Department for
Business, Energy
& Industrial Strategy

Cargill Heat Recovery Project

Industrial Heat Recovery Support (IHRS) Programme Case Study

April 2021

Context

Cargill PLC employs over 155,000 people in 70 countries and is known as the world's largest privately owned business providing services in food, agriculture, financial and industrial sectors.

Cargill's Manchester sweeteners plant is a production facility that forms part of the Cargill starches and sweeteners business and has been operated by Cargill since 2002. It has around 200 employees and has customers in the confectionery, brewing, alcoholic beverage, dairy and bakery sectors along with farming and aquaculture. It is also one of the top five energy users in the food industry within the UK, with the spend on energy totalling around £20m each year.

How IHRS supported the project

The Heat Recovery project proposed the recovery of waste heat from the Ethanol Plant currently sent to the cooling towers. Integration into the existing Vital Wheat Gluten (VWG) dryers via a hot water loop would allow for the air temperature in the dryers to increase 12°C and result in less steam consumed to reach target exit temperatures.

During phase 1 of the IHRS programme, we assessed the feasibility of this project identified possible future plans. We projected a reduction of site steam consumption by ~2tonnes/hour and an annual cost saving to the site of ~$350k/year including $55k of CO2 savings. We also identified higher than expected pressure losses due to fouled filters and heat exchangers in the VWG.

For phase 2, we will optimise this arrangement to increase functionality and cleanability of the filters. This project will also reduce loading on the currently highly loaded Ethanol cooling towers.

Benefits and added value

This unique project crosses multiple different areas (wheat and ethanol) meaning more engineers need to be involved to ensure smooth operation once commissioned. Similar technology is already implemented (hot water loop) with another heat source from the CHP. The site Engineering Manager came up with the idea of utilising the heat from the ethanol plant in the same sink just a few years ago.

The IHRS funding programme has made this project more favourable and made approval more obvious for senior leaders as it improved the payback of the project by over 1 ½ years. We were also able to accelerate the implementation the heat recovery project sooner than originally planned due to the timescales of the programme.

The application process for the IHRS programme is straightforward and the forms that needed to be completed highlighted all the necessary information required. The staff were also very responsive and helpful to any queries. The IHRS programme also improved collaboration between engineers working on different areas on site due to the complexity of the project.

Lessons learned

The feasibility studies for this project was of utmost importance as there is already a similar heat recovery loop into the dryers. The challenge was to ensure that the integrity of the existing heat recovery wasn't compromised. Plus, as this was a £1.5m investment, the payback needed to be attractive to make sure all stakeholders were confident with the implementation of the project.

This energy saving project is in-line with our business goals of substantially reducing energy consumption and CO2 emissions. The payback and subsidy makes this an attractive standalone project. However, the project also contributes to further energy optimisation and is a key step on the site energy masterplan. This was a major contributor for the decision to proceed along with the approval of funding for phase 2.

"The IHRS scheme ensured previously identified projects move from fighting for priority in a busy portfolio to 'must do' projects by effectively reducing their cost by 25-30%. Secondly, the relatively short time scale to deliver results and qualify for the scheme meant we needed to divert a lot of internal engineering resource to the project. While this causes some complications in balancing our effort to deliver on other business goals, it does provide a greater focus on energy projects to ensure we meet the deadline." (Liam McCarthy, Project Manager)

This publication is available from: www.gov.uk/guidance/industrial-heat-recovery-support-programme-how-to-apply

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