

Property details

| | | | |
|-----------------------------|----------------|---|-------------------------------|
| MPRN | 0 | Shared MPRN | |
| BER Number | N/A | BER number assigned to shared dwelling | N/A |
| Address line 1 | Earth House, | Type of Rating | Existing Dwelling |
| Address line 2 | Derrynalecka, | Purpose of Rating | Major Renovation |
| Address line 3 | | Building Regulations | 2019 TGD L |
| County | Co. Mayo | Planning Reference | |
| Eircode | F12HP63 | Date of Plans | |
| Dwelling Type | Detached house | Assessor Name | |
| Year of construction | 2008 | Date of Assessment | 17/06/2021 |
| Dwelling Extension | N/A | Assessor Comments | |
| Storeys | 2 | Assessor Description | Earth House - Plus New Boiler |

Dimension details

| | Area [m ²] | Height [m] | Volume [m ³] |
|-------------------------------|------------------------|-------------------------------|--------------------------|
| Ground floor | 134.74 | 2.50 | 336.85 |
| First floor | 0.00 | 0.00 | 0.00 |
| Second floor | 0.00 | 0.00 | 0.00 |
| Third and other floors | 0.00 | 0.00 | 0.00 |
| Room in Roof | 76.67 | 2.44 | 187.07 |
| Totals | 211.41 | | 523.92 |
| Living Area | 17.64 m ² | Living Area Percentage | 8.34 % |

Ventilation details

| | | Number | Air Change Rate [ac/h] |
|---|--|---|--|
| Chimneys | | 0 | 0.00 |
| Open Flues | | 0 | 0.00 |
| Fans & vents | | 0 | 0.00 |
| Flueless combustion room heaters | | 0 | 0.00 |
| Has a permeability test been carried out | No | | |
| Infiltration rate due to structure [ac/h] | 0.50 | Is there a draught lobby on main entrance? | No |
| Intermediate infiltration rate | 0.55 | Draught lobby air change [ac/h] | 0.05 |
| Number of sides sheltered | 1 | Openings infiltration [ac/h] | 0.05 |
| Adjusted infiltration rate [ac/h] | 0.51 | Structure type | Masonry |
| Effective air change rate [ac/h] | 0.56 | Is there a suspended wooden ground floor? | No |
| Ventilation heat loss [W/K] | 96.61 | Windows/doors/attic hatches draught stripped [%] | 100.00 |
| Adjusted result of air permeability test [ac/h] | 0.00 | Ventilation method | Balanced whole-house mechanical ventilation with heat recovery |
| Manufacturer and Model name | Vent Axia Sentennial Model B Plus | How many wetrooms (inc. kitchen)? Is the vent. ducting flexible/rigid/both? | 2+k |
| Specific fan power [W/(l/s)] | 0.63 | Is MVHR ducting uninsulated where outside of insulated envelope? | No |
| Heat exchanger efficiency [%] | 90.00 | Adjusted heat exchanger efficiency | 90.00 |
| Electricity for ventilation fans [Kwh/y] | 402.69 | | |
| Heat gains from ventilation fans [W] | 19.80 | | |

Building Elements - Floors

| Type | Description | U/F Heating | In Roof | Age Band | Exposed Perimeter [m] | Area [m ²] | U-Value [W/m ² K] | Heat Loss (AU) [W/K] |
|-----------------------------------|-------------|-------------|---------|------------|-----------------------|------------------------|------------------------------|----------------------|
| Ground Floor - Solid | | No | No | 2005 -2009 | 35 | 134.74 | 0.31 | 41.77 |
| Non-Heat Loss Floor | | N/A | Yes | 2005 -2009 | N/A | 76.67 | 0.00 | 0.00 |
| Total area [m²] | | | | | | | | 211.41 |

Building Elements - Roofs

| Type | Description | Insulation Thickness [mm] | Age Band | Area [m ²] | U-Value [W/m ² K] | Heat Loss (AU) [W/K] |
|-----------------------------------|-------------------------------------|---------------------------|------------|------------------------|------------------------------|----------------------|
| | Pitched Roof - Insulated on Ceiling | | 2005 -2009 | 48.37 | 0.13 | 6.29 |
| | Pitched Roof - Insulated on Ceiling | | 2005 -2009 | 121.70 | 0.14 | 17.04 |
| Total area [m²] | | | | | | 170.07 |

Building Elements - Walls

| Type | Description | Wall is semi-exposed | Include in compliance check | Age Band | Area [m ²] | U-Value [W/m ² K] | Heat Loss (AU) [W/K] |
|-----------------------------------|--------------|----------------------|-----------------------------|------------|------------------------|------------------------------|----------------------|
| | 300mm Cavity | No | No | 2005 -2009 | 126.35 | 0.27 | 34.11 |
| Total area [m²] | | | | | | | 126.35 |

Building Elements - Doors

| Count | Type | Description | Draught Stripped | Area [m ²] | U-Value [W/m ² K] | Heat Loss (AU) [W/K] |
|-----------------------------------|--------------------|-------------|------------------|------------------------|------------------------------|----------------------|
| 2 | Solid exposed door | | Yes | 3.70 | 3.00 | 11.10 |
| Total area [m²] | | | | | | 7.40 |

Building Elements - Windows

| Count | Glazing Type | Frame Type | Frame Factor | Solar Transm. | In Roof | Over shading | Orient. | Area [m ²] | U-value [W/m ² K] |
|-----------------------------------|---|------------|--------------|---------------|---------|--------------------|---------|------------------------|------------------------------|
| 1 | Double-glazed, air filled (low-E, en = 0.05, soft coat) | Wood/PVC | 0.700 | 0.630 | No | Average or Unknown | South | 5.22 | 1.70 |
| 1 | Double-glazed, air filled (low-E, en = 0.05, soft coat) | Wood/PVC | 0.700 | 0.630 | No | Average or Unknown | North | 7.56 | 1.70 |
| 1 | Double-glazed, air filled (low-E, en = 0.05, soft coat) | Wood/PVC | 0.700 | 0.630 | No | Average or Unknown | West | 5.94 | 1.70 |
| 1 | Double-glazed, air filled (low-E, en = 0.05, soft coat) | Wood/PVC | 0.700 | 0.630 | No | Average or Unknown | East | 0.60 | 1.70 |
| Total area [m²] | | | | | | | | 19.32 | |

Heat loss details

| | | | |
|--|--------|---|--------|
| Total glazed area [m²] | 19.32 | Glazing ratio | 0.04 |
| Total glazed heat loss [W/K] | 30.75 | Summer solar gain [W/m²] | 675.06 |
| Total effective collection area [m²] | 5.9 | Total element area [m²] | 457.88 |
| Total plane heat loss [W/K] | 152.16 | Thermal bridging factor [W/m²K] | 0.1500 |
| Fabric heat loss [W/K] | 220.84 | | |
| Total heat loss [W/K] | 317.45 | Per m2 | 1.50 |

Lighting and Internal Gains

| | | | |
|---|----------------|---|--------|
| Lighting Design Calculation Method | Bulb type only | Average Efficacy [lm/W] | 66.90 |
| Fixed lighting provision [klmh/y] | 5927.94 | Top up lighting requirement [klmh/y] | 0.00 |
| Energy required for fixed lighting [kWh/y] | 158.06 | Energy required for top up lighting [kWh/y] | 0.00 |
| Energy required for portable lighting [kWh/y] | 248.22 | | |
| Basic energy consumption for lighting [kWh/y] | 1254.04 | Water heating (In watts [W]) | 257.30 |
| Annual energy used for lighting [kWh/y] | 406.28 | Occupants (In watts [W]) | 150.84 |
| Internal gains from lighting during heating season [kWh/hs] (In watts [W]) | 310.80 (53.29) | Mechanical ventilation (In watts [W]) | 19.80 |
| Lighting (In watts [W]) | 53.29 | Heat loss to the cold water network (In watts [W]) | -41.15 |
| Appliance and cooking (In watts [W]) | 348.01 | Net internal gains (In watts [W]) | 788.10 |

Lights

| Count | Name | Description | Type | Efficiency | Power [W] |
|-------|-----------------|-------------|---------|------------|-----------|
| 1 | Default LED/CFL | | LED/CFL | 66.90 | |

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] | 1893.04 |
| Standard number of occupants | 3.02 | Temperature factor unadjusted | 0.60 |
| Number of mixer showers | 3 | Temperature Factor Multiplier | 1.30 |
| Number of electric showers | 1 | Hot water storage loss factor [kWh/l d] | 0.02 |
| Number of baths | 1 | Volume factor | 0.95 |
| Daily hot water use [Litres/d] | 120.72 | Combi-boiler electricity consumption [kWh/y] | 0.00 |
| Hot water energy reqs. at taps [kWh/y] | 1609.09 | Adjusted storage loss [kWh/y] | 907.37 |
| Distribution losses [kWh/y] | 283.96 | Adjusted primary circuit loss [kWh/y] | 1070.06 |
| Water storage volume [Litres] | 140.00 | Heat gains from water heating system [W] | 257.30 |
| Is manufacturers declared loss factor available? | No | Output from supplementary heater [kWh/y] | 0.00 |
| Declared loss factor [kWh/d] | 0.00 | | |
| Manufacturer and Model name | | | |
| Insulation type | Factory Insulated | | |
| Insulation thickness [mm] | 25 | | |

| Type of mixer shower | Flow restriction | Flow rate [l/min] | HW usage [l/day] | WWHRS Manufacturer/Model | WWHRS efficiency | WWHRS Utilisation Factor | Energy Savings [kWh/yr] |
|-------------------------|------------------|-------------------|------------------|--------------------------|------------------|--------------------------|-------------------------|
| Vented hot water system | No | 7.000 | | Any / Any | | | |
| Total : | | | 45.50 | | | | 0.00 |

| | | | |
|--|---|--|---------|
| Combi-boiler Type | None | Output from main water heater [kWh/y] | 3870.47 |
| Combi-boiler loss [kWh/y] | 0.00 | Annual Heat gains from water heating system [kWh/y] | 2253.97 |
| Keep Hot facility | None | WWHRS input to main system [kWh/y] | 0.00 |
| Storage Loss | 907.37 | WWHRS input to supplementary system [kWh/y] | 0.00 |
| Storage Type | Cylinder, indirect | | |
| Primary Circuit loss type | Boiler with uninsulated primary pipework and no cylinder thermostat | | |
| Primary circuit loss [kWh/y] | 1220.00 | Heat Pump Type of DHW | None |
| Is hot water storage indoors or in group heating system | Yes | | |

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 | 8.34 | Heat use during heating season [kWh/y] | 11578.33 |
| Required mean internal temperature [C] | 18.25 | Heat use for full year [kWh/y] | 12036.49 |
| Thermal mass category of dwelling | Medium-high | | |

Utilisation factor

Intermittent heating

| | | |
|--|-------|-------|
| Internal heat capacity of dwelling [per m ²] | 0.32 | 0.15 |
| Internal heat capacity [MJ/K] | 67.65 | 31.71 |

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 | 17.12 | 3751 | 2098 | 0.25 | 1.00 | 2820 | 931 | 144 |
| February | 5.5 | 17.13 | 3693 | 1785 | 0.28 | 1.00 | 2656 | 1037 | 251 |
| March | 7.0 | 17.27 | 3259 | 1566 | 0.36 | 1.00 | 2104 | 1154 | 371 |
| April | 8.3 | 17.38 | 2882 | 1161 | 0.44 | 0.99 | 1613 | 1269 | 494 |
| May | 11.0 | 17.62 | 2100 | 572 | 0.67 | 0.95 | 769 | 1331 | 612 |
| June | 13.5 | 17.83 | 1376 | 156 | 1.03 | 0.82 | 217 | 1159 | 623 |
| July | 15.5 | 18.01 | 797 | 18 | 1.72 | 0.56 | 24 | 773 | 582 |
| August | 15.2 | 17.98 | 884 | 33 | 1.49 | 0.64 | 44 | 839 | 531 |
| September | 13.3 | 17.82 | 1434 | 251 | 0.85 | 0.89 | 349 | 1085 | 428 |
| October | 10.4 | 17.56 | 2274 | 890 | 0.48 | 0.99 | 1196 | 1078 | 305 |
| November | 7.5 | 17.31 | 3114 | 1546 | 0.31 | 1.00 | 2147 | 967 | 181 |
| December | 6.0 | 17.18 | 3549 | 1960 | 0.26 | 1.00 | 2635 | 914 | 127 |

Space Heating

| Manufacturer & Model | Type | Space Heating Standard | Fuel | Design flow temp[°C] | Daily Operation [h] | SH Seasonal eff. | WH Seasonal eff. | Heats water |
|--|---------------------|------------------------|------|----------------------|---------------------|------------------|------------------|-------------|
| Grant Engineering, Vortex Wall Hung Module 40-55 | Gas and oil boilers | N/A | Oil | 0 | 0 | 94.9 | 94.9 | Yes |

Dist. System Losses and Gains

| | | | |
|--|-------|---|----------|
| Temperature adjustment [C] | 0.6 | Additional heat emissions due to non ideal control and responsiveness [kWh/y] | 2871.74 |
| Heating system control category | 1 | Gross heat emission to heated space [kWh/y] | 14450.07 |
| Heating system responsiveness category | 1 | Mean internal temperature [C] | 18.87 |
| Mean internal temperature during heating hours [C] | 19.95 | | |

| | Number present | Boiler controlled by thermostat | Inside dwelling | Electricity consumption [kWh/y] | Heat gain [W] |
|--|----------------|---------------------------------|-----------------|---------------------------------|---------------|
| Central heating pumps | 2 | No | Yes | 338 | 20 |
| Oil boiler pumps | 1 | No | No | 130 | 0 |
| Gas boiler flue fan | 0 | | | 0 | |
| Warm air heating or fan coil radiators present | No | | | 0 | 0 |
| Totals | | | | 468 | 20 |

Note: Wet central heating systems are likely to have one or more central heating pumps.

| | | | |
|--|-------|---|-------|
| Gains from fans and pumps associated with space heating system | 117 | Is there underfloor heating on the ground floor? | No |
| Average utilisation factor, October to May | 0.99 | U-Value of ground floor [W/m ² K] | 0.00 |
| Useful net gain [kWh/y] | 115 | Fraction of heating system output from ground floor | 0.67 |
| Net heat emission to heated space [kWh/y] | 14335 | Additional heat loss via envelope element | 0.00 |
| | | Annual space heating requirement [kWh/y] | 14335 |

Energy Requirements: Individual Heating Systems

| | | | |
|--|-------------------------------|--|----------|
| Efficiency of main heating system [%] | 94.9 | Fraction of heat from secondary system | N/A |
| Manufacturer name | Grant Engineering | Efficiency of secondary system [%] | N/A |
| Model name | Vortex Wall Hung Module 40-55 | Energy required for main heating system [kWh/y] | 15899.98 |
| Efficiency adjustment factor | 0.95 | Energy required for secondary heating system [kWh/y] | 0 |
| Adjusted efficiency of main heating system [%] | 90.16 | | |

| | | | |
|---|-------------------------------|---|---------|
| Fraction of main space and water heat from CHP | N/A | Efficiency adjustment factor | 0.9500 |
| Heat demand from CHP | 0.0 | Adj. efficiency of main water heating system [%] | 90.16 |
| Efficiency of main water heating system [%] | 94.9 | Water Heating Efficiency, η_{wh} | 94.9 |
| Manufacturer name | Grant Engineering | Energy req. for main water heater [kWh/y] | 4722.45 |
| Model name | Vortex Wall Hung Module 40-55 | Energy req. for secondary water heater [kWh/y] | 0.00 |
| Heat Pump Type | N/A | Water Heating Standard | N/A |

| | Fuel Type | Primary energy conversion factor | CO₂ emission factor |
|---------------------------------------|------------------|---|---------------------------------------|
| Main space heating system | Heating Oil | 1.10 | 0.272 |
| Secondary space heating system | None | 0.00 | 0.000 |
| Main water heating system | Heating Oil | 1.10 | 0.272 |
| Pumps, fans | Electricity | 2.08 | 0.409 |
| Energy for lighting | Electricity | 2.08 | 0.409 |

CHP data

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

Summer internal gains

| | | | |
|---|---------|---|---------|
| Dwelling volume [m ³] | 523.925 | Total gains in summer [W] | 1463.16 |
| Effective air change rate for summer period [ac/h] | | Temperature increment due to gains [C] | 6.63 |
| Ventilation heat loss coefficient [W/K] | 0.00 | Summer mean external temperature [C] | 15 |
| Fabric heat loss coefficient [W/K] | 220.84 | Heat capacity parameter | 0.32 |
| Heat loss coefficient under summer conditions [W/K] | 220.84 | Temperature increment related to thermal mass [C] | 0.00 |
| Total Solar Gains from Summer Period | 675.06 | Threshold internal temperature [C] | 21.63 |
| Internal gains [W] | 788.10 | | |

Results

| | Delivered energy [kWh/y] | Primary energy [kWh/y] | CO ₂ emissions [kgCO ₂ /y] |
|---|--------------------------|------------------------|--|
| Main space heating system | 15900 | 17490 | 4325 |
| Secondary space heating system | 0 | 0 | 0 |
| Main water heating system | 4293 | 4722 | 1168 |
| Supplementary water heating system | 0 | 0 | 0 |
| Pumps and fans | 1041 | 2165 | 426 |
| Energy for lighting | 406 | 845 | 166 |
| CHP input (individual heating systems only) | 0 | 0 | 0 |
| CHP electric output (individual heating systems only) | 0 | 0 | 0 |
| Renewable and energy saving technologies | | | |
| Energy produced and saved | 0 | 0 | 0 |
| Energy consumed by the technology | 0 | 0 | 0 |
| Total | 21640 | 25223 | 6084 |
| Per m² floor area | 102.36 | 119.31 | 28.78 |
| Energy Rating | B2 | | |