

**D1861**  
**42A Parkgate Street,**  
**Dublin 8**



**Energy Analysis Report**

27<sup>th</sup> November 2019

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## **CONTENTS**

- 1.0 EXECUTIVE SUMMARY**
- 2.0 BUILDING REGULATIONS**
  - 2.1 NZEB
  - 2.2 Part L 2017
  - 2.3 Primary Energy
  - 2.4 Renewable Technologies
  - 2.5 Centralised -v- Decentralised Plant
- 3.0 ENERGY ANALYSIS**
  - 3.1 Building Construction
  - 3.2 Mechanical and Electrical Systems
  - 3.3 Renewable Technologies
  - 3.4 Part L 2017 Compliance
- 4.0 HEATING PLANT OPTIONS**
  - 4.1 Exhaust Air Source Heat Pumps
  - 4.2 Ducted Air Source Heat Pumps
  - 4.3 Central Air Source Heat Pump with Gas Boiler
- 5.0 CONCLUSIONS**

## 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 2.08 for Electricity and 1.1 for Natural Gas.

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

The table below summarises the results of our analysis of 3 possible options which could be considered suitable for the Parkgate Street development

Although all options perform well with low associated CO<sub>2</sub> emissions the centralised solution is the optimal whole life cycle cost solution. We therefore recommend this strategy for the Parkgate Street development.

	Options	PV panels Required for NZEB	Annual CO <sub>2</sub> Emissions Per Apartment
1	Ducted Air Source Heat Pump	0.7	1,300 kg
2	Exhaust Air Heat Pump	0.7	1,300 kg
3	Centralised Air Source Heat Pump	0.2	750 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 was 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.

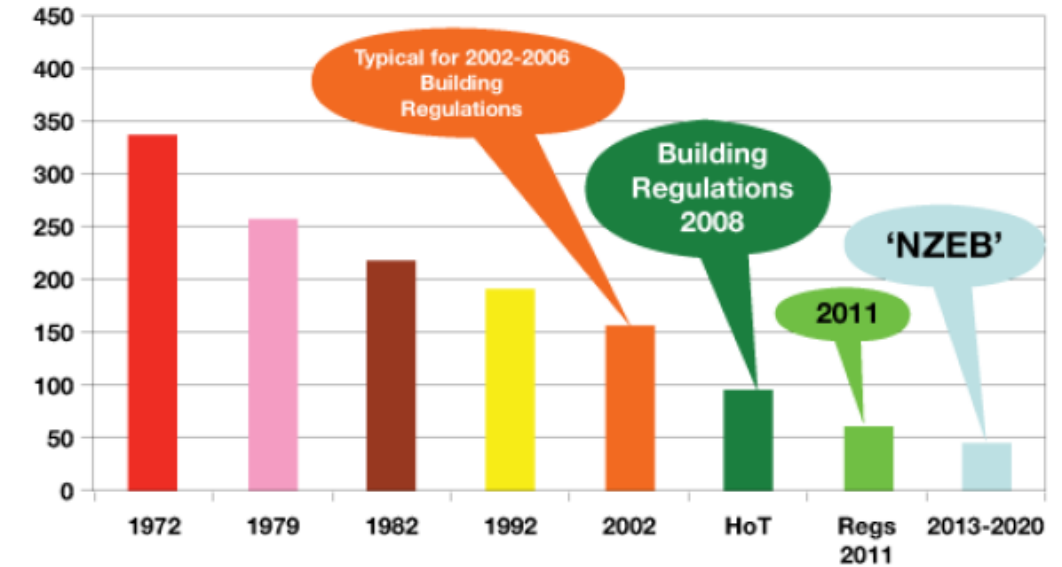


Figure 2.1.1 - Primary Energy Consumption in Irish Housing 1972-2020

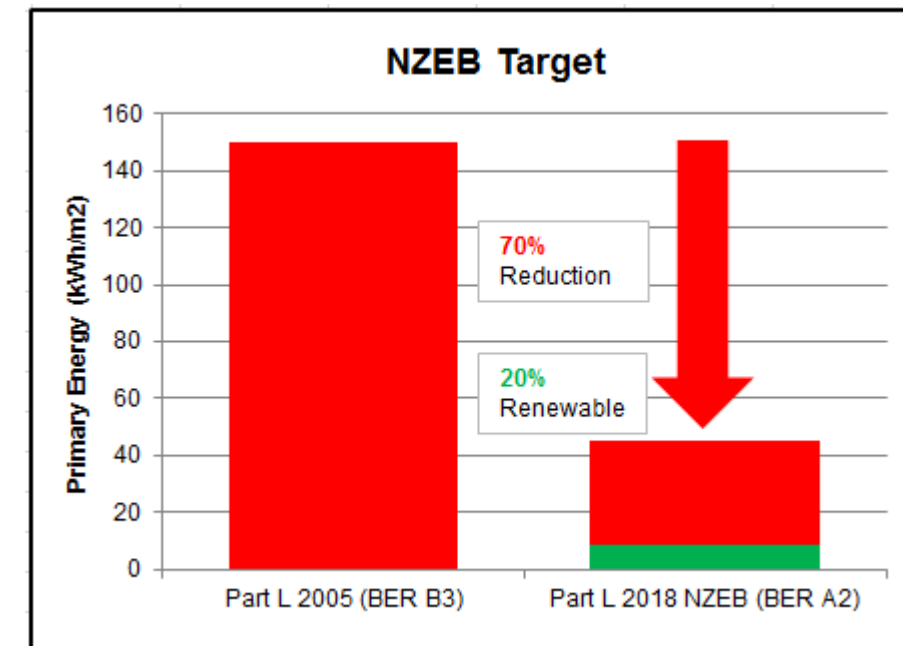


Figure 2.1.2 - NZEB Targets

## 2.0 BUILDING REGULATIONS

### 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/m<sup>2</sup>.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 (100m<sup>2</sup>, 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/m<sup>2</sup>K
- External Walls: 0.18 W/m<sup>2</sup>K
- Ground/ Exposed Floors: 0.18 W/m<sup>2</sup>K
- Windows/ Doors/ Rooflights: 1.40 W/m<sup>2</sup>K

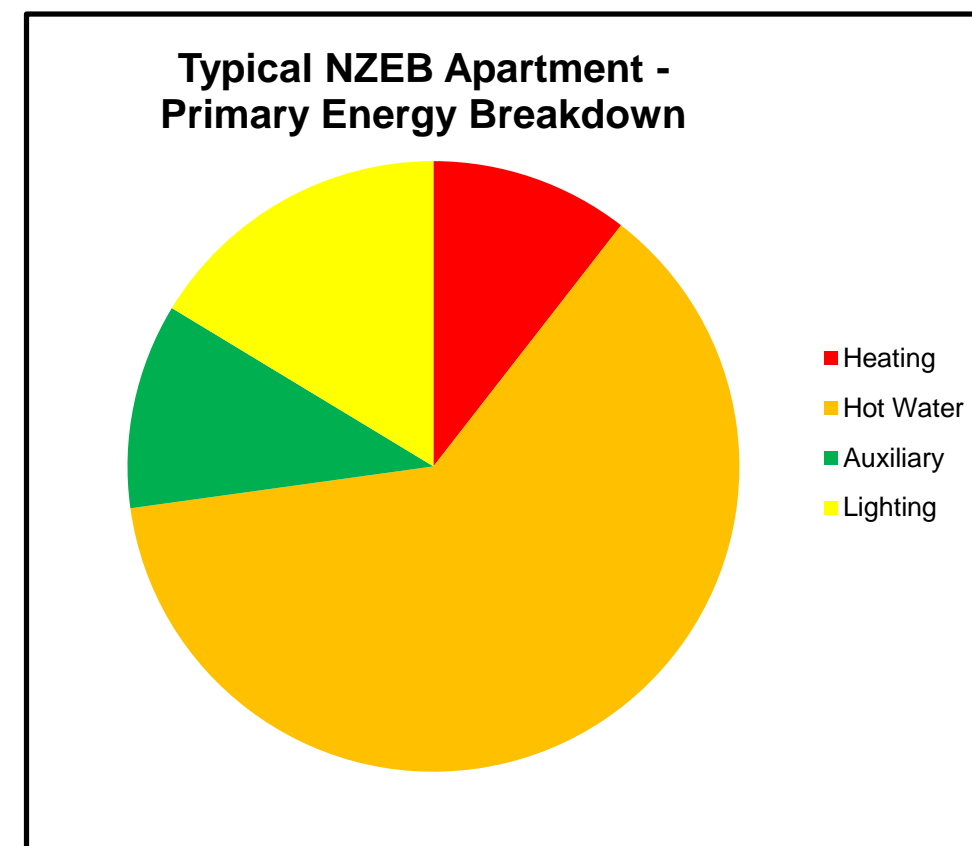


Figure 2.2 -Energy Breakdown

## 2.0 BUILDING REGULATIONS

### 2.2 Part L 2019 (Cont'd)

#### Air Permeability

- Maximum Air Leakage: 3 m<sup>3</sup>/hr.m<sup>2</sup> @ 50Pa

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

## 2.0 BUILDING REGULATIONS

### 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: 2.08
- Natural Gas/ LPG/ Oil/ Biomass: 1.10

It can be seen from the above that the Primary Energy conversion for Electricity is twice that of Natural Gas (as well as other fossil fuels and biomass); therefore a direct electric heater would consume 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: 409 gCO<sub>2</sub>/kWh
- Natural Gas: 203 gCO<sub>2</sub>/kWh

The Carbon Factors associated with Electricity have fallen by approximately 26% in Ireland over recent years (from 635 gCO<sub>2</sub>/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.

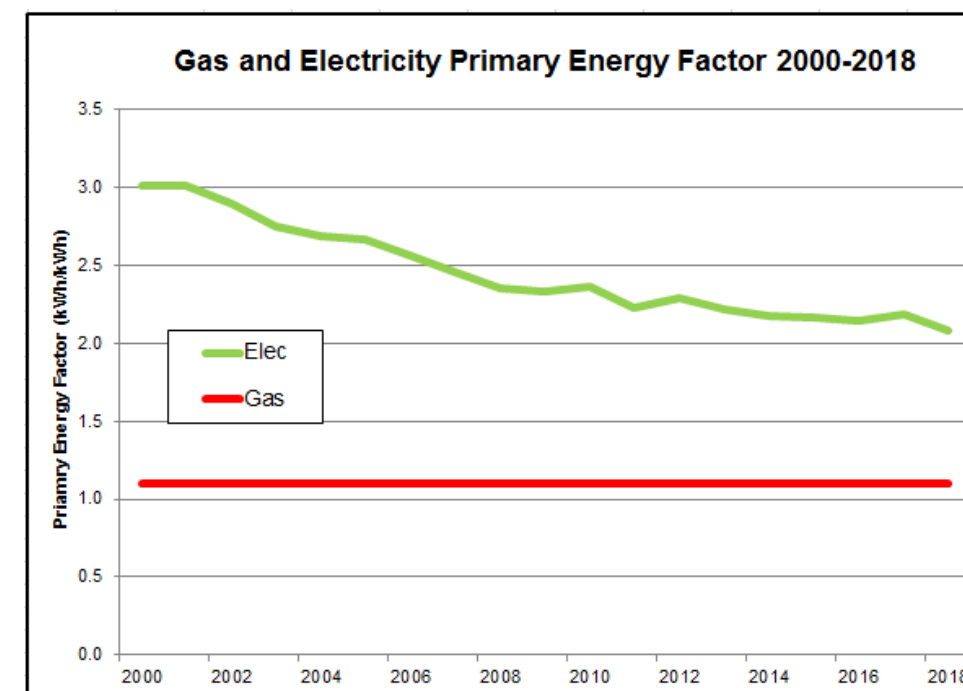


Figure 2.3 - Primary Energy Factors for Gas and Electricity 2000-2018

## 2.0 BUILDING REGULATIONS

### 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 2.2.2 indicates how, for a typical apartment (notional 100m<sup>2</sup>, 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).

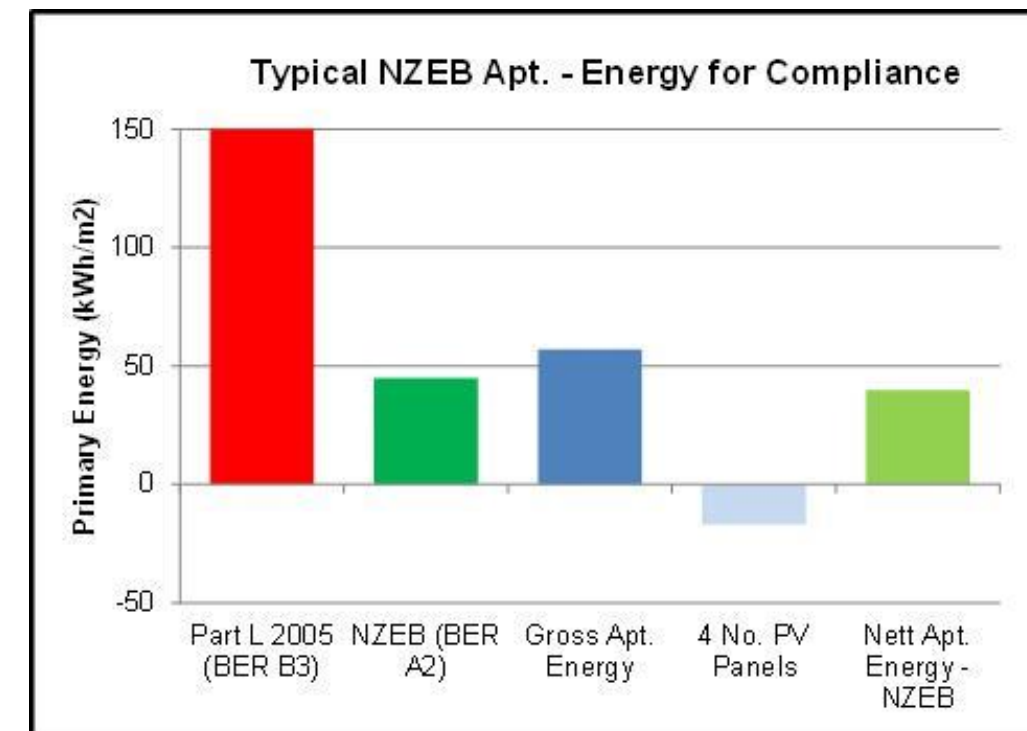


Figure 2.4 -EPC Compliance for Typical Apartment



### 3.0 ENERGY ANALYSIS

We have completed detailed analysis on 3no. heating strategy options for the Parkgate Street residential elements. The detailed results of this analysis are contained within the attached appendices. In each case 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 full floor of the tower building and a west and an east facing apartment from blocks B1/B2 were selected for the purposes of analysis with a small element of exposed floor and roof allowed for 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:

##### Thermal Transmittance (U-Values)

- Roofs: 0.12 W/m<sup>2</sup>K
- External Walls: 0.18 W/m<sup>2</sup>K
- Ground/ Exposed Floors: 0.12 W/m<sup>2</sup>K
- Windows/ Doors/ Rooflights: 1.40 W/m<sup>2</sup>K

##### Glazing Parameters

- Total Solar Heat Transmittance: 0.60
- Framing Factor: 0.70
- Overshadowing: Average

##### Air Permeability

- Air Leakage: 3.0 m<sup>3</sup>/hr.m<sup>2</sup> @ 50 Pa

##### Thermal Bridging

- Heat Transmission Coefficient: 0.08 W/m<sup>2</sup>K (standard construction details)

##### Domestic Potable Water Services and Lighting

- Shower Flowrate: 9l/min
- Water usage: 125l/person/day
- Lighting: 100% LED

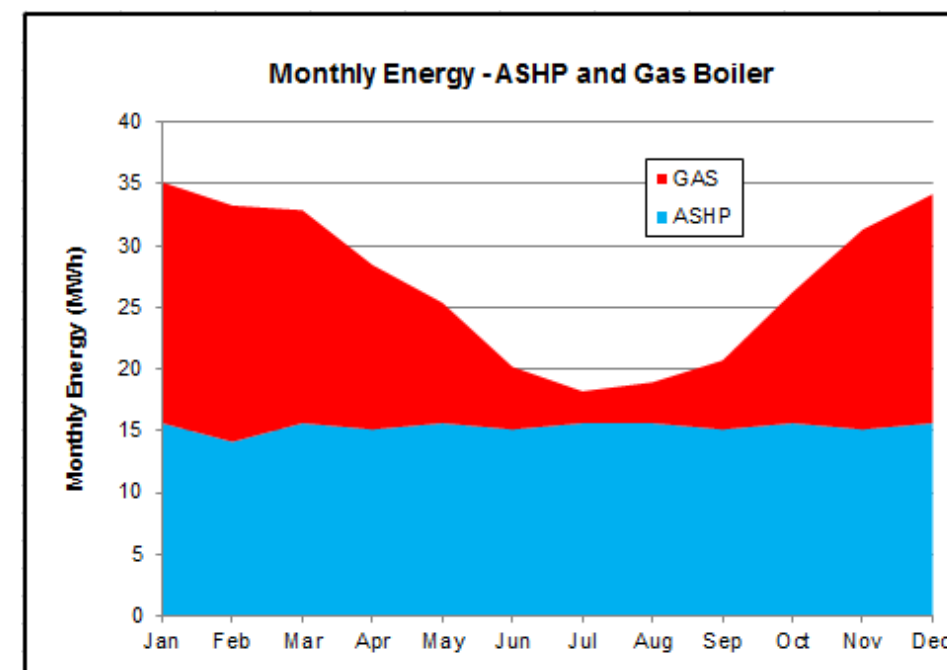


Figure 3.2 - Extent of Heating and Hot Water delivered by ASHP and Gas Boiler

## 4.0 HEATING PLANT OPTIONS

### 4.1 Decentralised Ducted Air Source Heat Pump Option

This decentralised solution would include a hot water cylinder with an integral air source heat pump for every apartment. Air would be ducted to and from the façade to the heat pump where the heat extracted from the air would be used to heat hot water for shower, basins etc. This solution does not allow for wet radiators. The heating to the apartments would instead be provided by electric radiators. This system is less efficient than the exhaust air heat pump version as the heating does not benefit from the heat pump Co-efficient of Performance(COP).

A ducted heat recovery ventilation unit would be provided to each apartment to maintain air quality while minimising heat losses associated with air infiltration. This would require a second set of intake and exhaust ducts from the building façade

The heat pump is electric therefore the only bills to the tenant would be for electricity.

Cold water storage would be located centrally at basement level and pressure boosted to all apartments to eliminate noisy pumps within residential areas.

The heat pump capacity is relatively low requiring an electric heating element to supplement the heat pump during periods of heavy duty.

#### Sustainability

Under the DEAP methodology for Parkgate Street this system will require an average of 1.0no. PV panels per apartment to achieve NZEB compliance.

The CO<sub>2</sub> emissions associated with the heating, hot water, ventilation and lighting for a typical Parkgate Street apartment averages **1,500kg/year**.



Figure 4.2 - Decentralised Ducted Air Source Heat Pump & PVs

#### Key Figures (per Apartment)

- PV requirement: **>1.2 panel**
- Annual CO<sub>2</sub> emissions: **>1,130kg**

#### Pro's

- Low capital cost solution
- Sustainable efficient solution - low CO<sub>2</sub> emissions
- No energy manager required - only bill to tenant is for electricity

#### Con's

- Relatively low life expectancy - 12 years
- Unproven technology - possible reliability issues
- Inflexible - no potential to add new sustainable technology in future

## 4.0 HEATING PLANT OPTIONS

### 4.2 Decentralised Exhaust Air Heat Pump Option

This is a decentralised solution in which each apartment is provided with a hot water cylinder with an integral exhaust air heat pump. The system includes 2no. ventilation extract fans, hot water cylinder and LPHW heat exchanger and circulation pumps.

This solution relies on trickle vents to the windows to provide the background ventilation to the living rooms and bedrooms. The warm exhaust air from the apartment is extracted via the heat pump from the bathrooms and kitchen area. This improves the efficiency of the heat pump which then heats both domestic hot water and provides LPHW to serve the radiators.

As the heat pump relies on warm air from the apartment to maintain capacity the system operates 24hours a day maintaining the the apartment at a minimum of 18°C. While this ensures comfort conditions are constant it is inherently less efficient as the apartment must be heated when not in use.

The heat pump is electric therefore the only bills to the tenant would be for electricity.

Cold water storage would be located centrally at basement level and pressure boosted to all apartments to eliminate noisy pumps within residential areas.

#### Sustainability

Under the DEAP methodology for Buidling 5 this system will require an average of 0.7no. PV panels per apartment to achieve NZEB compliance.

The CO<sub>2</sub> emmissions associated with the heating, hot water, ventilation and lighting for a typical Parkgate Street apartment averages **890kg/year**.

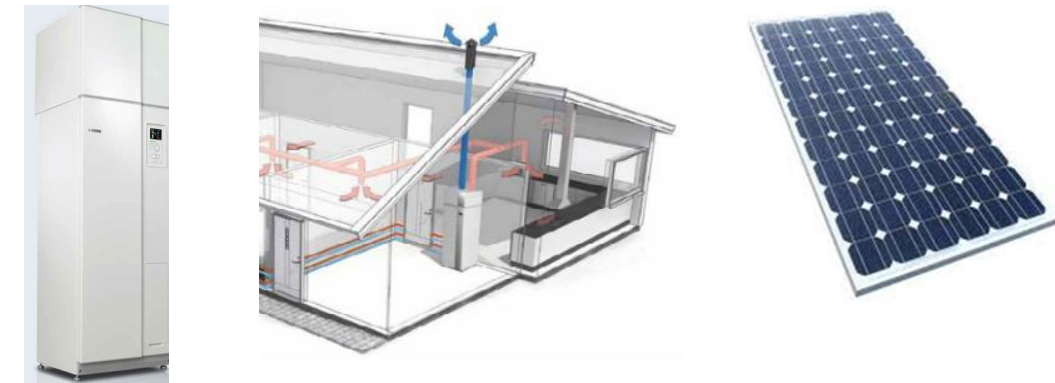


Figure 4.1 - Exhaust Air Heat Pump & PVs

#### Key Figures (per Apartment)

- PV requirement: **0.7 panel**
- Annual CO<sub>2</sub> emissions: **890kg**

#### Pro's

- Sustainable efficient solution - low CO<sub>2</sub> emissions
- No energy manager required - only bill to tenant is for electricity

#### Con's

- Relativley high capital cost
- Relativley low life expectancy - 13.5 years
- Unproven technology - possible reliability issues
- Inflexibile - no potential to add new sustainable technology in future
- Additional apartment storage space and ceiling void to house plant and associated ceiling ductwork incl. access hatches.

## 4.0 HEATING PLANT OPTIONS

### 4.3 Centralised Heat Pump Option

This centralised plant solution would consist of an Air Source Heat Pump located at basement level to provide the base heating load to the development, backed up by modulating gas-fired condensing boilers.

LPHW would be circulated vertically through a 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 Building 5 this system will require an average of 0.2no. PV panels per apartment to achieve NZEB compliance.

The CO<sub>2</sub> emissions associated with the heating, hot water, ventilation and lighting for a typical Parkgate Street apartment averages **650kg/year**.



*Figure 4.3 - Central Air Source Heat Pump, HIU & PVs*

#### Key Figures (per Apartment)

- PV requirement: **0.2 panels**
- Annual CO<sub>2</sub> emissions: **650kg**

#### Pro's

- Sustainable efficient solution - low CO<sub>2</sub> 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.

## 6.0 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 CO<sub>2</sub> emissions and running costs for each as outlined below:

### Ducted Air Source Heat Pump

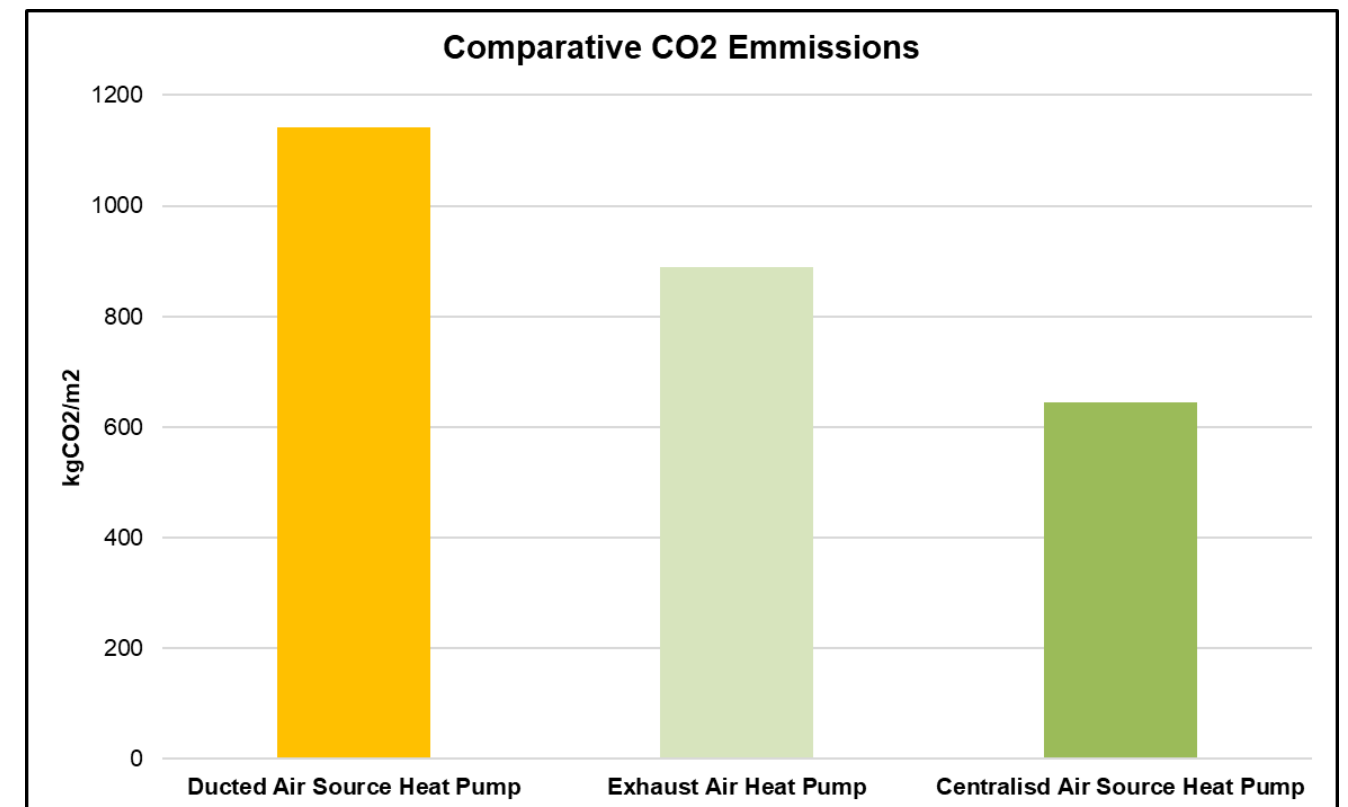
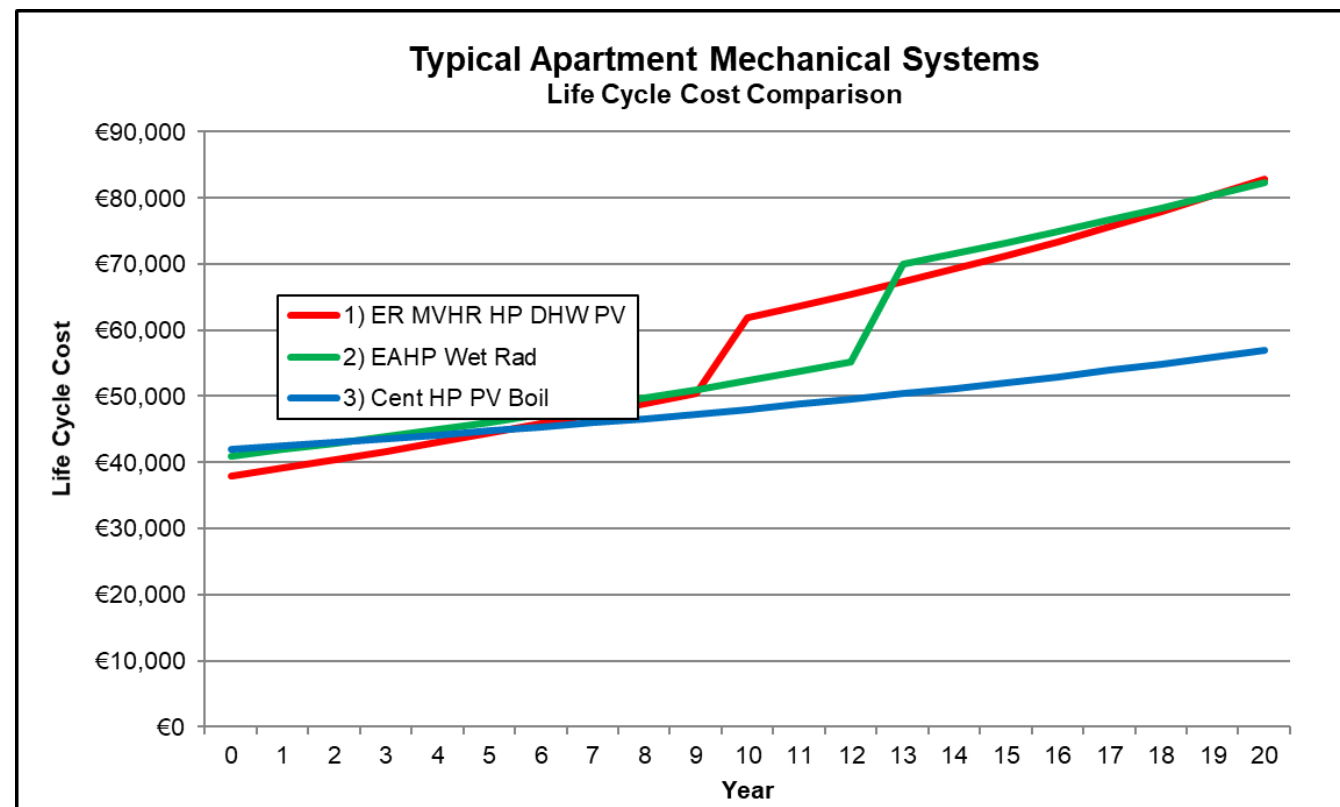
This is the least efficient solution, primarily due to using electric radiators for heating with no benefit from the heat pump. This option is not recommended

### Exhaust Air Heat Pump

This option is more efficient than the ducted heat pump. This is principally due to using wet radiators for heating served from the heat pump. This option is very efficient in operation however the overall seasonal efficiency for the system suffers due to the requirement to constantly maintain temperature to the apartment regardless of occupancy of time schedules.

### Central Air Source Heat Pump supplemented by Gas boilers

This option delivers approximately 60% 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 (with an option to also add a CHP engine if reduced running costs were a consideration). 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 CO<sub>2</sub> emissions of the three options considered.



## 7.0 Appendix A: DEAP Results for typical Apartment types

## Property details

<b>MPRN</b>	0	<b>BER Number</b>	N/A
<b>Shared MPRN</b>		<b>Previous BER</b>	
<b>Address line 1</b>	26 Parkgate Street	<b>Type of Rating</b>	New Dwelling - Provisional
<b>Address line 2</b>		<b>Purpose of rating</b>	Sale
<b>Address line 3</b>	Dublin 8 (copy) (copy) (copy) (copy)	<b>Building Regulations</b>	2019 TGD L
<b>County</b>	Co. Dublin	<b>Planning Reference</b>	
<b>Eircode</b>	A94X2F3	<b>Date of Plans</b>	
<b>Dwelling Type</b>	Mid-floor apartment	<b>Date of Assessment</b>	26/11/2019
<b>Year of construction</b>	2019	<b>Assessor Comments</b>	Gas Boilers
<b>Dwelling Extension</b>	N/A	<b>Assessor Description</b>	Central ASHP - Double Room - Fifth Floor (Middle)
<b>Storeys</b>	1		
<b>Bedrooms</b>	2		

## Dimension details

	Area [m <sup>2</sup> ]	Height [m]	Volume [m <sup>3</sup> ]
<b>Ground floor</b>	90.00	3.00	270.00
<b>First floor</b>	0.00	0.00	0.00
<b>Second floors</b>	0.00	0.00	0.00
<b>Third and other floors</b>	0.00	0.00	0.00
<b>Room in Roof</b>	0.00	0.00	0.00
<b>Totals</b>	90.00		270.00
<b>Living Area</b>	37.20 m <sup>2</sup>	<b>Living Area Percentage</b>	41.33 %

## Ventilation details

		Number	Air Change Rate [ac/h]
Chimneys		0	0.00
Open Flues		0	0.00
Fans & vents		1	10.00
Flueless combustion room heaters		0	0.00
Has a permeability test been carried out	Yes	Is there a draught lobby on main entrance?	Yes
Infiltration rate due to structure [ac/h]	0.15	Draught lobby air change [ac/h]	0.00
Intermediate infiltration rate	0.19	Openings infiltration [ac/h]	0.04
Number of sides sheltered	2	Structure type	N/A
Adjusted infiltration rate	0.16	Is there a suspended wooden ground floor?	N/A
Effective air change rate [ac/h]	0.26	Windows/doors/attic hatches draught stripped [%]	100.00
Ventilation heat loss [W/K]	23.50	Ventilation method	Balanced whole-house mechanical ventilation with heat recovery
Adjusted result of air permeability test [ac/h]	0.15	How many wetrooms (inc. kitchen)? Is the vent. ducting flexible/rigid/both?	3
Manufacturer and Model name	Vent-Axia Kinetic Sentinel B Lo Carbon	Is MVHR ducting insulated where outside of insulated envelope?	Yes
Specific fan power [W/(l/s)]	0.46	Adjusted heat exchanger efficiency	79.05
Heat exchanger efficiency [%]	93.00		
Electricity for ventilation fans [Kwh/y]	151.52		
Heat gains from ventilation fans [W]	7.45		



## Building Elements - Floors

Type	Description	U/F Heating	In Roof	Age Band	Exposed Perimeter [m]	Area [m <sup>2</sup> ]	U-Value [W/m <sup>2</sup> K]	Heat Loss (AU) [W/K]
Non-Heat Loss Floor	2 Bed Apartment	N/A	No	2005 onwards	N/A	90.00	0.00	0.00
<b>Total area [m<sup>2</sup>]</b>								90.00

## Building Elements - Roofs

Type	Description	Insulation Thickness [mm]	Age Band	Area [m <sup>2</sup> ]	U-Value [W/m <sup>2</sup> K]	Heat Loss (AU) [W/K]
<b>Total area [m<sup>2</sup>]</b>						0.00

## Building Elements - Walls

Type	Description	Wall is semi-exposed	Include in compliance check	Age Band	Area [m <sup>2</sup> ]	U-Value [W/m <sup>2</sup> K]	Heat Loss (AU) [W/K]
325mm Solid Brick	N Facing - External Wall	No	No	2005 onwards	11.00	0.18	1.98
325mm Solid Brick	N Facing - External Wall	No	No	2005 onwards	12.30	0.18	2.21
325mm Solid Brick	E Facing - External Wall	No	No	2005 onwards	10.65	0.18	1.92
<b>Total area [m<sup>2</sup>]</b>							<b>33.95</b>

## Building Elements - Doors

Count	Type	Description	Draught Stripped	Area [m <sup>2</sup> ]	U-Value [W/m <sup>2</sup> K]	Heat Loss (AU) [W/K]
<b>Total area [m<sup>2</sup>]</b>						0.00

## Building Elements - Windows

Count	Glazing Type	Frame Type	Frame Factor	Solar Transm.	In Roof	Over shading	Orient.	Area [m <sup>2</sup> ]	U-value [W/m <sup>2</sup> K]
1	Double-glazed, air filled (low-E, en = 0.1, soft coat)	Wood/PVC	0.700	0.63	No	Very Little	North	4.80	1.40
1	Double-glazed, air filled (low-E, en = 0.1, soft coat)	Wood/PVC	0.700	0.63	No	Very Little	North	2.25	1.40
1	Double-glazed, air filled (low-E, en = 0.1, soft coat)	Wood/PVC	0.700	0.63	No	Very Little	North	2.25	1.40
1	Double-glazed, air filled (low-E, en = 0.1, soft coat)	Wood/PVC	0.700	0.63	No	Very Little	East	2.25	1.40
<b>Total area [m<sup>2</sup>]</b>									<b>11.55</b>

## Heat loss details

<b>Total glazed area [m<sup>2</sup>]</b>	11.55	<b>Glazing ratio</b>	0.06
<b>Total glazed heat loss [W/K]</b>	15.31	<b>Summer solar gain [W/m<sup>2</sup>]</b>	387.04
<b>Total effective collection area [m<sup>2</sup>]</b>	4.58	<b>Total element area [m<sup>2</sup>]</b>	11.55
<b>Total plane heat loss [W/K]</b>	21.42	<b>Thermal bridging factor [W/m<sup>2</sup>K]</b>	0.08
<b>Fabric heat loss [W/K]</b>	25.06		
<b>Total heat loss [W/K]</b>	48.56	<b>Per m2</b>	0.54

## Lighting and Internal Gains

<b>Lighting Design Calculation Method</b>	Bulb type only	<b>Average Efficacy [lm/W]</b>	66.90
<b>Fixed lighting provision [klmh/y]</b>	3315.12	<b>Top up lighting requirement [klmh/y]</b>	0.00
<b>Energy required for fixed lighting [kWh/y]</b>	88.39	<b>Energy required for top up lighting [kWh/y]</b>	0.00
<b>Energy required for portable lighting [kWh/y]</b>	138.81		
<b>Basic energy consumption for lighting [kWh/y]</b>	785.34	<b>Water heating</b>	104.99
<b>Annual energy used for lighting [kWh/m<sup>2</sup>y]</b>	227.21	<b>Occupants</b>	131.29
<b>Internal gains from lighting during heating season [kWh/hs] (In watts [W])</b>	173.81 (29.80)	<b>Mechanical ventilation</b>	7.45
<b>Lighting</b>	29.80	<b>Heat loss to the cold water network</b>	-37.63
<b>Appliance and cooking</b>	194.89	<b>Net internal gains</b>	430.79

## Water heating details

Are there distribution losses?	Yes	Is supplementary electric water heating used in summer?	N/A
Are there storage losses?	Yes	Is there a combi boiler?	No
Is there a solar water heating system?	No	Total hot water demand [kWh/y]	1729.05
Standard number of occupants	2.63	Temperature factor unadjusted	1.00
Number of mixer showers	1	Temperature Factor Multiplier	1.00
Number of electric showers	0	Hot water storage loss factor [kWh/l d]	0.00
Is there a bath present	Yes	Volume factor	0.00
Daily hot water use [Litres/d]	110.27	Combi-boiler electricity consumption [kWh/y]	0.00
Hot water energy reqs. at taps [kWh/y]	1469.69	Adjusted storage loss [kWh/y]	132.86
Distribution losses [kWh/y]	259.36	Adjusted primary circuit loss [kWh/y]	298.16
Water storage volume [Litres]	4.00	Heat gains from water heating system [W]	104.99
Is manufacturers declared loss factor available?	Yes	Output from supplementary heater [kWh/y]	0.00
Declared loss factor [kWh/d]	0.36		
Manufacturer and Model name	Heat Rae		
Insulation type	None		
Insulation thickness [mm]	0		
Combi-boiler Type	None	Combi-boiler loss [kWh/y]	0.00
Keep Hot facility	None	Storage Loss	132.86
Primary Circuit loss type			Community heating
Primary circuit loss [kWh/y]	360.00	Output from main water heater [kWh/y]	2160.07
Is hot water storage indoors or in group heating system	Yes	Annual Heat gains from water heating system [kWh/y]	919.72
		WWHRS input to main system [kWh/y]	0.00
		WWHRS input to supplementary system [kWh/y]	0.00

## Net space heat demand

Required temp. during heated hours	21.00	Length of one unheated period [h]	8
Required temperature rest of dwelling	18.00	Unheated periods per week	14
Living area percentage	41.33	Heat use during heating season [kWh/y]	432.22
Required mean internal temperature [C]	19.24	Heat use for full year [kWh/y]	432.35
Thermal mass category of dwelling	Medium		

### Utilisation factor

### Intermittent heating

Internal heat capacity of dwelling [per m <sup>2</sup> ]	0.20	0.11
Internal heat capacity [MJ/K]	18.00	9.90

## Space heat demand details

Month	Mean Ext. Temp [C]	Adj. Int. Temp [C]	Heat Loss [W]	Heat Use [kWh]	Gain/Loss Ratio	Utilisation Factor	Heat Use [W]	Useful Gains [W]	Solar Gain [W]
January	5.3	18.61	647	128	0.76	0.97	172	474	58
February	5.5	18.62	637	84	0.85	0.95	125	512	111
March	7.0	18.69	568	31	1.10	0.84	42	526	196
April	8.3	18.75	507	7	1.43	0.69	10	498	293
May	11.0	18.87	382	0	2.17	0.46	0	382	398
June	13.5	18.98	266	0	3.25	0.31	0	266	434
July	15.5	19.07	173	0	4.78	0.21	0	173	398
August	15.2	19.06	187	0	4.07	0.25	0	187	332
September	13.3	18.97	275	0	2.41	0.42	0	275	233
October	10.4	18.84	410	7	1.39	0.70	9	401	138
November	7.5	18.71	544	59	0.92	0.92	83	462	72
December	6.0	18.64	614	115	0.77	0.97	155	459	45



## Dist. System Losses and Gains

Temperature adjustment [C]	0.000	Additional heat emissions due to non ideal control and responsiveness [kWh/y]	79.34
Heating system control category	2	Gross heat emission to heated space [kWh/y]	511.57
Heating system responsiveness category	1	Mean internal temperature [C]	19.00
Mean internal temperature during heating hours [C]	19.53		

	Number present	Boiler controlled by thermostat	Inside dwelling	Electricity consumption [kWh/y]	Heat gain [W]
Central heating pumps	0	No	No	0	0
Oil boiler pumps	0	No	No	0	0
Gas boiler flue fan	0			0	
Warm air heating or fan coil radiators present	No			0	0
<b>Totals</b>				0	0

Gains from fans and pumps associated with space heating system	0	Is there underfloor heating on the ground floor?	No
Average utilisation factor, October to May	0.81	U-Value of ground floor [W/m <sup>2</sup> K]	0.00
Useful net gain [kWh/y]	0	Fraction of heating system output from ground floor	1.00
Net heat emission to heated space [kWh/y]	512	Additional heat loss via envelope element	0.00
		Annual space heating requirement [kWh/y]	512

## Energy Requirements: Group Heating Systems

Is charging based on heat consumed?	Yes	Distribution loss factor	1.05
Heat for space heating delivered to dwelling [kWh/y]	511.57	Fraction of heat from CHP/recovered from power station	
Percentage of heat from secondary system			
Efficiency of secondary system [%]			
Energy required for secondary space heating [kWh/y]	0		

## CHP

	Fuel Type	Efficiency [%]	Percentage of Heat [%]	Primary energy conversion factor	CO <sub>2</sub> emission factor [kg/kWh]
Heating System 1	Electricity	335	60	2.08	0.409
Heating System 2	Mains Gas	95	40	1.10	0.203
Heat demand from CHP	0	Efficiency adjustment factor			N/A
Manufacturer name	N/A	Adjusted efficiency of main water heating system [%]			0.00
Model name	N/A	Energy required for main water heater [kWh/y]			1895.42
		Energy required for secondary water heater [kWh/y]			0

	Primary energy conversion factor	CO <sub>2</sub> emission factor
Factors for CHP fuel	0.00	0.00
Factors for electricity displaced from grid	2.08	0.41
Factors for heat leaving CHP plant	0.00	0.00
Factors for waste heat from power stations	0.00	0.00
Factors for heat delivered to dwelling	0.88	0.17

	Fuel Type	Primary energy conversion factor	CO <sub>2</sub> emission factor
Main space heating system	group heating scheme	0.88	0.17
Secondary space heating system	group heating scheme	0.88	0.17
Main water heating system	None	0.88	0.17
Supplementary water heating system		0.00	0.00
Pumps, fans		2.08	0.41
Energy for lighting		2.08	0.41

	Type	Part L Total Contribution [kWh/y]	Delivered Energy [kWh/y]	Primary energy conversion factor	CO <sub>2</sub> emission factor [kg/kWh]
Energy produced or saved 1	Electrical (Solar PV/Wind)	0.000	0.000	0.00	0.000
Energy consumed by the technology 1			0.000	0.00	0.000
Energy produced or saved 2	N/A	0.000	0.000	0.00	0.000
Energy consumed by the technology 2			0.000	0.00	0.000
Energy produced or saved 3	N/A	0.000	0.000	0.00	0.000
Energy consumed by the technology 3			0.000	0.00	0.000

## Summer internal gains

Dwelling volume [m <sup>3</sup> ]	270.000	Total gains in summer [W]	817.83
Effective air change rate for summer period [ac/h]		Temperature increment due to gains [C]	32.63
Ventilation heat loss coefficient [W/K]	0.00	Summer mean external temperature [C]	15
Fabric heat loss coefficient [W/K]	25.06	Heat capacity parameter	0.20
Heat loss coefficient under summer conditions [W/K]	25.06	Temperature increment related to thermal mass [C]	0.60
Total Solar Gains from Summer Period	387.04	Threshold internal temperature [C]	48.23
Internal gains [W]	430.79		

## Results

	Delivered energy [kWh/y]	Primary energy [kWh/y]	CO <sub>2</sub> emissions [kgCO <sub>2</sub> /y]
Main space heating system	512	449	85
Secondary space heating system	0	0	0
Main water heating system	2160	1895	360
Supplementary water heating system	0	0	0
Pumps and fans	178	371	73
Energy for lighting	227	473	93
CHP input (individual heating systems only)			
CHP electric output (individual heating systems only)			
Renewable and energy saving technologies			
Energy produced and saved	0	0	0
Energy consumed by the technology	0	0	0
<b>Total</b>	<b>3077</b>	<b>3188</b>	<b>611</b>
<b>Per m<sup>2</sup> floor area</b>	<b>34.19</b>	<b>35.42</b>	<b>6.79</b>
<b>Energy Rating</b>	<b>A2</b>		

## Part L Specification

### Property Details

<b>Dwelling Type</b>	Mid-floor apartment	<b>Type of BER rating</b>	New Dwelling - Provisional
<b>Address line 1</b>	26 Parkgate Street	<b>Year of Construction</b>	2019
<b>Address line 2</b>		<b>Date of Assessment</b>	26/11/2019
<b>Address line 3</b>	Dublin 8 (copy) (copy) (copy) (copy)	<b>Date of Plans</b>	
<b>County</b>	Co. Dublin	<b>Planning Reference</b>	
<b>Eircode</b>	A94X2F3	<b>Building Regulations</b>	2019 TGD L
<b>BER Number</b>		<b>Is MPRN shared with another dwelling?</b>	N/A
<b>Purpose of rating</b>	Sale	<b>MPRN No.</b>	0
<b>Comment</b>	Gas Boilers		

### Dimension Details

	Area [m <sup>2</sup> ]	Height [m]	Volume [m <sup>3</sup> ]	
Ground Floor	90.00	3.00	270.00	
First Floor	0.00	0.00	0.00	
Second Floors	0.00	0.00	0.00	
Third and other floors	0.00	0.00	0.00	
Room in roof	0.00	0.00	0.00	
Total Floor Area	90.00		270.00	
<b>Living Area [m<sup>2</sup>]</b>	37.20			<b>Living area percentage [%]</b> 41.33
<b>No of Storeys</b>	1			

### Ventilation Details

	Number		
<b>Chimneys</b>	0	<b>Has permeability test been carried out?</b>	Yes
<b>Open Flues</b>	0	<b>Structure type</b>	N/A
<b>Fans &amp; Vents</b>	1	<b>Is there a suspended wooden ground floor?</b>	No
<b>Number of flueless combustion room heaters</b>	0	<b>Percentage windows/doors draught stripped [%]</b>	100.00
<b>Is there a draught lobby on main entrance?</b>	Yes	<b>Number of sides sheltered</b>	2
<b>Ventilation method</b>	Balanced whole-house mechanical ventilation with heat recovery	<b>Mechanical Ventilation Manufacturer</b>	Vent-Axia
<b>Specific fan power [W/(L/s)]</b>	0.460	<b>Mechanical Ventilation Model Name</b>	Kinetic Sentinel B Lo Carbon
<b>Heat exchanger efficiency [%]</b>	93.00	<b>How many wetrooms (incl. kitchen)?</b>	3

## Building Elements - Floor Details

Type	Description	Underfloor heating	U-Value [W/m <sup>2</sup> K]	Area [m <sup>2</sup> ]
Non-Heat Loss Floor	2 Bed Apartment	N/A	0	90

## Building Elements - Roof Details

Type	Description	U-Value [W/m <sup>2</sup> K]	Area [m <sup>2</sup> ]
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## Building Elements - Wall Details

Type	Description	U-Value [W/m <sup>2</sup> K]	Area [m <sup>2</sup> ]
325mm Solid Brick	N Facing - External Wall	0.18	11
325mm Solid Brick	N Facing - External Wall	0.18	12.3
325mm Solid Brick	E Facing - External Wall	0.18	10.65

## Building Elements - Door Details

Description	Number of Doors	U-Value [W/m <sup>2</sup> K]	Area [m <sup>2</sup> ]
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## Building Elements - Window Details

Glazing type	User defined u-value	U-Value [W/m <sup>2</sup> K]	Area [m <sup>2</sup> ]
Double-glazed, air filled (low-E, en = 0.1, soft coat)	Yes	1.400	4.800
Double-glazed, air filled (low-E, en = 0.1, soft coat)	Yes	1.400	2.250
Double-glazed, air filled (low-E, en = 0.1, soft coat)	Yes	1.400	2.250
Double-glazed, air filled (low-E, en = 0.1, soft coat)	Yes	1.400	2.250

## Other Details

<b>Thermal bridging factor [W/m<sup>2</sup>k]</b>	0.0800	<b>Thermal mass category of dwelling</b>	Medium
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### Heating System - Solar Water Heating

<b>Solar Water Heating Present?</b>	No	<b>Aperture area of solar collector [m<sup>2</sup>]</b>	N/A
<b>Type, manufacturer, model</b>	N/A		
<b>Zero loss collector efficiency, n0</b>	N/A	<b>Collector heat loss coefficient, a1 [W/m<sup>2</sup>&gt;K]</b>	N/A
<b>Annual Solar Radiation [kWh/m<sup>2</sup>] (Refer to Appendix H in DEAP)</b>	N/A	<b>Overshading factor</b>	N/A
<b>Dedicated storage volume [Litres]</b>	N/A	<b>Combined Cylinder</b>	N/A
<b>Solar fraction [%]</b>	0.000		

### Heating System - Hot Water System

<b>Distribution Losses</b>	259.36	<b>Combi boiler present?</b>	No
<b>Supplementary electric water heating</b>	N/A	<b>Water Storage Volume [L]</b>	4
<b>Hot water storage manufacturer and model name</b>	Heat Rae	<b>Declared loss factor [kWh/d]</b>	0.36
<b>Temperature factor unadjusted</b>	1	<b>Temperature Factor Multiplier</b>	1
<b>Primary Circuit loss type</b>	Community heating		
<b>Is hot water storage indoors or in group heating system?</b>	Yes		

### Heating System - Dist. system losses and gains

<b>Temperature adjustment [°C]</b>	0.000	<b>Control Category</b>		<b>Responsiveness category</b>	
<b>Central heating pumps</b>	0	<b>Oil Boiler Pump</b>	0	<b>Oil boiler pump inside dwelling</b>	No
<b>Gas boiler flue fan</b>	0	<b>Warm air heating or fan coil radiators present</b>	No		

## Heating System - Energy Requirements (Individual)

Main space heating system efficiency [%]	N/A	Space heating efficiency adjustment factor	N/A	Main space heating fuel	None
Main water heating system efficiency [%]	N/A	Water heating efficiency adjustment factor	N/A	Main water heating fuel	None
Secondary heating system efficiency [%]	N/A	Fraction of heating from secondary heating system	N/A	Secondary space heating system fuel	None
Fraction of main space and water heat from CHP	N/A	Electrical efficiency of CHP	N/A	Heat efficiency of CHP	N/A
CHP Fuel type	N/A				

## Summary for Part L Conformance (Applies to TGD L 2008/2011/2019 for new dwellings only)

BER Number		Building Regulations	2019 TGD L
BER Result	A2	Energy Value kWh/m <sup>2</sup> /yr	35.42
CO <sub>2</sub> emissions [kg/m <sup>2</sup> /yr]	6.79		
EPC	0.268	EPC Pass/Fail	Pass
CPC	0.256	CPC Pass/Fail	Pass

## Part L Conformance - Fabric

Conformity with Maximum avg U-value requirements	U-value [W/m <sup>2</sup> K]	Pass/Fail	Conformity with Maximum U-value requirements	U-Value [W/m <sup>2</sup> K]	Pass/Fail
Pitched roof insulated on ceiling	0.00	Pass	Roofs	0	Pass
Pitched roof insulated on slope	0	Pass	Walls	0.18	Pass
Flat Roof	0	Pass	Floors	0	Pass
Floors with no underfloor heat	0.00	Pass	External doors / windows / rooflights	1.40	Pass
Floors with underfloor heat	0.00	Pass			
Walls	0.18	Pass			
Percentage of opening areas [%]	12.83				
Average U value of openings	1.40	Pass			
Permeability test carried out and meets guidelines in TGD L				0.15	Pass



**Part L Conformance - Renewables (applies to TGD L 2008/2011 individual heating system)**

Type of renewable	Total contribution [kWh/y]	Part L renewable contribution [kWh/m <sup>2</sup> /y]
Solar water heating system	0.000	0.000
Heat pump as main space heating system	0.000	0.000
Heat pump as secondary space heating system	0.000	0.000
Heat pump as main water heating system	0.000	0.000
Wood/Biomass heater as main space heating system	0.000	0.000
Wood/Biomass heater as secondary heating system	0.000	0.000
Wood/Biomass heater as main water heating system	0.000	0.000
Contribution from CHP	0.000	0.000
Renewable technology 1	0.000	0.000
Renewable technology 2	0.000	0.000
Renewable technology 3	0.000	0.000
Total thermal	0.000	0.000
Total electrical	0.000	0.000
Total thermal equivalent	0.000	0.000
Does total thermal equivalent meet part L requirement?	Fail	

**Part L Conformance - Renewables (applies to TGD L 2019 individual heating system)**

	Source	Renewables Primary Energy	Total Primary Energy	RER
+ Delivered energy	PV/Wind	0.000	0.000	
+ Delivered energy	Other	0.000	0.000	
+ Delivered energy	Solar	0.00	0.00	
+ Delivered energy	Biomass	0.000	0.000	
+ Delivered energy	Biodiesel	0.000	0.000	
+ Delivered energy	Bioethanol	0.000	0.000	
+ Environmental energy	HP	1124.478	1124.478	
+ Saved energy	CHP	0.000	0.000	
+ District heating	District Heating	0.000	0.000	
+ Delivered energy	Grid	0.000	2585.074	
+ Delivered energy	Thermal	0.000	0.000	
<b>SUBTOTAL</b>		<b>1124.478</b>	<b>3709.552</b>	<b>0.303 - Pass</b>
Energy not used in Regulated Loads	PV/Wind/CHP	0.000	0.000	
<b>TOTAL</b>		<b>1124.478</b>	<b>3709.552</b>	<b>0.303</b>

## Property details

<b>MPRN</b>	0	<b>BER Number</b>	N/A
<b>Shared MPRN</b>		<b>Previous BER</b>	
<b>Address line 1</b>	26 Parkgate Street	<b>Type of Rating</b>	New Dwelling - Provisional
<b>Address line 2</b>		<b>Purpose of rating</b>	Sale
<b>Address line 3</b>	Dublin 8 (copy) (copy) (copy) (copy) (copy) (copy) (copy) (copy) (copy) (copy)	<b>Building Regulations</b>	2019 TGD L
<b>County</b>	Co. Dublin	<b>Planning Reference</b>	
<b>Eircode</b>	A94X2F3	<b>Date of Plans</b>	
<b>Dwelling Type</b>	Mid-floor apartment	<b>Date of Assessment</b>	27/11/2019
<b>Year of construction</b>	2019	<b>Assessor Comments</b>	Gas Boilers
<b>Dwelling Extension</b>	N/A	<b>Assessor Description</b>	Central ASHP - Double Room - Tower Level 12
<b>Storeys</b>	1		
<b>Bedrooms</b>	2		

## Dimension details

	Area [m <sup>2</sup> ]	Height [m]	Volume [m <sup>3</sup> ]
<b>Ground floor</b>	75.00	3.00	225.00
<b>First floor</b>	0.00	0.00	0.00
<b>Second floors</b>	0.00	0.00	0.00
<b>Third and other floors</b>	0.00	0.00	0.00
<b>Room in Roof</b>	0.00	0.00	0.00
<b>Totals</b>	75.00		225.00
<b>Living Area</b>	25.00 m <sup>2</sup>	<b>Living Area Percentage</b>	33.33 %

## Ventilation details

		Number	Air Change Rate [ac/h]
Chimneys		0	0.00
Open Flues		0	0.00
Fans & vents		1	10.00
Flueless combustion room heaters		0	0.00
Has a permeability test been carried out	Yes		Is there a draught lobby on main entrance?
Infiltration rate due to structure [ac/h]	0.15		Draught lobby air change [ac/h]
Intermediate infiltration rate	0.19		Openings infiltration [ac/h]
Number of sides sheltered	2		Structure type
Adjusted infiltration rate	0.17		Is there a suspended wooden ground floor?
Effective air change rate [ac/h]	0.27		Windows/doors/attic hatches draught stripped [%]
Ventilation heat loss [W/K]	20.05		Ventilation method
Adjusted result of air permeability test [ac/h]	0.15		Balanced whole-house mechanical ventilation with heat recovery
Manufacturer and Model name	Vent-Axia Kinetic Sentinel B Lo Carbon		How many wetrooms (inc. kitchen)? Is the vent. ducting flexible/rigid/both?
Specific fan power [W/(l/s)]	0.46		Is MVHR ducting insulated where outside of insulated envelope?
Heat exchanger efficiency [%]	93.00		Adjusted heat exchanger efficiency
Electricity for ventilation fans [Kwh/y]	126.27		
Heat gains from ventilation fans [W]	6.21		

## Building Elements - Floors

Type	Description	U/F Heating	In Roof	Age Band	Exposed Perimeter [m]	Area [m <sup>2</sup> ]	U-Value [W/m <sup>2</sup> K]	Heat Loss (AU) [W/K]
Non-Heat Loss Floor	Double Bedroom Apartment	N/A	No	2005 onwards	N/A	75.00	0.00	0.00
<b>Total area [m<sup>2</sup>]</b>								75.00

## Building Elements - Roofs

Type	Description	Insulation Thickness [mm]	Age Band	Area [m <sup>2</sup> ]	U-Value [W/m <sup>2</sup> K]	Heat Loss (AU) [W/K]
<b>Total area [m<sup>2</sup>]</b>						0.00

## Building Elements - Walls

Type	Description	Wall is semi-exposed	Include in compliance check	Age Band	Area [m <sup>2</sup> ]	U-Value [W/m <sup>2</sup> K]	Heat Loss (AU) [W/K]
325mm Solid Brick	ES Facing - External Wall	No	No	2005 onwards	12.40	0.18	2.23
325mm Solid Brick	NS Facing - External Wall	No	No	2005 onwards	19.30	0.18	3.47
<b>Total area [m<sup>2</sup>]</b>							<b>31.70</b>

## Building Elements - Doors

Count	Type	Description	Draught Stripped	Area [m <sup>2</sup> ]	U-Value [W/m <sup>2</sup> K]	Heat Loss (AU) [W/K]
<b>Total area [m<sup>2</sup>]</b>						0.00

## Building Elements - Windows

Count	Glazing Type	Frame Type	Frame Factor	Solar Transm.	In Roof	Over shading	Orient.	Area [m <sup>2</sup> ]	U-value [W/m <sup>2</sup> K]
1	Double-glazed, air filled (low-E, en = 0.1, soft coat)	Wood/PVC	0.700	0.63	No	Very Little	East	8.00	1.40
1	Double-glazed, air filled (low-E, en = 0.1, soft coat)	Wood/PVC	0.700	0.63	No	Very Little	Northeast	4.00	1.40
1	Double-glazed, air filled (low-E, en = 0.1, soft coat)	Wood/PVC	0.700	0.63	No	Very Little	Northeast	4.00	1.40
<b>Total area [m<sup>2</sup>]</b>									<b>16.00</b>



## Heat loss details

<b>Total glazed area [m<sup>2</sup>]</b>	16.00	<b>Glazing ratio</b>	0.11
<b>Total glazed heat loss [W/K]</b>	21.21	<b>Summer solar gain [W/m<sup>2</sup>]</b>	647.74
<b>Total effective collection area [m<sup>2</sup>]</b>	6.35	<b>Total element area [m<sup>2</sup>]</b>	16
<b>Total plane heat loss [W/K]</b>	26.92	<b>Thermal bridging factor [W/m<sup>2</sup>K]</b>	0.08
<b>Fabric heat loss [W/K]</b>	30.73		
<b>Total heat loss [W/K]</b>	50.78	<b>Per m2</b>	0.68

## Lighting and Internal Gains

<b>Lighting Design Calculation Method</b>	Bulb type only	<b>Average Efficacy [lm/W]</b>	66.90
<b>Fixed lighting provision [klmh/y]</b>	2754.50	<b>Top up lighting requirement [klmh/y]</b>	0.00
<b>Energy required for fixed lighting [kWh/y]</b>	73.44	<b>Energy required for top up lighting [kWh/y]</b>	0.00
<b>Energy required for portable lighting [kWh/y]</b>	115.34		
<b>Basic energy consumption for lighting [kWh/y]</b>	685.47	<b>Water heating</b>	99.64
<b>Annual energy used for lighting [kWh/m<sup>2</sup>y]</b>	188.78	<b>Occupants</b>	118.06
<b>Internal gains from lighting during heating season [kWh/hs] (In watts [W])</b>	144.42 (24.76)	<b>Mechanical ventilation</b>	6.21
<b>Lighting</b>	24.76	<b>Heat loss to the cold water network</b>	-35.25
<b>Appliance and cooking</b>	171.86	<b>Net internal gains</b>	385.28

## Water heating details

Are there distribution losses?	Yes	Is supplementary electric water heating used in summer?	N/A
Are there storage losses?	Yes	Is there a combi boiler?	No
Is there a solar water heating system?	No	Total hot water demand [kWh/y]	1616.63
Standard number of occupants	2.36	Temperature factor unadjusted	1.00
Number of mixer showers	1	Temperature Factor Multiplier	1.00
Number of electric showers	0	Hot water storage loss factor [kWh/l d]	0.00
Is there a bath present	Yes	Volume factor	0.00
Daily hot water use [Litres/d]	103.10	Combi-boiler electricity consumption [kWh/y]	0.00
Hot water energy reqs. at taps [kWh/y]	1374.13	Adjusted storage loss [kWh/y]	132.86
Distribution losses [kWh/y]	242.49	Adjusted primary circuit loss [kWh/y]	286.25
Water storage volume [Litres]	4.00	Heat gains from water heating system [W]	99.64
Is manufacturers declared loss factor available?	Yes	Output from supplementary heater [kWh/y]	0.00
Declared loss factor [kWh/d]	0.36		
Manufacturer and Model name	Heat Rae		
Insulation type	None		
Insulation thickness [mm]	0		
Combi-boiler Type	None	Combi-boiler loss [kWh/y]	0.00
Keep Hot facility	None	Storage Loss	132.86
Primary Circuit loss type			Community heating
Primary circuit loss [kWh/y]	360.00	Output from main water heater [kWh/y]	2035.74
Is hot water storage indoors or in group heating system	Yes	Annual Heat gains from water heating system [kWh/y]	872.82
		WWHRS input to main system [kWh/y]	0.00
		WWHRS input to supplementary system [kWh/y]	0.00

## Net space heat demand

Required temp. during heated hours	21.00	Length of one unheated period [h]	8
Required temperature rest of dwelling	18.00	Unheated periods per week	14
Living area percentage	33.33	Heat use during heating season [kWh/y]	471.64
Required mean internal temperature [C]	19.00	Heat use for full year [kWh/y]	471.77
Thermal mass category of dwelling	Medium		

### Utilisation factor

### Intermittent heating

Internal heat capacity of dwelling [per m <sup>2</sup> ]	0.20	0.11
Internal heat capacity [MJ/K]	15.00	8.25

## Space heat demand details

Month	Mean Ext. Temp [C]	Adj. Int. Temp [C]	Heat Loss [W]	Heat Use [kWh]	Gain/Loss Ratio	Utilisation Factor	Heat Use [W]	Useful Gains [W]	Solar Gain [W]
January	5.3	18.24	657	146	0.73	0.96	196	461	94
February	5.5	18.25	647	84	0.88	0.91	125	522	187
March	7.0	18.33	575	25	1.25	0.75	33	542	335
April	8.3	18.40	513	4	1.76	0.56	6	507	519
May	11.0	18.55	384	0	2.80	0.36	0	383	691
June	13.5	18.69	264	0	4.16	0.24	0	264	713
July	15.5	18.80	168	0	6.21	0.16	0	168	656
August	15.2	18.79	182	0	5.28	0.19	0	182	577
September	13.3	18.68	273	0	2.94	0.34	0	273	418
October	10.4	18.52	412	7	1.53	0.64	9	403	247
November	7.5	18.36	551	70	0.91	0.90	97	454	118
December	6.0	18.28	623	135	0.74	0.96	182	442	75

## Dist. System Losses and Gains

Temperature adjustment [C]	0.000	Additional heat emissions due to non ideal control and responsiveness [kWh/y]	93.22
Heating system control category	2	Gross heat emission to heated space [kWh/y]	564.86
Heating system responsiveness category	1	Mean internal temperature [C]	18.68
Mean internal temperature during heating hours [C]	19.33		

	Number present	Boiler controlled by thermostat	Inside dwelling	Electricity consumption [kWh/y]	Heat gain [W]
Central heating pumps	0	No	No	0	0
Oil boiler pumps	0	No	No	0	0
Gas boiler flue fan	0			0	
Warm air heating or fan coil radiators present	No			0	0
<b>Totals</b>				0	0

Gains from fans and pumps associated with space heating system	0	Is there underfloor heating on the ground floor?	No
Average utilisation factor, October to May	0.76	U-Value of ground floor [W/m <sup>2</sup> K]	0.00
Useful net gain [kWh/y]	0	Fraction of heating system output from ground floor	1.00
Net heat emission to heated space [kWh/y]	565	Additional heat loss via envelope element	0.00
		Annual space heating requirement [kWh/y]	565

## Energy Requirements: Group Heating Systems

Is charging based on heat consumed?	Yes	Distribution loss factor	1.05
Heat for space heating delivered to dwelling [kWh/y]	564.86	Fraction of heat from CHP/recovered from power station	
Percentage of heat from secondary system			
Efficiency of secondary system [%]			
Energy required for secondary space heating [kWh/y]	0		

## CHP

	Fuel Type	Efficiency [%]	Percentage of Heat [%]	Primary energy conversion factor	CO <sub>2</sub> emission factor [kg/kWh]
Heating System 1	Electricity	335	60	2.08	0.409
Heating System 2	Mains Gas	95	40	1.10	0.203
Heat demand from CHP	0	Efficiency adjustment factor			N/A
Manufacturer name	N/A	Adjusted efficiency of main water heating system [%]			0.00
Model name	N/A	Energy required for main water heater [kWh/y]			1786.32
		Energy required for secondary water heater [kWh/y]			0

	Primary energy conversion factor	CO <sub>2</sub> emission factor
Factors for CHP fuel	0.00	0.00
Factors for electricity displaced from grid	2.08	0.41
Factors for heat leaving CHP plant	0.00	0.00
Factors for waste heat from power stations	0.00	0.00
Factors for heat delivered to dwelling	0.88	0.17

	Fuel Type	Primary energy conversion factor	CO <sub>2</sub> emission factor
Main space heating system	group heating scheme	0.88	0.17
Secondary space heating system	group heating scheme	0.88	0.17
Main water heating system	None	0.88	0.17
Supplementary water heating system		0.00	0.00
Pumps, fans		2.08	0.41
Energy for lighting		2.08	0.41

	Type	Part L Total Contribution [kWh/y]	Delivered Energy [kWh/y]	Primary energy conversion factor	CO <sub>2</sub> emission factor [kg/kWh]
Energy produced or saved 1	Electrical (Solar PV/Wind)	0.000	0.000	0.00	0.000
Energy consumed by the technology 1			0.000	0.00	0.000
Energy produced or saved 2	N/A	0.000	0.000	0.00	0.000
Energy consumed by the technology 2			0.000	0.00	0.000
Energy produced or saved 3	N/A	0.000	0.000	0.00	0.000
Energy consumed by the technology 3			0.000	0.00	0.000

## Summer internal gains

Dwelling volume [m <sup>3</sup> ]	225.000	Total gains in summer [W]	1033.02
Effective air change rate for summer period [ac/h]		Temperature increment due to gains [C]	33.61
Ventilation heat loss coefficient [W/K]	0.00	Summer mean external temperature [C]	15
Fabric heat loss coefficient [W/K]	30.73	Heat capacity parameter	0.20
Heat loss coefficient under summer conditions [W/K]	30.73	Temperature increment related to thermal mass [C]	0.60
Total Solar Gains from Summer Period	647.74	Threshold internal temperature [C]	49.21
Internal gains [W]	385.28		

## Results

	Delivered energy [kWh/y]	Primary energy [kWh/y]	CO <sub>2</sub> emissions [kgCO <sub>2</sub> /y]
Main space heating system	565	496	94
Secondary space heating system	0	0	0
Main water heating system	2036	1786	339
Supplementary water heating system	0	0	0
Pumps and fans	152	317	62
Energy for lighting	189	393	77
CHP input (individual heating systems only)			
CHP electric output (individual heating systems only)			
Renewable and energy saving technologies			
Energy produced and saved	0	0	0
Energy consumed by the technology	0	0	0
<b>Total</b>	<b>2942</b>	<b>2991</b>	<b>573</b>
<b>Per m<sup>2</sup> floor area</b>	<b>39.22</b>	<b>39.88</b>	<b>7.64</b>
<b>Energy Rating</b>	<b>A2</b>		

## Part L Specification

### Property Details

<b>Dwelling Type</b>	Mid-floor apartment	<b>Type of BER rating</b>	New Dwelling - Provisional
<b>Address line 1</b>	26 Parkgate Street	<b>Year of Construction</b>	2019
<b>Address line 2</b>		<b>Date of Assessment</b>	27/11/2019
<b>Address line 3</b>	Dublin 8 (copy) (copy) (copy) (copy) (copy) (copy) (copy) (copy) (copy) (copy)	<b>Date of Plans</b>	
<b>County</b>	Co. Dublin	<b>Planning Reference</b>	
<b>Eircode</b>	A94X2F3	<b>Building Regulations</b>	2019 TGD L
<b>BER Number</b>		<b>Is MPRN shared with another dwelling?</b>	N/A
<b>Purpose of rating</b>	Sale	<b>MPRN No.</b>	0
<b>Comment</b>	Gas Boilers		

### Dimension Details

	Area [m <sup>2</sup> ]	Height [m]	Volume [m <sup>3</sup> ]	
Ground Floor	75.00	3.00	225.00	
First Floor	0.00	0.00	0.00	
Second Floors	0.00	0.00	0.00	
Third and other floors	0.00	0.00	0.00	
Room in roof	0.00	0.00	0.00	
Total Floor Area	75.00		225.00	
<b>Living Area [m<sup>2</sup>]</b>	25.00			<b>Living area percentage [%]</b> 33.33
<b>No of Storeys</b>	1			

### Ventilation Details

	Number		
<b>Chimneys</b>	0	<b>Has permeability test been carried out?</b>	Yes
<b>Open Flues</b>	0	<b>Structure type</b>	N/A
<b>Fans &amp; Vents</b>	1	<b>Is there a suspended wooden ground floor?</b>	No
<b>Number of flueless combustion room heaters</b>	0	<b>Percentage windows/doors draught stripped [%]</b>	100.00
<b>Is there a draught lobby on main entrance?</b>	Yes	<b>Number of sides sheltered</b>	2
<b>Ventilation method</b>	Balanced whole-house mechanical ventilation with heat recovery	<b>Mechanical Ventilation Manufacturer</b>	Vent-Axia
<b>Specific fan power [W/(L/s)]</b>	0.460	<b>Mechanical Ventilation Model Name</b>	Kinetic Sentinel B Lo Carbon
<b>Heat exchanger efficiency [%]</b>	93.00	<b>How many wetrooms (incl. kitchen)?</b>	3

## Building Elements - Floor Details

Type	Description	Underfloor heating	U-Value [W/m <sup>2</sup> K]	Area [m <sup>2</sup> ]
Non-Heat Loss Floor	Double Bedroom Apartment	N/A	0	75

## Building Elements - Roof Details

Type	Description	U-Value [W/m <sup>2</sup> K]	Area [m <sup>2</sup> ]
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## Building Elements - Wall Details

Type	Description	U-Value [W/m <sup>2</sup> K]	Area [m <sup>2</sup> ]
325mm Solid Brick	ES Facing - External Wall	0.18	12.4
325mm Solid Brick	NS Facing - External Wall	0.18	19.3

## Building Elements - Door Details

Description	Number of Doors	U-Value [W/m <sup>2</sup> K]	Area [m <sup>2</sup> ]
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## Building Elements - Window Details

Glazing type	User defined u-value	U-Value [W/m <sup>2</sup> K]	Area [m <sup>2</sup> ]
Double-glazed, air filled (low-E, en = 0.1, soft coat)	Yes	1.400	8.000
Double-glazed, air filled (low-E, en = 0.1, soft coat)	Yes	1.400	4.000
Double-glazed, air filled (low-E, en = 0.1, soft coat)	Yes	1.400	4.000

## Other Details

<b>Thermal bridging factor [W/m<sup>2</sup>k]</b>	0.0800	<b>Thermal mass category of dwelling</b>	Medium
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### Heating System - Solar Water Heating

<b>Solar Water Heating Present?</b>	No	<b>Aperture area of solar collector [m<sup>2</sup>]</b>	N/A
<b>Type, manufacturer, model</b>	N/A		
<b>Zero loss collector efficiency, n0</b>	N/A	<b>Collector heat loss coefficient, a1 [W/m<sup>2</sup>&gt;K]</b>	N/A
<b>Annual Solar Radiation [kWh/m<sup>2</sup>] (Refer to Appendix H in DEAP)</b>	N/A	<b>Overshading factor</b>	N/A
<b>Dedicated storage volume [Litres]</b>	N/A	<b>Combined Cylinder</b>	N/A
<b>Solar fraction [%]</b>	0.000		

### Heating System - Hot Water System

<b>Distribution Losses</b>	242.49	<b>Combi boiler present?</b>	No
<b>Supplementary electric water heating</b>	N/A	<b>Water Storage Volume [L]</b>	4
<b>Hot water storage manufacturer and model name</b>	Heat Rae	<b>Declared loss factor [kWh/d]</b>	0.36
<b>Temperature factor unadjusted</b>	1	<b>Temperature Factor Multiplier</b>	1
<b>Primary Circuit loss type</b>	Community heating		
<b>Is hot water storage indoors or in group heating system?</b>	Yes		

### Heating System - Dist. system losses and gains

<b>Temperature adjustment [°C]</b>	0.000	<b>Control Category</b>		<b>Responsiveness category</b>	
<b>Central heating pumps</b>	0	<b>Oil Boiler Pump</b>	0	<b>Oil boiler pump inside dwelling</b>	No
<b>Gas boiler flue fan</b>	0	<b>Warm air heating or fan coil radiators present</b>	No		

## Heating System - Energy Requirements (Individual)

Main space heating system efficiency [%]	N/A	Space heating efficiency adjustment factor	N/A	Main space heating fuel	None
Main water heating system efficiency [%]	N/A	Water heating efficiency adjustment factor	N/A	Main water heating fuel	None
Secondary heating system efficiency [%]	N/A	Fraction of heating from secondary heating system	N/A	Secondary space heating system fuel	None
Fraction of main space and water heat from CHP	N/A	Electrical efficiency of CHP	N/A	Heat efficiency of CHP	N/A
CHP Fuel type	N/A				

## Summary for Part L Conformance (Applies to TGD L 2008/2011/2019 for new dwellings only)

BER Number		Building Regulations	2019 TGD L
BER Result	A2	Energy Value kWh/m <sup>2</sup> /yr	39.88
CO <sub>2</sub> emissions [kg/m <sup>2</sup> /yr]	7.64		
EPC	0.279	EPC Pass/Fail	Pass
CPC	0.267	CPC Pass/Fail	Pass

## Part L Conformance - Fabric

Conformity with Maximum avg U-value requirements	U-value [W/m <sup>2</sup> K]	Pass/Fail	Conformity with Maximum U-value requirements	U-Value [W/m <sup>2</sup> K]	Pass/Fail
Pitched roof insulated on ceiling	0.00	Pass	Roofs	0	Pass
Pitched roof insulated on slope	0	Pass	Walls	0.18	Pass
Flat Roof	0	Pass	Floors	0	Pass
Floors with no underfloor heat	0.00	Pass	External doors / windows / rooflights	1.40	Pass
Floors with underfloor heat	0.00	Pass			
Walls	0.18	Pass			
Percentage of opening areas [%]	21.33				
Average U value of openings	1.40	Pass			
Permeability test carried out and meets guidelines in TGD L				0.15	Pass

## Part L Conformance - Renewables (applies to TGD L 2008/2011 individual heating system)

Type of renewable	Total contribution [kWh/y]	Part L renewable contribution [kWh/m <sup>2</sup> /y]
Solar water heating system	0.000	0.000
Heat pump as main space heating system	0.000	0.000
Heat pump as secondary space heating system	0.000	0.000
Heat pump as main water heating system	0.000	0.000
Wood/Biomass heater as main space heating system	0.000	0.000
Wood/Biomass heater as secondary heating system	0.000	0.000
Wood/Biomass heater as main water heating system	0.000	0.000
Contribution from CHP	0.000	0.000
Renewable technology 1	0.000	0.000
Renewable technology 2	0.000	0.000
Renewable technology 3	0.000	0.000
Total thermal	0.000	0.000
Total electrical	0.000	0.000
Total thermal equivalent	0.000	0.000
Does total thermal equivalent meet part L requirement?	Fail	

## Part L Conformance - Renewables (applies to TGD L 2019 individual heating system)

	Source	Renewables Primary Energy	Total Primary Energy	RER
+ Delivered energy	PV/Wind	0.000	0.000	
+ Delivered energy	Other	0.000	0.000	
+ Delivered energy	Solar	0.00	0.00	
+ Delivered energy	Biomass	0.000	0.000	
+ Delivered energy	Biodiesel	0.000	0.000	
+ Delivered energy	Bioethanol	0.000	0.000	
+ Environmental energy	HP	1094.578	1094.578	
+ Saved energy	CHP	0.000	0.000	
+ District heating	District Heating	0.000	0.000	
+ Delivered energy	Grid	0.000	2404.836	
+ Delivered energy	Thermal	0.000	0.000	
<b>SUBTOTAL</b>		<b>1094.578</b>	<b>3499.414</b>	<b>0.313 - Pass</b>
Energy not used in Regulated Loads	PV/Wind/CHP	0.000	0.000	
<b>TOTAL</b>		<b>1094.578</b>	<b>3499.414</b>	<b>0.313</b>

## Property details

<b>MPRN</b>	0	<b>BER Number</b>	N/A
<b>Shared MPRN</b>		<b>Previous BER</b>	
<b>Address line 1</b>	26 Parkgate Street	<b>Type of Rating</b>	New Dwelling - Provisional
<b>Address line 2</b>		<b>Purpose of rating</b>	Sale
<b>Address line 3</b>	Dublin 8 (copy) (copy) (copy) (copy) (copy) (copy) (copy)	<b>Building Regulations</b>	2019 TGD L
<b>County</b>	Co. Dublin	<b>Planning Reference</b>	
<b>Eircode</b>	A94X2F3	<b>Date of Plans</b>	
<b>Dwelling Type</b>	Top-floor apartment	<b>Date of Assessment</b>	26/11/2019
<b>Year of construction</b>	2019	<b>Assessor Comments</b>	Gas Boilers
<b>Dwelling Extension</b>	N/A	<b>Assessor Description</b>	Central ASHP - Double Room - 10th Floor
<b>Storeys</b>	1		
<b>Bedrooms</b>	2		

## Dimension details

	Area [m <sup>2</sup> ]	Height [m]	Volume [m <sup>3</sup> ]
<b>Ground floor</b>	80.00	3.00	240.00
<b>First floor</b>	0.00	0.00	0.00
<b>Second floors</b>	0.00	0.00	0.00
<b>Third and other floors</b>	0.00	0.00	0.00
<b>Room in Roof</b>	0.00	0.00	0.00
<b>Totals</b>	80.00		240.00
<b>Living Area</b>	32.00 m <sup>2</sup>	<b>Living Area Percentage</b>	40.00 %

## Ventilation details

		Number	Air Change Rate [ac/h]
Chimneys		0	0.00
Open Flues		0	0.00
Fans & vents		1	10.00
Flueless combustion room heaters		0	0.00
Has a permeability test been carried out	Yes		Is there a draught lobby on main entrance? Yes
Infiltration rate due to structure [ac/h]	0.15		Draught lobby air change [ac/h] 0.00
Intermediate infiltration rate	0.19		Openings infiltration [ac/h] 0.04
Number of sides sheltered	2		Structure type N/A
Adjusted infiltration rate	0.16		Is there a suspended wooden ground floor? N/A
Effective air change rate [ac/h]	0.27		Windows/doors/attic hatches draught stripped [%] 100.00
Ventilation heat loss [W/K]	21.20		Ventilation method Balanced whole-house mechanical ventilation with heat recovery
Adjusted result of air permeability test [ac/h]	0.15		
Manufacturer and Model name	Vent-Axia Kinetic Sentinel B Lo Carbon		How many wetrooms (inc. kitchen)? Is the vent. ducting flexible/rigid/both? 3
Specific fan power [W/(l/s)]	0.46		Is MVHR ducting insulated where outside of insulated envelope? Yes
Heat exchanger efficiency [%]	93.00		Adjusted heat exchanger efficiency 79.05
Electricity for ventilation fans [Kwh/y]	134.69		
Heat gains from ventilation fans [W]	6.62		

## Building Elements - Floors

Type	Description	U/F Heating	In Roof	Age Band	Exposed Perimeter [m]	Area [m <sup>2</sup> ]	U-Value [W/m <sup>2</sup> K]	Heat Loss (AU) [W/K]
Non-Heat Loss Floor	Double Bedroom Apartment	N/A	No	2005 onwards	N/A	80.00	0.00	0.00
<b>Total area [m<sup>2</sup>]</b>								<b>80.00</b>

## Building Elements - Roofs

Type	Description	Insulation Thickness [mm]	Age Band	Area [m <sup>2</sup> ]	U-Value [W/m <sup>2</sup> K]	Heat Loss (AU) [W/K]
Flat Roof			2005 onwards	80.00	0.14	11.20
<b>Total area [m<sup>2</sup>]</b>						<b>80.00</b>



## Building Elements - Walls

Type	Description	Wall is semi-exposed	Include in compliance check	Age Band	Area [m <sup>2</sup> ]	U-Value [W/m <sup>2</sup> K]	Heat Loss (AU) [W/K]
325mm Solid Brick	E Facing - External Wall	No	No	2005 onwards	8.40	0.18	1.51
325mm Solid Brick	W Facing - External Wall	No	No	2005 onwards	36.12	0.18	6.50
325mm Solid Brick	SE Facing - External Wall	No	No	2005 onwards	15.20	0.18	2.74
<b>Total area [m<sup>2</sup>]</b>							<b>59.72</b>

## Building Elements - Doors

Count	Type	Description	Draught Stripped	Area [m <sup>2</sup> ]	U-Value [W/m <sup>2</sup> K]	Heat Loss (AU) [W/K]
<b>Total area [m<sup>2</sup>]</b>						0.00

## Building Elements - Windows

Count	Glazing Type	Frame Type	Frame Factor	Solar Transm.	In Roof	Over shading	Orient.	Area [m <sup>2</sup> ]	U-value [W/m <sup>2</sup> K]
1	Double-glazed, air filled (low-E, en = 0.1, soft coat)	Wood/PVC	0.700	0.63	No	Very Little	West	2.94	1.40
1	Double-glazed, air filled (low-E, en = 0.1, soft coat)	Wood/PVC	0.700	0.63	No	Very Little	West	2.94	1.40
1	Double-glazed, air filled (low-E, en = 0.1, soft coat)	Wood/PVC	0.700	0.63	No	Very Little	Southeast	3.60	1.40
1	Double-glazed, air filled (low-E, en = 0.1, soft coat)	Wood/PVC	0.700	0.63	No	Very Little	Southeast	2.70	1.40
<b>Total area [m<sup>2</sup>]</b>								<b>12.18</b>	

## Heat loss details

<b>Total glazed area [m<sup>2</sup>]</b>	12.18	<b>Glazing ratio</b>	0.08
<b>Total glazed heat loss [W/K]</b>	16.15	<b>Summer solar gain [W/m<sup>2</sup>]</b>	546.6
<b>Total effective collection area [m<sup>2</sup>]</b>	4.83	<b>Total element area [m<sup>2</sup>]</b>	12.18
<b>Total plane heat loss [W/K]</b>	38.10	<b>Thermal bridging factor [W/m<sup>2</sup>K]</b>	0.08
<b>Fabric heat loss [W/K]</b>	50.25		
<b>Total heat loss [W/K]</b>	71.45	<b>Per m2</b>	0.89

## Lighting and Internal Gains

<b>Lighting Design Calculation Method</b>	Bulb type only	<b>Average Efficacy [lm/W]</b>	66.90
<b>Fixed lighting provision [klmh/y]</b>	2949.78	<b>Top up lighting requirement [klmh/y]</b>	0.00
<b>Energy required for fixed lighting [kWh/y]</b>	78.65	<b>Energy required for top up lighting [kWh/y]</b>	0.00
<b>Energy required for portable lighting [kWh/y]</b>	123.52		
<b>Basic energy consumption for lighting [kWh/y]</b>	720.83	<b>Water heating</b>	101.70
<b>Annual energy used for lighting [kWh/m<sup>2</sup>y]</b>	202.17	<b>Occupants</b>	123.14
<b>Internal gains from lighting during heating season [kWh/hs] (In watts [W])</b>	154.66 (26.52)	<b>Mechanical ventilation</b>	6.62
<b>Lighting</b>	26.52	<b>Heat loss to the cold water network</b>	-36.17
<b>Appliance and cooking</b>	179.79	<b>Net internal gains</b>	401.61

## Water heating details

Are there distribution losses?	Yes	Is supplementary electric water heating used in summer?	N/A
Are there storage losses?	Yes	Is there a combi boiler?	No
Is there a solar water heating system?	No	Total hot water demand [kWh/y]	1659.84
Standard number of occupants	2.46	Temperature factor unadjusted	1.00
Number of mixer showers	1	Temperature Factor Multiplier	1.00
Number of electric showers	0	Hot water storage loss factor [kWh/l d]	0.00
Is there a bath present	Yes	Volume factor	0.00
Daily hot water use [Litres/d]	105.85	Combi-boiler electricity consumption [kWh/y]	0.00
Hot water energy reqs. at taps [kWh/y]	1410.87	Adjusted storage loss [kWh/y]	132.86
Distribution losses [kWh/y]	248.98	Adjusted primary circuit loss [kWh/y]	290.83
Water storage volume [Litres]	4.00	Heat gains from water heating system [W]	101.70
Is manufacturers declared loss factor available?	Yes	Output from supplementary heater [kWh/y]	0.00
Declared loss factor [kWh/d]	0.36		
Manufacturer and Model name	Heat Rae	Combi-boiler loss [kWh/y]	0.00
Insulation type	None	Storage Loss	132.86
Insulation thickness [mm]	0		
Combi-boiler Type	None		
Keep Hot facility	None		
Primary Circuit loss type			Community heating
Primary circuit loss [kWh/y]	360.00	Output from main water heater [kWh/y]	2083.53
Is hot water storage indoors or in group heating system	Yes	Annual Heat gains from water heating system [kWh/y]	890.85
		WWHRS input to main system [kWh/y]	0.00
		WWHRS input to supplementary system [kWh/y]	0.00

## Net space heat demand

Required temp. during heated hours	21.00	Length of one unheated period [h]	8
Required temperature rest of dwelling	18.00	Unheated periods per week	14
Living area percentage	40.00	Heat use during heating season [kWh/y]	1141.87
Required mean internal temperature [C]	19.20	Heat use for full year [kWh/y]	1146.61
Thermal mass category of dwelling	Medium		

	Utilisation factor	Intermittent heating
Internal heat capacity of dwelling [per m <sup>2</sup> ]	0.20	0.11
Internal heat capacity [MJ/K]	16.00	8.80

## Space heat demand details

Month	Mean Ext. Temp [C]	Adj. Int. Temp [C]	Heat Loss [W]	Heat Use [kWh]	Gain/Loss Ratio	Utilisation Factor	Heat Use [W]	Useful Gains [W]	Solar Gain [W]
January	5.3	18.20	921	293	0.59	0.97	394	527	141
February	5.5	18.21	908	201	0.71	0.94	299	610	245
March	7.0	18.32	809	113	0.94	0.86	153	656	360
April	8.3	18.41	723	46	1.23	0.74	64	658	489
May	11.0	18.61	544	8	1.83	0.53	11	532	595
June	13.5	18.79	378	1	2.60	0.38	2	376	582
July	15.5	18.93	245	0	3.86	0.26	0	245	546
August	15.2	18.91	265	0	3.47	0.29	0	265	518
September	13.3	18.77	391	3	2.12	0.47	4	387	427
October	10.4	18.56	583	41	1.21	0.75	54	529	306
November	7.5	18.36	776	169	0.75	0.93	235	541	178
December	6.0	18.25	875	270	0.60	0.97	363	512	127

## Dist. System Losses and Gains

Temperature adjustment [C]	0.000	Additional heat emissions due to non ideal control and responsiveness [kWh/y]	115.98
Heating system control category	2	Gross heat emission to heated space [kWh/y]	1257.85
Heating system responsiveness category	1	Mean internal temperature [C]	18.64
Mean internal temperature during heating hours [C]	19.50		

	Number present	Boiler controlled by thermostat	Inside dwelling	Electricity consumption [kWh/y]	Heat gain [W]
Central heating pumps	0	No	No	0	0
Oil boiler pumps	0	No	No	0	0
Gas boiler flue fan	0			0	
Warm air heating or fan coil radiators present	No			0	0
<b>Totals</b>				0	0

Gains from fans and pumps associated with space heating system	0	Is there underfloor heating on the ground floor?	No
Average utilisation factor, October to May	0.84	U-Value of ground floor [W/m <sup>2</sup> K]	0.00
Useful net gain [kWh/y]	0	Fraction of heating system output from ground floor	1.00
Net heat emission to heated space [kWh/y]	1258	Additional heat loss via envelope element	0.00
		Annual space heating requirement [kWh/y]	1258

## Energy Requirements: Group Heating Systems

Is charging based on heat consumed?	Yes	Distribution loss factor	1.05
Heat for space heating delivered to dwelling [kWh/y]	1257.85	Fraction of heat from CHP/recovered from power station	
Percentage of heat from secondary system			
Efficiency of secondary system [%]			
Energy required for secondary space heating [kWh/y]	0		

## CHP

	Fuel Type	Efficiency [%]	Percentage of Heat [%]	Primary energy conversion factor	CO <sub>2</sub> emission factor [kg/kWh]
Heating System 1	Electricity	335	60	2.08	0.409
Heating System 2	Mains Gas	95	40	1.10	0.203
Heat demand from CHP	0	Efficiency adjustment factor			N/A
Manufacturer name	N/A	Adjusted efficiency of main water heating system [%]			0.00
Model name	N/A	Energy required for main water heater [kWh/y]			1828.26
		Energy required for secondary water heater [kWh/y]			0

	Primary energy conversion factor	CO <sub>2</sub> emission factor
Factors for CHP fuel	0.00	0.00
Factors for electricity displaced from grid	2.08	0.41
Factors for heat leaving CHP plant	0.00	0.00
Factors for waste heat from power stations	0.00	0.00
Factors for heat delivered to dwelling	0.88	0.17

	Fuel Type	Primary energy conversion factor	CO <sub>2</sub> emission factor
Main space heating system	group heating scheme	0.88	0.17
Secondary space heating system	group heating scheme	0.88	0.17
Main water heating system	None	0.88	0.17
Supplementary water heating system		0.00	0.00
Pumps, fans		2.08	0.41
Energy for lighting		2.08	0.41

	Type	Part L Total Contribution [kWh/y]	Delivered Energy [kWh/y]	Primary energy conversion factor	CO <sub>2</sub> emission factor [kg/kWh]
Energy produced or saved 1	Electrical (Solar PV/Wind)	0.000	0.000	0.00	0.000
Energy consumed by the technology 1			0.000	0.00	0.000
Energy produced or saved 2	N/A	0.000	0.000	0.00	0.000
Energy consumed by the technology 2			0.000	0.00	0.000
Energy produced or saved 3	N/A	0.000	0.000	0.00	0.000
Energy consumed by the technology 3			0.000	0.00	0.000



## Summer internal gains

Dwelling volume [m <sup>3</sup> ]	240.000	Total gains in summer [W]	948.21
Effective air change rate for summer period [ac/h]		Temperature increment due to gains [C]	18.87
Ventilation heat loss coefficient [W/K]	0.00	Summer mean external temperature [C]	15
Fabric heat loss coefficient [W/K]	50.25	Heat capacity parameter	0.20
Heat loss coefficient under summer conditions [W/K]	50.25	Temperature increment related to thermal mass [C]	0.60
Total Solar Gains from Summer Period	546.60	Threshold internal temperature [C]	34.47
Internal gains [W]	401.61		

## Results

	Delivered energy [kWh/y]	Primary energy [kWh/y]	CO <sub>2</sub> emissions [kgCO <sub>2</sub> /y]
Main space heating system	1258	1104	210
Secondary space heating system	0	0	0
Main water heating system	2084	1828	347
Supplementary water heating system	0	0	0
Pumps and fans	168	350	69
Energy for lighting	202	421	83
CHP input (individual heating systems only)			
CHP electric output (individual heating systems only)			
Renewable and energy saving technologies			
Energy produced and saved	0	0	0
Energy consumed by the technology	0	0	0
<b>Total</b>	<b>3712</b>	<b>3702</b>	<b>708</b>
<b>Per m<sup>2</sup> floor area</b>	<b>46.40</b>	<b>46.28</b>	<b>8.85</b>
<b>Energy Rating</b>	<b>A2</b>		

## Part L Specification

### Property Details

<b>Dwelling Type</b>	Top-floor apartment	<b>Type of BER rating</b>	New Dwelling - Provisional
<b>Address line 1</b>	26 Parkgate Street	<b>Year of Construction</b>	2019
<b>Address line 2</b>		<b>Date of Assessment</b>	26/11/2019
<b>Address line 3</b>	Dublin 8 (copy) (copy) (copy) (copy) (copy) (copy) (copy)	<b>Date of Plans</b>	
<b>County</b>	Co. Dublin	<b>Planning Reference</b>	
<b>Eircode</b>	A94X2F3	<b>Building Regulations</b>	2019 TGD L
<b>BER Number</b>		<b>Is MPRN shared with another dwelling?</b>	N/A
<b>Purpose of rating</b>	Sale	<b>MPRN No.</b>	0
<b>Comment</b>	Gas Boilers		

### Dimension Details

	Area [m <sup>2</sup> ]	Height [m]	Volume [m <sup>3</sup> ]	
Ground Floor	80.00	3.00	240.00	
First Floor	0.00	0.00	0.00	
Second Floors	0.00	0.00	0.00	
Third and other floors	0.00	0.00	0.00	
Room in roof	0.00	0.00	0.00	
Total Floor Area	80.00		240.00	
<b>Living Area [m<sup>2</sup>]</b>	32.00			<b>Living area percentage [%]</b> 40.00
<b>No of Storeys</b>	1			

### Ventilation Details

	Number		
<b>Chimneys</b>	0	<b>Has permeability test been carried out?</b>	Yes
<b>Open Flues</b>	0	<b>Structure type</b>	N/A
<b>Fans &amp; Vents</b>	1	<b>Is there a suspended wooden ground floor?</b>	No
<b>Number of flueless combustion room heaters</b>	0	<b>Percentage windows/doors draught stripped [%]</b>	100.00
<b>Is there a draught lobby on main entrance?</b>	Yes	<b>Number of sides sheltered</b>	2
<b>Ventilation method</b>	Balanced whole-house mechanical ventilation with heat recovery	<b>Mechanical Ventilation Manufacturer</b>	Vent-Axia
<b>Specific fan power [W/(L/s)]</b>	0.460	<b>Mechanical Ventilation Model Name</b>	Kinetic Sentinel B Lo Carbon
<b>Heat exchanger efficiency [%]</b>	93.00	<b>How many wetrooms (incl. kitchen)?</b>	3

## Building Elements - Floor Details

Type	Description	Underfloor heating	U-Value [W/m <sup>2</sup> K]	Area [m <sup>2</sup> ]
Non-Heat Loss Floor	Double Bedroom Apartment	N/A	0	80

## Building Elements - Roof Details

Type	Description	U-Value [W/m <sup>2</sup> K]	Area [m <sup>2</sup> ]
Flat Roof		0.14	80

## Building Elements - Wall Details

Type	Description	U-Value [W/m <sup>2</sup> K]	Area [m <sup>2</sup> ]
325mm Solid Brick	E Facing - External Wall	0.18	8.4
325mm Solid Brick	W Facing - External Wall	0.18	36.12
325mm Solid Brick	SE Facing - External Wall	0.18	15.2

## Building Elements - Door Details

Description	Number of Doors	U-Value [W/m <sup>2</sup> K]	Area [m <sup>2</sup> ]
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## Building Elements - Window Details

Glazing type	User defined u-value	U-Value [W/m <sup>2</sup> K]	Area [m <sup>2</sup> ]
Double-glazed, air filled (low-E, en = 0.1, soft coat)	Yes	1.400	2.940
Double-glazed, air filled (low-E, en = 0.1, soft coat)	Yes	1.400	2.940
Double-glazed, air filled (low-E, en = 0.1, soft coat)	Yes	1.400	3.600
Double-glazed, air filled (low-E, en = 0.1, soft coat)	Yes	1.400	2.700

## Other Details

<b>Thermal bridging factor [W/m<sup>2</sup>k]</b>	0.0800	<b>Thermal mass category of dwelling</b>	Medium
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### Heating System - Solar Water Heating

<b>Solar Water Heating Present?</b>	No	<b>Aperture area of solar collector [m<sup>2</sup>]</b>	N/A
<b>Type, manufacturer, model</b>	N/A		
<b>Zero loss collector efficiency, n0</b>	N/A	<b>Collector heat loss coefficient, a1 [W/m<sup>2</sup>&gt;K]</b>	N/A
<b>Annual Solar Radiation [kWh/m<sup>2</sup>] (Refer to Appendix H in DEAP)</b>	N/A	<b>Overshading factor</b>	N/A
<b>Dedicated storage volume [Litres]</b>	N/A	<b>Combined Cylinder</b>	N/A
<b>Solar fraction [%]</b>	0.000		

### Heating System - Hot Water System

<b>Distribution Losses</b>	248.98	<b>Combi boiler present?</b>	No
<b>Supplementary electric water heating</b>	N/A	<b>Water Storage Volume [L]</b>	4
<b>Hot water storage manufacturer and model name</b>	Heat Rae	<b>Declared loss factor [kWh/d]</b>	0.36
<b>Temperature factor unadjusted</b>	1	<b>Temperature Factor Multiplier</b>	1
<b>Primary Circuit loss type</b>	Community heating		
<b>Is hot water storage indoors or in group heating system?</b>	Yes		

### Heating System - Dist. system losses and gains

<b>Temperature adjustment [°C]</b>	0.000	<b>Control Category</b>		<b>Responsiveness category</b>	
<b>Central heating pumps</b>	0	<b>Oil Boiler Pump</b>	0	<b>Oil boiler pump inside dwelling</b>	No
<b>Gas boiler flue fan</b>	0	<b>Warm air heating or fan coil radiators present</b>	No		

## Heating System - Energy Requirements (Individual)

Main space heating system efficiency [%]	N/A	Space heating efficiency adjustment factor	N/A	Main space heating fuel	None
Main water heating system efficiency [%]	N/A	Water heating efficiency adjustment factor	N/A	Main water heating fuel	None
Secondary heating system efficiency [%]	N/A	Fraction of heating from secondary heating system	N/A	Secondary space heating system fuel	None
Fraction of main space and water heat from CHP	N/A	Electrical efficiency of CHP	N/A	Heat efficiency of CHP	N/A
CHP Fuel type	N/A				

## Summary for Part L Conformance (Applies to TGD L 2008/2011/2019 for new dwellings only)

BER Number		Building Regulations	2019 TGD L
BER Result	A2	Energy Value kWh/m <sup>2</sup> /yr	46.28
CO <sub>2</sub> emissions [kg/m <sup>2</sup> /yr]	8.85		
EPC	0.271	EPC Pass/Fail	Pass
CPC	0.255	CPC Pass/Fail	Pass

## Part L Conformance - Fabric

Conformity with Maximum avg U-value requirements	U-value [W/m <sup>2</sup> K]	Pass/Fail	Conformity with Maximum U-value requirements	U-Value [W/m <sup>2</sup> K]	Pass/Fail
Pitched roof insulated on ceiling	0.00	Pass	Roofs	0.14	Pass
Pitched roof insulated on slope	0	Pass	Walls	0.18	Pass
Flat Roof	0.14	Pass	Floors	0	Pass
Floors with no underfloor heat	0.00	Pass	External doors / windows / rooflights	1.40	Pass
Floors with underfloor heat	0.00	Pass			
Walls	0.18	Pass			
Percentage of opening areas [%]	15.23				
Average U value of openings	1.40	Pass			
Permeability test carried out and meets guidelines in TGD L				0.15	Pass

## Part L Conformance - Renewables (applies to TGD L 2008/2011 individual heating system)

Type of renewable	Total contribution [kWh/y]	Part L renewable contribution [kWh/m <sup>2</sup> /y]
Solar water heating system	0.000	0.000
Heat pump as main space heating system	0.000	0.000
Heat pump as secondary space heating system	0.000	0.000
Heat pump as main water heating system	0.000	0.000
Wood/Biomass heater as main space heating system	0.000	0.000
Wood/Biomass heater as secondary heating system	0.000	0.000
Wood/Biomass heater as main water heating system	0.000	0.000
Contribution from CHP	0.000	0.000
Renewable technology 1	0.000	0.000
Renewable technology 2	0.000	0.000
Renewable technology 3	0.000	0.000
Total thermal	0.000	0.000
Total electrical	0.000	0.000
Total thermal equivalent	0.000	0.000
Does total thermal equivalent meet part L requirement?	Fail	

## Part L Conformance - Renewables (applies to TGD L 2019 individual heating system)

	Source	Renewables Primary Energy	Total Primary Energy	RER
+ Delivered energy	PV/Wind	0.000	0.000	
+ Delivered energy	Other	0.000	0.000	
+ Delivered energy	Solar	0.00	0.00	
+ Delivered energy	Biomass	0.000	0.000	
+ Delivered energy	Biodiesel	0.000	0.000	
+ Delivered energy	Bioethanol	0.000	0.000	
+ Environmental energy	HP	1406.373	1406.373	
+ Saved energy	CHP	0.000	0.000	
+ District heating	District Heating	0.000	0.000	
+ Delivered energy	Grid	0.000	2948.542	
+ Delivered energy	Thermal	0.000	0.000	
<b>SUBTOTAL</b>		<b>1406.373</b>	<b>4354.916</b>	<b>0.323 - Pass</b>
Energy not used in Regulated Loads	PV/Wind/CHP	0.000	0.000	
<b>TOTAL</b>		<b>1406.373</b>	<b>4354.916</b>	<b>0.323</b>

## Property details

<b>MPRN</b>	0	<b>BER Number</b>	N/A
<b>Shared MPRN</b>		<b>Previous BER</b>	
<b>Address line 1</b>	Parkgate Street	<b>Type of Rating</b>	New Dwelling - Provisional
<b>Address line 2</b>		<b>Purpose of rating</b>	Sale
<b>Address line 3</b>	Dublin 8 (copy)	<b>Building Regulations</b>	2019 TGD L
<b>County</b>	Co. Dublin	<b>Planning Reference</b>	
<b>Eircode</b>	A94X2F3	<b>Date of Plans</b>	
<b>Dwelling Type</b>	Top-floor apartment	<b>Date of Assessment</b>	27/11/2019
<b>Year of construction</b>	2019	<b>Assessor Comments</b>	Gas Boilers
<b>Dwelling Extension</b>	N/A	<b>Assessor Description</b>	EAPH - Parkgate Street -10th Floor - Double Bed
<b>Storeys</b>	1		
<b>Bedrooms</b>	2		

## Dimension details

	Area [m <sup>2</sup> ]	Height [m]	Volume [m <sup>3</sup> ]
<b>Ground floor</b>	80.00	3.00	240.00
<b>First floor</b>	0.00	0.00	0.00
<b>Second floors</b>	0.00	0.00	0.00
<b>Third and other floors</b>	0.00	0.00	0.00
<b>Room in Roof</b>	0.00	0.00	0.00
<b>Totals</b>	80.00		240.00
<b>Living Area</b>	32.00 m <sup>2</sup>	<b>Living Area Percentage</b>	40.00 %



## Ventilation details

		Number	Air Change Rate [ac/h]
<b>Chimneys</b>		0	0.00
<b>Open Flues</b>		0	0.00
<b>Fans &amp; vents</b>		4	40.00
<b>Flueless combustion room heaters</b>		0	0.00
<b>Has a permeability test been carried out</b>	Yes		<b>Is there a draught lobby on main entrance?</b> Yes
<b>Infiltration rate due to structure [ac/h]</b>	0.15		<b>Draught lobby air change [ac/h]</b> 0.00
<b>Intermediate infiltration rate</b>	0.32		<b>Openings infiltration [ac/h]</b> 0.17
<b>Number of sides sheltered</b>	2		<b>Structure type</b> N/A
<b>Adjusted infiltration rate</b>	0.27		<b>Is there a suspended wooden ground floor?</b> N/A
<b>Effective air change rate [ac/h]</b>	0.60		<b>Windows/doors/attic hatches draught stripped [%]</b> 100.00
<b>Ventilation heat loss [W/K]</b>	47.72		<b>Ventilation method</b> Exhaust Air Heat Pump
<b>Adjusted result of air permeability test [ac/h]</b>	0.15		
<b>Exhaust air flow rate [m<sup>3</sup>/h]</b>	160.00		<b>How many wetrooms (inc. kitchen)? Is the vent. ducting flexible/rigid/both?</b> 3
<b>Manufacturer and Model name</b>	ComfortZone EX35		<b>Is MVHR ducting insulated where outside of insulated envelope?</b> N/A
<b>Specific fan power [W/(l/s)]</b>	0.68		<b>Adjusted heat exchanger efficiency</b> 0.00
<b>Heat exchanger efficiency [%]</b>	0.00		
<b>Electricity for ventilation fans [Kwh/y]</b>	239.26		
<b>Heat gains from ventilation fans [W]</b>	0.00		

## Building Elements - Floors

Type	Description	U/F Heating	In Roof	Age Band	Exposed Perimeter [m]	Area [m <sup>2</sup> ]	U-Value [W/m <sup>2</sup> K]	Heat Loss (AU) [W/K]
Non-Heat Loss Floor	2 Bed Apartment	N/A	No	2005 onwards	N/A	80.00	0.00	0.00
<b>Total area [m<sup>2</sup>]</b>								80.00

## Building Elements - Roofs

Type	Description	Insulation Thickness [mm]	Age Band	Area [m <sup>2</sup> ]	U-Value [W/m <sup>2</sup> K]	Heat Loss (AU) [W/K]
Flat Roof			2005 onwards	80.00	0.14	11.20
<b>Total area [m<sup>2</sup>]</b>						<b>80.00</b>

## Building Elements - Walls

Type	Description	Wall is semi-exposed	Include in compliance check	Age Band	Area [m <sup>2</sup> ]	U-Value [W/m <sup>2</sup> K]	Heat Loss (AU) [W/K]
325mm Solid Brick	WF Facing - External Wall	No	No	2005 onwards	36.12	0.18	6.50
325mm Solid Brick	EF Facing - External Wall	No	No	2005 onwards	8.40	0.18	1.51
325mm Solid Brick	SE.F Facing - External Wall	No	No	2005 onwards	15.25	0.18	2.74
<b>Total area [m<sup>2</sup>]</b>							<b>59.77</b>

## Building Elements - Doors

Count	Type	Description	Draught Stripped	Area [m <sup>2</sup> ]	U-Value [W/m <sup>2</sup> K]	Heat Loss (AU) [W/K]
<b>Total area [m<sup>2</sup>]</b>						0.00

## Building Elements - Windows

Count	Glazing Type	Frame Type	Frame Factor	Solar Transm.	In Roof	Over shading	Orient.	Area [m <sup>2</sup> ]	U-value [W/m <sup>2</sup> K]
1	Double-glazed, air filled (low-E, en = 0.1, soft coat)	Wood/PVC	0.700	0.63	No	Very Little	West	2.94	1.40
1	Double-glazed, air filled (low-E, en = 0.1, soft coat)	Wood/PVC	0.700	0.63	No	Very Little	West	2.94	1.40
1	Double-glazed, air filled (low-E, en = 0.1, soft coat)	Wood/PVC	0.700	0.63	No	Very Little	Southeast	2.68	1.40
1	Double-glazed, air filled (low-E, en = 0.1, soft coat)	Wood/PVC	0.700	0.63	No	Very Little	Southeast	3.60	1.40
<b>Total area [m<sup>2</sup>]</b>								<b>12.16</b>	

## Heat loss details

<b>Total glazed area [m<sup>2</sup>]</b>	12.16	<b>Glazing ratio</b>	0.08
<b>Total glazed heat loss [W/K]</b>	16.12	<b>Summer solar gain [W/m<sup>2</sup>]</b>	545.69
<b>Total effective collection area [m<sup>2</sup>]</b>	4.83	<b>Total element area [m<sup>2</sup>]</b>	12.16
<b>Total plane heat loss [W/K]</b>	38.08	<b>Thermal bridging factor [W/m<sup>2</sup>K]</b>	0.08
<b>Fabric heat loss [W/K]</b>	50.23		
<b>Total heat loss [W/K]</b>	97.95	<b>Per m2</b>	1.22

## Lighting and Internal Gains

<b>Lighting Design Calculation Method</b>	Bulb type only	<b>Average Efficacy [lm/W]</b>	66.90
<b>Fixed lighting provision [klmh/y]</b>	2950.52	<b>Top up lighting requirement [klmh/y]</b>	0.00
<b>Energy required for fixed lighting [kWh/y]</b>	78.67	<b>Energy required for top up lighting [kWh/y]</b>	0.00
<b>Energy required for portable lighting [kWh/y]</b>	123.55		
<b>Basic energy consumption for lighting [kWh/y]</b>	720.83	<b>Water heating</b>	127.09
<b>Annual energy used for lighting [kWh/m<sup>2</sup>y]</b>	202.22	<b>Occupants</b>	123.14
<b>Internal gains from lighting during heating season [kWh/hs] (In watts [W])</b>	154.70 (26.53)	<b>Mechanical ventilation</b>	0.00
<b>Lighting</b>	26.53	<b>Heat loss to the cold water network</b>	-36.17
<b>Appliance and cooking</b>	179.79	<b>Net internal gains</b>	420.39

## Water heating details

Are there distribution losses?	Yes	Is supplementary electric water heating used in summer?	N/A
Are there storage losses?	Yes	Is there a combi boiler?	No
Is there a solar water heating system?	No	Total hot water demand [kWh/y]	1659.84
Standard number of occupants	2.46	Temperature factor unadjusted	0.89
Number of mixer showers	1	Temperature Factor Multiplier	1.10
Number of electric showers	0	Hot water storage loss factor [kWh/l d]	0.00
Is there a bath present	Yes	Volume factor	0.00
Daily hot water use [Litres/d]	105.85	Combi-boiler electricity consumption [kWh/y]	0.00
Hot water energy reqs. at taps [kWh/y]	1410.87	Adjusted storage loss [kWh/y]	410.94
Distribution losses [kWh/y]	248.98	Adjusted primary circuit loss [kWh/y]	290.83
Water storage volume [Litres]	200.00	Heat gains from water heating system [W]	127.09
Is manufacturers declared loss factor available?	Yes	Output from supplementary heater [kWh/y]	0.00
Declared loss factor [kWh/d]	1.15		
Manufacturer and Model name	ComfortZone EX35		
Insulation type	Factory Insulated		
Insulation thickness [mm]	100		
Combi-boiler Type	None	Combi-boiler loss [kWh/y]	0.00
Keep Hot facility	None	Storage Loss	410.94
Primary Circuit loss type	Boiler with insulated primary pipework and with cylinder thermostat		
Primary circuit loss [kWh/y]	360.00	Output from main water heater [kWh/y]	2361.61
Is hot water storage indoors or in group heating system	Yes	Annual Heat gains from water heating system [kWh/y]	1113.31
		WWHRS input to main system [kWh/y]	0.00
		WWHRS input to supplementary system [kWh/y]	0.00



## Net space heat demand

Required temp. during heated hours	21.00	Length of one unheated period [h]	8
Required temperature rest of dwelling	18.00	Unheated periods per week	14
Living area percentage	40.00	Heat use during heating season [kWh/y]	2318.16
Required mean internal temperature [C]	19.20	Heat use for full year [kWh/y]	2357.95
Thermal mass category of dwelling	Medium		

### Utilisation factor

### Intermittent heating

Internal heat capacity of dwelling [per m <sup>2</sup> ]	0.20	0.11
Internal heat capacity [MJ/K]	16.00	8.80

## Space heat demand details

Month	Mean Ext. Temp [C]	Adj. Int. Temp [C]	Heat Loss [W]	Heat Use [kWh]	Gain/Loss Ratio	Utilisation Factor	Heat Use [W]	Useful Gains [W]	Solar Gain [W]
January	5.3	17.86	1230	508	0.46	0.98	683	548	140
February	5.5	17.88	1213	387	0.55	0.96	576	637	244
March	7.0	18.03	1080	277	0.72	0.91	372	707	360
April	8.3	18.15	965	156	0.94	0.82	216	749	488
May	11.0	18.41	726	49	1.40	0.65	66	660	594
June	13.5	18.65	505	12	1.98	0.49	16	488	581
July	15.5	18.84	328	2	2.95	0.34	3	325	545
August	15.2	18.81	354	3	2.65	0.37	4	350	517
September	13.3	18.63	522	23	1.62	0.58	31	491	426
October	10.4	18.35	779	132	0.93	0.83	178	601	306
November	7.5	18.07	1036	336	0.58	0.95	467	569	178
December	6.0	17.93	1168	473	0.47	0.97	636	533	126

## Dist. System Losses and Gains

Temperature adjustment [C]	0	Additional heat emissions due to non ideal control and responsiveness [kWh/y]	154.87
Heating system control category	2	Gross heat emission to heated space [kWh/y]	2473.03
Heating system responsiveness category	1	Mean internal temperature [C]	18.36
Mean internal temperature during heating hours [C]	19.50		

	Number present	Boiler controlled by thermostat	Inside dwelling	Electricity consumption [kWh/y]	Heat gain [W]
Central heating pumps	1	Yes	Yes	26	10
Oil boiler pumps	0	No	No	0	0
Gas boiler flue fan	0			0	
Warm air heating or fan coil radiators present	No			0	0
<b>Totals</b>				26	10

Gains from fans and pumps associated with space heating system	58	Is there underfloor heating on the ground floor?	No
Average utilisation factor, October to May	0.88	U-Value of ground floor [W/m <sup>2</sup> K]	0.00
Useful net gain [kWh/y]	52	Fraction of heating system output from ground floor	1.00
Net heat emission to heated space [kWh/y]	2421	Additional heat loss via envelope element	0.00
		Annual space heating requirement [kWh/y]	2421

## Energy Requirements: Individual Heating Systems

Efficiency of main heating system [%]	426.78	Fraction of heat from secondary system	N/A
Manufacturer name	ComfortZone	Efficiency of secondary system [%]	N/A
Model name	EX35	Energy required for main heating system [kWh/y]	567.39
Efficiency adjustment factor	1.00	Energy required for secondary heating system [kWh/y]	0
Adjusted efficiency of main heating system [%]	426.78		

<b>Fraction of main space and water heat from CHP</b>	N/A	<b>Efficiency adjustment factor</b>	1.0000
<b>Heat demand from CHP</b>	0.0	<b>Adj. efficiency of main water heating system [%]</b>	251.86
<b>Efficiency of main water heating system [%]</b>	251.86	<b>Energy req. for main water heater [kWh/y]</b>	1950.35
<b>Manufacturer name</b>	ComfortZone	<b>Energy req. for secondary water heater [kWh/y]</b>	0.00
<b>Model name</b>	EX35		

	<b>Fuel Type</b>	<b>Primary energy conversion factor</b>	<b>CO<sub>2</sub> emission factor</b>
<b>Main space heating system</b>	Electricity	2.08	0.409
<b>Secondary space heating system</b>	None	0.00	0.000
<b>Main water heating system</b>	Electricity	2.08	0.409
<b>Pumps, fans</b>		2.08	0.409
<b>Energy for lighting</b>		2.08	0.409

	<b>Type</b>	<b>Part L Total Contribution [kWh/y]</b>	<b>Delivered Energy [kWh/y]</b>	<b>Primary energy conversion factor</b>	<b>CO<sub>2</sub> emission factor [kg/kWh]</b>
<b>Energy produced or saved 1</b>	Electrical (Solar PV/Wind)	171.500	171.500	0.00	0.000
<b>Energy consumed by the technology 1</b>			0.000	0.00	0.000
<b>Energy produced or saved 2</b>	N/A	0.000	0.000	0.00	0.000
<b>Energy consumed by the technology 2</b>			0.000	0.00	0.000
<b>Energy produced or saved 3</b>	N/A	0.000	0.000	0.00	0.000
<b>Energy consumed by the technology 3</b>			0.000	0.00	0.000

### CHP data

<b>Heat output from CHP [kWh/y]</b>	0.00	<b>CHP Fuel type</b>	N/A
<b>Electrical efficiency of CHP</b>		<b>Energy delivered to CHP [kWh/y]</b>	0
<b>Heat efficiency of CHP</b>		<b>Electrical output from CHP [kWh/y]</b>	0

## Summer internal gains

Dwelling volume [m <sup>3</sup> ]	240.000	Total gains in summer [W]	966.08
Effective air change rate for summer period [ac/h]		Temperature increment due to gains [C]	19.23
Ventilation heat loss coefficient [W/K]	0.00	Summer mean external temperature [C]	15
Fabric heat loss coefficient [W/K]	50.23	Heat capacity parameter	0.20
Heat loss coefficient under summer conditions [W/K]	50.23	Temperature increment related to thermal mass [C]	0.60
Total Solar Gains from Summer Period	545.69	Threshold internal temperature [C]	34.83
Internal gains [W]	420.39		

## Results

	Delivered energy [kWh/y]	Primary energy [kWh/y]	CO <sub>2</sub> emissions [kgCO <sub>2</sub> /y]
Main space heating system	567	1180	232
Secondary space heating system	0	0	0
Main water heating system	938	1950	384
Supplementary water heating system	0	0	0
Pumps and fans	265	552	108
Energy for lighting	202	421	83
CHP input (individual heating systems only)	0	0	0
CHP electric output (individual heating systems only)	0	0	0
<b>Renewable and energy saving technologies</b>			
Energy produced and saved	172	357	70
Energy consumed by the technology	0	0	0
<b>Total</b>	<b>1801</b>	<b>3746</b>	<b>737</b>
<b>Per m<sup>2</sup> floor area</b>	<b>22.51</b>	<b>46.83</b>	<b>9.21</b>
<b>Energy Rating</b>	<b>A2</b>		

## Part L Specification

### Property Details

<b>Dwelling Type</b>	Top-floor apartment	<b>Type of BER rating</b>	New Dwelling - Provisional
<b>Address line 1</b>	Parkgate Street	<b>Year of Construction</b>	2019
<b>Address line 2</b>		<b>Date of Assessment</b>	27/11/2019
<b>Address line 3</b>	Dublin 8 (copy)	<b>Date of Plans</b>	
<b>County</b>	Co. Dublin	<b>Planning Reference</b>	
<b>Eircode</b>	A94X2F3	<b>Building Regulations</b>	2019 TGD L
<b>BER Number</b>		<b>Is MPRN shared with another dwelling?</b>	N/A
<b>Purpose of rating</b>	Sale	<b>MPRN No.</b>	0
<b>Comment</b>	Gas Boilers		

### Dimension Details

	Area [m <sup>2</sup> ]	Height [m]	Volume [m <sup>3</sup> ]	
Ground Floor	80.00	3.00	240.00	
First Floor	0.00	0.00	0.00	
Second Floors	0.00	0.00	0.00	
Third and other floors	0.00	0.00	0.00	
Room in roof	0.00	0.00	0.00	
Total Floor Area	80.00		240.00	
<b>Living Area [m<sup>2</sup>]</b>	32.00		<b>Living area percentage [%]</b>	40.00
<b>No of Storeys</b>	1			

### Ventilation Details

	Number		
<b>Chimneys</b>	0	<b>Has permeability test been carried out?</b>	Yes
<b>Open Flues</b>	0	<b>Structure type</b>	N/A
<b>Fans &amp; Vents</b>	4	<b>Is there a suspended wooden ground floor?</b>	No
<b>Number of flueless combustion room heaters</b>	0	<b>Percentage windows/doors draught stripped [%]</b>	100.00
<b>Is there a draught lobby on main entrance?</b>	Yes	<b>Number of sides sheltered</b>	2
<b>Ventilation method</b>	Exhaust Air Heat Pump	<b>Mechanical Ventilation Manufacturer</b>	N/A
<b>Specific fan power [W/(L/s)]</b>	0.680	<b>Mechanical Ventilation Model Name</b>	N/A
<b>Heat exchanger efficiency [%]</b>	N/A	<b>How many wetrooms (incl. kitchen)?</b>	N/A

## Building Elements - Floor Details

Type	Description	Underfloor heating	U-Value [W/m <sup>2</sup> K]	Area [m <sup>2</sup> ]
Non-Heat Loss Floor	2 Bed Apartment	N/A	0	80

## Building Elements - Roof Details

Type	Description	U-Value [W/m <sup>2</sup> K]	Area [m <sup>2</sup> ]
Flat Roof		0.14	80

## Building Elements - Wall Details

Type	Description	U-Value [W/m <sup>2</sup> K]	Area [m <sup>2</sup> ]
325mm Solid Brick	WF Facing - External Wall	0.18	36.12
325mm Solid Brick	EF Facing - External Wall	0.18	8.4
325mm Solid Brick	SE.F Facing - External Wall	0.18	15.248

## Building Elements - Door Details

Description	Number of Doors	U-Value [W/m <sup>2</sup> K]	Area [m <sup>2</sup> ]
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## Building Elements - Window Details

Glazing type	User defined u-value	U-Value [W/m <sup>2</sup> K]	Area [m <sup>2</sup> ]
Double-glazed, air filled (low-E, en = 0.1, soft coat)	Yes	1.400	2.940
Double-glazed, air filled (low-E, en = 0.1, soft coat)	Yes	1.400	2.940
Double-glazed, air filled (low-E, en = 0.1, soft coat)	Yes	1.400	2.680
Double-glazed, air filled (low-E, en = 0.1, soft coat)	Yes	1.400	3.600

## Other Details

<b>Thermal bridging factor [W/m<sup>2</sup>k]</b>	0.0800	<b>Thermal mass category of dwelling</b>	Medium
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## Heating System - Solar Water Heating

<b>Solar Water Heating Present?</b>	No	<b>Aperture area of solar collector [m<sup>2</sup>]</b>	N/A
<b>Type, manufacturer, model</b>	N/A		
<b>Zero loss collector efficiency, n0</b>	N/A	<b>Collector heat loss coefficient, a1 [W/m<sup>2</sup>&gt;K]</b>	N/A
<b>Annual Solar Radiation [kWh/m<sup>2</sup>] (Refer to Appendix H in DEAP)</b>	N/A	<b>Overshading factor</b>	N/A
<b>Dedicated storage volume [Litres]</b>	N/A	<b>Combined Cylinder</b>	N/A
<b>Solar fraction [%]</b>	0.000		

## Heating System - Hot Water System

<b>Distribution Losses</b>	248.98	<b>Combi boiler present?</b>	No
<b>Supplementary electric water heating</b>	N/A	<b>Water Storage Volume [L]</b>	200
<b>Hot water storage manufacturer and model name</b>	ComfortZone EX35	<b>Declared loss factor [kWh/d]</b>	1.15
<b>Temperature factor unadjusted</b>	0.89	<b>Temperature Factor Multiplier</b>	1.1
<b>Primary Circuit loss type</b>	Boiler with insulated primary pipework and with cylinder thermostat		
<b>Is hot water storage indoors or in group heating system?</b>	Yes		

## Heating System - Dist. system losses and gains

<b>Temperature adjustment [°C]</b>	0	<b>Control Category</b>	2	<b>Responsiveness category</b>	1
<b>Central heating pumps</b>	1	<b>Oil Boiler Pump</b>	0	<b>Oil boiler pump inside dwelling</b>	No
<b>Gas boiler flue fan</b>	0	<b>Warm air heating or fan coil radiators present</b>	No		



## Heating System - Energy Requirements (Individual)

Main space heating system efficiency [%]	426.78	Space heating efficiency adjustment factor	1.0000	Main space heating fuel	Electricity
Main water heating system efficiency [%]	251.86	Water heating efficiency adjustment factor	1.0000	Main water heating fuel	Electricity
Secondary heating system efficiency [%]	N/A	Fraction of heating from secondary heating system	N/A	Secondary space heating system fuel	None
Fraction of main space and water heat from CHP	N/A	Electrical efficiency of CHP	N/A	Heat efficiency of CHP	N/A
CHP Fuel type	N/A				

## Summary for Part L Conformance (Applies to TGD L 2008/2011/2019 for new dwellings only)

BER Number		Building Regulations	2019 TGD L
BER Result	A2	Energy Value kWh/m <sup>2</sup> /yr	46.83
CO <sub>2</sub> emissions [kg/m <sup>2</sup> /yr]	9.21		
EPC	0.275	EPC Pass/Fail	Pass
CPC	0.265	CPC Pass/Fail	Pass

## Part L Conformance - Fabric

Conformity with Maximum avg U-value requirements	U-value [W/m <sup>2</sup> K]	Pass/Fail	Conformity with Maximum U-value requirements	U-Value [W/m <sup>2</sup> K]	Pass/Fail
Pitched roof insulated on ceiling	0.00	Pass	Roofs	0.14	Pass
Pitched roof insulated on slope	0	Pass	Walls	0.18	Pass
Flat Roof	0.14	Pass	Floors	0	Pass
Floors with no underfloor heat	0.00	Pass	External doors / windows / rooflights	1.40	Pass
Floors with underfloor heat	0.00	Pass			
Walls	0.18	Pass			
Percentage of opening areas [%]	15.20				
Average U value of openings	1.40	Pass			
Permeability test carried out and meets guidelines in TGD L				0.15	Pass

**Part L Conformance - Renewables (applies to TGD L 2008/2011 individual heating system)**

Type of renewable	Total contribution [kWh/y]	Part L renewable contribution [kWh/m <sup>2</sup> /y]
Solar water heating system	0.000	0.000
Heat pump as main space heating system	1003.027	12.538
Heat pump as secondary space heating system	0.000	0.000
Heat pump as main water heating system	17.441	0.218
Wood/Biomass heater as main space heating system	0.000	0.000
Wood/Biomass heater as secondary heating system	0.000	0.000
Wood/Biomass heater as main water heating system	0.000	0.000
Contribution from CHP	0.000	0.000
Renewable technology 1	171.500	2.144
Renewable technology 2	0.000	0.000
Renewable technology 3	0.000	0.000
Total thermal	1020.468	12.756
Total electrical	171.500	2.144
Total thermal equivalent	1449.218	18.115
Does total thermal equivalent meet part L requirement?	Pass	

**Part L Conformance - Renewables (applies to TGD L 2019 individual heating system)**

	Source	Renewables Primary Energy	Total Primary Energy	RER
+ Delivered energy	PV/Wind	356.720	356.720	
+ Delivered energy	Other	0.000	0.000	
+ Delivered energy	Solar	0.00	0.00	
+ Delivered energy	Biomass	0.000	0.000	
+ Delivered energy	Biodiesel	0.000	0.000	
+ Delivered energy	Bioethanol	0.000	0.000	
+ Environmental energy	HP	1780.565	1780.565	
+ Saved energy	CHP	0.000	0.000	
+ District heating	District Heating	0.000	0.000	
+ Delivered energy	Grid	0.000	3746.156	
+ Delivered energy	Thermal	0.000	0.000	
<b>SUBTOTAL</b>		<b>2137.285</b>	<b>5883.441</b>	<b>0.363 - Pass</b>
Energy not used in Regulated Loads	PV/Wind/CHP	0.000	0.000	
<b>TOTAL</b>		<b>2137.285</b>	<b>5883.441</b>	<b>0.363</b>

## Property details

<b>MPRN</b>	0	<b>BER Number</b>	N/A
<b>Shared MPRN</b>		<b>Previous BER</b>	
<b>Address line 1</b>	Parkgate Street	<b>Type of Rating</b>	New Dwelling - Provisional
<b>Address line 2</b>		<b>Purpose of rating</b>	Sale
<b>Address line 3</b>	Dublin 8 (copy) (copy)	<b>Building Regulations</b>	2019 TGD L
<b>County</b>	Co. Dublin	<b>Planning Reference</b>	
<b>Eircode</b>	A94X2F3	<b>Date of Plans</b>	
<b>Dwelling Type</b>	Mid-floor apartment	<b>Date of Assessment</b>	27/11/2019
<b>Year of construction</b>	2019	<b>Assessor Comments</b>	Gas Boilers
<b>Dwelling Extension</b>	N/A	<b>Assessor Description</b>	EAPH - Parkgate Street -Tower 12th - Double Bed
<b>Storeys</b>	1		
<b>Bedrooms</b>	2		

## Dimension details

	Area [m <sup>2</sup> ]	Height [m]	Volume [m <sup>3</sup> ]
<b>Ground floor</b>	75.00	3.00	225.00
<b>First floor</b>	0.00	0.00	0.00
<b>Second floors</b>	0.00	0.00	0.00
<b>Third and other floors</b>	0.00	0.00	0.00
<b>Room in Roof</b>	0.00	0.00	0.00
<b>Totals</b>	75.00		225.00
<b>Living Area</b>	25.00 m <sup>2</sup>	<b>Living Area Percentage</b>	33.33 %

## Ventilation details

		Number	Air Change Rate [ac/h]
Chimneys		0	0.00
Open Flues		0	0.00
Fans & vents		4	40.00
Flueless combustion room heaters		0	0.00
Has a permeability test been carried out	Yes		Is there a draught lobby on main entrance? Yes
Infiltration rate due to structure [ac/h]	0.15		Draught lobby air change [ac/h] 0.00
Intermediate infiltration rate	0.33		Openings infiltration [ac/h] 0.18
Number of sides sheltered	2		Structure type N/A
Adjusted infiltration rate	0.28		Is there a suspended wooden ground floor? N/A
Effective air change rate [ac/h]	0.63		Windows/doors/attic hatches draught stripped [%] 100.00
Ventilation heat loss [W/K]	47.09		Ventilation method Exhaust Air Heat Pump
Adjusted result of air permeability test [ac/h]	0.15		
Exhaust air flow rate [m <sup>3</sup> /h]	160.00		How many wetrooms (inc. kitchen)? Is the vent. ducting flexible/rigid/both? N/A
Manufacturer and Model name	N/A		Is MVHR ducting insulated where outside of insulated envelope? N/A
Specific fan power [W/(l/s)]	0.68		Adjusted heat exchanger efficiency 0.00
Heat exchanger efficiency [%]	0.00		
Electricity for ventilation fans [Kwh/y]	236.10		
Heat gains from ventilation fans [W]	0.00		

## Building Elements - Floors

Type	Description	U/F Heating	In Roof	Age Band	Exposed Perimeter [m]	Area [m <sup>2</sup> ]	U-Value [W/m <sup>2</sup> K]	Heat Loss (AU) [W/K]
Non-Heat Loss Floor	2 Bed Apartment	N/A	No	2005 onwards	N/A	75.00	0.00	0.00
<b>Total area [m<sup>2</sup>]</b>								75.00

## Building Elements - Roofs

Type	Description	Insulation Thickness [mm]	Age Band	Area [m <sup>2</sup> ]	U-Value [W/m <sup>2</sup> K]	Heat Loss (AU) [W/K]
<b>Total area [m<sup>2</sup>]</b>						0.00

## Building Elements - Walls

Type	Description	Wall is semi-exposed	Include in compliance check	Age Band	Area [m <sup>2</sup> ]	U-Value [W/m <sup>2</sup> K]	Heat Loss (AU) [W/K]
325mm Solid Brick	ES Facing - External Wall	No	No	2005 onwards	12.40	0.18	2.23
325mm Solid Brick	NE.F Facing - External Wall	No	No	2005 onwards	19.30	0.18	3.47
<b>Total area [m<sup>2</sup>]</b>							<b>31.70</b>

## Building Elements - Doors

Count	Type	Description	Draught Stripped	Area [m <sup>2</sup> ]	U-Value [W/m <sup>2</sup> K]	Heat Loss (AU) [W/K]
<b>Total area [m<sup>2</sup>]</b>						0.00



## Building Elements - Windows

Count	Glazing Type	Frame Type	Frame Factor	Solar Transm.	In Roof	Over shading	Orient.	Area [m <sup>2</sup> ]	U-value [W/m <sup>2</sup> K]
1	Double-glazed, air filled (low-E, en = 0.1, soft coat)	Wood/PVC	0.700	0.63	No	Very Little	East	8.00	1.40
1	Double-glazed, air filled (low-E, en = 0.1, soft coat)	Wood/PVC	0.700	0.63	No	Very Little	Northeast	4.00	1.40
1	Double-glazed, air filled (low-E, en = 0.1, soft coat)	Wood/PVC	0.700	0.63	No	Very Little	Northeast	4.00	1.40
<b>Total area [m<sup>2</sup>]</b>								<b>16.00</b>	

## Heat loss details

<b>Total glazed area [m<sup>2</sup>]</b>	16.00	<b>Glazing ratio</b>	0.11
<b>Total glazed heat loss [W/K]</b>	21.21	<b>Summer solar gain [W/m<sup>2</sup>]</b>	647.74
<b>Total effective collection area [m<sup>2</sup>]</b>	6.35	<b>Total element area [m<sup>2</sup>]</b>	16
<b>Total plane heat loss [W/K]</b>	26.92	<b>Thermal bridging factor [W/m<sup>2</sup>K]</b>	0.08
<b>Fabric heat loss [W/K]</b>	30.73		
<b>Total heat loss [W/K]</b>	77.82	<b>Per m2</b>	1.04

## Lighting and Internal Gains

<b>Lighting Design Calculation Method</b>	Lighting Design	<b>Average Efficacy [lm/W]</b>	91.00
<b>Fixed lighting provision [klmh/y]</b>	2149.80	<b>Top up lighting requirement [klmh/y]</b>	0.00
<b>Energy required for fixed lighting [kWh/y]</b>	53.99	<b>Energy required for top up lighting [kWh/y]</b>	0.00
<b>Energy required for portable lighting [kWh/y]</b>	115.34		
<b>Basic energy consumption for lighting [kWh/y]</b>	685.47	<b>Water heating</b>	125.03
<b>Annual energy used for lighting [kWh/m<sup>2</sup>y]</b>	169.33	<b>Occupants</b>	118.06
<b>Internal gains from lighting during heating season [kWh/hs] (In watts [W])</b>	129.54 (22.21)	<b>Mechanical ventilation</b>	0.00
<b>Lighting</b>	22.21	<b>Heat loss to the cold water network</b>	-35.25
<b>Appliance and cooking</b>	171.86	<b>Net internal gains</b>	401.91

## Water heating details

<b>Are there distribution losses?</b>	Yes	<b>Is supplementary electric water heating used in summer?</b>	N/A
<b>Are there storage losses?</b>	Yes	<b>Is there a combi boiler?</b>	No
<b>Is there a solar water heating system?</b>	No	<b>Total hot water demand [kWh/y]</b>	1616.63
<b>Standard number of occupants</b>	2.36	<b>Temperature factor unadjusted</b>	0.89
<b>Number of mixer showers</b>	1	<b>Temperature Factor Multiplier</b>	1.10
<b>Number of electric showers</b>	0	<b>Hot water storage loss factor [kWh/l d]</b>	0.00
<b>Is there a bath present</b>	Yes	<b>Volume factor</b>	0.00
<b>Daily hot water use [Litres/d]</b>	103.10	<b>Combi-boiler electricity consumption [kWh/y]</b>	0.00
<b>Hot water energy reqs. at taps [kWh/y]</b>	1374.13	<b>Adjusted storage loss [kWh/y]</b>	410.94
<b>Distribution losses [kWh/y]</b>	242.49	<b>Adjusted primary circuit loss [kWh/y]</b>	286.25
<b>Water storage volume [Litres]</b>	200.00	<b>Heat gains from water heating system [W]</b>	125.03
<b>Is manufacturers declared loss factor available?</b>	Yes	<b>Output from supplementary heater [kWh/y]</b>	0.00
<b>Declared loss factor [kWh/d]</b>	1.15		
<b>Manufacturer and Model name</b>	ComfortZone EX35		
<b>Insulation type</b>	Factory Insulated		
<b>Insulation thickness [mm]</b>	100		
<b>Combi-boiler Type</b>	None	<b>Combi-boiler loss [kWh/y]</b>	0.00
<b>Keep Hot facility</b>	None	<b>Storage Loss</b>	410.94
<b>Primary Circuit loss type</b>	Boiler with insulated primary pipework and with cylinder thermostat		
<b>Primary circuit loss [kWh/y]</b>	360.00	<b>Output from main water heater [kWh/y]</b>	2313.81
<b>Is hot water storage indoors or in group heating system</b>	Yes	<b>Annual Heat gains from water heating system [kWh/y]</b>	1095.28
		<b>WWHRS input to main system [kWh/y]</b>	0.00
		<b>WWHRS input to supplementary system [kWh/y]</b>	0.00

## Net space heat demand

Required temp. during heated hours	21.00	Length of one unheated period [h]	8
Required temperature rest of dwelling	18.00	Unheated periods per week	14
Living area percentage	33.33	Heat use during heating season [kWh/y]	1516.34
Required mean internal temperature [C]	19.00	Heat use for full year [kWh/y]	1524.63
Thermal mass category of dwelling	Medium		

	Utilisation factor	Intermittent heating
Internal heat capacity of dwelling [per m <sup>2</sup> ]	0.20	0.11
Internal heat capacity [MJ/K]	15.00	8.25

## Space heat demand details

Month	Mean Ext. Temp [C]	Adj. Int. Temp [C]	Heat Loss [W]	Heat Use [kWh]	Gain/Loss Ratio	Utilisation Factor	Heat Use [W]	Useful Gains [W]	Solar Gain [W]
January	5.3	17.86	978	367	0.51	0.98	493	485	94
February	5.5	17.88	964	269	0.61	0.96	401	563	187
March	7.0	18.01	856	157	0.86	0.88	211	646	335
April	8.3	18.11	764	62	1.21	0.74	86	678	519
May	11.0	18.34	571	11	1.91	0.51	14	557	691
June	13.5	18.54	393	2	2.84	0.35	2	390	713
July	15.5	18.71	250	0	4.24	0.24	0	250	656
August	15.2	18.69	271	0	3.61	0.28	1	271	577
September	13.3	18.53	407	6	2.02	0.49	9	398	418
October	10.4	18.29	614	72	1.06	0.80	97	517	247
November	7.5	18.05	821	235	0.63	0.95	327	494	118
December	6.0	17.92	928	344	0.51	0.98	462	466	75

## Dist. System Losses and Gains

Temperature adjustment [C]	0	Additional heat emissions due to non ideal control and responsiveness [kWh/y]	138.75
Heating system control category	2	Gross heat emission to heated space [kWh/y]	1655.08
Heating system responsiveness category	1	Mean internal temperature [C]	18.36
Mean internal temperature during heating hours [C]	19.33		

	Number present	Boiler controlled by thermostat	Inside dwelling	Electricity consumption [kWh/y]	Heat gain [W]
Central heating pumps	1	Yes	Yes	26	10
Oil boiler pumps	0	No	No	0	0
Gas boiler flue fan	0			0	
Warm air heating or fan coil radiators present	No			0	0
<b>Totals</b>				26	10

Gains from fans and pumps associated with space heating system	58	Is there underfloor heating on the ground floor?	No
Average utilisation factor, October to May	0.85	U-Value of ground floor [W/m <sup>2</sup> K]	0.00
Useful net gain [kWh/y]	49	Fraction of heating system output from ground floor	1.00
Net heat emission to heated space [kWh/y]	1606	Additional heat loss via envelope element	0.00
		Annual space heating requirement [kWh/y]	1606

## Energy Requirements: Individual Heating Systems

Efficiency of main heating system [%]	448.78	Fraction of heat from secondary system	N/A
Manufacturer name	ComfortZone	Efficiency of secondary system [%]	N/A
Model name	EX35	Energy required for main heating system [kWh/y]	357.78
Efficiency adjustment factor	1.00	Energy required for secondary heating system [kWh/y]	0
Adjusted efficiency of main heating system [%]	448.78		

<b>Fraction of main space and water heat from CHP</b>	N/A	<b>Efficiency adjustment factor</b>	1.0000
<b>Heat demand from CHP</b>	0.0	<b>Adj. efficiency of main water heating system [%]</b>	251.86
<b>Efficiency of main water heating system [%]</b>	251.86	<b>Energy req. for main water heater [kWh/y]</b>	1910.88
<b>Manufacturer name</b>	ComfortZone	<b>Energy req. for secondary water heater [kWh/y]</b>	0.00
<b>Model name</b>	EX35		

	<b>Fuel Type</b>	<b>Primary energy conversion factor</b>	<b>CO<sub>2</sub> emission factor</b>
<b>Main space heating system</b>	Electricity	2.08	0.409
<b>Secondary space heating system</b>	None	0.00	0.000
<b>Main water heating system</b>	Electricity	2.08	0.409
<b>Pumps, fans</b>		2.08	0.409
<b>Energy for lighting</b>		2.08	0.409

	<b>Type</b>	<b>Part L Total Contribution [kWh/y]</b>	<b>Delivered Energy [kWh/y]</b>	<b>Primary energy conversion factor</b>	<b>CO<sub>2</sub> emission factor [kg/kWh]</b>
<b>Energy produced or saved 1</b>	Electrical (Solar PV/Wind)	171.500	171.500	0.00	0.000
<b>Energy consumed by the technology 1</b>			0.000	0.00	0.000
<b>Energy produced or saved 2</b>	N/A	0.000	0.000	0.00	0.000
<b>Energy consumed by the technology 2</b>			0.000	0.00	0.000
<b>Energy produced or saved 3</b>	N/A	0.000	0.000	0.00	0.000
<b>Energy consumed by the technology 3</b>			0.000	0.00	0.000

### CHP data

<b>Heat output from CHP [kWh/y]</b>	0.00	<b>CHP Fuel type</b>	N/A
<b>Electrical efficiency of CHP</b>		<b>Energy delivered to CHP [kWh/y]</b>	0
<b>Heat efficiency of CHP</b>		<b>Electrical output from CHP [kWh/y]</b>	0

## Summer internal gains

Dwelling volume [m <sup>3</sup> ]	225.000	Total gains in summer [W]	1049.65
Effective air change rate for summer period [ac/h]		Temperature increment due to gains [C]	34.15
Ventilation heat loss coefficient [W/K]	0.00	Summer mean external temperature [C]	15
Fabric heat loss coefficient [W/K]	30.73	Heat capacity parameter	0.20
Heat loss coefficient under summer conditions [W/K]	30.73	Temperature increment related to thermal mass [C]	0.60
Total Solar Gains from Summer Period	647.74	Threshold internal temperature [C]	49.75
Internal gains [W]	401.91		

## Results

	Delivered energy [kWh/y]	Primary energy [kWh/y]	CO <sub>2</sub> emissions [kgCO <sub>2</sub> /y]
Main space heating system	358	744	146
Secondary space heating system	0	0	0
Main water heating system	919	1911	376
Supplementary water heating system	0	0	0
Pumps and fans	262	545	107
Energy for lighting	169	352	69
CHP input (individual heating systems only)	0	0	0
CHP electric output (individual heating systems only)	0	0	0
<b>Renewable and energy saving technologies</b>			
Energy produced and saved	172	357	70
Energy consumed by the technology	0	0	0
<b>Total</b>	<b>1536</b>	<b>3196</b>	<b>628</b>
<b>Per m<sup>2</sup> floor area</b>	<b>20.49</b>	<b>42.61</b>	<b>8.38</b>
<b>Energy Rating</b>	<b>A2</b>		

## Part L Specification

### Property Details

<b>Dwelling Type</b>	Mid-floor apartment	<b>Type of BER rating</b>	New Dwelling - Provisional
<b>Address line 1</b>	Parkgate Street	<b>Year of Construction</b>	2019
<b>Address line 2</b>		<b>Date of Assessment</b>	27/11/2019
<b>Address line 3</b>	Dublin 8 (copy) (copy)	<b>Date of Plans</b>	
<b>County</b>	Co. Dublin	<b>Planning Reference</b>	
<b>Eircode</b>	A94X2F3	<b>Building Regulations</b>	2019 TGD L
<b>BER Number</b>		<b>Is MPRN shared with another dwelling?</b>	N/A
<b>Purpose of rating</b>	Sale	<b>MPRN No.</b>	0
<b>Comment</b>	Gas Boilers		

### Dimension Details

	Area [m <sup>2</sup> ]	Height [m]	Volume [m <sup>3</sup> ]	
Ground Floor	75.00	3.00	225.00	
First Floor	0.00	0.00	0.00	
Second Floors	0.00	0.00	0.00	
Third and other floors	0.00	0.00	0.00	
Room in roof	0.00	0.00	0.00	
Total Floor Area	75.00		225.00	
<b>Living Area [m<sup>2</sup>]</b>	25.00			<b>Living area percentage [%]</b> 33.33
<b>No of Storeys</b>	1			

### Ventilation Details

	Number		
<b>Chimneys</b>	0	<b>Has permeability test been carried out?</b>	Yes
<b>Open Flues</b>	0	<b>Structure type</b>	N/A
<b>Fans &amp; Vents</b>	4	<b>Is there a suspended wooden ground floor?</b>	No
<b>Number of flueless combustion room heaters</b>	0	<b>Percentage windows/doors draught stripped [%]</b>	100.00
<b>Is there a draught lobby on main entrance?</b>	Yes	<b>Number of sides sheltered</b>	2
<b>Ventilation method</b>	Exhaust Air Heat Pump	<b>Mechanical Ventilation Manufacturer</b>	N/A
<b>Specific fan power [W/(L/s)]</b>	0.680	<b>Mechanical Ventilation Model Name</b>	N/A
<b>Heat exchanger efficiency [%]</b>	N/A	<b>How many wetrooms (incl. kitchen)?</b>	N/A



## Building Elements - Floor Details

Type	Description	Underfloor heating	U-Value [W/m <sup>2</sup> K]	Area [m <sup>2</sup> ]
Non-Heat Loss Floor	2 Bed Apartment	N/A	0	75

## Building Elements - Roof Details

Type	Description	U-Value [W/m <sup>2</sup> K]	Area [m <sup>2</sup> ]
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## Building Elements - Wall Details

Type	Description	U-Value [W/m <sup>2</sup> K]	Area [m <sup>2</sup> ]
325mm Solid Brick	ES Facing - External Wall	0.18	12.4
325mm Solid Brick	NE.F Facing - External Wall	0.18	19.3

## Building Elements - Door Details

Description	Number of Doors	U-Value [W/m <sup>2</sup> K]	Area [m <sup>2</sup> ]
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## Building Elements - Window Details

Glazing type	User defined u-value	U-Value [W/m <sup>2</sup> K]	Area [m <sup>2</sup> ]
Double-glazed, air filled (low-E, en = 0.1, soft coat)	Yes	1.400	8.000
Double-glazed, air filled (low-E, en = 0.1, soft coat)	Yes	1.400	4.000
Double-glazed, air filled (low-E, en = 0.1, soft coat)	Yes	1.400	4.000

## Other Details

<b>Thermal bridging factor [W/m<sup>2</sup>k]</b>	0.0800	<b>Thermal mass category of dwelling</b>	Medium
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## Heating System - Solar Water Heating

<b>Solar Water Heating Present?</b>	No	<b>Aperture area of solar collector [m<sup>2</sup>]</b>	N/A
<b>Type, manufacturer, model</b>	N/A		
<b>Zero loss collector efficiency, n0</b>	N/A	<b>Collector heat loss coefficient, a1 [W/m<sup>2</sup>&gt;K]</b>	N/A
<b>Annual Solar Radiation [kWh/m<sup>2</sup>] (Refer to Appendix H in DEAP)</b>	N/A	<b>Overshading factor</b>	N/A
<b>Dedicated storage volume [Litres]</b>	N/A	<b>Combined Cylinder</b>	N/A
<b>Solar fraction [%]</b>	0.000		

## Heating System - Hot Water System

<b>Distribution Losses</b>	242.49	<b>Combi boiler present?</b>	No
<b>Supplementary electric water heating</b>	N/A	<b>Water Storage Volume [L]</b>	200
<b>Hot water storage manufacturer and model name</b>	ComfortZone EX35	<b>Declared loss factor [kWh/d]</b>	1.15
<b>Temperature factor unadjusted</b>	0.89	<b>Temperature Factor Multiplier</b>	1.1
<b>Primary Circuit loss type</b>	Boiler with insulated primary pipework and with cylinder thermostat		
<b>Is hot water storage indoors or in group heating system?</b>	Yes		

## Heating System - Dist. system losses and gains

<b>Temperature adjustment [°C]</b>	0	<b>Control Category</b>	2	<b>Responsiveness category</b>	1
<b>Central heating pumps</b>	1	<b>Oil Boiler Pump</b>	0	<b>Oil boiler pump inside dwelling</b>	No
<b>Gas boiler flue fan</b>	0	<b>Warm air heating or fan coil radiators present</b>	No		

## Heating System - Energy Requirements (Individual)

Main space heating system efficiency [%]	448.78	Space heating efficiency adjustment factor	1.0000	Main space heating fuel	Electricity
Main water heating system efficiency [%]	251.86	Water heating efficiency adjustment factor	1.0000	Main water heating fuel	Electricity
Secondary heating system efficiency [%]	N/A	Fraction of heating from secondary heating system	N/A	Secondary space heating system fuel	None
Fraction of main space and water heat from CHP	N/A	Electrical efficiency of CHP	N/A	Heat efficiency of CHP	N/A
CHP Fuel type	N/A				

## Summary for Part L Conformance (Applies to TGD L 2008/2011/2019 for new dwellings only)

BER Number		Building Regulations	2019 TGD L
BER Result	A2	Energy Value kWh/m <sup>2</sup> /yr	42.61
CO <sub>2</sub> emissions [kg/m <sup>2</sup> /yr]	8.38		
EPC	0.298	EPC Pass/Fail	Pass
CPC	0.293	CPC Pass/Fail	Pass

## Part L Conformance - Fabric

Conformity with Maximum avg U-value requirements	U-value [W/m <sup>2</sup> K]	Pass/Fail	Conformity with Maximum U-value requirements	U-Value [W/m <sup>2</sup> K]	Pass/Fail
Pitched roof insulated on ceiling	0.00	Pass	Roofs	0	Pass
Pitched roof insulated on slope	0	Pass	Walls	0.18	Pass
Flat Roof	0	Pass	Floors	0	Pass
Floors with no underfloor heat	0.00	Pass	External doors / windows / rooflights	1.40	Pass
Floors with underfloor heat	0.00	Pass			
Walls	0.18	Pass			
Percentage of opening areas [%]	21.33				
Average U value of openings	1.40	Pass			
Permeability test carried out and meets guidelines in TGD L				0.15	Pass

**Part L Conformance - Renewables (applies to TGD L 2008/2011 individual heating system)**

Type of renewable	Total contribution [kWh/y]	Part L renewable contribution [kWh/m <sup>2</sup> /y]
Solar water heating system	0.000	0.000
Heat pump as main space heating system	711.203	9.483
Heat pump as secondary space heating system	0.000	0.000
Heat pump as main water heating system	17.088	0.228
Wood/Biomass heater as main space heating system	0.000	0.000
Wood/Biomass heater as secondary heating system	0.000	0.000
Wood/Biomass heater as main water heating system	0.000	0.000
Contribution from CHP	0.000	0.000
Renewable technology 1	171.500	2.287
Renewable technology 2	0.000	0.000
Renewable technology 3	0.000	0.000
Total thermal	728.291	9.711
Total electrical	171.500	2.287
Total thermal equivalent	1157.041	15.427
Does total thermal equivalent meet part L requirement?	Pass	

**Part L Conformance - Renewables (applies to TGD L 2019 individual heating system)**

	Source	Renewables Primary Energy	Total Primary Energy	RER
+ Delivered energy	PV/Wind	356.720	356.720	
+ Delivered energy	Other	0.000	0.000	
+ Delivered energy	Solar	0.00	0.00	
+ Delivered energy	Biomass	0.000	0.000	
+ Delivered energy	Biodiesel	0.000	0.000	
+ Delivered energy	Bioethanol	0.000	0.000	
+ Environmental energy	HP	1511.990	1511.990	
+ Saved energy	CHP	0.000	0.000	
+ District heating	District Heating	0.000	0.000	
+ Delivered energy	Grid	0.000	3195.728	
+ Delivered energy	Thermal	0.000	0.000	
<b>SUBTOTAL</b>		<b>1868.710</b>	<b>5064.438</b>	<b>0.369 - Pass</b>
Energy not used in Regulated Loads	PV/Wind/CHP	0.000	0.000	
<b>TOTAL</b>		<b>1868.710</b>	<b>5064.438</b>	<b>0.369</b>

## Property details

<b>MPRN</b>	0	<b>BER Number</b>	N/A
<b>Shared MPRN</b>		<b>Previous BER</b>	
<b>Address line 1</b>	Parkgate Street	<b>Type of Rating</b>	New Dwelling - Provisional
<b>Address line 2</b>		<b>Purpose of rating</b>	Sale
<b>Address line 3</b>	Dublin 8	<b>Building Regulations</b>	2019 TGD L
<b>County</b>	Co. Dublin	<b>Planning Reference</b>	
<b>Eircode</b>	A94X2F3	<b>Date of Plans</b>	
<b>Dwelling Type</b>	Mid-floor apartment	<b>Date of Assessment</b>	27/11/2019
<b>Year of construction</b>	2019	<b>Assessor Comments</b>	Gas Boilers
<b>Dwelling Extension</b>	N/A	<b>Assessor Description</b>	EAPH - Parkgate - Fifth Floor (Middle)
<b>Storeys</b>	1		
<b>Bedrooms</b>	2		

## Dimension details

	Area [m <sup>2</sup> ]	Height [m]	Volume [m <sup>3</sup> ]
<b>Ground floor</b>	90.00	2.80	252.00
<b>First floor</b>	0.00	0.00	0.00
<b>Second floors</b>	0.00	0.00	0.00
<b>Third and other floors</b>	0.00	0.00	0.00
<b>Room in Roof</b>	0.00	0.00	0.00
<b>Totals</b>	90.00		252.00
<b>Living Area</b>	37.20 m <sup>2</sup>	<b>Living Area Percentage</b>	41.33 %

## Ventilation details

		Number	Air Change Rate [ac/h]
<b>Chimneys</b>		0	0.00
<b>Open Flues</b>		0	0.00
<b>Fans &amp; vents</b>		4	40.00
<b>Flueless combustion room heaters</b>		0	0.00
<b>Has a permeability test been carried out</b>	Yes		<b>Is there a draught lobby on main entrance?</b> Yes
<b>Infiltration rate due to structure [ac/h]</b>	0.15		<b>Draught lobby air change [ac/h]</b> 0.00
<b>Intermediate infiltration rate</b>	0.31		<b>Openings infiltration [ac/h]</b> 0.16
<b>Number of sides sheltered</b>	2		<b>Structure type</b> N/A
<b>Adjusted infiltration rate</b>	0.26		<b>Is there a suspended wooden ground floor?</b> N/A
<b>Effective air change rate [ac/h]</b>	0.58		<b>Windows/doors/attic hatches draught stripped [%]</b> 100.00
<b>Ventilation heat loss [W/K]</b>	48.22		<b>Ventilation method</b> Exhaust Air Heat Pump
<b>Adjusted result of air permeability test [ac/h]</b>	0.15		
<b>Exhaust air flow rate [m<sup>3</sup>/h]</b>	160.00		<b>How many wetrooms (inc. kitchen)? Is the vent. ducting flexible/rigid/both?</b> 3
<b>Manufacturer and Model name</b>	ComfortZone EX35		<b>Is MVHR ducting insulated where outside of insulated envelope?</b> N/A
<b>Specific fan power [W/(l/s)]</b>	0.68		<b>Adjusted heat exchanger efficiency</b> 0.00
<b>Heat exchanger efficiency [%]</b>	0.00		
<b>Electricity for ventilation fans [Kwh/y]</b>	241.80		
<b>Heat gains from ventilation fans [W]</b>	0.00		

## Building Elements - Floors

Type	Description	U/F Heating	In Roof	Age Band	Exposed Perimeter [m]	Area [m <sup>2</sup> ]	U-Value [W/m <sup>2</sup> K]	Heat Loss (AU) [W/K]
Non-Heat Loss Floor	2 Bed Apartment	N/A	No	2005 onwards	N/A	90.00	0.00	0.00
<b>Total area [m<sup>2</sup>]</b>								90.00



## Building Elements - Roofs

Type	Description	Insulation Thickness [mm]	Age Band	Area [m <sup>2</sup> ]	U-Value [W/m <sup>2</sup> K]	Heat Loss (AU) [W/K]
<b>Total area [m<sup>2</sup>]</b>						0.00

## Building Elements - Walls

Type	Description	Wall is semi-exposed	Include in compliance check	Age Band	Area [m <sup>2</sup> ]	U-Value [W/m <sup>2</sup> K]	Heat Loss (AU) [W/K]
325mm Solid Brick	N Facing - External Wall	No	No	2005 onwards	11.00	0.18	1.98
325mm Solid Brick	NF Facing - External Wall	No	No	2005 onwards	12.30	0.18	2.21
325mm Solid Brick	E Facing - External Wall	No	No	2005 onwards	10.65	0.18	1.92
<b>Total area [m<sup>2</sup>]</b>							<b>33.95</b>

## Building Elements - Doors

Count	Type	Description	Draught Stripped	Area [m <sup>2</sup> ]	U-Value [W/m <sup>2</sup> K]	Heat Loss (AU) [W/K]
<b>Total area [m<sup>2</sup>]</b>						0.00

## Building Elements - Windows

Count	Glazing Type	Frame Type	Frame Factor	Solar Transm.	In Roof	Over shading	Orient.	Area [m <sup>2</sup> ]	U-value [W/m <sup>2</sup> K]
1	Double-glazed, air filled (low-E, en = 0.1, soft coat)	Wood/PVC	0.700	0.63	No	Very Little	North	4.80	1.40
1	Double-glazed, air filled (low-E, en = 0.1, soft coat)	Wood/PVC	0.700	0.63	No	Very Little	East	2.25	1.40
1	Double-glazed, air filled (low-E, en = 0.1, soft coat)	Wood/PVC	0.700	0.63	No	Very Little	North	2.25	1.40
1	Double-glazed, air filled (low-E, en = 0.1, soft coat)	Wood/PVC	0.700	0.63	No	Very Little	North	2.25	1.40
<b>Total area [m<sup>2</sup>]</b>								<b>11.55</b>	

## Heat loss details

<b>Total glazed area [m<sup>2</sup>]</b>	11.55	<b>Glazing ratio</b>	0.06
<b>Total glazed heat loss [W/K]</b>	15.31	<b>Summer solar gain [W/m<sup>2</sup>]</b>	387.04
<b>Total effective collection area [m<sup>2</sup>]</b>	4.58	<b>Total element area [m<sup>2</sup>]</b>	11.55
<b>Total plane heat loss [W/K]</b>	21.42	<b>Thermal bridging factor [W/m<sup>2</sup>K]</b>	0.08
<b>Fabric heat loss [W/K]</b>	25.06		
<b>Total heat loss [W/K]</b>	73.29	<b>Per m2</b>	0.81

## Lighting and Internal Gains

<b>Lighting Design Calculation Method</b>	Bulb type only	<b>Average Efficacy [lm/W]</b>	66.90
<b>Fixed lighting provision [klmh/y]</b>	3315.12	<b>Top up lighting requirement [klmh/y]</b>	0.00
<b>Energy required for fixed lighting [kWh/y]</b>	88.39	<b>Energy required for top up lighting [kWh/y]</b>	0.00
<b>Energy required for portable lighting [kWh/y]</b>	138.81		
<b>Basic energy consumption for lighting [kWh/y]</b>	785.34	<b>Water heating</b>	130.39
<b>Annual energy used for lighting [kWh/m<sup>2</sup>y]</b>	227.21	<b>Occupants</b>	131.29
<b>Internal gains from lighting during heating season [kWh/hs] (In watts [W])</b>	173.81 (29.80)	<b>Mechanical ventilation</b>	0.00
<b>Lighting</b>	29.80	<b>Heat loss to the cold water network</b>	-37.63
<b>Appliance and cooking</b>	194.89	<b>Net internal gains</b>	448.73

## Water heating details

Are there distribution losses?	Yes	Is supplementary electric water heating used in summer?	N/A
Are there storage losses?	Yes	Is there a combi boiler?	No
Is there a solar water heating system?	No	Total hot water demand [kWh/y]	1729.05
Standard number of occupants	2.63	Temperature factor unadjusted	0.89
Number of mixer showers	1	Temperature Factor Multiplier	1.10
Number of electric showers	0	Hot water storage loss factor [kWh/l d]	0.00
Is there a bath present	Yes	Volume factor	0.00
Daily hot water use [Litres/d]	110.27	Combi-boiler electricity consumption [kWh/y]	0.00
Hot water energy reqs. at taps [kWh/y]	1469.69	Adjusted storage loss [kWh/y]	410.94
Distribution losses [kWh/y]	259.36	Adjusted primary circuit loss [kWh/y]	298.16
Water storage volume [Litres]	200.00	Heat gains from water heating system [W]	130.39
Is manufacturers declared loss factor available?	Yes	Output from supplementary heater [kWh/y]	0.00
Declared loss factor [kWh/d]	1.15		
Manufacturer and Model name	ComfortZone EX35		
Insulation type	None		
Insulation thickness [mm]	0		
Combi-boiler Type	None	Combi-boiler loss [kWh/y]	0.00
Keep Hot facility	None	Storage Loss	410.94
Primary Circuit loss type	Boiler with insulated primary pipework and with cylinder thermostat		
Primary circuit loss [kWh/y]	360.00	Output from main water heater [kWh/y]	2438.14
Is hot water storage indoors or in group heating system	Yes	Annual Heat gains from water heating system [kWh/y]	1142.18
		WWHRS input to main system [kWh/y]	0.00
		WWHRS input to supplementary system [kWh/y]	0.00

## Net space heat demand

Required temp. during heated hours	21.00	Length of one unheated period [h]	8
Required temperature rest of dwelling	18.00	Unheated periods per week	14
Living area percentage	41.33	Heat use during heating season [kWh/y]	1481.98
Required mean internal temperature [C]	19.24	Heat use for full year [kWh/y]	1491.30
Thermal mass category of dwelling	Medium		

	Utilisation factor	Intermittent heating
Internal heat capacity of dwelling [per m <sup>2</sup> ]	0.20	0.11
Internal heat capacity [MJ/K]	18.00	9.90

## Space heat demand details

Month	Mean Ext. Temp [C]	Adj. Int. Temp [C]	Heat Loss [W]	Heat Use [kWh]	Gain/Loss Ratio	Utilisation Factor	Heat Use [W]	Useful Gains [W]	Solar Gain [W]
January	5.3	18.32	954	338	0.53	0.99	454	499	58
February	5.5	18.33	940	264	0.60	0.98	394	547	111
March	7.0	18.43	838	175	0.77	0.93	235	602	196
April	8.3	18.51	749	85	0.99	0.85	117	631	293
May	11.0	18.69	564	16	1.50	0.64	21	543	398
June	13.5	18.86	393	2	2.25	0.44	2	390	434
July	15.5	18.99	256	0	3.31	0.30	0	256	398
August	15.2	18.97	276	0	2.83	0.35	1	276	332
September	13.3	18.85	406	7	1.68	0.58	10	397	233
October	10.4	18.65	605	75	0.97	0.86	101	504	138
November	7.5	18.46	803	216	0.65	0.97	301	503	72
December	6.0	18.36	906	313	0.54	0.98	421	485	45

## Dist. System Losses and Gains

Temperature adjustment [C]	0	Additional heat emissions due to non ideal control and responsiveness [kWh/y]	117.06
Heating system control category	2	Gross heat emission to heated space [kWh/y]	1599.04
Heating system responsiveness category	1	Mean internal temperature [C]	18.74
Mean internal temperature during heating hours [C]	19.53		

	Number present	Boiler controlled by thermostat	Inside dwelling	Electricity consumption [kWh/y]	Heat gain [W]
Central heating pumps	1	Yes	Yes	26	10
Oil boiler pumps	0	No	No	0	0
Gas boiler flue fan	0			0	
Warm air heating or fan coil radiators present	No			0	0
<b>Totals</b>				26	10

Gains from fans and pumps associated with space heating system	58	Is there underfloor heating on the ground floor?	No
Average utilisation factor, October to May	0.90	U-Value of ground floor [W/m <sup>2</sup> K]	0.00
Useful net gain [kWh/y]	52	Fraction of heating system output from ground floor	1.00
Net heat emission to heated space [kWh/y]	1547	Additional heat loss via envelope element	0.00
		Annual space heating requirement [kWh/y]	1547

## Energy Requirements: Individual Heating Systems

Efficiency of main heating system [%]	449.71	Fraction of heat from secondary system	N/A
Manufacturer name	ComfortZone	Efficiency of secondary system [%]	N/A
Model name	EX35	Energy required for main heating system [kWh/y]	343.90
Efficiency adjustment factor	1.00	Energy required for secondary heating system [kWh/y]	0
Adjusted efficiency of main heating system [%]	449.71		



<b>Fraction of main space and water heat from CHP</b>	N/A	<b>Efficiency adjustment factor</b>	1.0000
<b>Heat demand from CHP</b>	0.0	<b>Adj. efficiency of main water heating system [%]</b>	251.86
<b>Efficiency of main water heating system [%]</b>	251.86	<b>Energy req. for main water heater [kWh/y]</b>	2013.55
<b>Manufacturer name</b>	ComfortZone	<b>Energy req. for secondary water heater [kWh/y]</b>	0.00
<b>Model name</b>	EX35		

	<b>Fuel Type</b>	<b>Primary energy conversion factor</b>	<b>CO<sub>2</sub> emission factor</b>
<b>Main space heating system</b>	Electricity	2.08	0.409
<b>Secondary space heating system</b>	None	0.00	0.000
<b>Main water heating system</b>	Electricity	2.08	0.409
<b>Pumps, fans</b>		2.08	0.409
<b>Energy for lighting</b>		2.08	0.409

	<b>Type</b>	<b>Part L Total Contribution [kWh/y]</b>	<b>Delivered Energy [kWh/y]</b>	<b>Primary energy conversion factor</b>	<b>CO<sub>2</sub> emission factor [kg/kWh]</b>
<b>Energy produced or saved 1</b>	Electrical (Solar PV/Wind)	171.500	171.500	0.00	0.000
<b>Energy consumed by the technology 1</b>			0.000	0.00	0.000
<b>Energy produced or saved 2</b>	N/A	0.000	0.000	0.00	0.000
<b>Energy consumed by the technology 2</b>			0.000	0.00	0.000
<b>Energy produced or saved 3</b>	N/A	0.000	0.000	0.00	0.000
<b>Energy consumed by the technology 3</b>			0.000	0.00	0.000

### CHP data

<b>Heat output from CHP [kWh/y]</b>	0.00	<b>CHP Fuel type</b>	N/A
<b>Electrical efficiency of CHP</b>		<b>Energy delivered to CHP [kWh/y]</b>	0
<b>Heat efficiency of CHP</b>		<b>Electrical output from CHP [kWh/y]</b>	0

## Summer internal gains

Dwelling volume [m <sup>3</sup> ]	252.000	Total gains in summer [W]	835.77
Effective air change rate for summer period [ac/h]		Temperature increment due to gains [C]	33.35
Ventilation heat loss coefficient [W/K]	0.00	Summer mean external temperature [C]	15
Fabric heat loss coefficient [W/K]	25.06	Heat capacity parameter	0.20
Heat loss coefficient under summer conditions [W/K]	25.06	Temperature increment related to thermal mass [C]	0.60
Total Solar Gains from Summer Period	387.04	Threshold internal temperature [C]	48.95
Internal gains [W]	448.73		

## Results

	Delivered energy [kWh/y]	Primary energy [kWh/y]	CO <sub>2</sub> emissions [kgCO <sub>2</sub> /y]
Main space heating system	344	715	141
Secondary space heating system	0	0	0
Main water heating system	968	2014	396
Supplementary water heating system	0	0	0
Pumps and fans	268	557	110
Energy for lighting	227	473	93
CHP input (individual heating systems only)	0	0	0
CHP electric output (individual heating systems only)	0	0	0
<b>Renewable and energy saving technologies</b>			
Energy produced and saved	172	357	70
Energy consumed by the technology	0	0	0
<b>Total</b>	<b>1635</b>	<b>3402</b>	<b>669</b>
<b>Per m<sup>2</sup> floor area</b>	<b>18.17</b>	<b>37.80</b>	<b>7.43</b>
<b>Energy Rating</b>	<b>A2</b>		

## Part L Specification

### Property Details

<b>Dwelling Type</b>	Mid-floor apartment	<b>Type of BER rating</b>	New Dwelling - Provisional
<b>Address line 1</b>	Parkgate Street	<b>Year of Construction</b>	2019
<b>Address line 2</b>		<b>Date of Assessment</b>	27/11/2019
<b>Address line 3</b>	Dublin 8	<b>Date of Plans</b>	
<b>County</b>	Co. Dublin	<b>Planning Reference</b>	
<b>Eircode</b>	A94X2F3	<b>Building Regulations</b>	2019 TGD L
<b>BER Number</b>		<b>Is MPRN shared with another dwelling?</b>	N/A
<b>Purpose of rating</b>	Sale	<b>MPRN No.</b>	0
<b>Comment</b>	Gas Boilers		

### Dimension Details

	Area [m <sup>2</sup> ]	Height [m]	Volume [m <sup>3</sup> ]	
Ground Floor	90.00	2.80	252.00	
First Floor	0.00	0.00	0.00	
Second Floors	0.00	0.00	0.00	
Third and other floors	0.00	0.00	0.00	
Room in roof	0.00	0.00	0.00	
Total Floor Area	90.00		252.00	
<b>Living Area [m<sup>2</sup>]</b>	37.20		<b>Living area percentage [%]</b>	41.33
<b>No of Storeys</b>	1			

### Ventilation Details

	Number		
<b>Chimneys</b>	0	<b>Has permeability test been carried out?</b>	Yes
<b>Open Flues</b>	0	<b>Structure type</b>	N/A
<b>Fans &amp; Vents</b>	4	<b>Is there a suspended wooden ground floor?</b>	No
<b>Number of flueless combustion room heaters</b>	0	<b>Percentage windows/doors draught stripped [%]</b>	100.00
<b>Is there a draught lobby on main entrance?</b>	Yes	<b>Number of sides sheltered</b>	2
<b>Ventilation method</b>	Exhaust Air Heat Pump	<b>Mechanical Ventilation Manufacturer</b>	N/A
<b>Specific fan power [W/(L/s)]</b>	0.680	<b>Mechanical Ventilation Model Name</b>	N/A
<b>Heat exchanger efficiency [%]</b>	N/A	<b>How many wetrooms (incl. kitchen)?</b>	N/A

## Building Elements - Floor Details

Type	Description	Underfloor heating	U-Value [W/m <sup>2</sup> K]	Area [m <sup>2</sup> ]
Non-Heat Loss Floor	2 Bed Apartment	N/A	0	90

## Building Elements - Roof Details

Type	Description	U-Value [W/m <sup>2</sup> K]	Area [m <sup>2</sup> ]
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## Building Elements - Wall Details

Type	Description	U-Value [W/m <sup>2</sup> K]	Area [m <sup>2</sup> ]
325mm Solid Brick	N Facing - External Wall	0.18	11
325mm Solid Brick	NF Facing - External Wall	0.18	12.3
325mm Solid Brick	E Facing - External Wall	0.18	10.65

## Building Elements - Door Details

Description	Number of Doors	U-Value [W/m <sup>2</sup> K]	Area [m <sup>2</sup> ]
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## Building Elements - Window Details

Glazing type	User defined u-value	U-Value [W/m <sup>2</sup> K]	Area [m <sup>2</sup> ]
Double-glazed, air filled (low-E, en = 0.1, soft coat)	Yes	1.400	4.800
Double-glazed, air filled (low-E, en = 0.1, soft coat)	Yes	1.400	2.250
Double-glazed, air filled (low-E, en = 0.1, soft coat)	Yes	1.400	2.250
Double-glazed, air filled (low-E, en = 0.1, soft coat)	Yes	1.400	2.250

## Other Details

<b>Thermal bridging factor [W/m<sup>2</sup>k]</b>	0.0800	<b>Thermal mass category of dwelling</b>	Medium
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### Heating System - Solar Water Heating

<b>Solar Water Heating Present?</b>	No	<b>Aperture area of solar collector [m<sup>2</sup>]</b>	N/A
<b>Type, manufacturer, model</b>	N/A		
<b>Zero loss collector efficiency, n0</b>	N/A	<b>Collector heat loss coefficient, a1 [W/m<sup>2</sup>&gt;K]</b>	N/A
<b>Annual Solar Radiation [kWh/m<sup>2</sup>] (Refer to Appendix H in DEAP)</b>	N/A	<b>Overshading factor</b>	N/A
<b>Dedicated storage volume [Litres]</b>	N/A	<b>Combined Cylinder</b>	N/A
<b>Solar fraction [%]</b>	0.000		

### Heating System - Hot Water System

<b>Distribution Losses</b>	259.36	<b>Combi boiler present?</b>	No
<b>Supplementary electric water heating</b>	N/A	<b>Water Storage Volume [L]</b>	200
<b>Hot water storage manufacturer and model name</b>	ComfortZone EX35	<b>Declared loss factor [kWh/d]</b>	1.15
<b>Temperature factor unadjusted</b>	0.89	<b>Temperature Factor Multiplier</b>	1.1
<b>Primary Circuit loss type</b>	Boiler with insulated primary pipework and with cylinder thermostat		
<b>Is hot water storage indoors or in group heating system?</b>	Yes		

### Heating System - Dist. system losses and gains

<b>Temperature adjustment [°C]</b>	0	<b>Control Category</b>	2	<b>Responsiveness category</b>	1
<b>Central heating pumps</b>	1	<b>Oil Boiler Pump</b>	0	<b>Oil boiler pump inside dwelling</b>	No
<b>Gas boiler flue fan</b>	0	<b>Warm air heating or fan coil radiators present</b>	No		

## Heating System - Energy Requirements (Individual)

Main space heating system efficiency [%]	449.71	Space heating efficiency adjustment factor	1.0000	Main space heating fuel	Electricity
Main water heating system efficiency [%]	251.86	Water heating efficiency adjustment factor	1.0000	Main water heating fuel	Electricity
Secondary heating system efficiency [%]	N/A	Fraction of heating from secondary heating system	N/A	Secondary space heating system fuel	None
Fraction of main space and water heat from CHP	N/A	Electrical efficiency of CHP	N/A	Heat efficiency of CHP	N/A
CHP Fuel type	N/A				

## Summary for Part L Conformance (Applies to TGD L 2008/2011/2019 for new dwellings only)

BER Number		Building Regulations	2019 TGD L
BER Result	A2	Energy Value kWh/m <sup>2</sup> /yr	37.80
CO <sub>2</sub> emissions [kg/m <sup>2</sup> /yr]	7.43		
EPC	0.293	EPC Pass/Fail	Pass
CPC	0.287	CPC Pass/Fail	Pass

## Part L Conformance - Fabric

Conformity with Maximum avg U-value requirements	U-value [W/m <sup>2</sup> K]	Pass/Fail	Conformity with Maximum U-value requirements	U-Value [W/m <sup>2</sup> K]	Pass/Fail
Pitched roof insulated on ceiling	0.00	Pass	Roofs	0	Pass
Pitched roof insulated on slope	0	Pass	Walls	0.18	Pass
Flat Roof	0	Pass	Floors	0	Pass
Floors with no underfloor heat	0.00	Pass	External doors / windows / rooflights	1.40	Pass
Floors with underfloor heat	0.00	Pass			
Walls	0.18	Pass			
Percentage of opening areas [%]	12.83				
Average U value of openings	1.40	Pass			
Permeability test carried out and meets guidelines in TGD L				0.15	Pass

**Part L Conformance - Renewables (applies to TGD L 2008/2011 individual heating system)**

Type of renewable	Total contribution [kWh/y]	Part L renewable contribution [kWh/m <sup>2</sup> /y]
Solar water heating system	0.000	0.000
Heat pump as main space heating system	686.806	7.631
Heat pump as secondary space heating system	0.000	0.000
Heat pump as main water heating system	18.006	0.200
Wood/Biomass heater as main space heating system	0.000	0.000
Wood/Biomass heater as secondary heating system	0.000	0.000
Wood/Biomass heater as main water heating system	0.000	0.000
Contribution from CHP	0.000	0.000
Renewable technology 1	171.500	1.906
Renewable technology 2	0.000	0.000
Renewable technology 3	0.000	0.000
Total thermal	704.812	7.831
Total electrical	171.500	1.906
Total thermal equivalent	1133.562	12.595
Does total thermal equivalent meet part L requirement?	Pass	

**Part L Conformance - Renewables (applies to TGD L 2019 individual heating system)**

	Source	Renewables Primary Energy	Total Primary Energy	RER
+ Delivered energy	PV/Wind	356.720	356.720	
+ Delivered energy	Other	0.000	0.000	
+ Delivered energy	Solar	0.00	0.00	
+ Delivered energy	Biomass	0.000	0.000	
+ Delivered energy	Biodiesel	0.000	0.000	
+ Delivered energy	Bioethanol	0.000	0.000	
+ Environmental energy	HP	1548.334	1548.334	
+ Saved energy	CHP	0.000	0.000	
+ District heating	District Heating	0.000	0.000	
+ Delivered energy	Grid	0.000	3401.754	
+ Delivered energy	Thermal	0.000	0.000	
<b>SUBTOTAL</b>		<b>1905.054</b>	<b>5306.808</b>	<b>0.359 - Pass</b>
Energy not used in Regulated Loads	PV/Wind/CHP	0.000	0.000	
<b>TOTAL</b>		<b>1905.054</b>	<b>5306.808</b>	<b>0.359</b>