

**D2453 - Parkgate Street Block A
42A Parkgate Street,
Dublin 8**

**Energy Analysis Report - Block A
06/02/2025
R.01**

CONTENTS

EXECUTIVE SUMMARY

BUILDING REGULATIONS

NZEB

Part L 2019

Primary Energy

Renewable Technologies

ENERGY ANALYSIS

Building Construction

HEATING STRATEGY

Central Energy Centre / Air Source Heat Pump

CONCLUSION

APPENDIX A - DEAP Results for Typical Apartment Types

2 Bed Typical Apartment Mechanical & Electrical Installations

1 Bed Typical Apartment Mechanical & Electrical Installations

Studio Apartment Mechanical & Electrical Installations

1.0 EXECUTIVE SUMMARY

This report outlines the current building regulations framework and the requirement to achieve a Nearly Zero Energy Building (NZEB) for all new developments. The NZEB standard is demonstrated using the Dwelling Energy Assessment Procedure (DEAP) software. The principal energy use associated with residential developments as assessed under DEAP is the domestic hot water to showers, sinks, basins etc. which accounts for over half of the total annual energy consumption for an apartment.

Energy consumption is not the same as energy produced however, this is due to the inefficiencies associated with generation and transmission of electricity. The DEAP software therefore analyses Primary Energy use which is a measure of the total energy required to deliver the energy consumed. This multiplier factor in Ireland is 1.75 for Electricity and 1.1 for Natural Gas.

NZEB includes a requirement for on-site renewable technology, considered suitable for Parkgate Street are Heat Pumps and PV panels each of which are examined in detail.

The table below summarises the results of our proposed heating strategy which could be considered suitable for the Parkgate Street development Block A.

Although all options perform well with low associated CO₂ emissions the centralised solution is the optimal whole life cycle cost solution. We therefore recommend this strategy for the Parkgate Street development.

	Heatin Strategy	PV panels Required for NZEB	Annual CO₂ Emisssions Per Apartment
	Centralised Air Source Heat Pump & Boiler combination.	0.0	650 kg

2.0 BUILDING REGULATIONS

2.1 NZEB

Building energy has been long understood as contributing a major component of greenhouse gas emissions which was acknowledged within the 2030 Communication published by the European Commission (2014) which stated that “the majority of the energy-saving potential (for the EU) is in the building sector.” Figure 2.1.1 illustrates comparative Primary Energy (see Section 3.3) for Dwellings in Ireland from 1970’s through to NZEB,

The EU Energy Performance of Buildings Directive set out the target that all new developments should be Nearly Zero-Energy Buildings (NZEB) by the end of 2020, with the intention having been that all Public buildings be in accordance with this by the end of 2018.

A Nearly-Zero Energy Building is defined as having “very high energy performance”, with Article 2 of the EPBD outlining that “the nearly zero or very low amount of energy required should be covered to a very significant extent by energy from renewable sources, including energy from renewable sources produced on-site or nearby”; the latter understood to refer to district heating systems and centralised plant arrangements.

Interpretation and implantation of these statements within the directive are at the discretion of each EU Member State in accordance with their “National, Regional or Local considerations” and thus the definition of NZEB itself varies greatly between different countries.

For new dwellings in Ireland, NZEB has been defined as being (primarily) associated with demonstrating the following characteristics are achieved:

- Primary Energy/ Carbon Emissions: 70% reduction against Part L 2005
- Renewable Energy: 20% of this Primary Energy required

Figure 2.1.2 illustrates the NZEB targets for Primary Energy (and Carbon Emissions) and Renewable Energy. The Part L 2005 benchmark could be expected to be achieving a B3 BER, in comparison to A2/A3 for NZEB compliance.

These NZEB targets have been now incorporated within the Technical Guidance Document (TGD) Part L 2019, as discussed below.

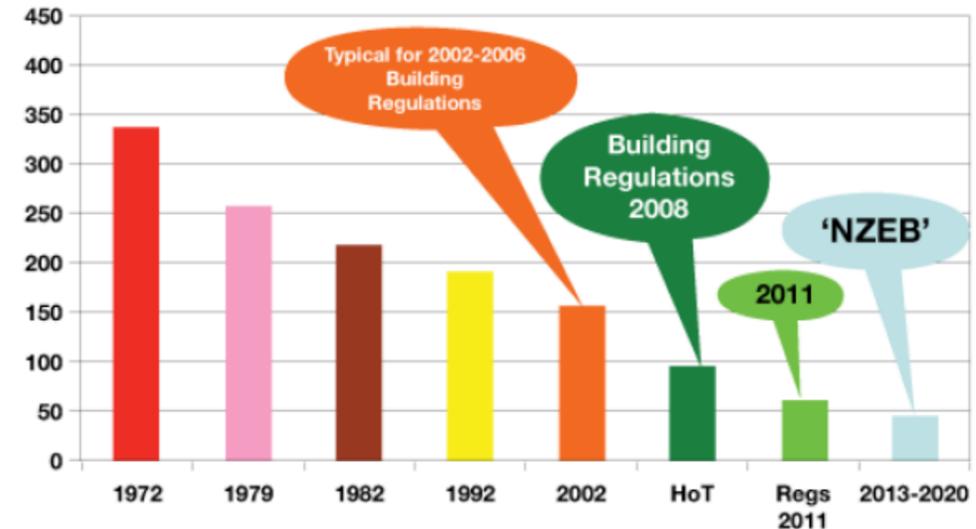


Figure 2.1.1 – Primary Energy Consumption in Irish Housing 1972-2020

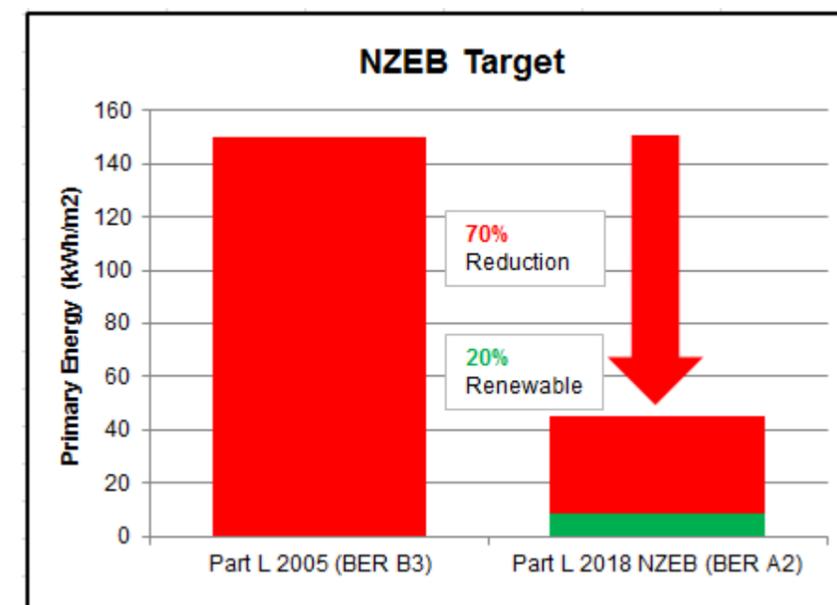


Figure 2.1.2: - NZEB Target

2.2 Part L 2019

Technical Guidance Document (TGD) Part L Conservation of Fuel and Energy – Dwellings outlines how compliance to this element of the Building Regulations can be demonstrated through the utilisation of the Dwelling Energy Assessment Procedure (DEAP) software, which analyses comparative energy usage for a particular residence.

The energy assessment is determined annually on a floor area basis (kWh/m².ann) for the following usages, known as “regulated loads”:

- Heating
- Hot Water
- Auxiliary (Fans, Pumps and Controls)
- Lighting

It may be noted therefore that considerable energy usages within dwellings; particularly equipment associated with cooking, washing etc. are excluded from DEAP analysis and associated Part L Compliance/ BER calculations. These energy usages, known as “unregulated loads” are deemed to be associated with operational usage, as opposed to the building’s fabric and services performance.

Figure 2.2 indicates an energy breakdown for a typical apartment (100m², local gas-fired boiler) compliant to NZEB/ Part L 2018. It can be seen that Hot Water Energy consumption pre-dominates, with Heating Energy considerably lower; reflective of the extensive improvement in insulation/ air permeability/ thermal bridging/ glazing/ heating system efficiency etc. through successive Building Regulations improvements.

However, as both Hot Water and Lighting Energy consumption are effectively fixed within the calculation methodology (as based on standardised databases of hot water usage etc.), further improvements to Heating related items (insulation etc.) are generally required to ensure overall compliance can be achieved.

In addition, minimum Fabric Performance is defined as follows in Part L 2019:

Thermal Transmittance (U-Values)

- Roofs: 0.16 W/m²K
- External Walls: 0.18 W/m²K
- Ground/ Exposed Floors: 0.18 W/m²K
- Windows/ Doors/ Rooflights: 1.40 W/m²K

Air Permeability

- Maximum Air Leakage: 3 m³/hr.m² @ 50Pa

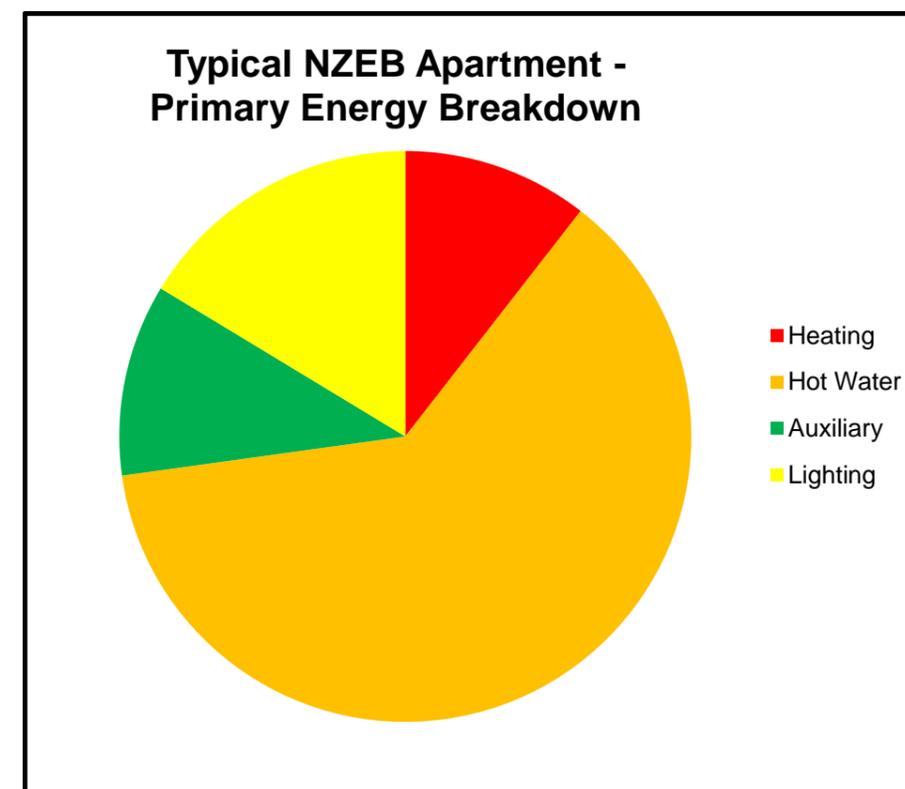


Figure 2.2.1 – Energy Breakdown

In terms of apartments or other terraced residential buildings, Part L allows that the compliance can be demonstrated based on the average of all dwellings for each of the parameters associated with Part L, namely Primary Energy (EPC), Carbon Emissions (CPC) and Renewable Energy (RER). Therefore, for the purposes of analysis, an apartment representative of the average attributes of the dwellings has been selected.

In summary, DEAP analysis must demonstrate the following to ensure compliance to Part L 2019:

- Energy Performance Coefficient (EPC): 0.30 or lower (i.e. 70% reduction in Primary Energy against Part L 2005 benchmark)
- Carbon Performance Coefficient (CPC): 0.35 or lower
- Renewable Energy Ratio (RER): 0.20

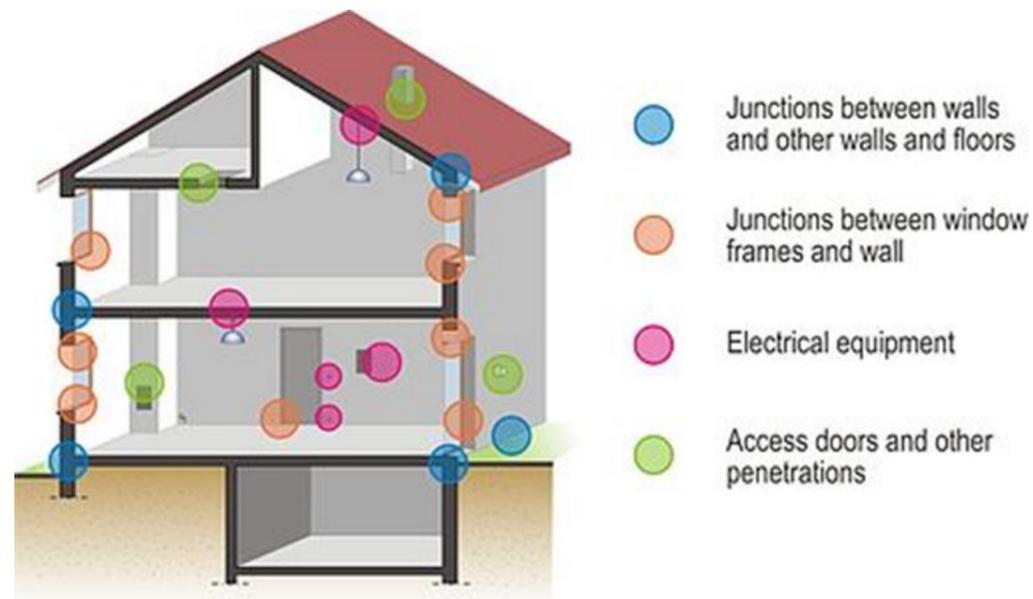


Figure 2.2.2: Common areas of air leakage

2.3 Primary Energy

In assessing energy performance for dwellings, Part L (and BER) utilises Primary Energy as a means of comparative analysis. This relates to the energy at source as required for the dwelling, as opposed to that consumed within the actual building. For example, electrical Primary Energy relates to that required for both generation (based on average of power plant fuels and efficiencies) and transmission for electricity through the ESB grid.

Primary Energy Factor (PEF) conversions for main fuel types are as follows:

- Electricity: 1.75
- Natural Gas/ LPG/ Oil/ Biomass: 1.10

It can be seen from the above that the Primary Energy conversion for electricity is almost twice that of Natural Gas (as well as other fossil fuels and biomass); therefore, a direct electric heater would consume nearly double the Primary Energy of a LPHW radiator. However, as can be seen from Figure 2.3, the underlying trend over time has been that the Primary Energy of electricity with respect to Natural Gas (and other fuels) has been reducing (due to the increased “greening” of the ESB grid with Wind and Solar renewables and more efficient plant operation), with the following impacts in terms of technologies and associated Part L compliance, as PEF for electricity reduces.

- Heat Pump, both Air Source and Geothermal, are becoming increasingly viable.
- Natural Gas Combined Heat and Power (CHP) is becoming less viable.
- Larger Photovoltaic (PV) arrays required to offset electricity usage (albeit offset by increases in PV efficiency for equivalent array sizes).

The associated Carbon Factors for main fuel types in Ireland are as follows:

- Electricity: 330.4 gCO₂/kWh
- Natural Gas: 203 gCO₂/kWh

The Carbon Factors associated with electricity have fallen by approximately 26% in Ireland over recent years (from 635 gCO₂/kWh in 2005) as renewable technologies

are added to the grid however the reliance on natural gas, peat and coal ensures electricity remains a relatively significant source of carbon emissions.

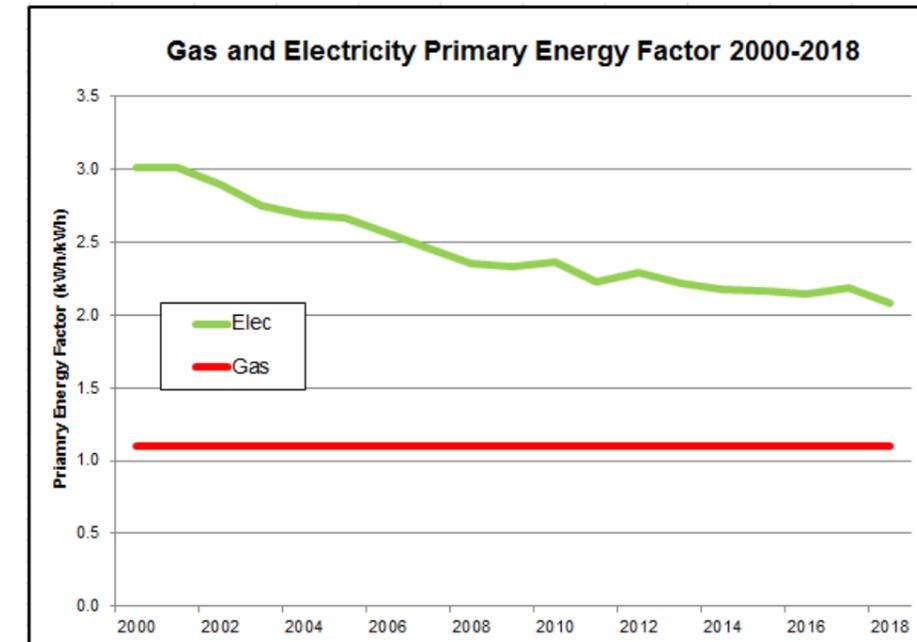


Figure 2.3.1 –Primary Energy Factors for Gas and Electricity 2000-2018

2.4 Renewable Technologies

In addition to improving heating energy related aspects, renewable technologies can be utilised to significantly reduce Primary Energy requirements (in addition to ensuring the RER renewable energy percentage is achieved). Figure 2.4.1 indicates how, for a typical apartment (notional 100m², gas boiler plant) designed to ensure NZEB compliance, 4 no. (250W) PV panels would offset the excess energy within the gross consumption. This extent of renewable energy must be at least 20% of the overall Primary Energy (RER =0.20+).

With regards to renewable energy technology types, the most effective for integration within apartment design to ensure compliance to Part L in a cost-effective manner are as follows:

- Air Source Heat Pumps (ASHP)

Reduces Primary Energy associated with both Heating and Hot Water compared to gas boilers. Can be implemented on either a centralised or decentralised basis (see Section 2.5 below). The project will target Heat Pump efficiencies (seasonal CoP) of 450%.

All three options considered for the Parkgate Street development rely on Air Source Heat Pump technology. Both decentralised solutions include heat pumps within the apartment while the centralised option includes a basement level heat pump with boiler back up.

- Combined Heat and Power (CHP)

Offsets Primary Energy associated with Hot Water (and potentially some Heating) where used in conjunction with centralised plant/ district heating. Viable for larger (300+ unit) apartment developments where larger, higher efficiency units can be deployed.

May also be considered in tandem with a central air source heat pump where the electricity generated by the CHP powers the heat pump delivering further savings. This strategy, although complex to implement, delivers lower running costs than a central heat pump only option.

- Photovoltaics (PV)

Offsets Primary Energy associated with electricity. Most cost-effective where installed as part of Centralised plant arrangement, with single array interlinked to Landlord electricity supply (as opposed to individual units).

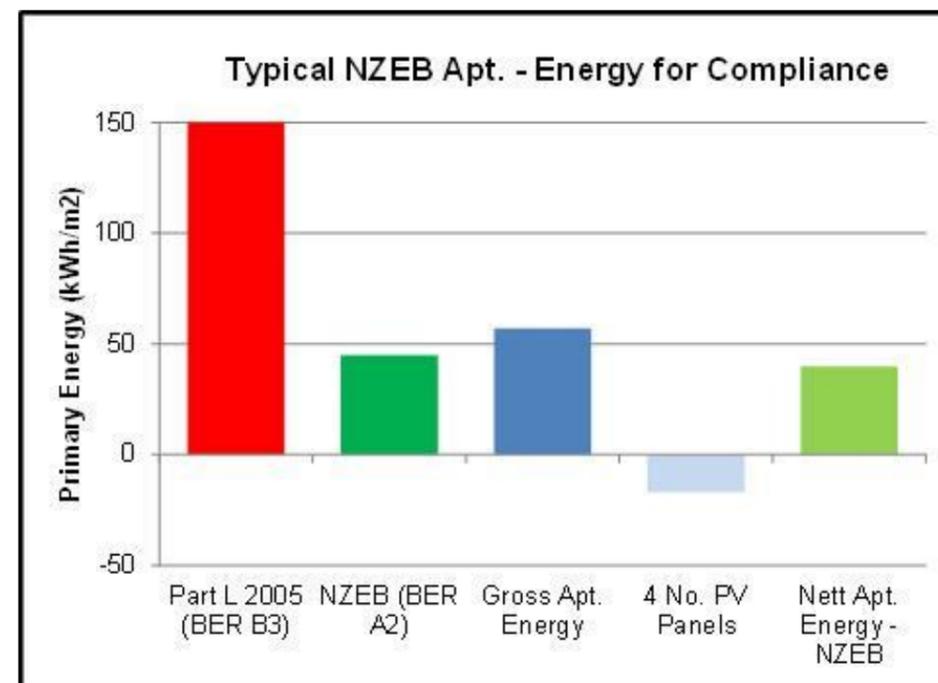


Figure 2.4.1 –EPC Compliance for Typical Apartment

Centralised Air source Heat Pump & Boilers:

In this configuration, the heat from the Air Source Heat Pump (ASHP) contributes renewable energy to both the apartment and the landlord areas. If this contribution is insufficient, a small Landlord PV array may be included to increase the renewable energy contribution.

Current Part L 2019 regulations require a Renewable Energy Ratio (RER) of 20% for each apartment. The landlord areas (separately assessed as a commercial building) must also be served by a renewable technology to be deemed compliant.

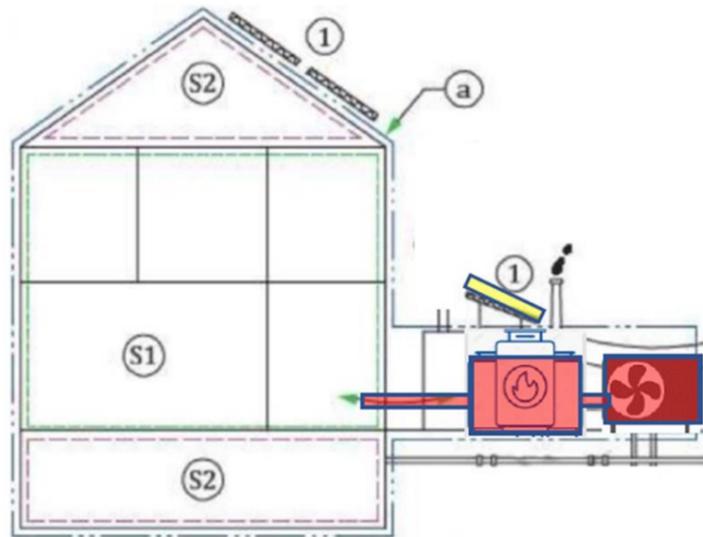


Figure 2.4.2: Centralised Boilers/ASHP with PV array (if required) to Landlord Areas

3.0 ENERGY ANALYSIS

We have completed detailed analysis based on the proposed heating strategy for the Parkgate Street residential elements. The detailed results of this analysis are contained within the attached appendices. The analysis was completed using the building control approved Dwelling Energy Assessment Procedure (DEAP) software administered by Sustainable Energy Authority Ireland (SEAI) of behalf of the Department of Housing, Planning and Local Government.

3.1 Building Construction

A typical type of each apartment was selected for the purposes of analysis to simulate the whole block average. The following building performance was assumed for analysis, in terms of Thermal Transmittance, Glazing Parameters, Air Permeability and Thermal Bridging respectively:

Building Construction and U-Values		
Element Type	Part-L 2019 Regulations	Targeted
Roof	0.16 W/m ² k	0.15 W/m ² k
External Wall	0.18 W/m ² k	0.18 W/m ² k
Ground/Exposed Floors	0.18 W/m ² k	0.15 W/m ² k – where applicable
Windows/Doors/Rooflights	1.4 W/m ² k	1.2 W/m ² k
Heat Transmission Coefficient	0.15 W/m ² k (default)	0.08 W/m ² k (ACD's)

Table 3.1.1: Building Construction & U-Values

Glazing Parameters	
Total Solar Heat Transmittance	0.63
Framing Factor	0.70
Overshadowing	Very little

Table 3.1.2: Glazing Parameters

Miscellaneous Building Parameters	
Element	Value Targeted
Shower Flow Rates	6 l/min
Water Usage	125 l/person/day
Lighting	100% LED
Air Permeability Rate (Air Leakage)	3m ³ /h/m ² @ 50Pa
Thermal Bridging (Heat Transmission Coefficient)	0.15 W/m ² K (default)

Table 3.1.3: Miscellaneous Building Parameters

4.0 HEATING STRATEGY

4.1 Centralised Energy Centre / Air Source Heat Pump

The centralised plant solution will receive all heating energy from an Energy Centre located at basement level of Block B&C (Phase I). The central energy centre plant will consist of an Air Source Heat Pump to provide the base heating load to the development, with back-up modulating gas-fired condensing boilers.

LPHW would be distributed throughout the site via buried district heating mains and circulated vertically through a tower core riser to serve apartments above. This riser would include a motorised isolation valve for each apartment at every floor controlled by an automatic metering system. The metering system would provide functionality for a pre-pay or billed heat metering solution and would include for remote isolation of heat to individual apartments.

A ducted heat recovery ventilation unit would be provided to each apartment to maintain air quality while minimising heat losses associated with air infiltration.

All maintenance to the systems would be remote from the Apartment avoiding co-ordination with the tenants for access. Systems would be provided with duty/standby resilience throughout to ensure services are maintained to apartments at all times.

Heat billing would be calculated based on metered heat use against system efficiency and gas cost, plus a fixed standing charge and a sinking fund charge for plant replacement.

Sustainability

Under the DEAP methodology for the tower this system will NOT require any PV panels per apartment, as the centralised heat pump will provide the necessary renewable contribution, to achieve NZEB compliance.

The CO₂ emissions associated with the heating, hot water, ventilation and lighting for a typical Parkgate Street apartment averages 650kg/year.



Figure 4.1.1 – Central Air Source Heat Pump, HIU & PVs

Key Figures (per Apartment)

- PV requirement: **0 panels**
- Annual CO₂ emissions: **650kg**

Pro's

- Sustainable efficient solution - low CO₂ emissions
- Low maintenance
- Reliability - proven technology, commercial standard plant
- Option to include plant replacement sinking fund in heating bills
- Flexibility - potential to add new sustainable technology in future

Con's

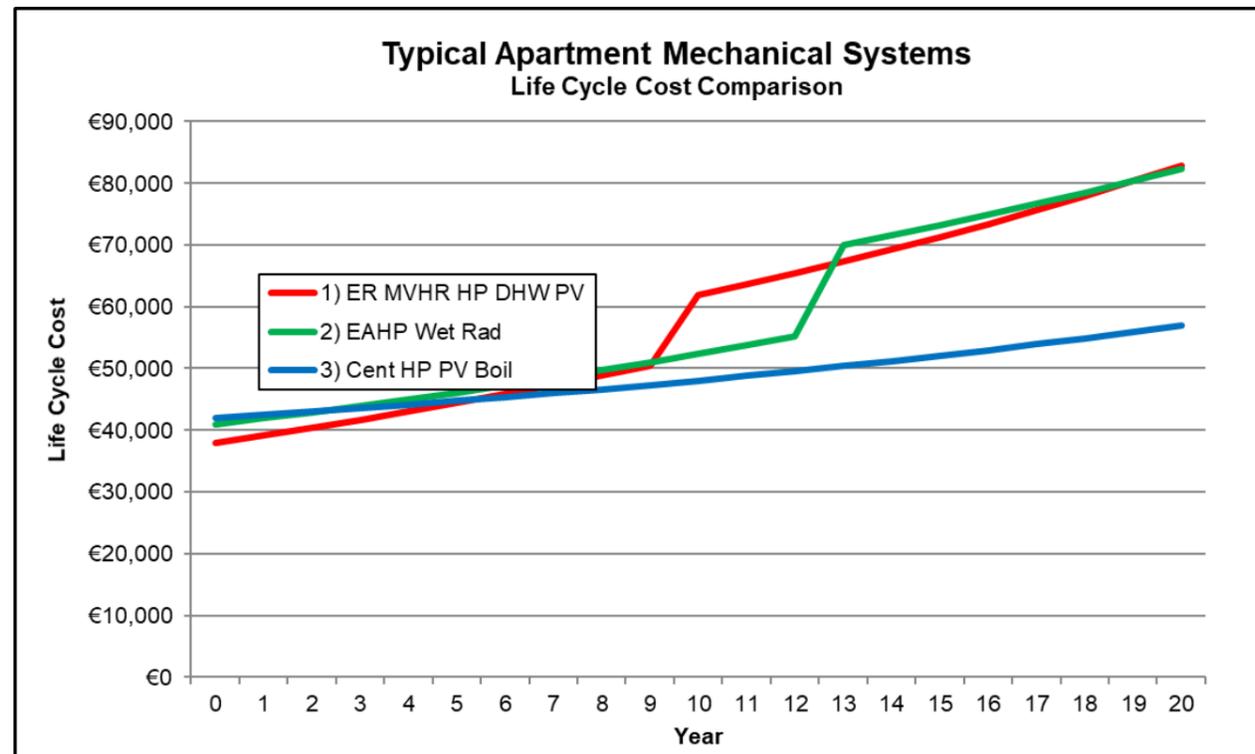
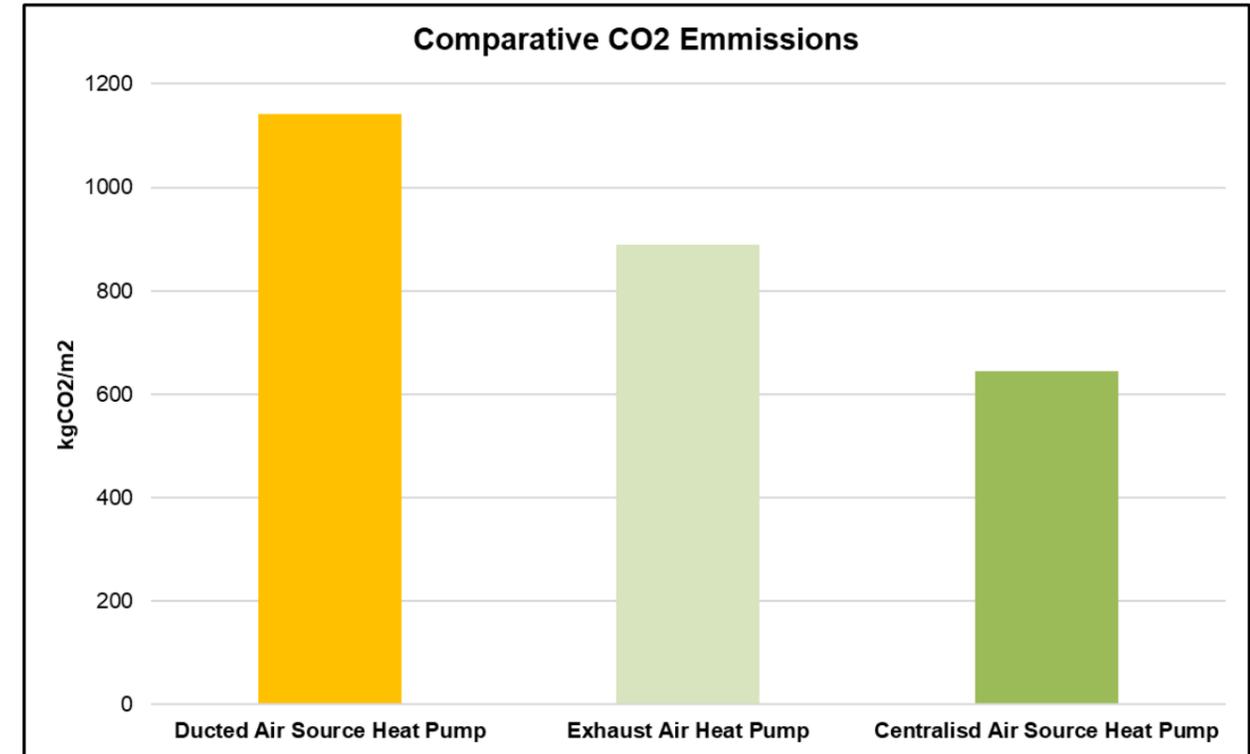
- Higher capital cost when compared to decentralised heat pump
- Requires energy manager to maintain plant and equipment, procure fuel and bill tenants.

CONCLUSION

All three options considered for Parkgate Street will achieve NZEB compliance and would be suitable options for this development. All three options considered rely on Heat Pump technology which uses the energy released from a phase change of the refrigerant to deliver more heating energy than inputted to the system. The application of this technology for each solution results in variable CO2 emissions and running costs for each as outlined below:

Central Air Source Heat Pump supplemented by Gas boilers

The proposed strategy delivers approximately 50% of the annual heating and hot water load from a centrally located air source heat pump. The remaining load is met by condensing gas boiler plant. This system combines the efficiencies of a heat pump with the efficiencies of a district heating system. This option also achieves the lowest life cycle cost combined with the lowest CO2 emissions of the three options considered. Therefore, we recommend this option.



Amenity and commercial units

Amenity and commercial units shall be provided with the following PV panels (located on Block C roof and connected directly to the associated space), to ensure overall building compliance.

The PV allowance below were calculated using sBEM methodology.

Block A							
Building Space			Photovoltaic Provision				Heating System
Ref	Description	Floor Area (m ²)	PV (No.)	PV (kW)	PV (^2)	PV (%)	
Block A	Restaurant	174	8	2.32	12.8	7.4%	Central FCU-ASHP(67%) + PV
Block A	Mezzanine	128	6	1.74	9.6	7.5%	Central FCU-ASHP(67%) + PV
Block A	Level 28 Amenity	145	7	2.03	11.2	7.7%	Central FCU-ASHP(67%) + PV
Total		447	21	6.09	33.6	7.5%	

Appendix A: DEAP Results for typical apartment types

1.1 2 Bed Typical Apartment Mechanical & Electrical Installations

The following sub-sections detail the DEAP analysis for the below 2-bed apartment.



Figure 1.1.1: Floor 12, 2 Bed Apartment

Primary Heat Generators

Primary Heat Generators	
Type	Air Source Heat Pumps & Boilers (Centralised)
Model:	ASHP – Model TBC Gas-fired boilers – Models TBC
Fuel:	Electricity/Gas
Heating (HTG) Flow Temperature:	65°C
Hot Water (HWS) Flow Temperature:	35°C
HTG Seasonal Energy Efficiency Ratio:	360% (Approximate)
HWS Seasonal Energy Efficiency Ratio:	308% (Approximate)

Table 1.1.1: Primary Heat Generator

Heating Installations

Heating Installations	
Type	Centralised
Distribution:	Heat Interface Unit
Heat Emitter:	Radiators

Table 1.1.2: Heating Installation

Hot Water Installations

Hot Water Installations	
Type	Heat Interface Unit
Storage Type:	HIU
Storage Volume:	2L
Fitting Flow Rates	
- Shower	6 l/min
- Bath	N/A
- Sink	N/A
- Wash hand basin	N/A

Table 1.1.3: Hot Water Installations

Ventilation Installations

Ventilations Installations	
Type	Whole-Apartment Supply & Extract Ventilation with Heat Recovery
Model:	Vent-Axia Kinetic Sentinel B Low Carbon
Heat Recovery Efficiency:	91%
Specific Fan Power:	0.55 w/l/s

Table 1.1.4: Ventilation Installations

Lighting Installations:

Lighting Installations	
Lamp Type:	LED
Luminaire Efficiency (lm/W)	Default
Specific Power Density:	Default

Table 1.1.5: Lighting Installation

Renewable Technologies

Renewable Technologies	
Renewable Energy Ratio (% or RER)	23% or RER: 0.23

Table 1.1.6: Renewable technologies

Part L Compliance

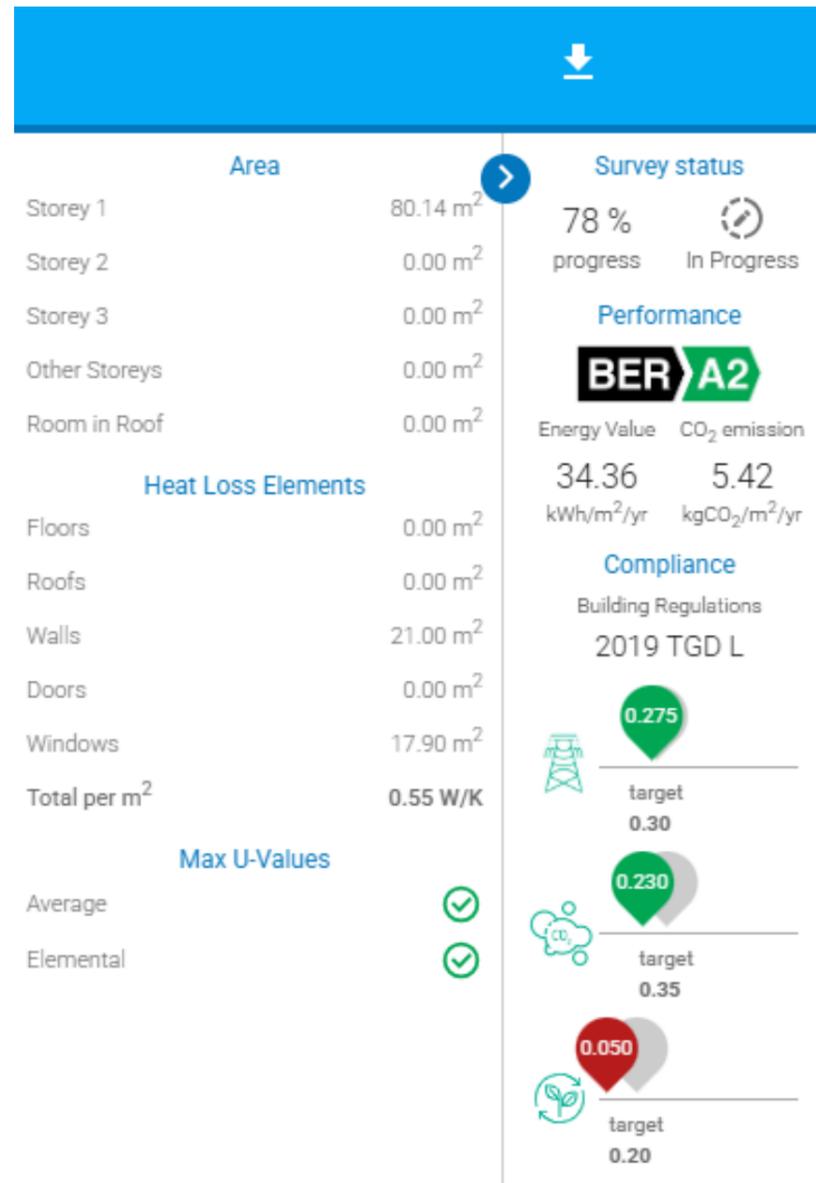


Figure 1.1.2: Part L Compliance – Primary Energy Breakdown

From figure 4.2.2, it is clear that the renewable energy ratio, RER, shown is not sufficient to meet the requirement within DEAP. The RER requirement is as per the value indicated below:

- Renewable Energy Ratio (RER) > 0.20

The SEAI have a dedicated heat pump calculator which considers heat pumps used within group schemes. Based on inputs from both DEAP and the overall design of the system, an adjusted RER is generated and is shown in Figure 4.2.3 at 23% renewable contribution.

Figure 4.2.2 & 4.2.3 shows that a centralised system, as designed, complies with the NZEB & the Part L 2019 Building regulations for the Park Gate Street Development.

RESULTS: Part L compliance Renewable Energy Ratio (RER) Adjustment. Applies to New final and New provisional assessments only. BER Assessor must advise the client of any adjustment to RER, and attach details of adjusted RER to Part L compliance report. This section is completed AFTER the above heat pump calculation results are entered in DEAP software.

Total renewable contribution adjustment	673.74
Total renewables primary energy from DEAP software	144.47
Total Primary Energy from DEAP software	2897.72
Adjusted Renewable Energy Ratio to be attached to compliance report	<u>0.23</u>

Figure 1.1.3 –Adjusted RER

Figure 4.2.2 above, indicates confirmation of compliance to Part-L for one of the typical 2 Bed apartments on the 12th floor, **without the need for PV panels to the residential unit**, with the following parameters achieved:

- Energy Performance Coefficient (EPC) < 0.30
- Carbon Performance Coefficient (CPC) < 0.35

1.2 1 Bed Typical Apartment Mechanical & Electrical Installations

The following sub-sections detail the DEAP analysis for the below 1-bed apartment.

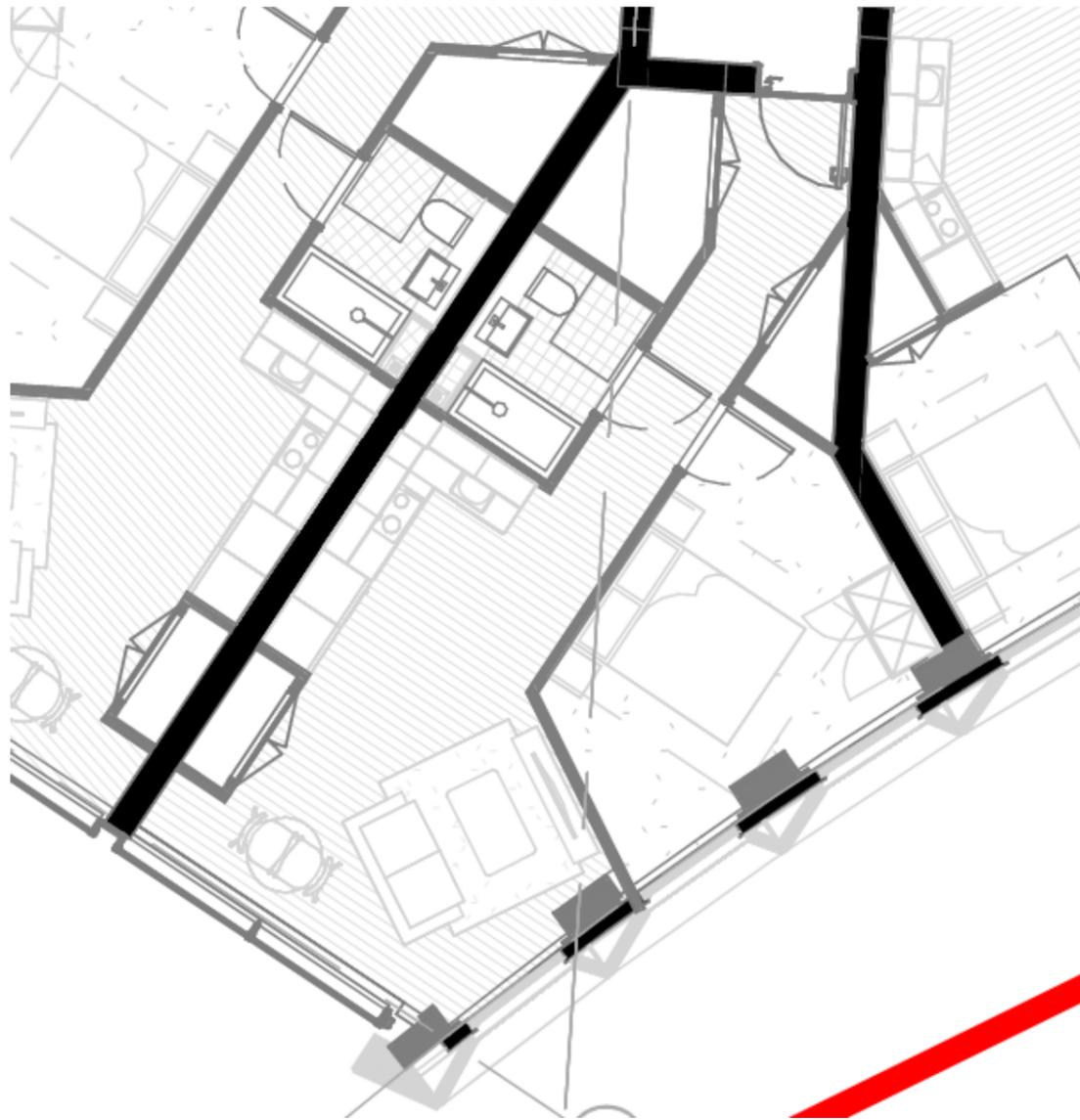


Figure 1.2.1: Floor 12, 2 Bed Apartment

Primary Heat Generators

Primary Heat Generators	
Type	Air Source Heat Pumps & Boilers (Centralised)
Model:	ASHP – Model TBC Gas-fired boilers – Models TBC
Fuel:	Electricity/Gas
Heating (HTG) Flow Temperature:	65°C
Hot Water (HWS) Flow Temperature:	35°C
HTG Seasonal Energy Efficiency Ratio:	360% (Approximate)
HWS Seasonal Energy Efficiency Ratio:	308% (Approximate)

Table 1.2.1: Primary Heat Generator

Heating Installations

Heating Installations	
Type	Centralised
Distribution:	Heat Interface Unit
Heat Emitter:	Radiators

Table 1.2.2: Heating Installation

Hot Water Installations

Hot Water Installations	
Type	Heat Interface Unit
Storage Type:	HIU
Storage Volume:	2L
Fitting Flow Rates	
- Shower	6 l/min
- Bath	N/A
- Sink	N/A
- Wash hand basin	N/A

Table 1.2.3: Hot Water Installations

Ventilation Installations

Ventilations Installations	
Type	Whole-Apartment Supply & Extract Ventilation with Heat Recovery
Model:	Vent-Axia Kinetic Sentinel B Low Carbon
Heat Recovery Efficiency:	89%
Specific Fan Power:	0.49 w/l/s

Table 1.2.4: Ventilation Installations

Lighting Installations:

Lighting Installations	
Lamp Type:	LED
Luminaire Efficiency (lm/W)	Default
Specific Power Density:	Default

Table 1.2.5: Lighting Installation

Renewable Technologies

Renewable Technologies	
Renewable Energy Ratio (% or RER)	23% or RER: 0.23

Table 1.2.6: Renewable technologies

Part L Compliance

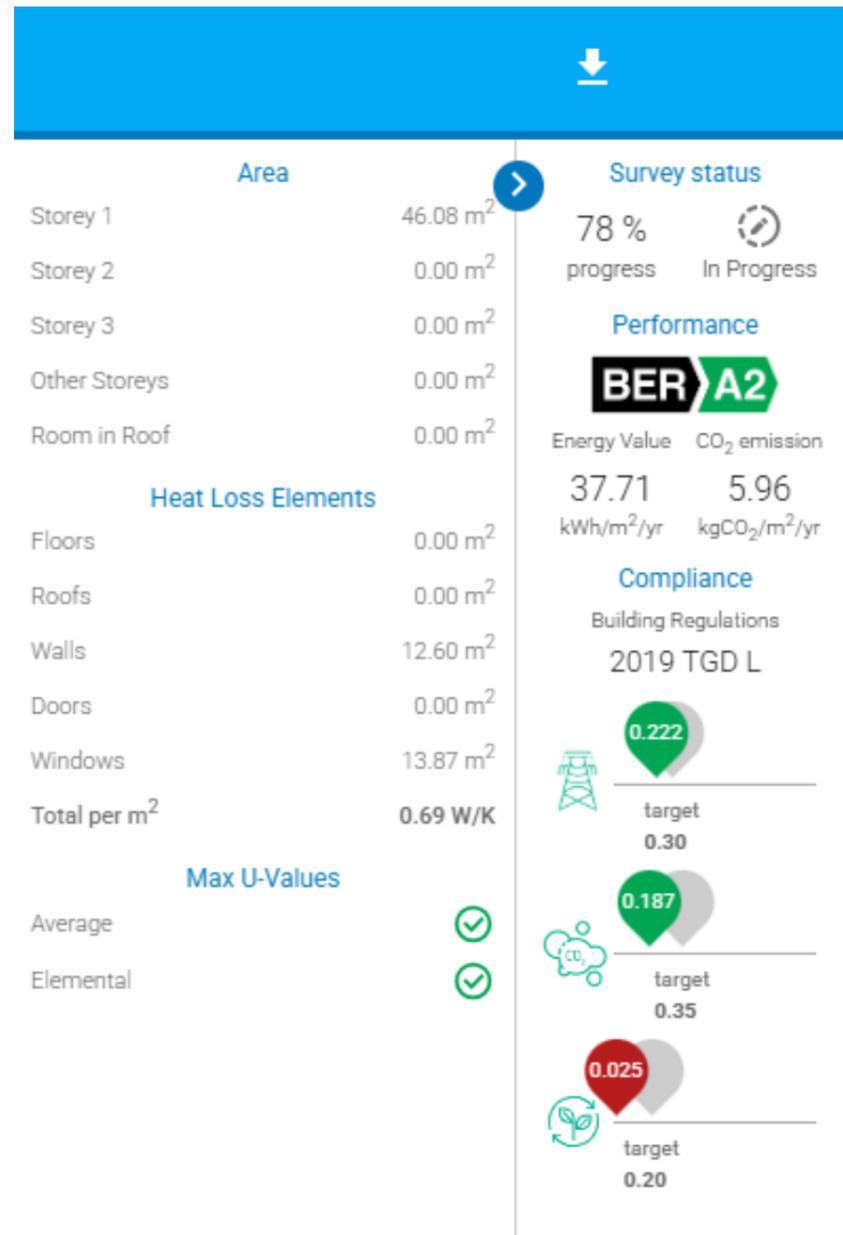


Figure 1.2.2: Part L Compliance – Primary Energy Breakdown

Figure 4.2.2 above, indicates confirmation of compliance to Part-L for one of the typical 1 Bed apartments on the 12th floor, **without the need for PV panels to the residential unit**, with the following parameters achieved:

- Energy Performance Coefficient (EPC) < 0.30
- Carbon Performance Coefficient (CPC) < 0.35

From figure 4.2.2, it is clear that the renewable energy ratio, RER, shown is not sufficient to meet the requirement within DEAP. The RER requirement is as per the value indicated below:

- Renewable Energy Ratio (RER) > 0.20

The SEAI have a dedicated heat pump calculator which considers heat pumps used within group schemes. Based on inputs from both DEAP and the overall design of the system, an adjusted RER is generated and is shown in Figure 4.2.3 at 23% renewable contribution.

Figure 4.2.2 & 4.2.3 shows that a centralised system, as designed, complies with the NZEB & the Part L 2019 Building regulations for the Park Gate Street Development.

RESULTS: Part L compliance Renewable Energy Ratio (RER) Adjustment. Applies to New final and New provisional assessments only. BER Assessor must advise the client of any adjustment to RER, and attach details of adjusted RER to Part L compliance report. This section is completed AFTER the above heat pump calculation results are entered in DEAP software.

Total renewable contribution adjustment	474.67
Total renewables primary energy from DEAP software	45.36
Total Primary Energy from DEAP software	1782.84
Adjusted Renewable Energy Ratio to be attached to compliance report	0.23

Figure 1.2.3 –Adjusted RER

1.3 Typical Studio Apartment Mechanical & Electrical Installations

The following sub-sections detail the DEAP analysis for the below studio apartment.

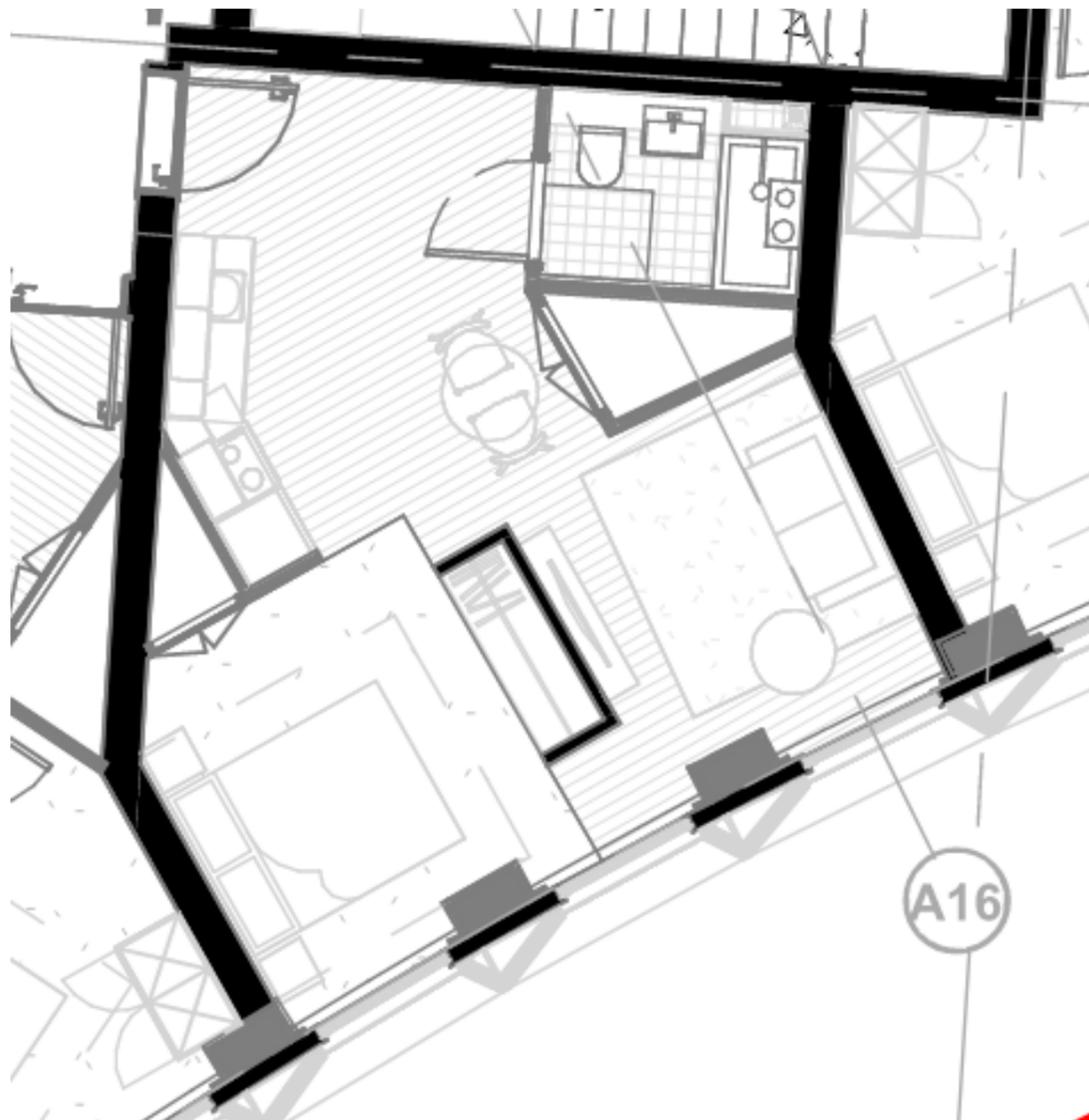


Figure 1.3.1: Floor 12, Studio Apartment

Primary Heat Generators

Primary Heat Generators	
Type	Air Source Heat Pumps & Boilers (Centralised)
Model:	ASHP – Model TBC Gas-fired boilers – Models TBC
Fuel:	Electricity/Gas
Heating (HTG) Flow Temperature:	65°C
Hot Water (HWS) Flow Temperature:	35°C
HTG Seasonal Energy Efficiency Ratio:	360% (Approximate)
HWS Seasonal Energy Efficiency Ratio:	308% (Approximate)

Table 1.3.1: Primary Heat Generator

Heating Installations

Heating Installations	
Type	Centralised
Distribution:	Heat Interface Unit
Heat Emitter:	Radiators

Table 1.3.2: Heating Installation

Hot Water Installations

Hot Water Installations	
Type	Heat Interface Unit
Storage Type:	HIU
Storage Volume:	2L
Fitting Flow Rates	
- Shower	6 l/min
- Bath	N/A
- Sink	N/A
- Wash hand basin	N/A

Table 1.3.3: Hot Water Installations

Ventilation Installations

Ventilations Installations	
Type	Whole-Apartment Supply & Extract Ventilation with Heat Recovery
Model:	Vent-Axia Kinetic Sentinel B Low Carbon
Heat Recovery Efficiency:	89%
Specific Fan Power:	0.49 w/l/s

Table 1.3.4: Ventilation Installations

Lighting Installations:

Lighting Installations	
Lamp Type:	LED
Luminaire Efficiency (lm/W)	Default
Specific Power Density:	Default

Table 1.3.5: Lighting Installation

Renewable Technologies

Renewable Technologies	
Renewable Energy Ratio (% or RER)	23% or RER: 0.23

Table 1.3.6: Renewable technologies

Part L Compliance

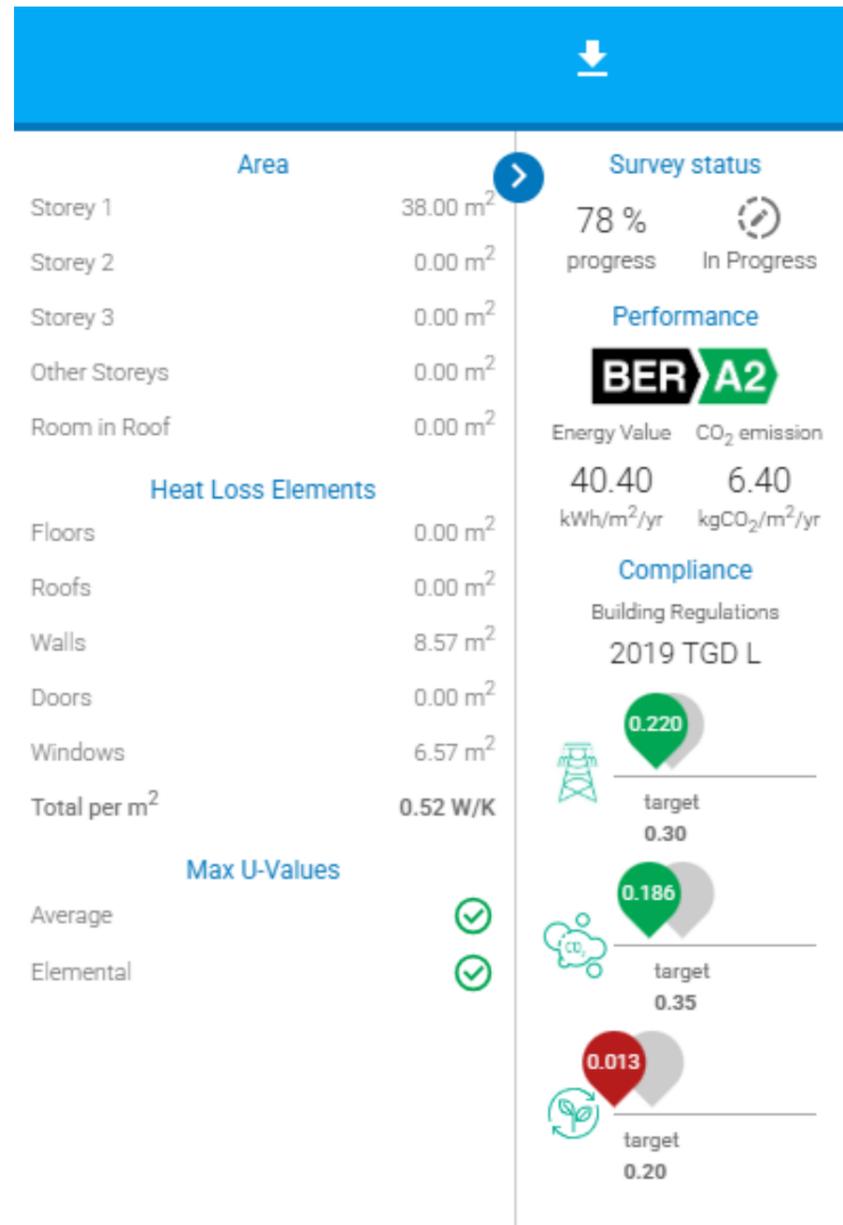


Figure 1.3.2: Part L Compliance – Primary Energy Breakdown

From figure 4.2.2, it is clear that the renewable energy ratio, RER, shown is not sufficient to meet the requirement within DEAP. The RER requirement is as per the value indicated below:

- Renewable Energy Ratio (RER) > 0.20

The SEAI have a dedicated heat pump calculator which considers heat pumps used within group schemes. Based on inputs from both DEAP and the overall design of the system, an adjusted RER is generated and is shown in Figure 4.2.3 at 23% renewable contribution.

Figure 4.2.2 & 4.2.3 shows that a centralised system, as designed, complies with the NZEB & the Part L 2019 Building regulations for the Park Gate Street Development.

RESULTS: Part L compliance Renewable Energy Ratio (RER) Adjustment. Applies to New final and New provisional assessments only. BER Assessor must advise the client of any adjustment to RER, and attach details of adjusted RER to Part L compliance report. This section is completed AFTER the above heat pump calculation results are entered in DEAP software.		
Total renewable contribution adjustment	443.66	
Total renewables primary energy from DEAP software	20.59	
Total Primary Energy from DEAP software	1555.78	
Adjusted Renewable Energy Ratio to be attached to compliance report	<u>0.23</u>	

Figure 1.3.3 –Adjusted RER

Figure 4.2.2 above, indicates confirmation of compliance to Part-L for one of the typical 2 Bed apartments on the 12th floor, **without the need for PV panels to the residential unit**, with the following parameters achieved:

- Energy Performance Coefficient (EPC) < 0.30
- Carbon Performance Coefficient (CPC) < 0.35

