



# Case Study

## Energy efficient 'A2' rated homes ready for renewable gas

The Cluain Beag development in Wexford meets all Part L (NZEB) requirements using a combination of natural gas and solar photovoltaic (PV) panels. The owners of these energy efficient homes will continue to decarbonise their home heating, as more renewable gas enters the network, therefore supporting Ireland's cleaner energy future.

### Benefits of natural gas and PV panel system:

Lower energy costs for homeowners

Meets Part L (NZEB) building regulations

PV panels with 320wp performance

Renewable gas ready

Compatible with modern heating controls

Warm, energy efficient A2 BER homes



Cluain Beag, Wexford.

### Committed to quality home building

William Neville & Sons have been constructing quality homes across Ireland for over 45 years and are now in their third generation. Cluain Beag is their latest project in Wexford that combines the most modern building standards, energy efficient designs and quality construction materials to ensure each home has an A2 BER rating and meets Part L (NZEB) of the building regulations.

From the outset, William Neville & Sons were committed to providing quality energy efficient homes with low running costs using the latest in PV technology and high efficiency gas boilers connected to the national network, combined with a high standard in building fabric construction.

### What are NZEB standards?

Every new home built in Ireland must meet stringent building standards as set out by the Department of Housing, Planning and Local Government. The Technical Guidance Document (TGD) Part L (NZEB) – Conservation of Fuel and Energy, contains strict criteria which must be met when building new homes. This document sets out the requirements for the building elements, including levels of insulation, window details, thermal bridging, ventilation and the heating system, as well as renewable energy requirements.

The building regulations require new residential buildings to have a very high energy performance. The low amount of energy (nearly zero) that these buildings require should, to a very significant extent, come from renewable sources produced on-site or nearby.

“Natural gas remains the energy source of choice, as we know our prospective homeowners will be able to continue to decarbonise their homes into the future using renewable gas.”

William Neville, Director and Engineer, William Neville & Sons

## Insulation

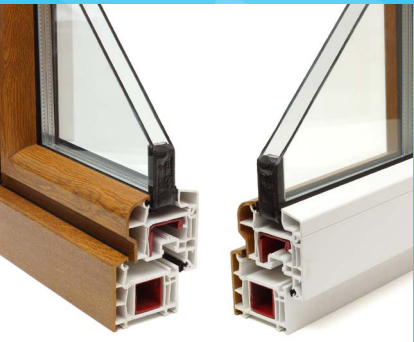
Higher levels of insulation ensure greater thermal comfort and lower energy bills for homeowners.

Pumped, bonded bead cavity wall insulation is installed providing a uniform insulation barrier around the home.



## Windows and air tightness

Double-glazed, argon filled PVC windows installed, eliminating draughts and heat loss.



## System features

- 91% efficient boiler and weather compensator
- 4 solar PV panels
- 122 litre copper cylinder
- High levels of insulation with double-glazed, argon filled PVC windows

## How does the building perform?

The figures below outline the performance of the building when assessed using the Dwelling Energy Assessment Procedure (DEAP) and demonstrates compliance with Part L (NZEB), achieving the required A2 standard.

Building Energy Rating Parameters	Part L (NZEB) Requirement	DEAP File
Floor U-Value W/m <sup>2</sup> K	0.18	0.17
Wall U-Value W/m <sup>2</sup> K	0.18	0.18
Roof U-Value	0.16	0.14
Window U-Value	1.40	1.20
Door U-Value	1.40	1.40
Air Permeability m <sup>3</sup> /hr/m <sup>2</sup>	5	3
Thermal Bridging Factor W/m <sup>2</sup> K	0.08	0.06
Carbon Performance Coefficient (CPC)	0.35	0.265
Energy Performance Coefficient (EPC)	0.30	0.30
Renewable Energy Ratio (RER)	0.20	0.29
Boiler Efficiency	0.90	0.91

## Increased Thermal Bridging Factor performance

William Neville & Sons are committed to quality design and construction standards, focusing on key areas of the build process to ensure heat loss from the building fabric is minimised. This includes rigidly maintaining the necessary construction practices as laid out in the Acceptable Construction Details (ACDs). By following these guidelines, a non-default value of 0.08 W/m<sup>2</sup>K can be entered for the Thermal Bridging Factor into DEAP. This is then further enhanced by completing a desktop calculation of the linear thermal bridges throughout the dwelling, improving the final figure to 0.06 W/m<sup>2</sup>K.

## Meets Part L compliance easily

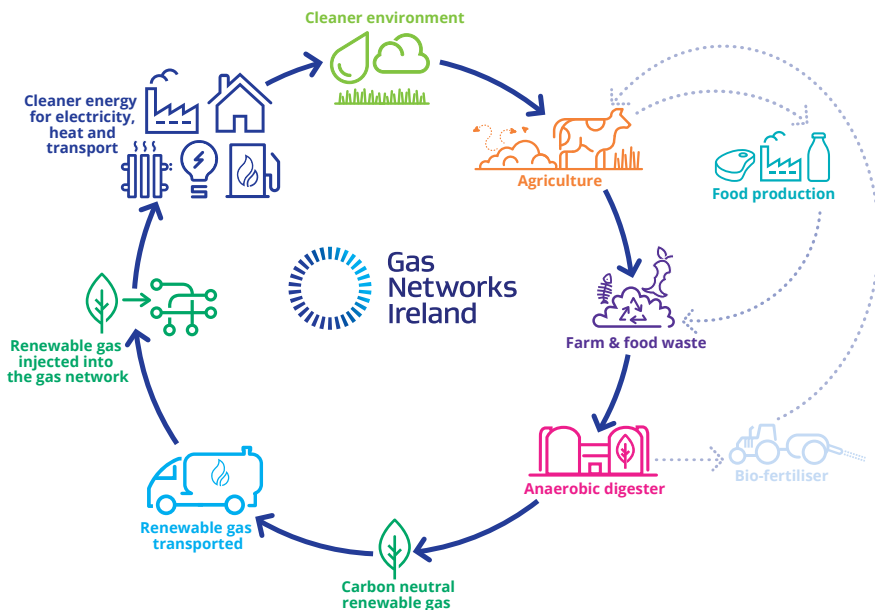
The combination of natural gas, PV panels and high standards of insulation is a cost effective approach that allow this development surpass all of the Part L Building Regulation requirements. With natural gas, homeowners are guaranteed a fully proven 'A' rated solution.

## Natural Gas - A unique selling point

A house with natural gas is a home. It is instantaneous, easy to control and versatile. When the levels of insulation used are combined with natural gas and PV panels, the Cluain Beag homeowner has a complete system that is on a par with the most economical solutions available. A modern solution for a modern home that is ready for an even cleaner energy future with renewable gas.

With natural gas, the homes in Cluain Beag will enjoy a constant and uninterrupted supply with no need to order or schedule fuel deliveries. Each homeowner will be able to come in, switch the heating on and enjoy instant and controllable heating and hot water. Natural gas, PV panels and modern smart heating will provide each owner a warm, comfortable and energy efficient home that will continue to contribute to Ireland's cleaner energy future with the introduction of renewable gas.

## What is renewable gas and how does it work?

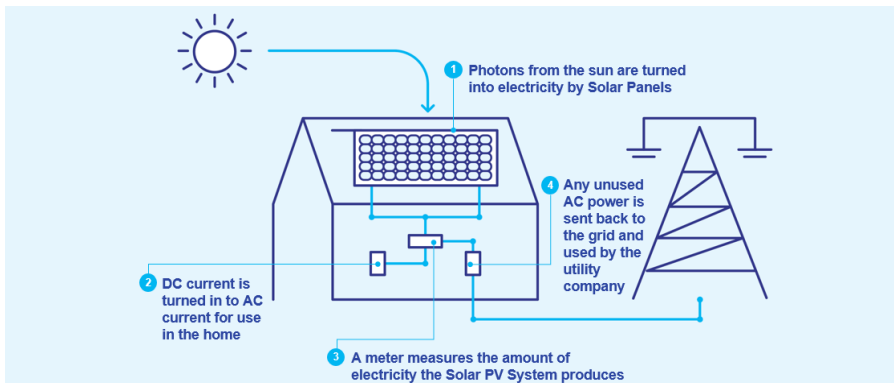


Ireland's gas network is a vital national asset that generates over 50% of Ireland's electricity. Today, more than 680,000 Irish homes rely on the gas network to provide safe, reliable, flexible and affordable energy to meet their heating, cooking and power needs. By gradually replacing natural gas with renewable, carbon neutral and ultimately zero carbon gases, such as biomethane and hydrogen, these same homes and more will be powered by increasingly cleaner energy.

Biomethane, which began flowing on the network in 2019, is the first step on this journey. Produced from agricultural and food waste, this renewable gas is structurally identical to natural gas and can be used in exactly the same way through the existing infrastructure, boilers and appliances, meaning homeowners will transition to this carbon neutral energy and play their part in progressing Ireland towards a cleaner energy future, without changing a thing.

By connecting new homes and developments to the gas network today, you are ensuring that each homeowner will have reliable, affordable and increasingly clean energy keeping them and their families safe, warm and comfortable for generations to come.

## Benefits of solar PV panels



### Lower energy bills

On average, a solar PV system can save between €200 - €300 per year on a domestic electricity bill (SEAI 2020).

### Operate all year

Modern, high efficiency solar PV panels operate all year round, ensuring the benefits to the homeowner are not restricted to the summer period.

### Reduced emissions

Generating renewable electricity will mean the energy consumed will be clean therefore reducing greenhouse gas emissions.

## 91% efficient boiler

A Baxi Potterton gas boiler operates at 91% efficiency. This highly efficient boiler includes zone control for 3 heating zones.



## 4 high efficiency solar photovoltaic panels

Photovoltaic systems convert solar energy into free electricity. These types of high efficiency panels operate all year round ensuring the benefits to the home owner are not restricted to the periods of warm weather.



## What are solar photovoltaic panels?

Solar panels that produce electricity are known as solar photovoltaic (PV) panels.

Solar PV panels capture the light from the sun and convert it into the electricity that can be used in your home to power your television, kettle, toaster, phone and other household appliances.

With the proposed introduction of micro-generation feed in tariffs, homeowners with PV panels will potentially be able to generate electricity on their roof tops and sell it back to the national electricity grid allowing them to reduce their energy costs.



“Our focus is to deliver top quality homes today and ensure they are still top quality homes in years to come. By providing an A2 home today our homeowners enjoy maximum comfort at the lowest possible running cost and, by connecting to the gas network, we’re ensuring they can continue to decarbonise their homes into the future with renewable gas.”

William Neville, Director and Engineer  
William Neville & Sons



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*This information is only a guideline to the different products available for use with natural gas in new development construction. Users should ensure that products are suitable for the specific circumstances in which they seek to apply them. Contact the supplier or manufacturer directly for specific information on building requirements and materials needed for installation. Professional advice specific to the project should always be sought. The current Irish Gas Standards and Technical Guidance Documents (Building Regulations) override all contents. Users should ensure they always have the most up to date information.*