



Decarbonisation of Aras de Brun, NUIG Co. Galway

The retrofit of an old building serving as a pilot project for NUIG for their future retrofitting campus programme.

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Commercial Heat Pump Systems

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NUIG Retrofit Commercial Heat pump Project

The drivers behind this project is a collaboration between the HEA and SEAI under Project Ireland 20 40 Higher Education Efficiency and Decarbonisation Pathfinder Programme.

- This project serves as a pilot project for National University of Ireland, Galway for their future retrofitting programme campus wide between 2020 2025.
- This research will be used as guidelines for other retrofitting measurement and verification in third level institutes, nationwide.

The project focus is on the performance of a commercial Air to Water heat pump in an existing commercial building in the context of the climate zone existing in Ireland.

Aims and Objectives

- To analysis the energy performance of Áras de Brún pre and post retrofit in line with the IPMVP framework.
- To use linear regression analysis to calculate a predicted energy usage for Áras de Brún
- To create a calibrated building energy model.
- Investigate post retrofit sensing data to monitor thermal comfort.
- To calculate pay back periods of retrofit options.





Data Collection

There are 3 different sets of data which give a seasonal efficiency based on different calculation parameters/methodologies. If heat load of the building can be found/calculated and then compared to the heat output of the heat pump, a control strategy can be agreed upon.

EN14825 - This data is accepted as a harmonised industry standard and is useful for comparing individual heat pumps performance as they are all tested under the exact same conditions. This is also known as a medium temperature fiche document. Although this data has its uses, it is not considered useful in modelling the potential energy usage as it only considers the efficiency of the heat pump at four different external air temperatures and does not give a true reflection of the heat pumps true on-site performance.

Fixed Flow - This is a more comprehensive set of data which gives the output and COP at external air temperatures ranging from -10oC to +15oC at a flow temperature of 55 oC. It also gives the number of hours spent each year at any given temperature. The average COP is then calculated based on the number of hours spent at each temperature.

Varied Flow Temperature - This data set calculates the average COP using the same methodology as the fixed flow data set. However, in this data set the flow temperature varies depending on the external air temperature. If this control methodology is used, much greater seasonal efficiencies can be achieved. It is possible to vary the flow temperature in this way using the "CSP" accessory on the heat pump.

Zeta Rev HP XT

- High outlet water temperature: up to 65°C
- Operation down to ambient -20°C with outlet water at +55°C
- Efficient energy performance: COP up to 3,5
- Intelligent management of defrost cycles: Anti-Ice Circuit
- BlueThink advanced control with integrated web server. Multilogic function and Blueye® supervision system. (options)
- Flowzer: inverter driven pumps (options)



PF - Hot water buffer store Pufferspeicher - Buffer Tank - Bespoke

TML 3000ltr with 4" Connection

Carbon steel hot water buffer store for the storage of primary water produced from continuous and discontinuous heat sources. The thermal fluid contained in the cylinder and in the primary heat exchangers must operate in closed circuit (without oxygen), in order to avoid corrosion phenomena.