



Department for  
Business, Energy  
& Industrial Strategy

# Basell's Carrington Heat Recovery and Integration Project

Industrial Heat Recovery Support (IHRS)  
Programme Case Study

## Context

LyondellBasell Industries (LBI) is one of the world's largest polymers, petrochemicals and fuels companies. LBI is a global leader in polyolefins technology, production and marketing; a pioneer in propylene oxide and derivatives; and a significant producer of fuels and refined products, including biofuels. Through research and development, LyondellBasell develops innovative materials and technologies that deliver exceptional customer value and products that improve quality of life for people around the world.



### Basell Boilers

The LyondellBasell Carrington polyolefins site, 10 miles to the south-west of Manchester has made significant strides in reduction of energy use through optimisation and small/medium projects. A feasibility study had previously been carried out into the potential of a further step-change reduction in boiler gas consumption by installation of a heat integration scheme. The conclusion was that, although interesting, the return on such a project would be marginal and further development was on-hold until March 2019 when BasellPolyolefins put in an application to the Department for Business, Energy and Industrial Strategy's (BEIS) Industrial Heat Recovery Support (IHRS) Programme.

## How IHRS supported the project

The IHRS Programme is designed to encourage and support investment in heat recovery technologies. The recovered heat can be used within the industrial site, by another end user or used to generate power, helping businesses to lower their fuel costs, reduce waste heat and cut emissions. Chemicals is one of the industrial sectors eligible to participate in the Programme due to an acceptable SIC Code plus data centers.

BasellPolyolefins was awarded up to £40,680 grant funding towards preliminary engineering for their project. The project proposes utilising the heat available in two vapour recycle streams (heat source) to provide the re-boil duty of a distillation column (heat sink) resulting in savings of steam for the distillation reboiler and cooling water for the recycle condensers.

The availability of support via the IHRS Programme unlocked internal funding to further develop the project to the Front-End Engineering (FEED) stage. A local engineering design consultancy who had carried out other project design for the company was appointed to further develop the design into a full FEED package, with support from a small team of LyondellBasell's own engineers where appropriate.

“The IHRS Programme made the difference to further develop the heat integration project which had been shelved for the last 2-3 years. This also created the chance to assess the opportunity in more detail and provide more information on technical and economic feasibility that may be the difference between such a project being installed or not.”

David Royle, Site Energy Manager

## Benefits and added value

The heat recovery was achieved by providing piping for the vapour recycle from the main production plant to the distillation unit ~150m away. Based on the pressures and compositions of the hot and cold streams, the differential temperature across the system was limited, thus resulting in a much larger reboiler being required. A separation vessel was also included in the design to allow the liquid and gas streams to be returned separately to the main production plant.

The overall energy savings of the proposal are approximately 17,000 MWh (net) of natural gas and associated reduction of approximately 3,500 tonnes of carbon dioxide emissions from the site boilers. Wider benefits achieved include a commensurate reduction in electrical energy on the cooling water tower pumps and fans and a small reduction in make-up water to the cooling tower from the nearby river.

If you are interested in finding out more about the IHRS Programme, please contact BEIS's IHRS delivery partner, ICF directly at 020 3096 3106 – where the IHRS delivery team will be able to assist you.

Alternatively, you can email [ihrsprogramme@icf.com](mailto:ihrsprogramme@icf.com) or visit the website at <https://www.gov.uk/guidance/industrial-heat-recovery-support-programme-how-to-apply>.

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