La Vallee House
Upper Dargle Road
Bray, Co. Wicklow
A98 W2H9
Ireland

00 353 1 204 0005
e: info@metec.ie
w: www.metec.ie

CLIMATE ACTION AND ENERGY STATEMENT

for the

PROPOSED DEVELOPMENT

at

SITE 4
CLONBURRIS HOUSING DEVELOPMENT
KISHOGE
CO. DUBLIN

for

SOUTH DUBLIN COUNTY COUNCIL

issue no.	issue date	pages	issued for	by	approvals checked	approved
02	04/04/2025	22	Planning	AW	SC	BD
01	27/03/2025	22	Planning	AW	SC	BD
00	30/01/2025	21	Draft – Design Team Review	AW	SC	BD

CONTENTS

EXECUTIVE SUMMARY

This Climate Action and Energy Statement was compiled by METEC Consulting Engineers on behalf of our client, South Dublin County Council, as part of the planning submission for the proposed development located at Site 4, Clonburris, Co. Dublin.

Our client and the design team recognise the importance of creating a sustainable development which interplays between good urban design, accessibility to sustainable modes of transportation and the most efficient use of energy and natural resources. This report highlights how the construction and long-term management of the proposed development will be catered for and how overall energy considerations have been inherently addressed.

The design intent is to follow the requirements of the E.P.B.D. (Energy Performance of Buildings Directive), Building Regulations Technical Guidance Document (TGD) Part L 2022 and the South Dublin County Development Plan 2022-2028 which are the current drivers for sustainable building design in the region and Ireland.

The design team intend to achieve building envelope and HVAC performance that is a significant improvement on the statutory requirements contained in the Irish Building Regulations. The design team will achieve TGD Part L 2022 Nearly Zero Energy Buildings (NZEB) for the proposed development. A preliminary DEAP analysis has been undertaken on the residential units within the development to inform the design strategy, demonstrate compliance with the domestic Building Regulations Part L and to ensure that the targeted Building Energy Ratings (BERs) of A2 (or better) will be achieved as a minimum.

A Thermal Dynamic Simulation Model of the commercial areas will be constructed to demonstrate compliance with the non-domestic Building Regulations Part L and to ensure that the targeted BER of a A3 (or better) will be achieved using the SEAI approved NEAP methodology. This simulation model can be used to generate heating loads in an energy conscious manner and can also be used to inform key decisions in the building design such as the fabric performance metrics. As a minimum NZEB will be achieved for these areas.

RESIDENTIAL UNITS

Summary of the proposed Sustainability target:

Residential Units Energy Rating (BER) using SEAI's DEAP Methodology	A2 or Better

Summary of the Energy Performance Quality Assurance checks carried out:

TGD Part L 2022 section 1.3.2 - A compliance check will be carried out to ensure that the average U-value complies with the maximum permitted by the TGD standard	✓
TGD Part L 2022 section 1.3.2 – Maximum elemental U-value Check will be carried out using SEAI approved software (DEAP)	✓
The Energy Performance Coefficient (EPC) for the proposed dwellings will be calculated to ensure it is less than 0.3	✓
The Carbon Performance Coefficient (CPC) for the proposed dwellings will be calculated ensure it is less than 0.35	✓
TGD Part L 2022 section 1.2 – Minimum level of renewable energy technology to be provided check will be carried out	✓
TGD Part L 2022 section 1.3.5 – TM 59 Overheating analysis carried out on apartments	✓
TGD Part L 2022 section 1.4.5.2 – Airtightness to be under $3m^3/m^2/hr$ at 50Pa where Mechanical Ventilation is installed.	✓

COMMERCIAL UNITS

Summary of the proposed Sustainability target:

Building Energy Rating (BER) using SEAI's NEAP Methodology	A3 or Better

Summary of the Energy Performance Quality Assurance checks carried out:

TGD Part L 2022 section 1.3.2.2 - Overall Heat Loss Method Compliance Check will be carried out using SEAI approved software (IES VE)	✓
TGD Part L 2022 section 1.3.2.3 - A compliance check will be carried out to ensure that the average U-value complies with the maximum permitted by the TGD standard	✓
The Energy Performance Coefficient (EPC) for the proposed communal areas will be calculated to ensure it is less than 1.0	✓
The Carbon Performance Coefficient (CPC) for the proposed commercial units will be calculated to ensure it is less than 1.15	✓
TGD Part L 2022 section 1.2.1 – Renewable Energy Ratio Check will be carried out.	✓
TGD Part L 2022 section 1.3.5.3 - Solar Overheating Compliance Check will be carried out	✓

1.0 INTRODUCTION

This Climate Action and Energy Statement was compiled by METEC Consulting Engineers on behalf of our client, South Dublin County Council, as part of the planning submission for the proposed development located at Site 4, Clonburris, Co. Dublin.

Both the Client and the Design Team are committed to supporting energy efficiency and energy conservation to facilitate measures which seek to reduce emissions of greenhouse gases and to promote the ethos of sustainability. Residential and commercial buildings account for 15.5% of Irelands greenhouse gases in 2020. (12.3% residential, 1.6% commercial sector, 1.6% public sector). This includes emissions from fuel used for space and hot water heating in buildings.

This report highlights how the construction and long-term management of the proposed development will be catered for and how overall energy considerations have been inherently addressed. This report also addresses how the proposed development will comply with Technical Guidance Document (TGD) Part L – Conservation of Fuel and Energy 2022 (Dwellings) & 2022 (Buildings other than Dwellings) and which are the main influence on standards of energy performance and carbon dioxide emissions in Ireland. Where possible the design team intend to achieve building envelope and HVAC performance that is a significant improvement on the statutory requirements contained in the Irish Building Regulations.

It is now a requirement for all new domestic and non-domestic buildings to meet the NZEB (Near Zero Energy Building) standard. The design team will incorporate the requirements of this standard into the proposed development.

The building services design strategy for the proposed development utilises as many sustainable design options and energy efficient systems that are technically, environmentally and economically viable for the project to achieve a low energy and environmentally friendly development, while also providing suitable dwellings to meet current market demands.

2.0 SITE AND DEVELOPMENT SUMMARY

Part 10 Planning Application for a primarily residential development located within the Clonburris SDZ lands. The development site extends to c. 11.7ha and is bounded to the north by the Irish Rail Railway Line and to the south, east and west by lands zoned for development. The site is bisected by the permitted South Link Street (PL Reg Ref. SDZ20A/0021) from which vehicular, cycle and pedestrian access shall be provided.

The proposed development comprises 436no. residential units in a mix of house, apartment, duplex and triplex units comprising 141no. houses (133no. 3-bedroom and 8no. 4-bedroom), 124no. apartments units (62no. 1-bedroom and 62no. 2-bedroom), 106no. duplex units (53no. 2-bedroom and 53no. 3-bedroom), 57no. triplex units (57no. 2-bedroom), 3no. age-friendly apartment units (3no. 1-bedroom), and 5no. garden apartment units (5no. 2-bedroom).

Non-residential accommodation proposed (c. 1,550 m2 total) includes: A childcare facility (c. 544sqm), retail unit (c. 150sqm), employment use within the existing Grange House (c. 173 sq m) and a community building/ pavilion (c. 683 sq m) fronting Griffeen Valley Park.

All associated and ancillary site development and infrastructural works including 408 no. surface level car parking, 793no. bicycle parking (591no. long term and 202no. short term spaces), hard and soft landscaping and boundary treatment works, including public, communal and private open space, public lighting, substations, bin stores and foul and water services.

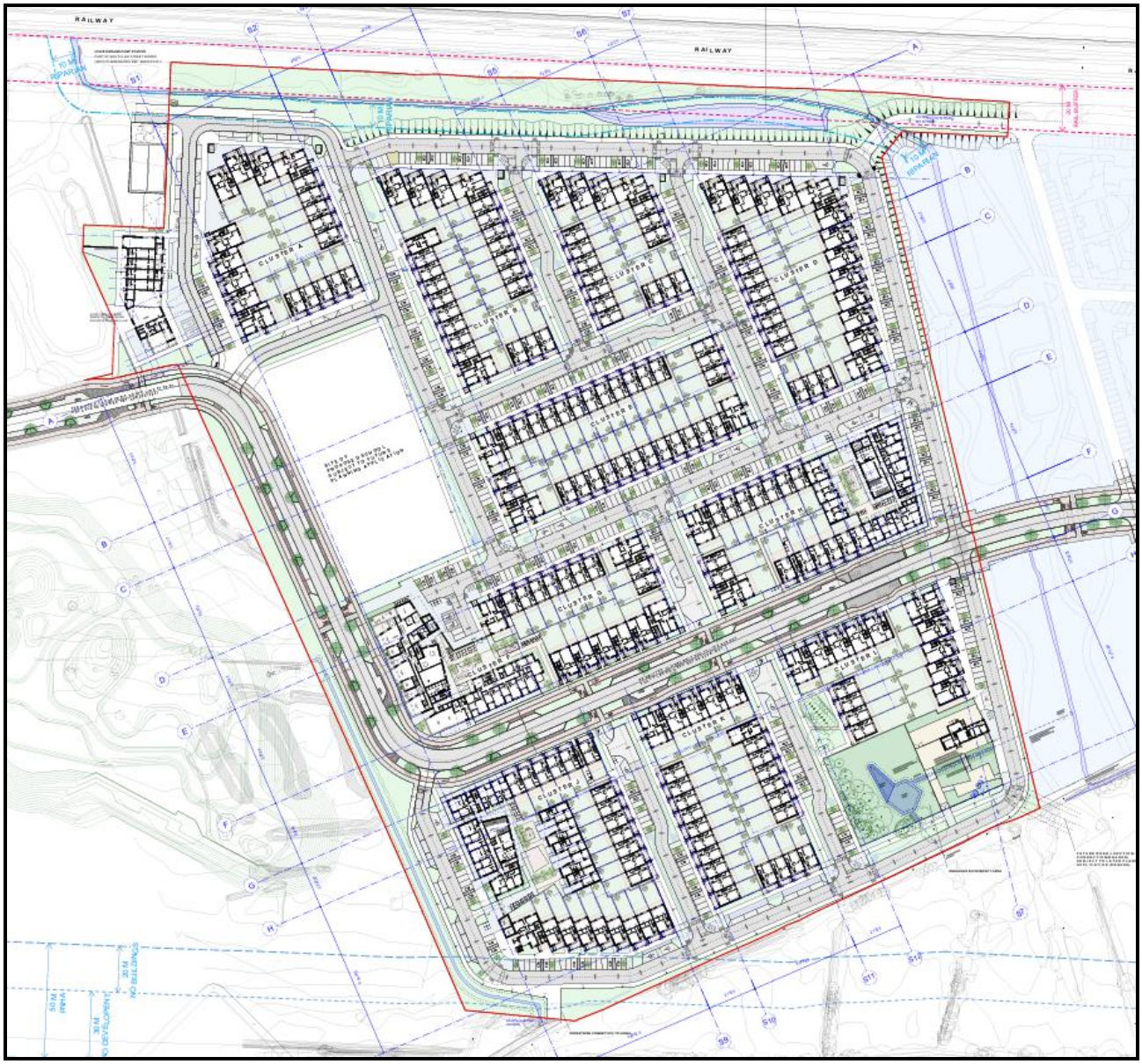

Figure 2.0.1 – Proposed Development Site Layout Plan

3.0 POLICY CONTEXT

SOUTH DUBLIN COUNTY DEVELOPMENT PLAN 2022-2028

The South Dublin County Development Plan (2022-2028) sets out policies and objectives to guide how and where development will take place in the county over the lifetime of the Plan. It provides an integrated, coherent spatial framework to ensure the county is developed in an inclusive way which improves the quality of life for its citizens, whilst also being a more attractive place to visit and work. The proposed development shall consider and address the relevant requirements and objectives set out in the South County Development Plan.

SOUTH DUBLIN COUNTY COUNCIL CLIMATE ACTION PLAN 2024-2029

South Dublin County Council's climate action plan sets out targets and objectives to improve energy efficiency and reduce greenhouse gas emissions associated with buildings located within South Dublin County. The proposed development shall consider and address the relevant requirements and objectives set out in the South Dublin County Council Climate Action Plan.

NATIONAL PLANNING FRAMEWORK

The National Planning Framework provides a high-level strategic planning and development guide for the country over the next 20+ years, as the population grows, that growth is sustainable (in economic, social, and environmental terms). The proposed development shall consider and address the relevant requirements and objectives set out in the National Planning Framework.

REGIONAL SPATIAL & ECONOMIC STRATEGY - EASTERN & MIDLAND REGIONAL ASSEMBLY

The Regional Spatial and Economic Strategy is a strategic plan and investment framework to shape the future development of the Region to 2031 and beyond. It aims to create a sustainable and competitive Region that supports the health and wellbeing of our people and places, from urban to rural, with access to quality housing, travel, and employment opportunities for all. The proposed development shall consider and address the relevant requirements and objectives set out in the Regional Spatial & Economic Strategy - Eastern & Midland Regional Assembly.

SUSTAINABLE URBAN HOUSING: DESIGN STANDARDS FOR NEW APARTMENTS (JULY 2023)

Guidelines for Planning Authorities issued under Section 28 of the Planning and Development Act, 2000 (as amended)

4.0 METHODOLOGY ADOPTED IN THIS ENERGY STRATEGY

The design approach that shall be adopted for the proposed development located at Site 4, Clonburris, Co. Dublin will be the **LEAN, CLEAN, GREEN** Approach.

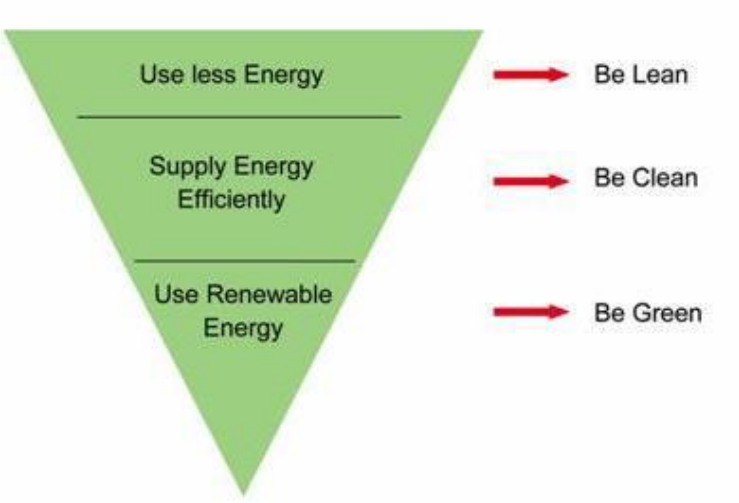

Figure 4.1 Energy Hierarchy

METEC Consulting Engineers considers this hierarchy, now endorsed by many local authorities, to be well-considered and an appropriate set of principles to adhere to in tackling climate change. In adopting this hierarchy, the Energy and CO2 savings at each stage are maximised before strategies at the next stage are considered.

Lean: The plan is to reduce the demand for energy by designing efficiency into the very fabric of the building. This focus will extend to air tightness, thermal bridges and solar control, as well as taking into account the thermal mass of the areas being considered. A full DEAP (Domestic Energy Assessment Procedure) shall be carried out for all residential units to ensure compliance with TGD Part L 2022. All residential units on the site shall achieve the required Energy Performance Coefficient (EPC) and Carbon Performance Coefficient (CPC) in accordance with the DEAP methodology. Separately a full NEAP (Non-Domestic Energy Assessment Procedure) and NZEB Analysis shall be carried out for the commercial units to ensure compliance with TGD Part L 2022.

Clean: In specifying mechanical and electrical services the plan is to use systems that are best-in-class technology and most efficient in their range. Consideration will be given to both the embodied energy and the energy consumed over its lifespan within the building. This is relevant to the heating system, hot water generation, ventilation systems and lighting. The design team will also focus on the control and metering of these energy end uses which would greatly assist future energy measurement and verification activities.

Green: Leveraging renewable technologies to a higher degree due to the greatly reduced energy requirements of the building.

Adopting this approach ensures that where renewable technologies are considered, they are sized efficiently, not based on excessive over-sized plant loads. This approach helps to develop a more cost-efficient renewable solution.

South Dublin County Council is committed to encouraging more sustainable development, the efficient use of energy and the use of renewables in new buildings. In accordance with South Dublin County Planning Policy, a feasibility assessment shall be carried out during the detailed design stage to determine the practical, economic and environmental benefits of such technologies for this development.

5.0 SERVICING APPROACH

The plan for the building services (mechanical and electrical) design strategy is to utilise as many sustainable design options as possible and energy-efficient features that are technically, environmentally and economically feasible for the project with an aim to achieve a development that is low energy and environmentally friendly. Making the right decisions in relation to design/construction can contribute greatly to the sustainability of a building, which will lead to cost savings in the future and raise comfort levels for the occupants of the buildings.

Typical considerations when defining our approach include but are not limited to the following:

- Our Client's preferences i.e. Centralised vs Decentralised system
- Space Heating & Hot Water needs of the buildings
- Choice of fuel, in particular with reference to net carbon emissions
- Overall Running Costs
- Capital Costs & Ongoing Maintenance requirements
- Regulatory Requirements i.e. NZEB, TGD's etc.

Servicing approaches that have been considered for this development include:

- District Heating with CHP and/or Air Source Heat Pumps (ASHP)
- Individual Heat Pumps
- Exhaust Air Heat Pumps
- Gas Boilers with Solar Photovoltaic

District Heating

This approach uses a centralised heating plant which typically includes Combine Heat & Power and/or ASHP's with Gas fired boilers for meeting the peak loads i.e. very cold weather or morning hot water peak.

Heat is produced efficiently by the centralised plant and delivered via highly insulated main pipes to each dwelling unit for heating and hot water, both of which are produced in a Heat Interface Unit (HIU) within each dwelling. It is important to note that the electricity produced by the CHP is used directly by the ASHP which has a Seasonal Coefficient of Performance of c.3.0. This effectively means that for every 1 kWh of natural gas input into the heating plant results in c. 1.4 kWh of high-grade heat being delivered to the dwellings. Such an arrangement can meet the renewable requirements of TGD Part L 2022.

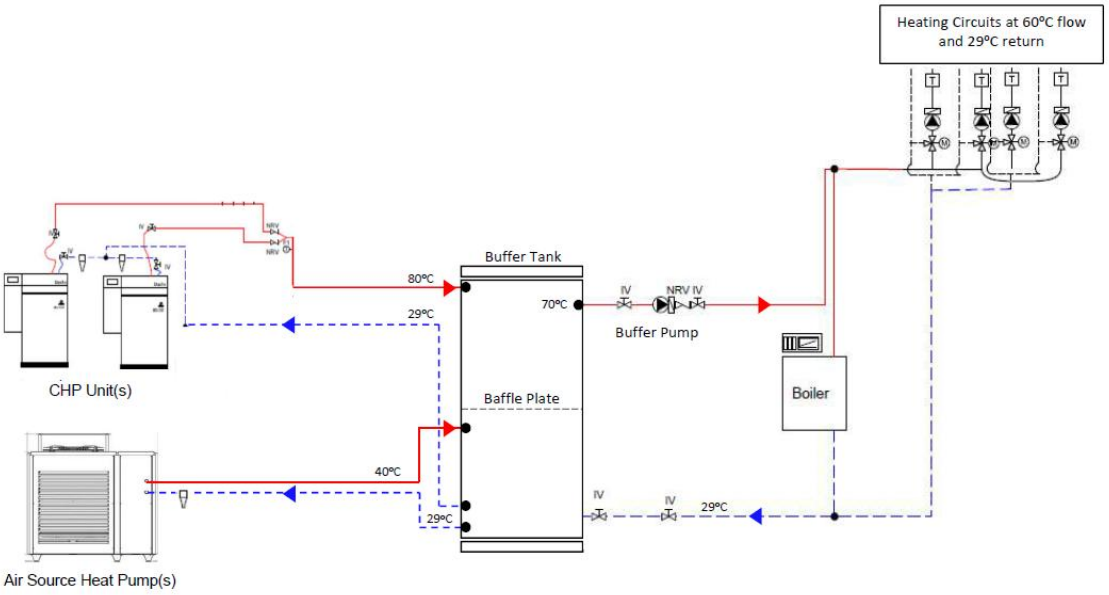

Fig. 5.1 – Typical Centralised Heating Plant incorporating CHP and Heat Pumps with Gas Boilers for meeting Peak Loads

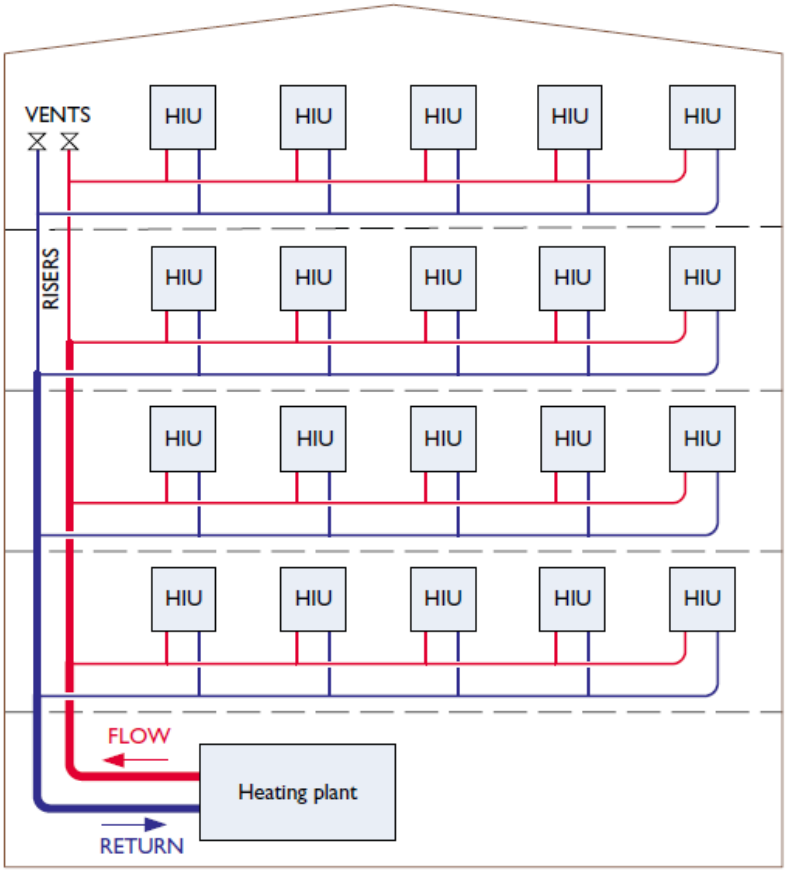

Fig. 5.2 - Apartment block with district heating using Heat Interface Units.

Individual Air Source Heat Pumps (ASHP)

Air Source Heat Pumps utilise low-grade environmental heat from the outside air and use a refrigerant cycle to convert this heat into high-grade heat that can be used with radiators or underfloor heating and to produce hot water in a very efficient manner. The heat pump then transfers this energy to a water circuit for space heating and hot water production.

As most of the energy is extracted from the outside air, the efficiency of this system, measured using a metric called SCOP (Seasonal Coefficient of Performance) is very favourable in terms of energy and running costs. For example, typically, one kWh of grid-supplied electricity will generate between 3 & 4 kWh of heating depending on the system.

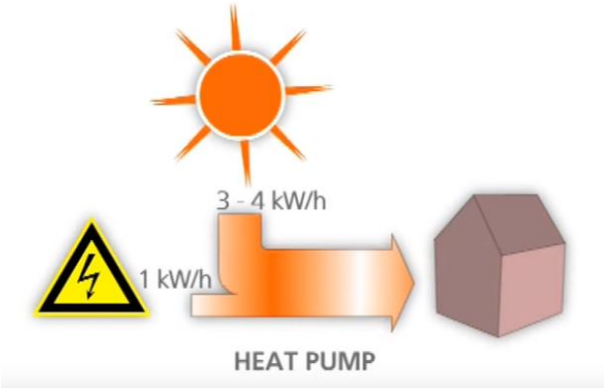

Fig. 5.3 – Heat Pump Energy Balance Illustration

Fig. 5.4 – Typical Air Source Heat Pump Installation

Exhaust Air Heat Pumps (EAHP)

An all-in-one unit – Heat recovery ventilation, Heating and Hot water. Suitable for apartments that will be at a high level of airtightness and low heat loss. Therefore, the building envelope will need to achieve low U-values. This unit is not suitable for existing buildings where it has not been possible to upgrade the building envelope thermal performance to meet the current standards. For this system to work effectively, the building needs to be airtight with low heat loss.

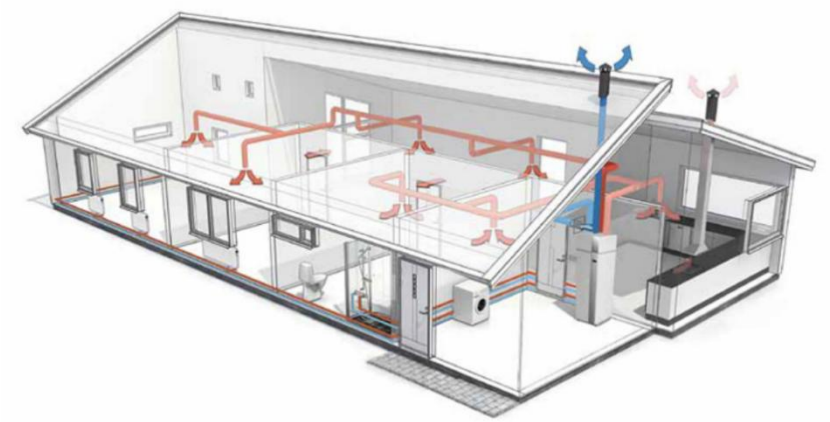

Fig. 5.5 – Typical Exhaust Air Heat Pump Installation

An Exhaust Air Heat Pump (EAHP) extracts heat from the exhaust air and transfers the heat to domestic hot water and/or hydronic heating system (underfloor heating, radiators). This type of heat pump requires a certain air exchange rate to maintain its output power. Since the inside air is approximately 20-22 degrees Celsius all year round, the maximum output power of the heat pump is not varying with the seasons and outdoor temperature. It has similar operating characteristics to an Air Source Heat Pump, for every 1 kWh of electricity inputted, 3-4 kWh of usable heat is produced.

Fig. 5.6 – Typical Exhaust Air Heat Pumps

Gas Boilers with Photovoltaic Cells (PV)

In this approach, traditional gas boilers are used to provide space heating and hot water in a conventional manner with Solar Photovoltaic panels used to meet the renewable requirements of TGD Part L.

Photovoltaic (PV) modules convert sunlight/daylight to DC electricity. The solar cells consist of a thin piece of semiconductor material, in most cases of silicon. Through a process called doping, a very small number of impurities are added to the semiconductor material, which creates two different layers called n-type and p-type layers. Certain wavelengths of light are able to ionise the silicon atoms, which separates some of the positive charges (holes) from the negative charges (electrons). The holes move into the positive or p-layer and the electrons into the negative or n-layer. These opposite charges are attracted to each other, but most of them can only re-combine by the electrons passing through an external circuit, due to an internal potential energy barrier. This flow of electrons produces a DC current.

As the cost of PV reduces over time it is slowly becoming a more attractive renewable technology. PV modules can be integrated into the building fabric, such as roofing material, and this cost offset can improve viability. At the detailed design stage, a full lifecycle cost assessment will be carried out for a PV installation which shall include maintenance and degradation of the panels over time. PV panels are high in embodied energy and this would need to be considered by the design team.

Conclusion

While Gas Boilers are a tried and tested technology, it has a significant disadvantage in that it uses fossil fuel (natural gas) and has a relatively high CO2 emissions per kWh of heat produced. This is not ideal and is not future-proofed.

Air Source Heat Pumps (ASHP) and Exhaust Air Heat Pumps (EAHP) options have a significant advantage in that they use electricity and convert each kWh of electricity into 3-4 kWh of usable heat. As the national grid currently uses high volumes of renewable energy and is likely to become carbon neutral in the future, by default, any dwelling heated using an electrically powered heat pump will also become carbon neutral.

Therefore, the proposed development will avail of Air Source Heat Pumps (ASHP) and Exhaust Air Heat Pumps (EAHP) options throughout the development. This approach will ensure that the complex is not only provided with a low-emission heating system but is also future-proofed for future grid improvements.

6.0 ENERGY PERFORMANCE STRATEGY – RESIDENTIAL UNITS

The plan is to incorporate the following passive design measures for the proposed residential units where it is both technically and economically practical. These design measures will help with achieving compliance and sustainable development. These design parameters are the current targets and are subject to amendment during design development. As a minimum, all U-Values shall comply in full with TGD Part L 2022 (current edition for Dwellings).

Element	Performance Target
Roof U-Value	≤ 0.15 W/m² °K (target value).
Wall U-Value	≤ 0.18 W/m² °K (target value).
Floor U-Value	≤ 0.15 W/m² °K (target value).
Window U-Value	≤ 1.3 W/m² °K (target value including window frame).
Building Air Permeability	≤3.0 m³ h-1 m-2 @50Pa (target value) All dwellings to be tested and certified
Thermal Bridging	Acceptable Construction Details are to be specified and followed on-site.
Lighting	LED Lighting Throughout
Ventilation	Mechanical Ventilation with Heat Recovery (MVHR) via plate heat exchanger

Table 6.1

7.0 ENERGY PERFORMANCE STRATEGY – COMMERCIAL UNITS

The intent is to incorporate the following passive design measures for the proposed commercial units where it is both technically and economically practical. These design measures will help with achieving compliance and sustainable development. Many of these target values also comply with the forthcoming TGD Part L 2022 specification for Buildings other than Dwellings.

These design parameters are the current targets and are subject to amendment during design development. As a minimum, all U-Values shall comply in full with TGD Part L 2022 (current edition for Buildings other than Dwellings).

Element	Performance Target
Roof U-Value	≤ 0.15 W/m² °K (target value).
Wall U-Value	≤ 0.18 W/m² °K (target value).
Floor U-Value	≤ 0.15 W/m² °K (target value).
Window U-Value	≤ 1.4 W/m² °K (target value including window frame).
Window G-Value	0.25 - 0.35 (target range). This will help to reduce unwanted solar gain and in turn, reduce cooling plant loads.
Light Transmittance	0.65 - 0.71 (target range) – the highest value possible shall be specified where feasible.
Building Air Permeability	≤ 3.0 m³ h-1 m-2 @50Pa (target value) All units and communal areas to be tested and certified
Lighting	LED Throughout with PIR sensors in communal hallways to reduce electricity consumption.

Table 7.1

By implementing these passive design measures energy consumption associated with heating and lighting will be reduced considerably at source.

8.0 SOLAR PHOTOVOLTAIC PANELS

PV panels can be utilised to provide a source of renewable electricity to the proposed development as required by Building Regulations for compliance with TGD Part L 2022. Should they be required, the PV panels will be specified to be orientated southerly and installed at a pitch of approximately 15 degrees. Consideration will also be given to the full lifecycle analysis, efficiency, average degradation rates and economic payback.

Figure 8.1 – Photovoltaic Panels

9.0 WATER CONSUMPTION

Our Client and the Design Team are committed to identifying opportunities to reduce potable water consumption for this project. Water-saving solutions proposed for this project include dual-flush toilets, shower aeration devices, and rainwater harvesting.

	
Dual Flush Toilets	Showers to be fitted with a flow restrictor to limit flowrates to 6L/min

Figure 9.1 Examples of proposed sanitary ware fixtures and fittings to reduce potable water consumption for this project.

10.0 GREEN ROOF

Consideration will be given to the installation of a green roof on sections of roof areas. A green roof is a purposely fitted or cultivated roof with vegetation. Consideration will be given to the structural viability, uniformity and local character.

Figure 10.1 Green Roof Solutions

11.0 ELECTRIC CHARGING POINTS

It is the design intent to specify a number of electric charging points within the proposed development, with electrical infrastructure provided to all parking spaces for the future upgrade to electric charging.

Electric cars offer a real opportunity to reduce the carbon output of the transport sector, as they emit zero exhaust pipe emissions. Providing electric car charging points will encourage the buildings users towards this sustainable mode of transport.

Figure 11.1 Electric Charging Points