

Energy Performance Evaluation

[Project Number] SABLES OLLONNES

Key Values

General Project Data

Project Name: SABLES OLLONNES
 City Location:
 Latitude: 46° 29' 50" N
 Longitude: 1° 47' 0" W
 Altitude: 0.00 m
 Climate Data Source: Strusoft server
 Evaluation Date: 7/5/2019 12:26:27 PM

Heat Transfer Coefficients

U value [W/m²K]
 Building Shell Average: **0.22**
 Floors: **0.08 - 0.08**
 External: **0.08 - 0.15**
 Underground: --
 Openings: **0.90 - 0.90**

Specific Annual Values

Net Heating Energy: **8.79** kWh/m²a
 Net Cooling Energy: **7.70** kWh/m²a
 Total Net Energy: **16.49** kWh/m²a
 Energy Consumption: **78.58** kWh/m²a
 Fuel Consumption: **0.80** kWh/m²a
 Primary Energy: **85.51** kWh/m²a
 Fuel Cost: **0.16** EUR/m²a
 CO₂ Emission: **0.01** kg/m²a

Building Geometry Data

Gross Floor Area: **67.38** m²
 Treated Floor Area: **61.72** m²
 External Envelope Area: **178.61** m²
 Ventilated Volume: **190.48** m³
 Glazing Ratio: **10** %

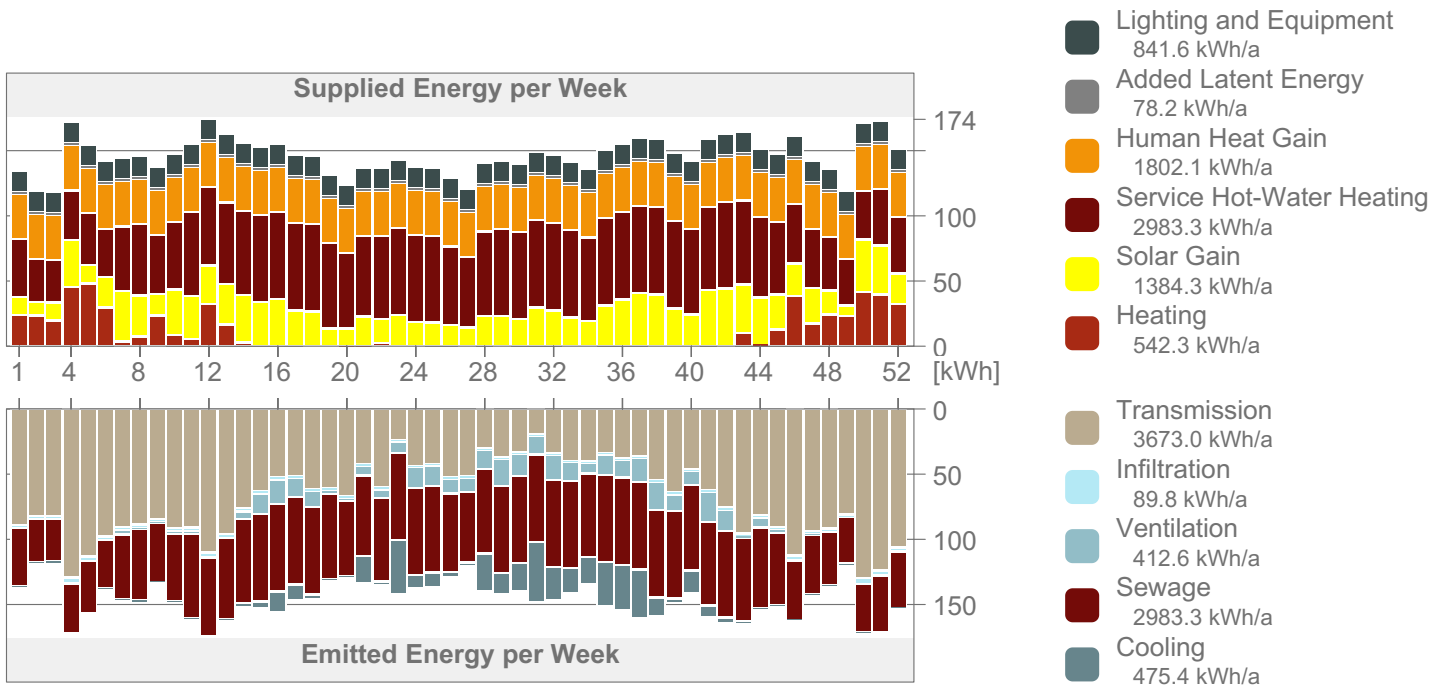
Building Shell Performance Data

Infiltration at 50Pa: **0.41** ACH

Degree Days

Heating (HDD): **2667.67**
 Cooling (CDD): **1221.85**

Project Energy Balance



Thermal Blocks

Thermal Block	Zones Assigned	Operation Profile	Gross Floor Area m ²	Volume m ³
001 LIVING AREAS	1	Residential	67.38	190.48
Total:	1		67.38	190.48

Energy Performance Evaluation

[Project Number] SABLES OLLONNES

001 LIVING AREAS - Key Values

Geometry Data

Gross Floor Area:	67.38	m ²
Treated Floor Area:	61.72	m ²
Building Shell Area:	178.61	m ²
Ventilated Volume:	190.48	m ³
Glazing Ratio:	10	%

Internal Temperature

Min. (22:00 Dec. 15):	22.86	°C
Annual Mean:	24.13	°C
Max. (16:00 Sep. 16):	25.87	°C

Unmet Load Hours

Heating:	0	hrs/a
Cooling:	0	hrs/a

Heat Transfer Coefficients

	U value	[W/m ² K]
Floors:	0.08 - 0.08	
External:	0.08 - 0.15	
Underground:	-	
Openings:	0.90 - 0.90	

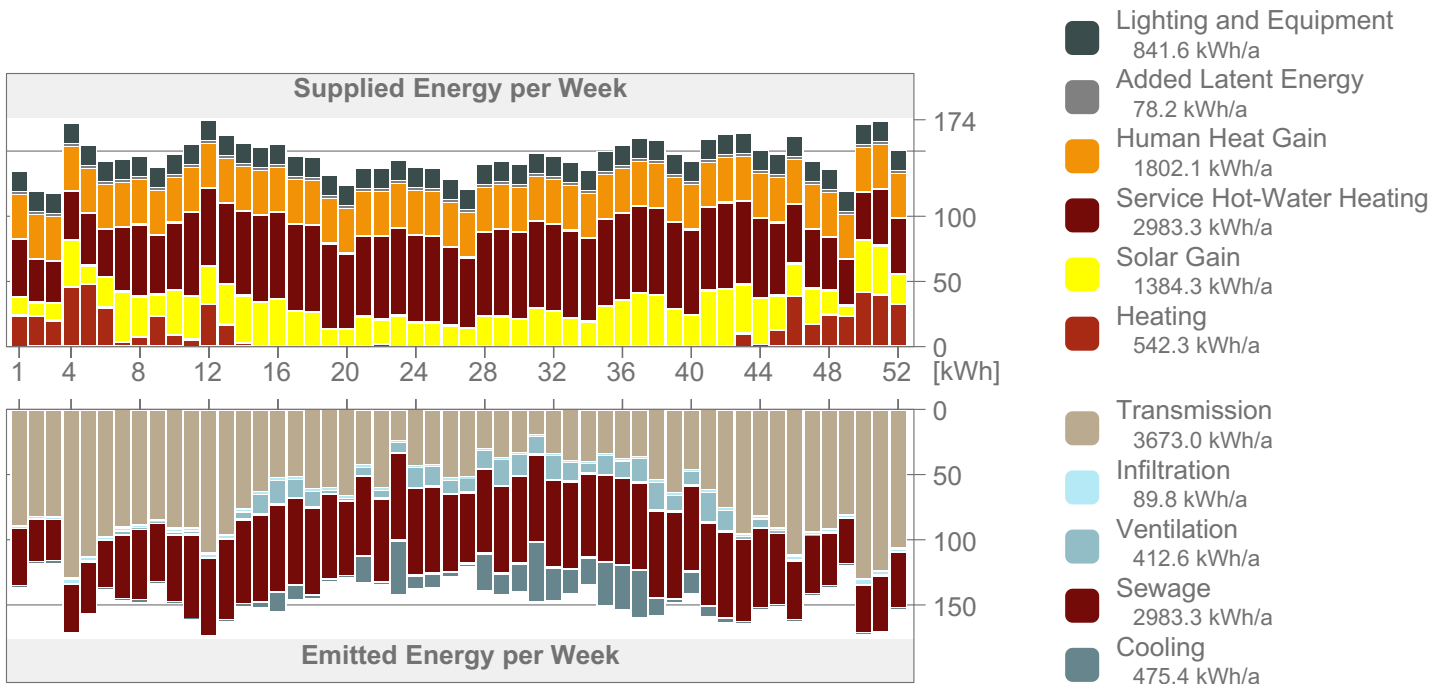
Annual Supplies

Heating:	542.26	kWh
Cooling:	475.36	kWh

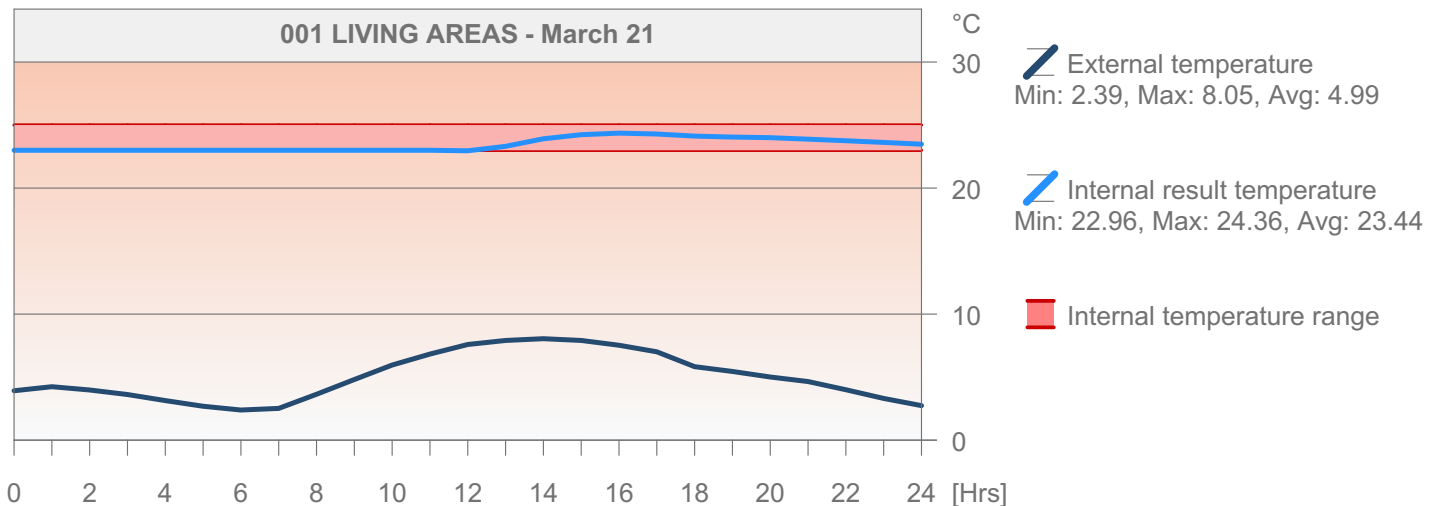
Peak Loads

Heating (06:00 Jan. 26):	0.83	kW
Cooling (15:00 Aug. 26):	0.74	kW

001 LIVING AREAS Energy Balance

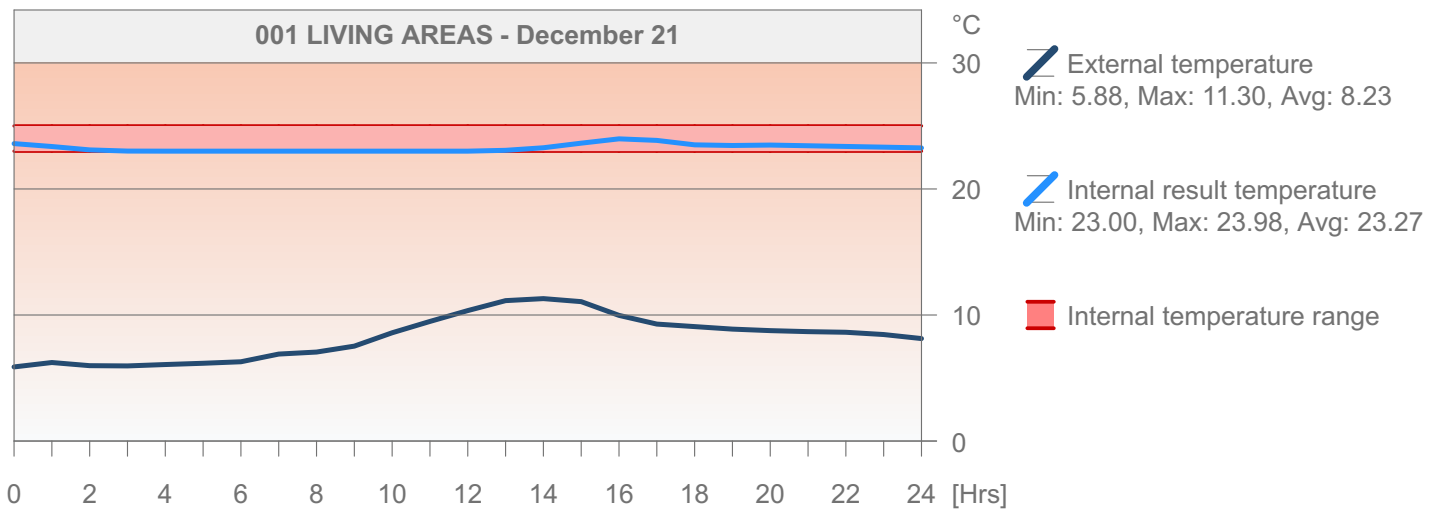
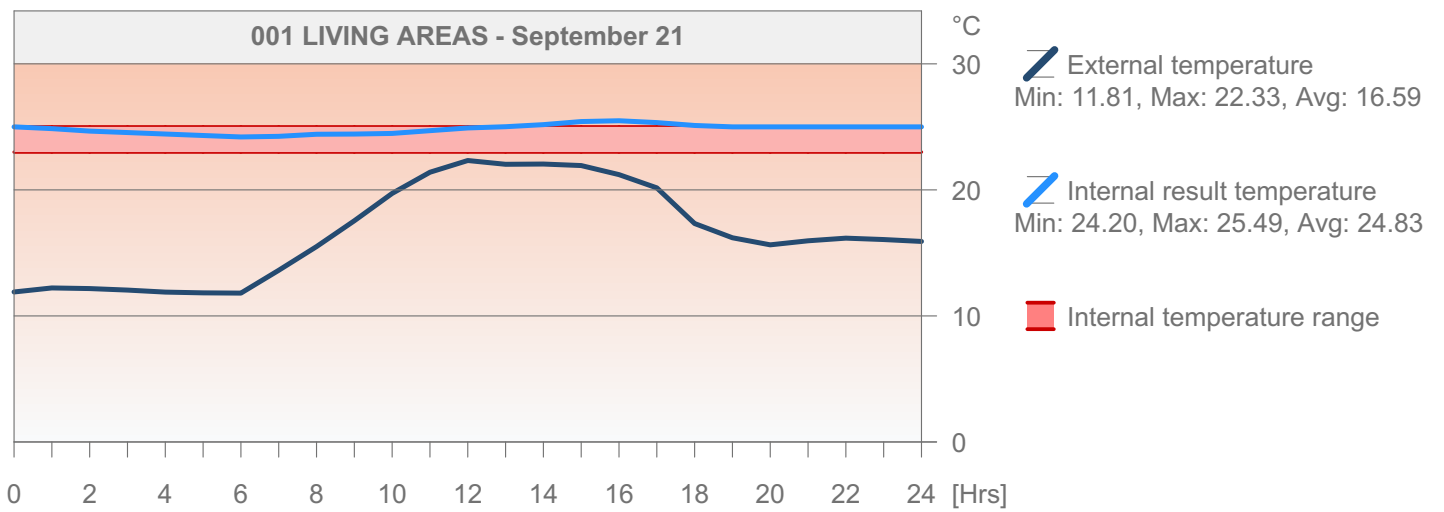
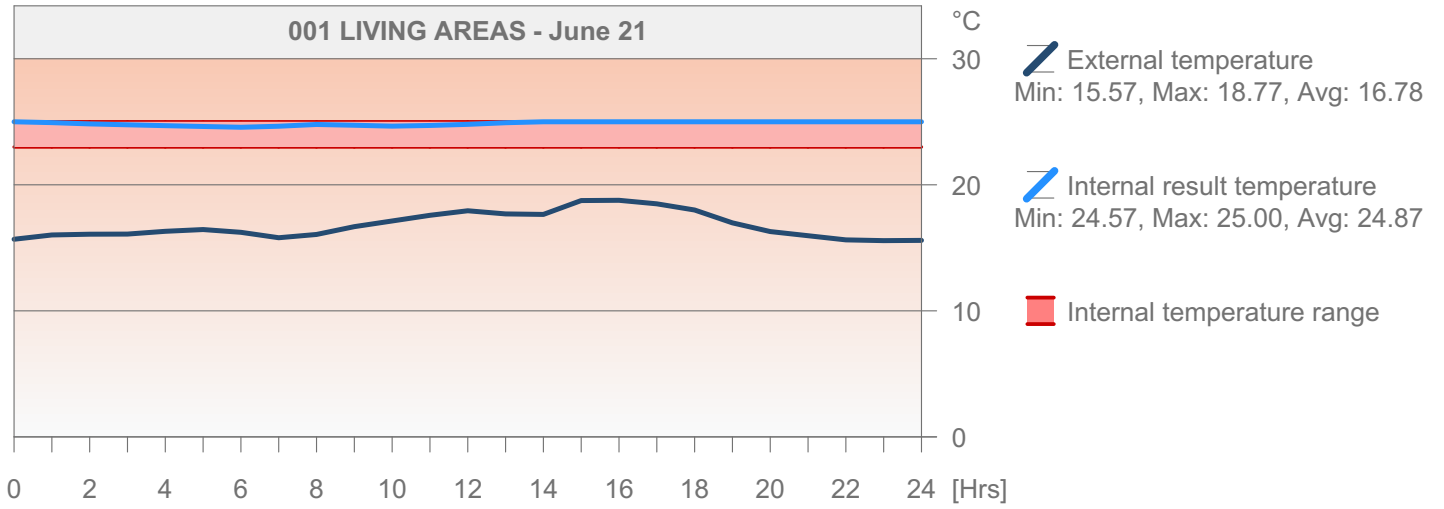


Daily Temperature Profile



Energy Performance Evaluation

[Project Number] SABLES OLONNES



Energy Performance Evaluation

[Project Number] SABLES OLONNES

HVAC Design Data

Thermal Block	Heating Demand		Cooling Demand		Internal Temperature	
	Yearly [kWh]	Hourly Peak [kW]	Yearly [kWh]	Hourly Peak [kW]	Min. [°C]	Max. [°C]
001 LIVING AREAS	542	0.8 06:00 Jan. 26	475	0.7 15:00 Aug. 26	22.9 22:00 Dec. 15	25.9 16:00 Sep. 16
All Thermal Blocks:	542	0.8 06:00 Jan. 26	475	0.7 15:00 Aug. 26		

Number of Used Hours in Year:

Heating: 1890 hrs
Cooling: 3069 hrs

Unmet Load Hours in Year:

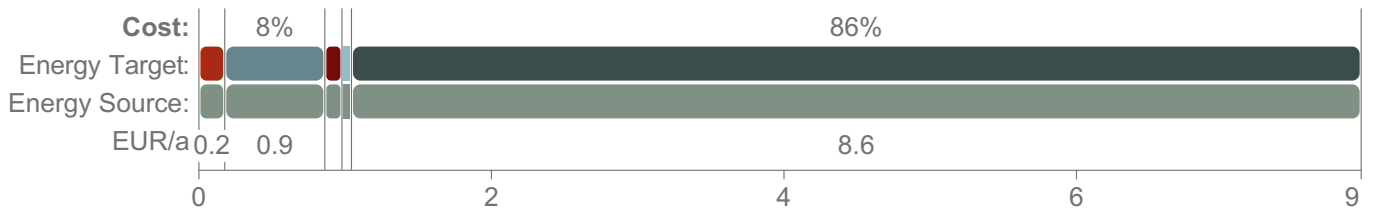
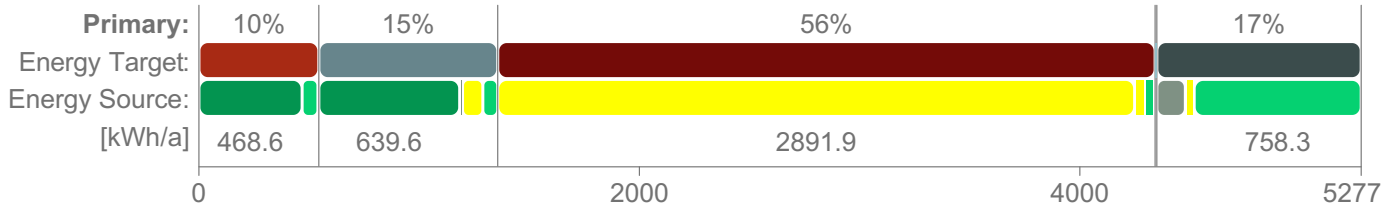
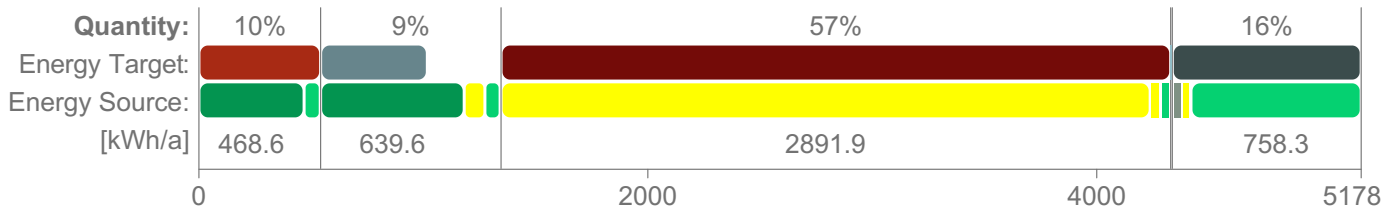
Heating: 0 hrs
Cooling: 0 hrs

Energy Performance Evaluation

[Project Number] SABLES OLONNES

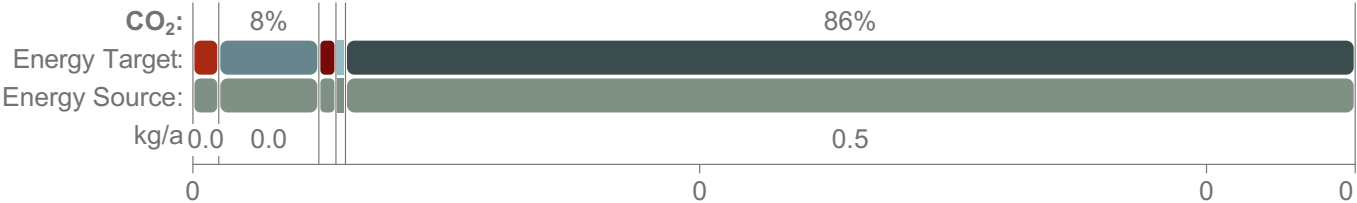
Energy Consumption by Targets

Target Name	Energy			CO ₂ Emission kg/a
	Quantity kWh/a	Primary kWh/a	Cost EUR/a	
Heating	542	544	0	0
Cooling	475	812	0	0
Service Hot-Water	2983	2984	0	0
Ventilation Fans	7	7	0	0
Lighting & Appliances	841	927	8	0
Total:	4849	5277	9	0



Energy Performance Evaluation

[Project Number] SABLES OLONNES



Energy Sources

Renewable

- Solar (Thermal & PV)
- Wind Energy
- Soil
- External Air

Secondary

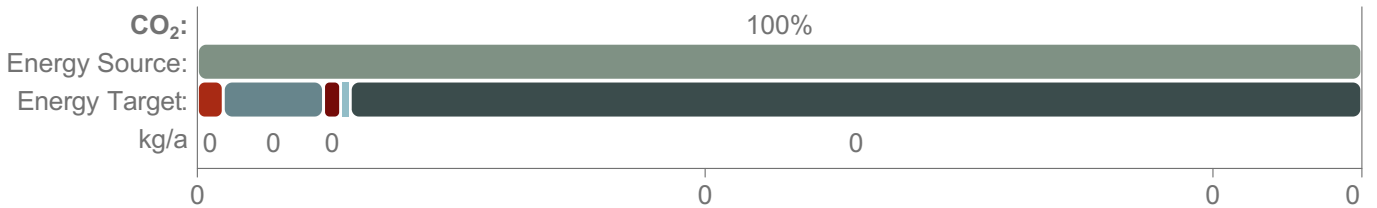
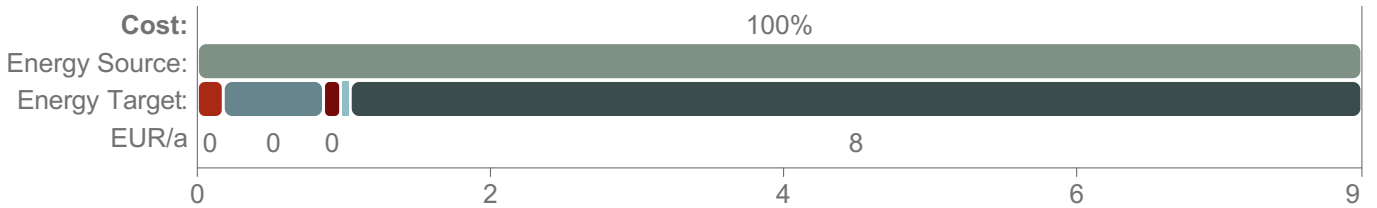
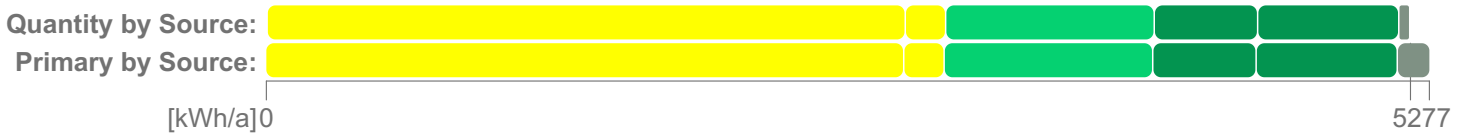
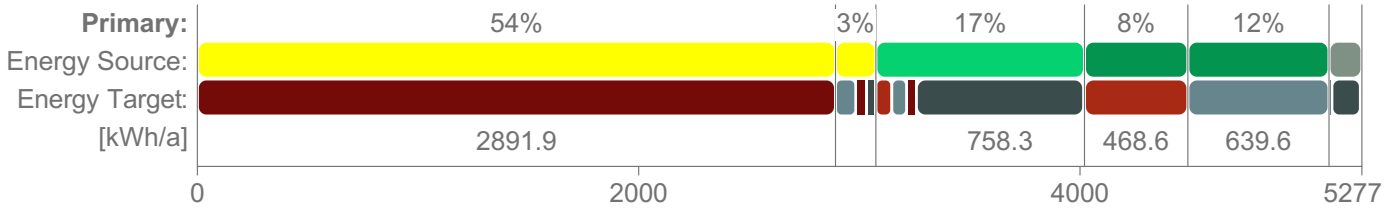
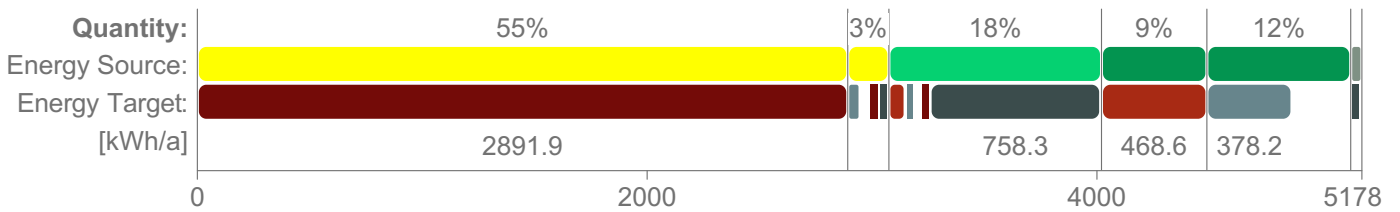
- Electricity

Energy Performance Evaluation

[Project Number] SABLES OLONNES

Energy Consumption by Sources

Source Type	Energy				CO ₂ Emission
	Source Name	Quantity kWh/a	Primary kWh/a	Cost EUR/a	kg/a
Renewable	Solar (Thermal & PV)	3074	3074	NA	0
	Wind Energy	945	945		0
	Soil	468	468		0
	External Air	639	639		0
Secondary	Electricity	49	148	9	0
Total:		5178	5277	9	0








Energy Targets

- Heating
- Cooling
- Ventilation Fans
- Service Hot-Water Heating
- Lighting
- Equipment





Energy Performance Evaluation

[Project Number] SABLES OLONNES




Environmental Impact

Source Type	Source Name	Primary Energy kWh/a	CO ₂ emission kg/a
Renewable	 Solar (Thermal & PV)	3074	0
	 Wind Energy	945	0
	 Soil	468	0
	 External Air	639	0
Secondary	 Electricity	148	0
Total:		5274	0

Renewable Building System Summary

Building System	Annual Energy Generated kWh	Renewable Energy Cost EUR
 Photovoltaic System	183	0.0
 Wind energy System	945	0.0
 Solar thermal System	2983	18.3
Total LEED Renewable Energy:	4111	18
 Heat Pump Heating (soil)	468	14.7
Total:	4579	33

Baseline Performance

Energy Type	Annual Energy & Peak Demand	Baseline Design				
		0°	90°	180°	270°	Average
 Soil	Energy Use (kWh)	3595	3602	3829	3814	3710
	Peak Demand (kW)	1	1	1	1	1
 External Air	Energy Use (kWh)	1198	1976	542	680	1099
	Peak Demand (kW)	2	2	1	1	1
 Electricity	Energy Use (kWh)	1984	2181	1921	1954	2010
	Peak Demand (kW)	0	0	0	0	0
Total Energy Use: (kWh/a)		6777	7759	6292	6448	6819

Baseline Energy Costs

Energy Type	Baseline Cost				Baseline Building Performance EUR/a (average)
	0° EUR/a	90° EUR/a	180° EUR/a	270° EUR/a	
 Electricity	396	436	384	390	402
Sum:	396	436	384	390	402

Energy Performance Evaluation

[Project Number] SABLES OLLONNES

Performance Rating Table

Energy Use	Units	Proposed Design Results	BaseLine Building Results	Savings %
Heating	Energy Use (kWh)	542.26	1312.62	58.69
	Peak Demand (kW)	0.83	1.18	29.74
Cooling	Energy Use (kWh)	475.36	846.76	43.86
	Peak Demand (kW)	0.74	1.38	46.27
Service Hot-Water	Energy Use (kWh)	2983.33	3338.98	10.65
	Peak Demand (kW)	0.40	0.38	-4.44
Ventilation Fans	Energy Use (kWh)	7.12	11.05	35.51
	Peak Demand (kW)	0.01	0.01	-13.94
Lighting	Energy Use (kWh)	90.10	86.27	-4.44
	Peak Demand (kW)	0.03	0.03	-4.44
Equipment	Energy Use (kWh)	751.47	719.49	-4.44
	Peak Demand (kW)	0.26	0.25	-4.44
Total Annual Energy Use: (kWh/a)		4849.65	6315.17	23.21
Annual Process Energy: (kWh/a)		841.58	805.76	-4.44

Energy Consumptions and Savings

Purchased Energy	Proposed Design		Baseline Building		Saving	
	Energy Use	Cost EUR/a	Energy Use	Cost EUR/a	Energy Use %	Cost %
Electricity (kWh)	49	9	2010	402	98	98
Subtotal: (kWh)	49	9	2010	402	-563	77

On Site Renewable Energy	Energy	
	Generated kWh/a	Energy Cost EUR/a
☀️ Photovoltaic System	183	0
🌬️ Wind energy System	945	0
🔥 Solar thermal System	2983	18
🔥 Heat Pump Heating (soil)	468	14
Subtotal:	4579	32

	Proposed Design		Baseline Building		Saving	
	Energy Use kWh/a	Cost EUR/a	Energy Use kWh/a	Cost EUR/a	Energy Use %	Cost %
Total:	4628	41	2010	402	-563	77

Energy Performance Evaluation

[Project Number] SABLES OLONNES

Advisory Messages

	Warnings
	Proposed Design