage costs of the electric boiler. For example, the use of a heat pump on our heat transfer system.”

Gavin continues, “We use heat transfer to heat and cool the processes in our production plant, and there’s a lot of waste heat that we don’t capture. The heat pump is potentially going to capture that heat and reuse it for space heating.

“We expect that the emission savings we’re making will only increase over the next couple of years.”

As Takeda continues to prioritise sustainability, Gavin says “it’s crucial to explore innovative solutions that avoid fossil fuels, harness the forces of nature and maximise energy utilisation”.

Michelle adds, “Becoming greener is the right thing to do. We must do what we can, not just for ourselves, but for future generations.”



**Michelle Farrell,
EHS Head, Takeda**