



## Multi Family House



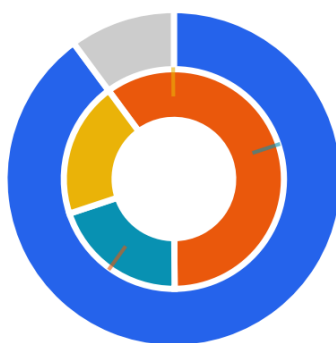
|                      |           |
|----------------------|-----------|
| Region               | south     |
| Municipality Size    | rural     |
| Municipality Growth  | growing   |
| Age Class            | 2002-2009 |
| Adjacency            | terraced  |
| Net leased area [m²] | 2190.0    |
| Storey Height [m]    | 2.7       |
| Storeys a.g.         | 3.0       |



## Building Performance (KPIs)

| KPI                                                                         | Mean       | 95% CI      | Unit                            | CV   | n <sub>Sim</sub> |
|-----------------------------------------------------------------------------|------------|-------------|---------------------------------|------|------------------|
| Final heat energy demand - per year                                         | 99580.65   | ± 6212.37   | kWh/a                           | 0.59 | 90               |
| Final heat energy demand - per m² net leased area and year                  | 45.40      | ± 2.69      | kWh/m²a                         | 0.56 | 90               |
| Carbon footprint (GWP) from heat energy - per year                          | 24879.63   | ± 1552.12   | kgCO <sub>2</sub> eq,B6/a       | 0.59 | 90               |
| Carbon footprint (GWP) from heat energy - per m² net leased area and year   | 11.34      | ± 0.67      | kgCO <sub>2</sub> eq,B6/m²a     | 0.56 | 90               |
| Life Cycle Carbon footprint (GWP) - over 50 years                           | 1642394.38 | ± 100399.77 | kgCO <sub>2</sub> eq,full/50a   | 0.58 | 90               |
| Life Cycle Carbon footprint (GWP) - per m² net leased area and for 50 years | 748.03     | ± 43.15     | kgCO <sub>2</sub> eq,full/m²50a | 0.55 | 90               |

## ABC



- Operational (89.0%)
- Exterior walls (6.00%)
- Foundation (2.00%)
- Windows (2.00%)
- Roof (0.00%)

| Building element | D [kgCO <sub>2</sub> eq/50a] |
|------------------|------------------------------|
| Exterior walls   | -150.4                       |
| Roof             | 101.3                        |
| Foundation       | 177.6                        |
| Windows          | -3,723                       |



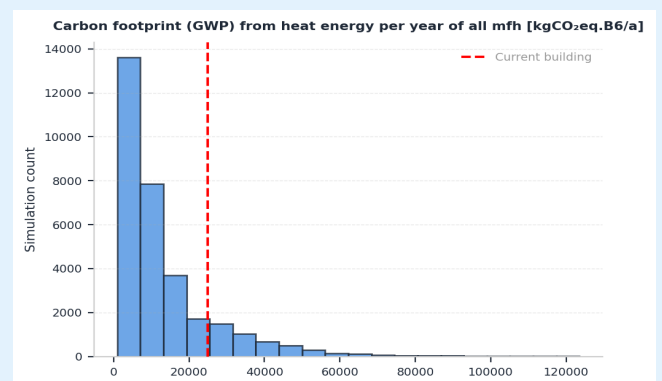
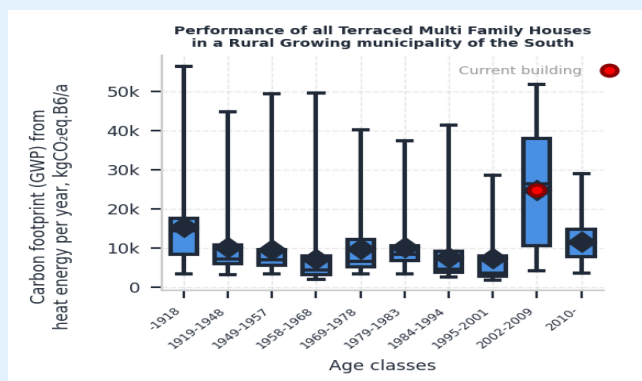
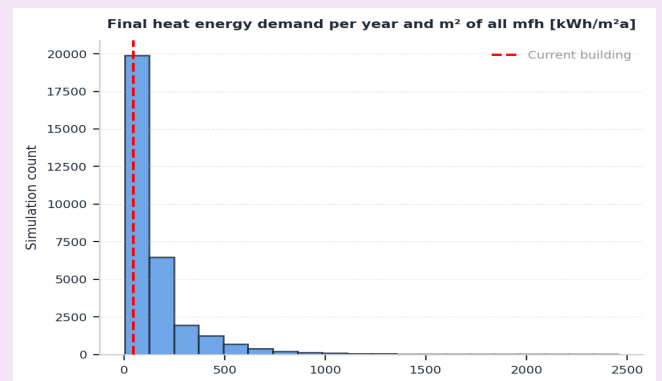
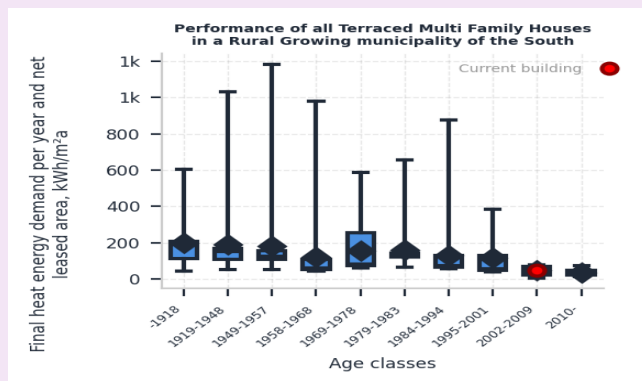
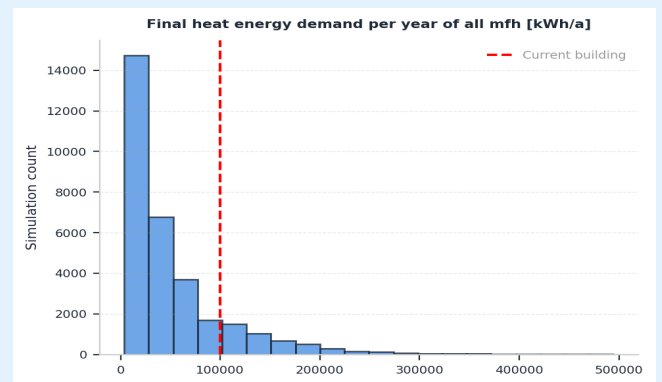
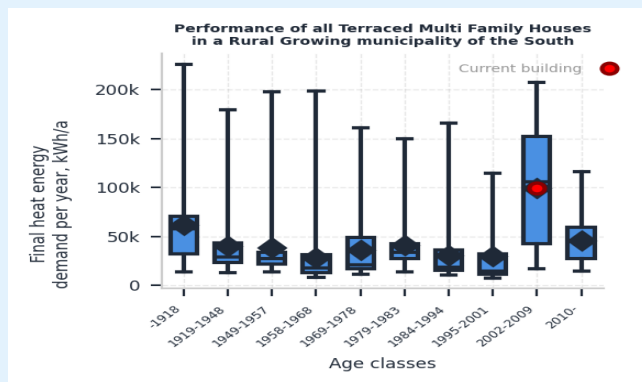
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## Building Performance





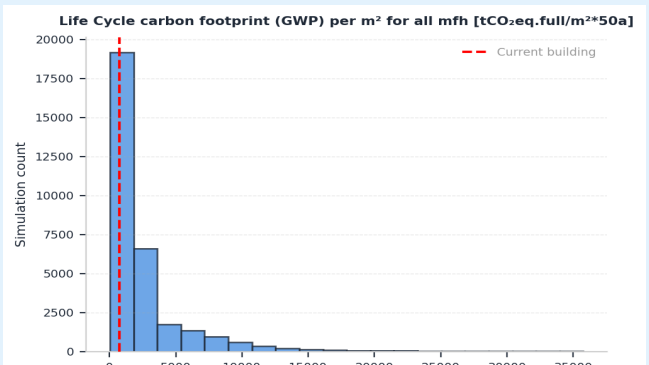
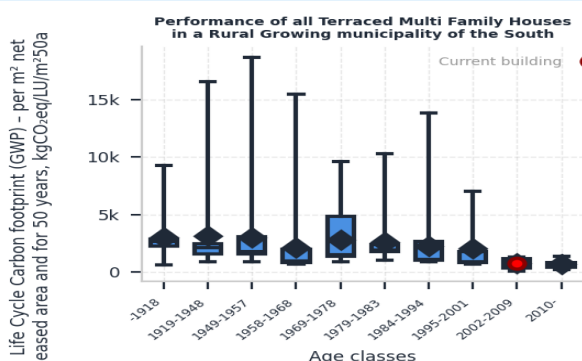
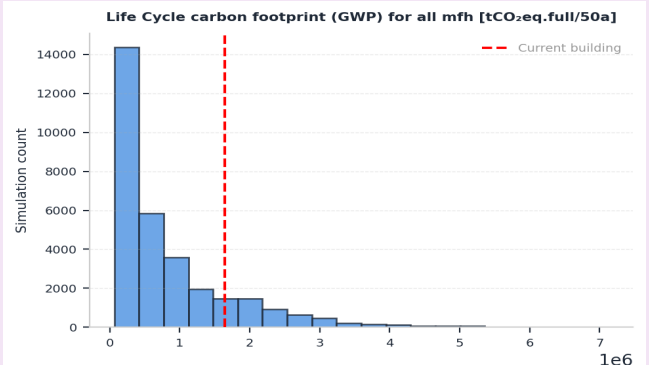
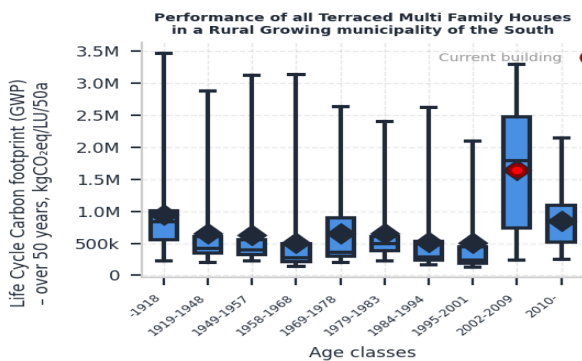
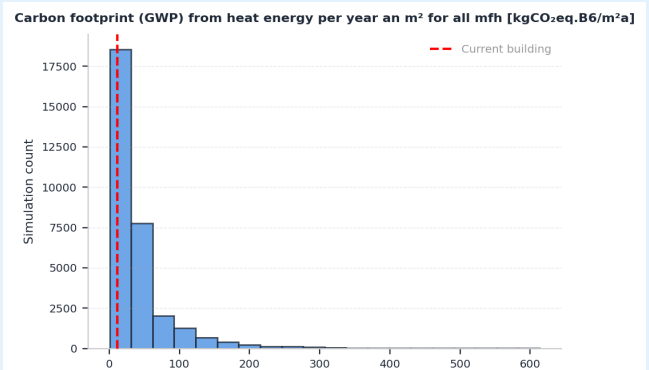
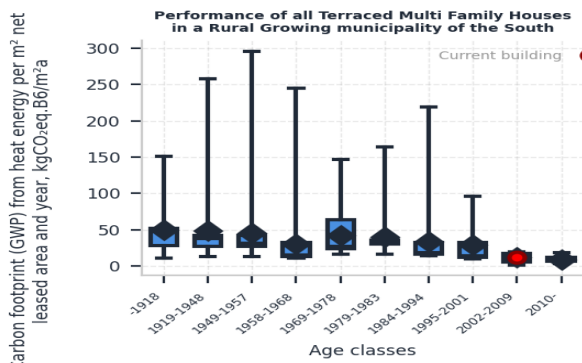
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### Exterior Wall

| Type: massive | U [W/m²K]     |            |            |
|---------------|---------------|------------|------------|
|               | Actual: 0.490 | Min: 0.160 | Max: 0.600 |

| Layer | Material Name               | t <sub>i</sub> [m] | ρ <sub>i</sub> [kg/m³] | λ <sub>i</sub> [W/mK] | c <sub>i</sub> [J/kgK] | EPD <sub>1</sub> | EPD <sub>2</sub> |
|-------|-----------------------------|--------------------|------------------------|-----------------------|------------------------|------------------|------------------|
| 0     | insulating plaster          | 0.02               | 1291                   | 0.39                  | 1291                   | 5                | -                |
| 1     | concrete_CEM_II_BS325R_wz05 | 0.175              | 2420                   | 2.1                   | 1000                   | 7                | -                |
| 2     | EPS_040_15                  | 0.07               | 15                     | 0.04                  | 1500                   | 2                | -                |

### Interior Wall

| U [W/m²K]     |            |            |
|---------------|------------|------------|
| Actual: 2.420 | Min: 0.140 | Max: 0.300 |

| Layer | Material Name | t <sub>i</sub> [m] | ρ <sub>i</sub> [kg/m³] | λ <sub>i</sub> [W/mK] | c <sub>i</sub> [J/kgK] | EPD <sub>1</sub> | EPD <sub>2</sub> |
|-------|---------------|--------------------|------------------------|-----------------------|------------------------|------------------|------------------|
| 0     | lime plaster  | 0.01               | 1600                   | 0.7                   | 850                    | 5                | -                |
| 1     | solid brick   | 0.15               | 1800                   | 0.7                   | 850                    | 7                | -                |
| 2     | lime plaster  | 0.01               | 1600                   | 0.7                   | 850                    | 2                | -                |

### Roof

| Type: wooden | U [W/m²K]     |            |            |
|--------------|---------------|------------|------------|
|              | Actual: 0.210 | Min: 0.140 | Max: 0.300 |

| Layer | Material Name | t <sub>i</sub> [m] | ρ <sub>i</sub> [kg/m³] | λ <sub>i</sub> [W/mK] | c <sub>i</sub> [J/kgK] | EPD <sub>1</sub> | EPD <sub>2</sub> |
|-------|---------------|--------------------|------------------------|-----------------------|------------------------|------------------|------------------|
| 0     | plasterboard  | 0.0125             | 732                    | 0.21                  | 1384                   | 1                | -                |
| 1     | rafters       | 0.08               | 455                    | 0.14                  | 1500                   | 12               | -                |
| 2     | mineral wool  | 0.15               | 60                     | 0.04                  | 850                    | 3                | -                |
| 3     | roof battens  | 0.02               | 600                    | 0.14                  | 1500                   | 11               | -                |
| 4     | gravel        | 0.03               | 750                    | 0.19                  | 920                    | 8                | -                |



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### Foundation

| Type: massive | U [W/m²K]     |            |            |
|---------------|---------------|------------|------------|
|               | Actual: 0.550 | Min: 0.160 | Max: 0.600 |

| Layer | Material Name               | t <sub>i</sub> [m] | ρ <sub>i</sub> [kg/m³] | λ <sub>i</sub> [W/mK] | c <sub>i</sub> [J/kgK] | EPD <sub>1</sub> | EPD <sub>2</sub> |
|-------|-----------------------------|--------------------|------------------------|-----------------------|------------------------|------------------|------------------|
| 0     | floating cement screed      | 0.04               | 1940                   | 1.4                   | 1000                   | 13               | -                |
| 1     | EPS_040_15                  | 0.06               | 15                     | 0.04                  | 1500                   | 2                | -                |
| 2     | concrete_CEM_II_BS325R_wz05 | 0.16               | 2420                   | 2.1                   | 1000                   | 7                | -                |

### Floor

| U [W/m²K]     |            |            |
|---------------|------------|------------|
| Actual: 2.420 | Min: 0.140 | Max: 0.300 |

| Layer | Material Name          | t <sub>i</sub> [m] | ρ <sub>i</sub> [kg/m³] | λ <sub>i</sub> [W/mK] | c <sub>i</sub> [J/kgK] | EPD <sub>1</sub> | EPD <sub>2</sub> |
|-------|------------------------|--------------------|------------------------|-----------------------|------------------------|------------------|------------------|
| 0     | floating cement screed | 0.04               | 1940                   | 1.4                   | 1000                   | 13               | -                |
| 1     | EPS_040_15             | 0.06               | 15                     | 0.04                  | 1500                   | 2                | -                |
| 2     | reinforced concrete    | 0.16               | 2104                   | 1.94                  | 776                    | 7                | -                |

### Window System

| Glazing | EPD <sub>Gl</sub> | Frame type | EPD <sub>Fr</sub> | window wall share |
|---------|-------------------|------------|-------------------|-------------------|
| 2       | 10                | pvc        | 4                 | 0.14096           |

### Heating System

| Generator 1                  | EPD | Heating energy carrier | EPD |
|------------------------------|-----|------------------------|-----|
| boiler_gas_medium_condensing | 9   | gas                    | 6   |



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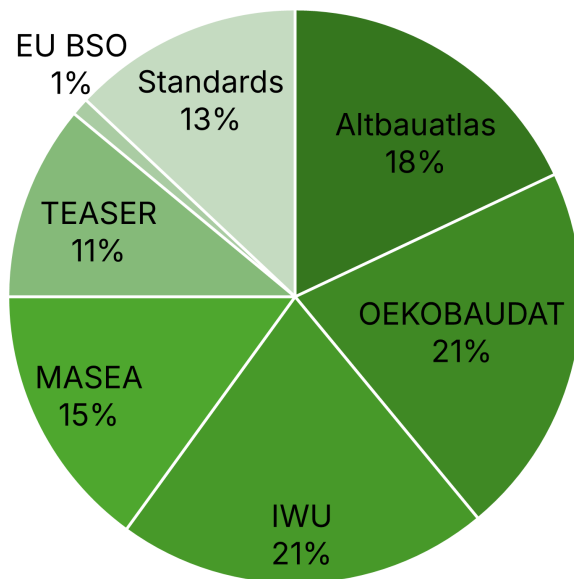


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## EPD Summary Table

| SPN | Full EPD ID                          | Material Title                                                           |
|-----|--------------------------------------|--------------------------------------------------------------------------|
| 1   | 0773f90c-78ef-4727-a966-3b005c1a1469 | PLASTERBOARD / Tool                                                      |
| 2   | 205b761d-e344-49c3-a3a9-bb1bfd59b916 | Expanded Polystyrene (EPS) Foam Insulation (density 15 kg/m³)            |
| 3   | 50d421e2-3a7b-4659-92a4-f20d6a52fcf0 | Mineral wool (facade insulation)                                         |
| 4   | 73de9e80-8ed2-47d8-b5b6-854c84166f24 | Window sash PVC-U                                                        |
| 5   | 7e8801e0-c0e4-4995-bf8a-883181f6aa20 | ETICS gluing and coating mineral lightweight plaster                     |
| 6   | 84aa7483-9824-49a9-a3e3-f9fb092ea7b7 | Use - 1 kWh of final energy from gas calorific value (according to GEG)  |
| 7   | Synthetic_2                          | Concrete C30/37 with reinforcement steel                                 |
| 8   | a7bad3b6-2123-483b-99b5-2ec481254be7 | Gravel 2/32 (dried)                                                      |
| 9   | ce333ecb-6cad-441c-9dae-70966acf9333 | Gas condensing boiler 20-120 kW (upright unit)                           |
| 10  | dcf38066-e336-46a7-b0a8-b2453dd2872d | Window glass, single                                                     |
| 11  | e70d9027-5315-481c-92e2-7b7d8a02eaba | holzius ? solid wood slab elements                                       |
| 12  | efa55966-4f29-4f15-bfec-8c08b3945923 | Glued laminated timber                                                   |
| 13  | fe371be5-c72f-4203-8569-a085ef375ba4 | CALCIUM SULPHATE FLOWING SCREED AND CONVENTIONAL CALCIUM SULPHATE SCREED |



This archetype represents :

- 0.15% of all Multi-Family Houses
- 0.36% of all Multi-Family Houses of the specific region
- 0.63% of all Multi-Family Houses of the specific region and municipality type

| Data source | Link                                                                                                                                                           |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Altbauatlas | <a href="https://www.altbauatlas.de/index.php">https://www.altbauatlas.de/index.php</a>                                                                        |
| OEKOBAUDAT  | <a href="https://www.oekobaudat.de/en.html">https://www.oekobaudat.de/en.html</a>                                                                              |
| IWU         | <a href="https://datenbasis.iwu.de/">https://datenbasis.iwu.de/</a><br><a href="https://wohngebaeuedaten2016.iwu.de/">https://wohngebaeuedaten2016.iwu.de/</a> |
| MASEA       | <a href="https://www.masea-ensan.de/">https://www.masea-ensan.de/</a>                                                                                          |
| TEASER      | <a href="https://ebc-tools.eonerc.rwth-aachen.de/en/teaser">https://ebc-tools.eonerc.rwth-aachen.de/en/teaser</a>                                              |
| EU BSO      | <a href="https://building-stock-observatory.energy.ec.europa.eu/database/">https://building-stock-observatory.energy.ec.europa.eu/database/</a>                |