

Case Study

Edel hot water
heat pumps by
Dimplex for the
modern Vesta
development



The nZEB compliant Edel hot water heat pump is at the heart of a smart turnkey heating, ventilation and hot water solution

The construction of the Vesta development commenced in August 2018 with plans for 382 modern apartments set on a plot in the Dublin 13 area. The development is located a quick walk away from the Dublin Area Rapid Transit (DART) and offers an easy and fast commuter connection to the city. [Twinlite](#) delivered the impressive private rental sector development in February 2020, attracting attention from professionals seeking convenience, luxury, and connectivity.

The end-user was the focal point for the developers who were seeking to completely change the way the occupant-property relationship works. The Vesta development is a unique concept. The tenancy can be arranged via an interactive app, cutting down on house hunting time and paperwork. Whether it's an aspect of the annual tenancy, or collection of a parcel from the receiving service the member needs to arrange, the mobile app offers the convenience of anytime assistance. The meeting room and hot desks can be

used by occupiers to connect with their work whilst the communal lounge, a club room and member-only events help to connect members within the development. The 24-hour gym, a yoga studio and a private cinema can be booked via the app if the member prefers a bit of quiet time.

The apartment's services and utilities required the same level of connectivity, with easy and convenient access, allowing residents to be fully in charge of their living space. The design also targeted high energy-efficiency to achieve on-site renewable requirements, regional compliance, and low-cost energy for the residents. The initial plan involved the installation of an exhaust air heat pump, however, [Dimplex](#) approached the project consultants with a new concept of a low-carbon, renewable energy system capable of delivering smart heating, ventilation and hot water based on their [Edel hot water heat pump](#) solution.



Q-Rad Electric Panel Heater

Energy-efficient heating, hot water and ventilation solution designed by Dimplex includes intelligent control integration

The scope of the heating, hot water and ventilation requirements for the Vesta development required a highly efficient, renewable energy solution to deliver all the specified services with the additional requirement of smart connectivity. Specification of a solution for an urban development of this size, using various manufacturers and installers, can be a challenge in terms of the overall system design, achieving compliance and a high-level of efficiency. Dimplex was able to supply all key building services for the Vesta development, helping to streamline the project.



The solution Dimplex proposed for Vesta was based on their [Edel hot water heat pump](#) which was incorporated into a system featuring [direct-acting panels](#), smart storage heaters and [mechanical ventilation with heat recovery \(MVHR\)](#). This solution is ideal for specification in large residential developments. In these developments, installing a traditional centralised heating system with a higher operating temperature would result in heat loss affecting the efficiency of the heating system. In modern developments, the highly thermally efficient envelopes could amplify the issue and trap the heat in corridors and other spaces, potentially causing overheating and requiring comfort cooling that would further lower the overall energy efficiency or cause condensation.

The 200 litre [Edel hot water heat pump](#) specified for the Vesta development is a low-carbon energy solution that uses external air delivered through a ducted system to an air source heat pump integrated into a single unit alongside a hot water cylinder. The [hot water heat pump](#) recovers heat from the external air, which is used to raise the temperature of the water in the cylinder to the standard 60°C. The Coefficient of Performance for the Edel hot water heat pump, determined by EN 16147, is 3.24 and SAP Appendix Q recognition aids compliance with Building Regulations.

The Edel hot water heat pump therefore has an energy efficiency of over 300% and is often specified with electric panel heaters to form an effective and compliant fully-electric solution. The sizable improvement in the efficiency of the supply for the dominant service of hot water demand can allow for the specification of electric panel heaters within the systems and still

achieve compliance. The Dimplex XLE Smart Storage and [Q-Rads](#) were chosen to deliver space heating. The XLE stores heat using cheaper off-peak electricity and uses a smart function to extract the heat when it is required using an inbuilt fan. Q-Rad [direct electric panel heaters](#) supplement this function during the day if the demand requires it.

To maximise the comfort levels and provide fresh, ambient air in the apartments, mechanical ventilation with heat recovery was specified (MVHR). The Xpelair NA180 MVHR units were installed in each apartment along with extract valves and external louvre bricks. The MVHR units are continuously extracting stale air whilst recovering up to 86-89% of the heat that would usually be lost back into fresh, filtered air entering the apartment. This simple measure improves indoor air quality by removing pollutants from the living spaces without a significant impact on the cost of maintaining the temperature in the space.

The Dimplex Control app provides the interface to connect the occupier to the low-carbon, renewable heat management system in their apartment and helps them control their energy use. The individual control of energy expenditure is an important aspect to many prospective tenants or apartment buyers for both the reasons of financial planning and being able to make greener living choices.



NaturalAir180 MVHR Unit

By incorporating all heating, hot water, ventilation and control requirements into one low-carbon energy solution from one supplier, Twinlite gained more control over the planning and installation. Dimplex were able to design the solution to fit the specification for the building and deliver a compliant energy system that will benefit the owners, tenants and environment throughout its lifecycle.



The flexible and efficient hot water heat pump solution helps create high-value living space at lower installation and running costs

The Vesta development is one of the first to benefit from the Edel hot water heat pump with full smart connectivity. The cooperation between Twinlite and Dimplex on this project highlighted the benefits of the close collaboration that is likely to see a widespread application of similar energy systems in large residential developments.

Capital cost is a common driver for developers building to sell or rent. The originally intended exhaust air heat pump solution required large initial financial commitment and the integration and installation of the system had to be completed by specialist installers. The new system designed by Dimplex was installed by electrical and plumbing contractors and didn't require specialist installers, whilst the time to complete the installation and setup was 2-4 times quicker.

The Dimplex Control system is less complex than similar control solutions for large residential developments that often utilise cabled communications, and it also presents a lower lifetime cost due to reduced maintenance and servicing requirements. The connectivity across the system also means a fault can be diagnosed and localised remotely by Dimplex using the 'Service Mode' of the system, reducing the need for a call-out. In the unlikely event a physical repair is necessary, the operative can visit the site with the relevant part or parts required and complete the repair. The ability to localise the fault to

a specific apartment saves time and avoids what otherwise may be a significant disruption to residents. This approach requires far simpler maintenance provision for the building owner, offering cheaper and more effective maintenance agreements.



Edel hot water heat pump

No annual safety checks are required as the system does not utilise gas and there is no risk of carbon monoxide being released. The whole system is underwritten by a five-year Dimplex warranty, offering financial stability in the important initial years of a buy-to-rent project, and providing an important point of sale for the develop-to-sell market. The low energy bills and the high energy efficiency of the low-carbon solution are increasingly sought-after benefits for both sale and rental markets.

Part of the value of the Vesta development is its undoubted aesthetic appeal. Replacing the unsightly exhaust air heat pump systems with the Edel hot water heat pump solution gave Twinlite far more design options. External services were no longer required, helping to achieve the clean and elegant look of the exterior. There are no visible pipes or pipe entries as we often see where wet heating systems are installed. The Edel hot water heat pump solution and the Xpelair MVHR unit are installed within the service cupboard, leaving room for a washing machine. All ductwork and the necessary services for the MVHR and the ducting for Edel hot water heat pump are in the ceiling. The operational noise is reduced and there is more room in the apartment, adding rental and sale value.



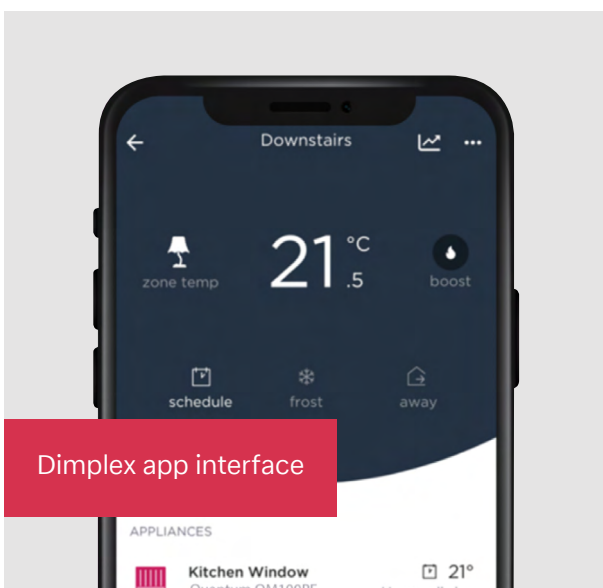
Fully integrated remote connectivity puts apartment owners and tenants in control of their energy usage

Connectivity is an integral part of the Vesta development. It aims to connect people, technology, and services, to create a communal hub where everything can be taken care of with a push of a button.

The Dimplex Control App is the critical part that brings the services in the apartments together, but rather than simply acting as a centralised controller, it also allows remote access. The Edel hot water heat pump, XLE storage heater and Q-Rad panel heaters are connected to the Dimplex Hub via radio frequency (RF) at 868Hz, which offers a greater communication range than Wi-Fi and doesn't impact the Wi-Fi performance or stability in the apartment or building. The Dimplex Control system features end-to-end encryption and authentication for industry-leading security.

The user-friendly app interface allows apartment residents to control their heating easier by grouping multiple heaters together as a zone and changing the temperature as a single entity. The app also includes a timed 'boost' option for flexible changes to the heating schedule without making a permanent change. The hot water screen will show how many litres of water is ready for use at the required temperature and shows this as an approximate number of available baths or showers. Users can see if the cylinder is currently heating up, set water temperature and even give a little 'boost' if hot water runs out.

Energy reports are available for users per apartment, zone or product and with a 24-hour, 7-day, month and annual view. The energy-usage screen offers a comparison of the current period with a previous for an easy overview of energy usage. Remote access is available at the building level to afford easy maintenance and ability to iron out any issues before residents get to know about them, leaving them largely unaffected by smaller faults. The convenience and ease-of-use of the Dimplex Control system give residents complete control of their comfort levels and energy usage while giving building managers more visibility of faults and improved remote assistance. The result is an exclusive, green lifestyle for the occupiers and additional value of apartments for the developers.





For more information on heating, hot water and ventilation solutions for new-build multi-occupancy residential buildings please visit:

www.dimplex.co.uk/professional/sectors/residential-apartments


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