



Education Building



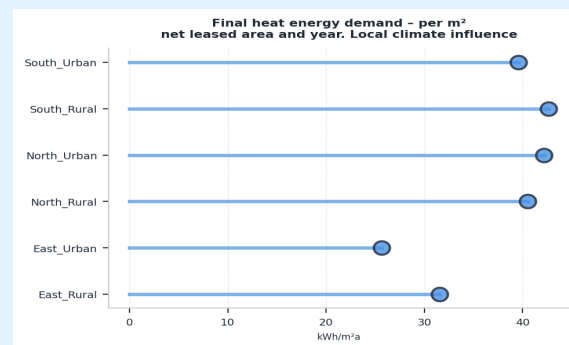
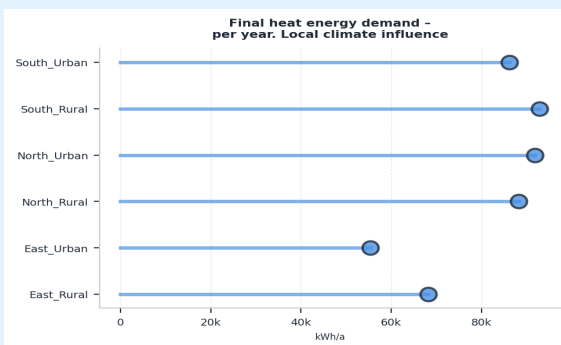
Net leased area [m²]	2179.3
Bldg Height [m]	8.0
Storeys a.g.	1.8
Storeys b.g.	0.5



Building Performance (KPIs)

KPI	Mean	95% CI	Unit	CV	n _{Sim}
Final heat energy demand - per year	75843.60	± 1302.56	kWh/a	0.47	3240
Final heat energy demand - per m² net leased area and year	34.90	± 0.44	kWh/m²a	0.38	3240
Carbon footprint (GWP) from heat energy - per year	18970.39	± 324.70	kgCO ₂ eq,B6/a	0.47	3240
Carbon footprint (GWP) from heat energy - per m² net leased area and year	8.73	± 0.11	kgCO ₂ eq,B6/m²a	0.38	3240
Life Cycle Carbon footprint (GWP) - over 50 years	1391680.54	± 24482.16	kgCO ₂ eq,full/50a	0.49	3240
Life Cycle Carbon footprint (GWP) - per m² net leased area and for 50 years	640.06	± 8.37	kgCO ₂ eq,full/m²50a	0.40	3240

Local Climate Influence

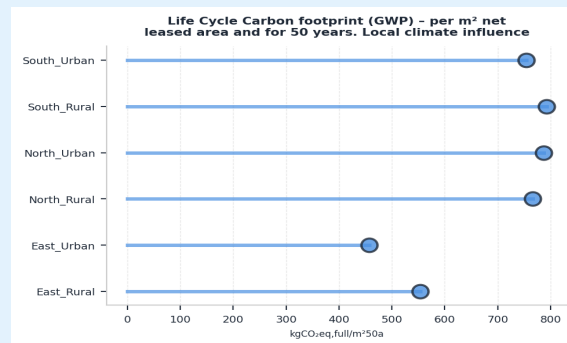
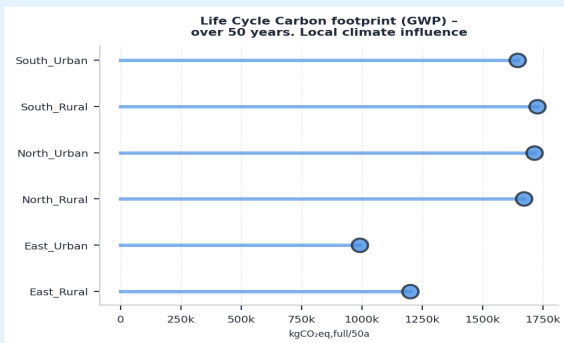
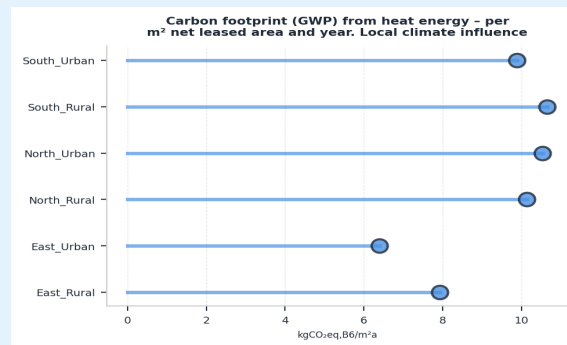
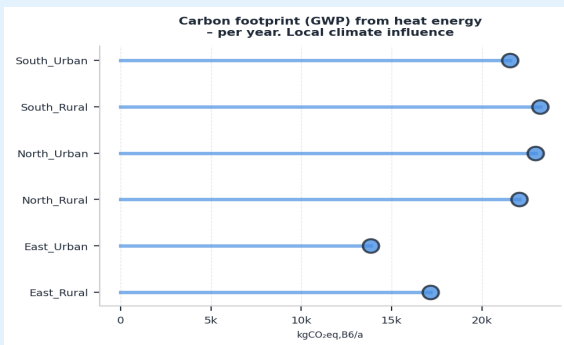




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Mean Life Cycle GWP

ABC



- Operational (82.0%)
- Exterior walls (7.00%)
- Roof (3.00%)
- Foundation (4.00%)
- Windows (4.00%)

Building element	D [kgCO ₂ eq/50a]
Exterior walls	2,032
Roof	-2,183
Foundation	1,003
Windows	-5,517



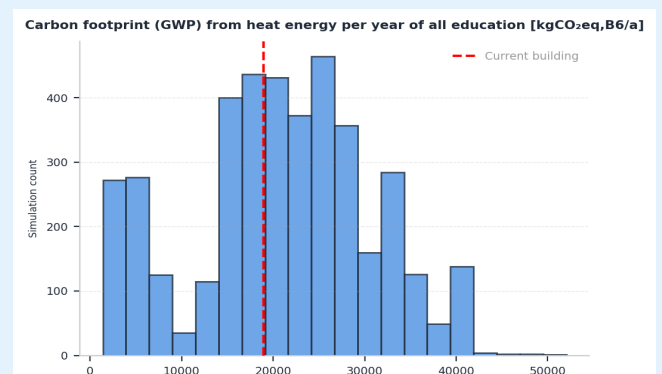
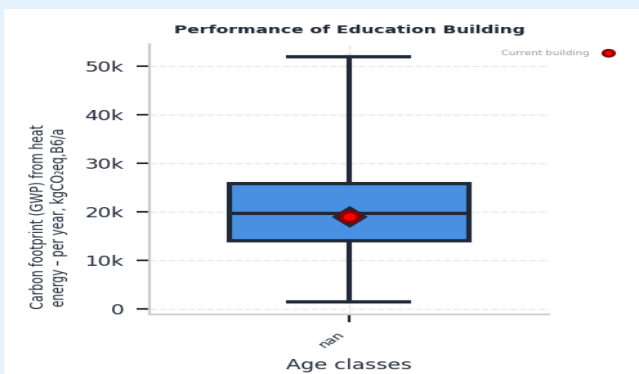
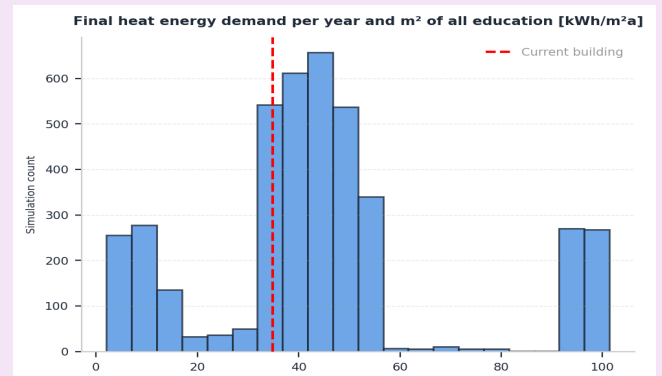
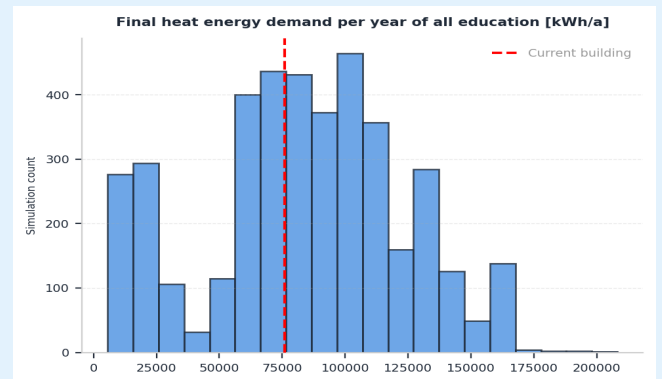
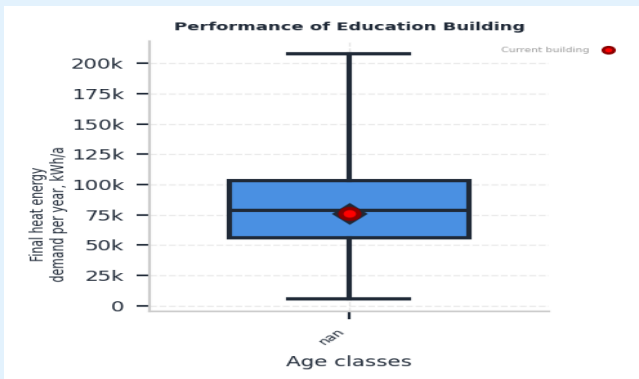
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Building Performance





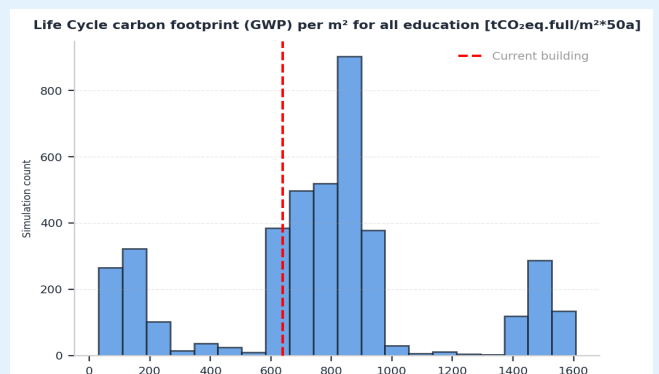
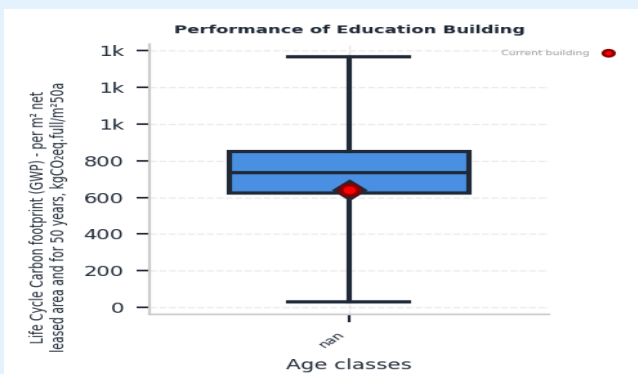
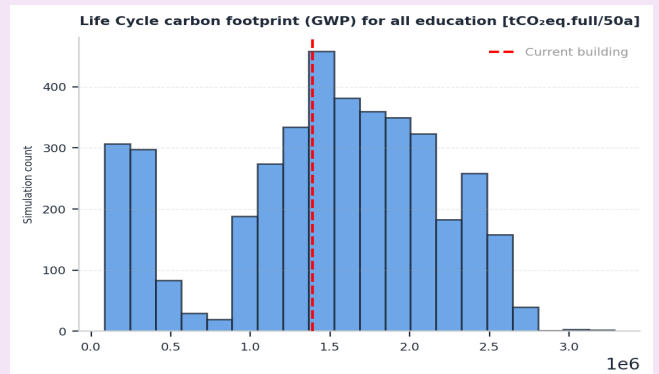
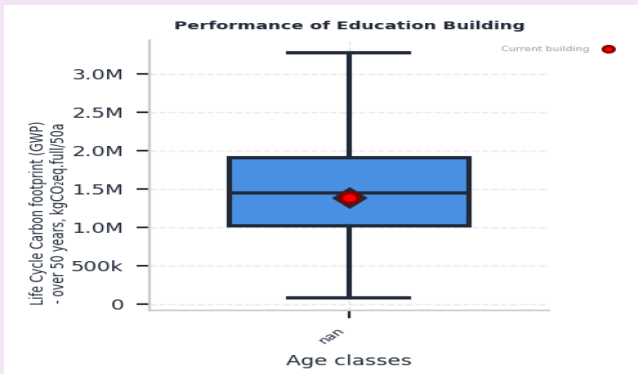
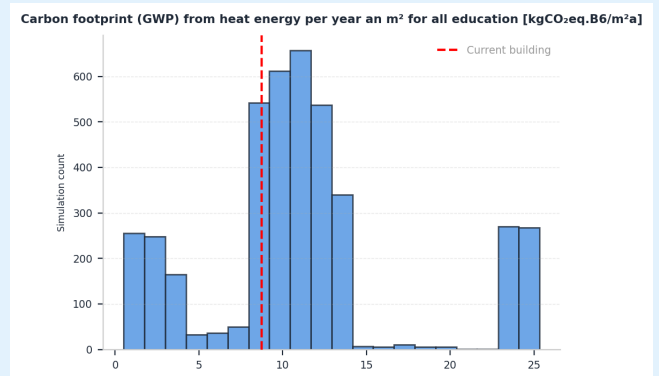
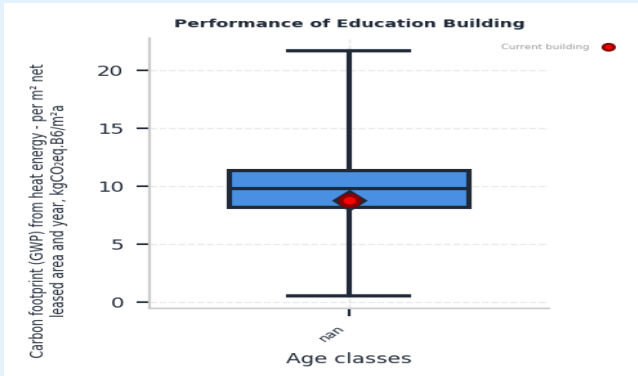
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Building Performance





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Net leased area [m²]	2179.3
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Exterior Wall

Type: massive

U [W/m²K]: 0.27

Layer	Material Name	t_i [cm]	ρ_i [kg/m³]	λ_i [W/mK]	c_i [J/kgK]	EPD ₁	EPD ₂
0	interior plaster	1	1400	0.7	850	6	-
1	precast reinforced concrete	32.75	2400	2.04	776	7	-
2	mineral wool	4.13	60	0.04	850	3	-
3	resting air layer	6	1.184	0.026	1.005	8	-
4	concrete weather shell	12	2400	2.04	776	7	-

Interior Wall

U [W/m²K]: 4.04

Layer	Material Name	t_i [cm]	ρ_i [kg/m³]	λ_i [W/mK]	c_i [J/kgK]	EPD ₁	EPD ₂
0	lime plaster	1	1600	0.7	850	6	-
1	reinforced concrete	10	2100	2.04	776	7	-
2	lime plaster	1	1600	0.7	850	3	-

Roof

U [W/m²K]: 0.15

Layer	Material Name	t_i [cm]	ρ_i [kg/m³]	λ_i [W/mK]	c_i [J/kgK]	EPD ₁	EPD ₂
0	interior plaster	1	1400	0.7	850	6	-
1	reinforced concrete	29	2400	2.1	776	7	-
2	rafters	8	600	0.13	1500	11	-
3	mineral wool	12.91	60	0.04	850	3	-
4	moving air layer	6	1.184	0.026	1.005	8	-
5	roof tiles	2	1786	0.55	889	9	-



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Foundation

U [W/m²K]: 0.68

Layer	Material Name	t_i [cm]	ρ_i [kg/m³]	λ_i [W/mK]	c_i [J/kgK]	EPD ₁	EPD ₂
0	floating cement screed	4	1940	1.4	1000	12	-
1	stone wool	10	60	0.09	840	1	-
2	reinforced concrete	22	2104	1.94	776	7	-

Floor

U [W/m²K]: 4.04

Layer	Material Name	t_i [cm]	ρ_i [kg/m³]	λ_i [W/mK]	c_i [J/kgK]	EPD ₁	EPD ₂
0	floating cement screed	4.5	2200	2	1000	12	-
1	EPS_040_15	6	15	0.04	1500	2	-
2	reinforced concrete	24.875	2104	1.94	776	7	-

Window System

Glazing	EPD _{Gl}	Frame type	EPD _{Fr}	Shading type	EPD _{Sh}
2	10	pvc	4	-	-

Heating System

Unit type	Generator	EPD _{HEG}	Heating energy carrier	EPD _{HEC}
per_bldg	boiler_gas_large_condensing	13	gas	5



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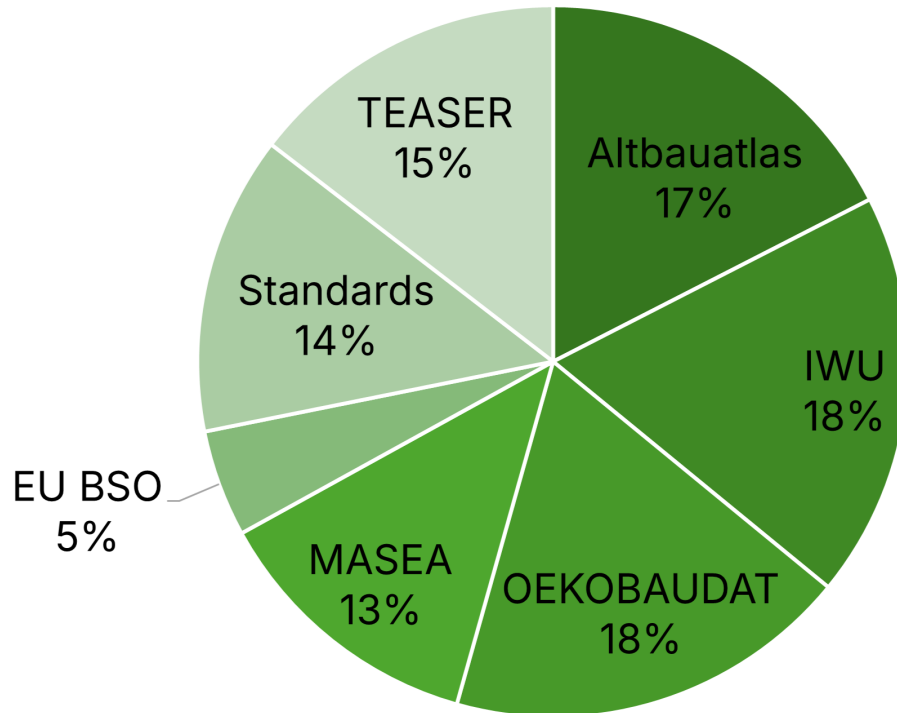


Façade length [m]							
N		S		E		W	
Mean	SE	Mean	SE	Mean	SE	Mean	SE
41.22	7.04	40.96	7.02	41.37	7.15	40.6	7.16

Façade area [m²]							
N		S		E		W	
Mean	SE	Mean	SE	Mean	SE	Mean	SE
357.76	80.46	354.39	79.63	354.28	77.39	348.34	76.08

EPD Summary Table

Serial No.	Full UUID	Material Name
1	155a3b83-ed73-4462-a4f1-69ce64e24981	Mineral wool insulation (high bulk density range)
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	84aa7483-9824-49a9-a3e3-f9fb092ea7b7	Use - 1 kWh of final energy from gas calorific value (according to GEG)
6	9a670d29-efb9-4fde-95ab-182a0b1e7280	Lime gypsum interior plaster
7	Synthetic_2	Concrete C30/37 with reinforcement steel
8	Synthetic_8	Air layer
9	a6d60a75-7a4e-4dfc-87cc-fd40f68d279a	Roofing tiles (including accessories)
10	dcf38066-e336-46a7-b0a8-b2453dd2872d	Window glass, single
11	efa55966-4f29-4f15-bfec-8c08b3945923	Glued laminated timber
12	fe371be5-c72f-4203-8569-a085ef375ba4	CALCIUM SULPHATE FLOWING SCREED AND CONVENTIONAL CALCIUM SULPHATE SCREED
13	fe91b985-60da-45dc-b3fd-29b9e632d49f	Gas condensing boiler120-400 kW (upright unit)



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

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