Pilot actions preparation	Version 1 06/2021

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1. Introduction

The data collected in this document will present the energy condition of the building, what actions should be taken to improve its energy efficiency during the pilot actions and will outline the implementation plan for the pilot action in Podgórzyn and Chrastava. This document can be seen as an abridged version of the building energy characteristic made to implementation of the pilot action. It also presents what tools will be used in the activities and what steps should be taken for this purpose.
The aim of this document is to indicate the actions that should be taken in order to successfully implement the pilot action and to present the problematic aspects that must be solved at the initial stage of implementation.

Pilot Action title:
"Implementation & testing of capitalized solutions in the cross-border PL/CZ area (PA3)"

Objective of Pilot Action

The Pilot Action focuses on the use and test of the OnePlace platform - the tool which was developed under the BOOSTEE-CE project framework. In particular the OnePlace modules 3D Energy Management System (EMS), will be tested in Podgórzyn / Poland and Chrastava / Czech Republic. Within the 3D Energy Management System (EMS) module, which is an innovative tool for a better assessment of energy use within a building and sharing energy-related information to citizens and public authorities, the 3D building models will be developed and connected with non-spatial information such as: type of the building, year of construction, typology, heating source type, heating consumption, and etc. The tool allows users to virtual walk-through buildings, select a building of interest and retrieve energy and other cadastral / building information.

Within the cross-border pilo action also the GreenSoul project results will be tested. The GreenSoul questionnaire will be used to obtain comparable user data to determine if set intervention strategies have the intended impact on energy related user behaviour. Therefore in the participating pilot buildings the questionnaire with some small changes regarding the buildings have been made. The GreenSoul "energy saving sticker" intervention strategy will be applied. No additional adjustments are necessary, only the correct placement and graphical design of the stickers for the different intervention groups has to be carefully considered.

2. Buildings energy data

2.1. Zespół Szkolno-Przedszkolny w Podgórzynie

2.1.1. Basic information

Building address: ul. Szkolna 1, 58-562 Podgórzyn
Owner: Municipality Podgórzyn
Year of building: 2017
Type of building (School, public utility ect.): school
Gross building area: 5319,63
Net building area: 4665,05
Heated building area: 4538,7
Cubature (volume): 22166,56 (brutto)/13491,1
Number of users: 700
Energy audit: YES
Technical documentation: YES

2.1.2. Energy data

2.1.2.1. Central heating system:

Type of source (boiler, heating network ect.): brine-water heat pump
Source power [kW]: 2,90477
Type of radiators: floor and wall heating
Automatic air vents In radiators – NO
Isolation of pipes: heat-insulating lagging
Heat meters: YES

2.1.2.2. Domestic hot water system

Type of source brine-water heat pump
Source power [kW]: 3,117
Water meter: YES

2.1.2.3. Energy consumption

Annual energy usage for central heating (GJ/year): 74,4726
Annual energy usage for domestic hot water (GJ/year): 77,0147
Electricity consumption[MWh/year]: 27,86402

2.1.3. External partitions

2.1.3.1. Walls

Envelope material layers (*If envelopes has different layers, show in separate tables)*:

No.	Material	Thickness [m]	Thermal conductivity [W/mK]	Heat transfer coefficient for external wall [W/m^{2}K]	Defined heat transfer coefficient for external wall (normative coefficient) [W/m^{2}K]
1	hollow silicate brick	0,24		0,194	0,2
2	styrofoam	0,18			
3	plaster				

2.1.3.2. Roof, flat roof or a ceiling under an unheated attic.

Type of roof (flat, pent, gable, hip, multihip, tented, half-hipped, mansard): flat roof
Roof slope and direction [°]: 0÷5
Roofing (tile, metal tile ect.): PVC membrane
Total surface area: 221
Envelope material (layers):

No.	Material	Thickness [m]	Thermal conductivity [W/mK]	Heat transfer coefficient for external wall [W/m^{2}K]	Defined heat transfer coefficient for external wall (normative coefficient) [W/m^{2}K]
1	rafters	0,16		0,144	0,15
2	mineral wool	0,16			
3	thermal isolation	0,1			
4	plasterboard				

2.1.3.3. Ground floor/floor above the unheated basement/basement floor

Total surface area: 2139,31

Envelope material (layers):

No.	Material	Thickness [m]	Thermal conductivity [W/mK]	Heat transfer coefficient for external wall [W/m^{2}K]	Defined heat transfer coefficient for external wall (normative coefficient) [W/m^{2}K]
1	concrete slab	0,1		0,14	0,359
2	styrofoam	0,1			
3	floor panels on a concrete base				

2.1.3.4. Window joinery

2.1.3.4.1. Windows

No.	Type	Material	Window surface [m^2]	Quantity	Total windows surface [m^2]	Diffusers	Thermal conductivity [W/mK]
1	tilt and turn windows	PVC					0,8
2							

Defined heat transfer coefficient for external window (normative coefficient) [W/m^{2}K]: 0,9

2.1.3.4.2. Doors

No.	Material	Door surface [m^2]	Quantity	Total doors surface [m^2]	Thermal conductivity [W/mK]	Defined heat transfer coefficient for external wall (normative coefficient) [W/m^{2}K]
1	aluminium				1,3	0,9

2.1.4. Ventilation

Type of ventilation *(e.g. natural, mechanical, mechanical with heat recovery, mixed)*: mechanical supply and exhaust ventilation with recuperation

2.1.5. Lighting

Lighting type(e.g. LED, bulbs, fluorescent lamps): LED

2.1.6. Renewable Energy Sources

Photovoltaic installation: NO
Solar collectors: NO
Heat pump: YES

2.1.7. Energy indicators and building energy status

The building is in very good technical condition, it is a new, passive building from 2017.
Utility energy (EU): 40,17 [kWh/m^2/year]
Final energy demand (EK): 23,48 [kWh/m^2/year]
Primary energy (EP): 70,43 [kWh/m^2/year]

<u>Needed actions to improve the energy efficiency of the building:</u>
Walls insulation: NO
Roof insulation: NO
Windows replacement: NO
Doors replacement: NO
Heating system modernization:
- Replacement of central heating source: NO
- Modernization of central heating source: NO
- Replacement of central heating installation: NO
- Radiators replacement: NO
- Thermostatic valves installation: NO

Domestic hot water system modernization: NO
RES installation:
- Photovoltaic installation: NO
- Solar collectors: NO
- Heat pump: NO

Lighting replacement with LED: NO
Building monitoring system: NO

<u>Planned actions to improve the energy efficiency of the building:</u>
Walls insulation: NO
Roof insulation: NO

Windows replacement: NO
Doors replacement: NO
Heating system modernization:
- Replacement of central heating source: NO
- Modernization of central heating source: NO
- Replacement of central heating installation: NO
- Radiators replacement: NO
- Thermostatic valves installation: NO

Domestic hot water system modernization: NO
RES installation:
- Photovoltaic installation: NO
- Solar collectors: NO
- Heat pump: NO

Lighting replacement with LED: NO
Building monitoring system: NO

2.1.8. Source of information

Construction project from 2017.

2.2. Szkoła podstawowa w Ścięgnach - building A

2.2.1. Basic information

Building address: Ścięgny 110a, 58-535 Miłków
Owner: Municipality Podgórzyn
Year of building: 1904
Type of building (School, public utility ect.): school
Gross building area: 443
Net building area: 443
Heated building area: 443
Cubature (volume): 1552
Number of users: 90
Energy audit: NO
Technical documentation: NO

2.2.2. Energy data

2.2.2.1. Central heating system:

Type of source (boiler, heating network ect.): gas boiler
Source power [kW]: no data
Energy efficiency of source [%]: no data
Type of radiators: steel
Type of pipes (material): copper
Thermostatic valves: YES
Riser control valves – NO
Automatic air vents In radiators –NO
Isolation of pipes: NO
Heat meters: NO
Energy efficiency of heating system [%]: no data

2.2.2.2. Domestic hot water system

Type of source: gas boiler
Source power [kW]: no data
Energy efficiency of source [%]: no data
Type of pipes (material)
Riser control valves – NO
Water meter: YES
Energy efficiency of domestic hot water preparation system [%]: no data

2.2.2.3. Energy consumption

Annual energy usage for central heating (GJ/year): no data
Annual energy usage for domestic hot water (GJ/year): no data
Average usage of hot water [m^3]: 60/year
Costs of heating (central heating + domestic hot water): no data

Electricity consumption[MWh/year]: no data

2.2.3. External partitions

2.2.3.1. Walls

South envelope surface area: no data
North envelope surface area: no data
East envelope surface area: no data
West envelope surface area: no data
Walls of the basement area (*if applicable*): no data
Envelope material layers (*If envelopes has different layers, show in separate tables)*:

No.	Material	Thickness [m]	Thermal conductivity [W/mK]	Heat transfer coefficient for external wall [W/m^{2}K]	Defined heat transfer coefficient for external wall (normative coefficient) [W/m^{2}K]
1	brick + styrofoam + plaster	0,55	no data	no data	0,2
2					
3					

2.2.3.2. Roof, flat roof or a ceiling under an unheated attic.

Type of roof (flat, pent, gable, hip, multihip, tented, half-hipped, mansard): gable
Roof slope and direction [°]: 35
Roofing (tile, metal tile ect.): standing seam sheet
Total surface area: 270
Envelope material (layers):

No.	Material	Thickness [m]	Thermal conductivity [W/mK]	Heat transfer coefficient for external wall [W/m^{2}K]	Defined heat transfer coefficient for external wall (normative coefficient) [W/m^{2}K]
1	standing seam sheet	0,005	no data	no data	0,15
2	boards	0,025	no data		
3					

2.2.3.3. Ground floor/floor above the unheated basement/basement floor

Total surface area:
Envelope material (layers):

No.	Material	Thickness [m]	Thermal conductivity [W/mK]	Heat transfer coefficient for external wall [W/m^{2}K]	Defined heat transfer coefficient for external wall (normative coefficient) [W/m^{2}K]
1					0,3
2					
3					

2.2.3.4. Window joinery

2.2.3.4.1. Windows

No.	Type	Material	Window surface [m^2]	Quantity	Total windows surface [m^2]	Diffusers	Thermal conductivity [W/mK]
1	window	PVC	2,16	28	60,48	NO	no data
2							

Defined heat transfer coefficient for external window (normative coefficient) [W/m^2K]: 0,9

2.2.3.4.2. Doors

No.	Material	Door surface [m^2]	Quantity	Total doors surface [m^2]	Thermal conductivity [W/mK]	Defined heat transfer coefficient for external wall (normative coefficient) [W/m^2K]
1	PVC	3,1	2	6,2	no data	0,9

2.2.4. Ventilation

Type of ventilation *(e.g. natural, mechanical, mechanical with heat recovery, mixed)*: gravity ventilation

2.2.5. Lighting

Lighting type(e.g. LED, bulbs, fluorescent lamps): fluorescent lamps / LED
Number of lighting points: 42
Power of lighting points [kW]: no data

2.2.6. Renewable Energy Sources

Photovoltaic installation: NO
if YES, power of installation [kWp]: ……..
Solar collectors: NO
if YES, number of collectors in installation[amount]: ……..
Heat pump: NO
If YES, type: ……., power: ……, COP: ……..

2.2.7. Energy indicators and building energy status

Utility energy (EU): no data [kWh/m^2/year]
Final energy demand (EK): no data [kWh/m^2/year]
Primary energy (EP): no data[kWh/m^2/year]

Energy class of buildings: no data

Needed actions to improve the energy efficiency of the building:
Walls insulation: NO
Roof insulation: YES
Windows replacement: NO
Doors replacement: NO
Heating system modernization:
- Replacement of central heating source: NO
- Modernization of central heating source: NO
- Replacement of central heating installation: NO
- Radiators replacement: NO
- Thermostatic valves installation: NO

Domestic hot water system modernization: NO
RES installation:
- Photovoltaic installation: YES
- Solar collectors: NO
- Heat pump: NO

Lighting replacement with LED: YES
Building monitoring system: YES

Planned actions to improve the energy efficiency of the building:
Walls insulation: NO
Roof insulation: YES
Windows replacement: NO
Doors replacement: NO
Heating system modernization:
- Replacement of central heating source: NO
- Modernization of central heating source: NO
- Replacement of central heating installation: NO
- Radiators replacement: NO
- Thermostatic valves installation: NO

Domestic hot water system modernization: NO
RES installation:
- Photovoltaic installation: YES
- Solar collectors: NO
- Heat pump: NO

Lighting replacement with LED: YES
Building monitoring system: YES

2.2.8. Source of information

From the municipality of Podgórzyn

2.3. Zespół Szkolno-Przedszkolny w Miłkowie - sports hall building

2.3.1. Basic information

Building address: ul. Szkolna 95, 58-535 Miłków
Owner: Municipality Podgórzyn
Year of building: 2003
Type of building (School, public utility ect.): school - sports hall building
Gross building area: 1535
Net building area: 1535
Heated building area: 1535
Cubature (volume): 14090
Number of users: 10-120
Energy audit: NO
Technical documentation: NO

2.3.2. Energy data

2.3.2.1. Central heating system:

Type of source (boiler, heating network ect.): fuel oil boiler
Source power [kW]: no data
Energy efficiency of source [%]: no data
Type of radiators: steel
Type of pipes (material): copper
Thermostatic valves: YES
Riser control valves – NO
Automatic air vents In radiators - NO

Isolation of pipes: YES
Heat meters: NO
Energy efficiency of heating system [%]: no data

2.3.2.2. Domestic hot water system

Type of source: fuel oil boiler
Source power [kW]: no data
Energy efficiency of source [%]: no data
Riser control valves – NO
Water meter: YES
Energy efficiency of domestic hot water preparation system [%]: no data

2.3.2.3. Energy consumption

Annual energy usage for central heating (GJ/year): no data
Annual energy usage for domestic hot water (GJ/year): no data
Average usage of hot water [m^3]: 120/year
Costs of heating (central heating + domestic hot water): no data
Electricity consumption[MWh/year]: no data

2.3.3. External partitions

2.3.3.1. Walls

South envelope surface area: no data
North envelope surface area: no data
East envelope surface area: no data
West envelope surface area: no data
Walls of the basement area (*if applicable*): no data
Envelope material layers (*If envelopes has different layers, show in separate tables)*:

No.	Material	Thickness [m]	Thermal conductivity [W/mK]	Heat transfer coefficient for external wall [W/m^2K]	Defined heat transfer coefficient for external wall (normative coefficient) [W/m^2K]
1	sandwich panels	0,15	no data	no data	0,2
2					
3					

2.3.3.2. Roof, flat roof or a ceiling under an unheated attic.

Type of roof (flat, pent, gable, hip, multihip, tented, half-hipped, mansard): gable
Roof slope and direction [°]: 10
Roofing (tile, metal tile ect.): sandwich panels
Total surface area: 1173
Envelope material (layers):

No.	Material	Thickness [m]	Thermal conductivity [W/mK]	Heat transfer coefficient for external wall [W/m^{2}K]	Defined heat transfer coefficient for external wall (normative coefficient) [W/m^{2}K]
1	sandwich panels	0,15	no data	no data	0,15
2					
3					

2.3.3.3. Ground floor/floor above the unheated basement/basement floor

Total surface area:

Envelope material (layers):

No.	Material	Thickness [m]	Thermal conductivity [W/mK]	Heat transfer coefficient for external wall [W/m^{2}K]	Defined heat transfer coefficient for external wall (normative coefficient) [W/m^{2}K]
1					0,3
2					
3					

2.3.3.4. Window joinery

2.3.3.4.1. Windows

No.	Type	Material	Window surface [m^2]	Quantity	Total windows surface [m^2]	Diffusers	Thermal conductivity [W/mK]
1	window	aluminum		8	94,76	NO	no data
2							

Defined heat transfer coefficient for external window (normative coefficient) [W/m^{2}K]: 0,9

2.3.3.4.2. Doors

No.	Material	Door surface [m^2]	Quantity	Total doors surface [m^2]	Thermal conductivity [W/mK]	Defined heat transfer coefficient for external wall (normative coefficient) [W/m^{2}K]
1	aluminum		8	94,76	no data	0,9

2.3.4. Ventilation

Type of ventilation *(e.g. natural, mechanical, mechanical with heat recovery, mixed)*: gravity ventilation

2.3.5. Lighting

Lighting type(e.g. LED, bulbs, fluorescent lamps): fluorescent lamps / LED

Number of lighting points: 24
Power of lighting points [kW]: no data

2.3.6. Renewable Energy Sources

Photovoltaic installation: NO
if YES, power of installation [kWp]: ……..
Solar collectors: NO
if YES, number of collectors in installation[amount]: ……..
Heat pump: NO
If YES, type: ……., power: ……, COP: ……..

2.3.7. Energy indicators and building energy status

Utility energy (EU): no data [kWh/m^2/year]
Final energy demand (EK): no data [kWh/m^2/year]
Primary energy (EP): no data [kWh/m^2/year]

Energy class of buildings: no data

<u>Needed actions to improve the energy efficiency of the building:</u>
Walls insulation: NO
Roof insulation: NO
Windows replacement: NO
Doors replacement: NO
Heating system modernization:
- Replacement of central heating source: YES
- Modernization of central heating source: NO
- Replacement of central heating installation: NO
- Radiators replacement: NO
- Thermostatic valves installation: NO

Domestic hot water system modernization: NO
RES installation:
- Photovoltaic installation: YES
- Solar collectors: NO
- Heat pump: NO

Lighting replacement with LED: YES
Building monitoring system: YES

<u>Planned actions to improve the energy efficiency of the building:</u>
Walls insulation: NO
Roof insulation: NO
Windows replacement: NO
Doors replacement: NO
Heating system modernization:
- Replacement of central heating source: YES
- Modernization of central heating source: NO
- Replacement of central heating installation: NO

Radiators replacement: NO
Thermostatic valves installation: NO
Domestic hot water system modernization: NO
RES installation:
Photovoltaic installation: YES
Solar collectors: NO
Heat pump: NO
Lighting replacement with LED: YES
Building monitoring system: YES

2.3.8. Source of information

From the municipality of Podgórzyn

2.4. Gminna Biblioteka Publiczna Gminy Podgórzyn, Filia w Miłkowie


2.4.1. Basic information

Building address: ul. Wiejska 153, 58-535 Miłków
Owner: Municipality Podgórzyn
Year of building: 1904
Type of building (School, public utility ect.): public utility - culture building
Gross building area: 298
Net building area: 298
Heated building area: 298
Cubature (volume): 1460
Number of users: 4-100
Energy audit: NO
Technical documentation: NO

2.4.2. Energy data

2.4.2.1. Central heating system:

Type of source (boiler, heating network ect.): pellet boiler
Source power [kW]: no data
Energy efficiency of source [%]: no data
Type of radiators: steel
Type of pipes (material): copper
Thermostatic valves: YES
Riser control valves – NO
Automatic air vents In radiators – NO
Isolation of pipes: YES
Heat meters: NO
Energy efficiency of heating system [%]: no data

2.4.2.2. Domestic hot water system

Type of source: pellet boiler
Source power [kW]: no data
Energy efficiency of source [%]:no data
Type of pipes (material): no data
Riser control valves – NO
Water meter: YES
Energy efficiency of domestic hot water preparation system [%]: no data

2.4.2.3. Energy consumption

Annual energy usage for central heating (GJ/year): no data
Annual energy usage for domestic hot water (GJ/year): no data
Average usage of hot water [m^3]: 50/year
Costs of heating (central heating + domestic hot water): no data
Electricity consumption[MWh/year]: no data

2.4.3. External partitions

2.4.3.1. Walls

South envelope surface area: no data
North envelope surface area: no data
East envelope surface area: no data
West envelope surface area: no data
Walls of the basement area (*if applicable*): no data
Envelope material layers (*If envelopes has different layers, show in separate tables)*:

No.	Material	Thickness [m]	Thermal conductivity [W/mK]	Heat transfer coefficient for external wall [W/m^{2}K]	Defined heat transfer coefficient for external wall (normative coefficient) [W/m^{2}K]
1	brick + styrofoam + plaster	0,68	no data	no data	0,2
2					
3					

2.4.3.2. Roof, flat roof or a ceiling under an unheated attic.

Type of roof (flat, pent, gable, hip, multihip, tented, half-hipped, mansard): gable
Roof slope and direction [°]: 5
Roofing (tile, metal tile ect.): roofing felt
Total surface area: 393
Envelope material (layers):

No.	Material	Thickness [m]	Thermal conductivity [W/mK]	Heat transfer coefficient for external wall [W/m^{2}K]	Defined heat transfer coefficient for external wall (normative coefficient) [W/m^{2}K]
1	roofing felt	0,006	no data	no data	0,2
2	boards	0,025	no data		
3	mineral wool	0,15	no data		

2.4.3.3. Ground floor/floor above the unheated basement/basement floor

Total surface area:
Envelope material (layers):

No.	Material	Thickness [m]	Thermal conductivity [W/mK]	Heat transfer coefficient for external wall [W/m^{2}K]	Defined heat transfer coefficient for external wall (normative coefficient) [W/m^{2}K]
1					
2					
3					

2.4.3.4. Window joinery

2.4.3.4.1. Windows

No.	Type	Material	Window surface [m^2]	Quantity	Total windows surface [m^2]	Diffusers	Thermal conductivity [W/mK]
1	window	pvc	2,16	10	21,6	NO	no data
2							

Defined heat transfer coefficient for external window (normative coefficient) [W/m^{2}K]: 0,9

2.4.3.4.2. Doors

No.	Material	Door surface [m^2]	Quantity	Total doors surface [m^2]	Thermal conductivity [W/mK]	Defined heat transfer coefficient for external wall (normative coefficient) [W/m^2K]
1	pvc	5,04	2	10,08	no data	0,9

2.4.4. Ventilation

Type of ventilation *(e.g. natural, mechanical, mechanical with heat recovery, mixed)*: gravity ventilation

2.4.5. Lighting

Lighting type(e.g. LED, bulbs, fluorescent lamps): fluorescent lamps/ LED
Number of lighting points: 32
Power of lighting points [kW]: no data

2.4.6. Renewable Energy Sources

Photovoltaic installation: NO
if YES, power of installation [kWp]: ……..
Solar collectors: NO
if YES, number of collectors in installation[amount]: ……..
Heat pump: NO
If YES, type: ……., power: ……, COP: ……..

2.4.7. Energy indicators and building energy status

Utility energy (EU): no data [kWh/m^2/year]
Final energy demand (EK): no data [kWh/m^2/year]
Primary energy (EP): no data [kWh/m^2/year]

Energy class of buildings: no data

<u>Needed actions to improve the energy efficiency of the building:</u>
Walls insulation: NO
Roof insulation: YES
Windows replacement: NO
Doors replacement: NO
Heating system modernization:
- Replacement of central heating source: NO
- Modernization of central heating source: NO

Replacement of central heating installation: NO
Radiators replacement: NO
Thermostatic valves installation: NO
Domestic hot water system modernization: NO
RES installation:
Photovoltaic installation: YES
Solar collectors: NO
Heat pump: NO
Lighting replacement with LED: YES
Building monitoring system: YES

Planned actions to improve the energy efficiency of the building:
Walls insulation: NO
Roof insulation: YES
Windows replacement: NO
Doors replacement: NO
Heating system modernization:
Replacement of central heating source: NO
Modernization of central heating source: NO
Replacement of central heating installation: NO
Radiators replacement: NO
Thermostatic valves installation: NO
Domestic hot water system modernization: NO
RES installation:
Photovoltaic installation: YES
Solar collectors: NO
Heat pump: NO
Lighting replacement with LED: YES
Building monitoring system: YES

2.4.8. Source of information

From the municipality of Podgórzyn

2.5. *Urząd Gminy Podgórzyn*

2.5.1. Basic information

Building address: ul. Żołnierska 14, 58-562 Podgórzyn
Owner: Municipality Podgórzyn
Year of building: 1920
Type of building (School, public utility ect.): public administration building
Gross building area: 680
Net building area: 680
Heated building area: 680
Cubature (volume): 3463
Number of users: 34
Energy audit: NO
Technical documentation: NO

2.5.2. Energy data

2.5.2.1. Central heating system:

Type of source (boiler, heating network ect.): gas boiler
Source power [kW]: 69,8
Energy efficiency of source [%]: no data
Type of radiators: steel
Type of pipes (material): copper
Thermostatic valves: YES
Riser control valves – NO
Automatic air vents In radiators – NO

Isolation of pipes: NO
Heat meters: NO
Energy efficiency of heating system [%]: no data

2.5.2.2. Domestic hot water system

Type of source: gas boiler
Source power [kW]: 69,8
Energy efficiency of source [%]: no data
Type of pipes (material): no data
Riser control valves – NO
Water meter: YES
Energy efficiency of domestic hot water preparation system [%]: no data

2.5.2.3. Energy consumption

Annual energy usage for central heating (GJ/year): no data
Annual energy usage for domestic hot water (GJ/year): no data
Average usage of hot water [m^3]: 300
Costs of heating (central heating + domestic hot water): no data
Electricity consumption[MWh/year]: no data

2.5.3. External partitions

2.5.3.1. Walls

South envelope surface area: no data
North envelope surface area: no data
East envelope surface area: no data
West envelope surface area: no data
Walls of the basement area (*if applicable*): no data
Envelope material layers (*If envelopes has different layers, show in separate tables)*:

No.	Material	Thickness [m]	Thermal conductivity [W/mK]	Heat transfer coefficient for external wall [W/m^2K]	Defined heat transfer coefficient for external wall (normative coefficient) [W/m^2K]
1	brick + styrofoam + plaster	0,6	no data	no data	0,2
2	brick + plaster	0,65	no data		
3					

2.5.3.2. Roof, flat roof or a ceiling under an unheated attic.

Type of roof (flat, pent, gable, hip, multihip, tented, half-hipped, mansard): gable
Roof slope and direction [°]: 30
Roofing (tile, metal tile ect.): standing seam sheet

Total surface area: 240
Envelope material (layers):

No.	Material	Thickness [m]	Thermal conductivity [W/mK]	Heat transfer coefficient for external wall [W/m^{2}K]	Defined heat transfer coefficient for external wall (normative coefficient) [W/m^{2}K]
1	standing seam sheet	0,005	no data	no data	0,15
2	boards	0,025	no data		
3					

2.5.3.3. Ground floor/floor above the unheated basement/basement floor

Total surface area:
Envelope material (layers):

No.	Material	Thickness [m]	Thermal conductivity [W/mK]	Heat transfer coefficient for external wall [W/m^{2}K]	Defined heat transfer coefficient for external wall (normative coefficient) [W/m^{2}K]
1	concrete	0,15	no data	no data	0,3
2					
3					

2.5.3.4. Window joinery

2.5.3.4.1. Windows

No.	Type	Material	Window surface [m^2]	Quantity	Total windows surface [m^2]	Diffusers	Thermal conductivity [W/mK]
1	window	pvc	1,8	12	21,6	NO	no data
2	window	wood	1,8	16	28,8	NO	no data

Defined heat transfer coefficient for external window (normative coefficient) [W/m^{2}K]: 0,9

2.5.3.4.2. Doors

No.	Material	Door surface [m^2]	Quantity	Total doors surface [m^2]	Thermal conductivity [W/mK]	Defined heat transfer coefficient for external wall (normative coefficient) [W/m^{2}K]
1	pvc	2,4	3	7,2	no data	0,9

2.5.4. Ventilation

Type of ventilation *(e.g. natural, mechanical, mechanical with heat recovery, mixed)*: gravity ventilation

2.5.5. Lighting

Lighting type(e.g. LED, bulbs, fluorescent lamps): fluorescent lamps/LED
Number of lighting points: 46
Power of lighting points [kW]: no data

2.5.6. Renewable Energy Sources

Photovoltaic installation: NO
if YES, power of installation [kWp]: ……..
Solar collectors: NO
if YES, number of collectors in installation[amount]: ……..
Heat pump: NO
If YES, type: ……., power: ……., COP: ……..

2.5.7. Energy indicators and building energy status

Utility energy (EU): no data [kWh/m^2/year]
Final energy demand (EK): no data [kWh/m^2/year]
Primary energy (EP): no data [kWh/m^2/year]

Energy class of buildings: no data

<u>Needed actions to improve the energy efficiency of the building:</u>
Walls insulation: YES
Roof insulation: YES
Windows replacement: YES
Doors replacement: YES
Heating system modernization:
- Replacement of central heating source: NO
- Modernization of central heating source: NO
- Replacement of central heating installation: YES
- Radiators replacement: YES
- Thermostatic valves installation: NO

Domestic hot water system modernization: YES
RES installation:
- Photovoltaic installation: YES
- Solar collectors: NO
- Heat pump: NO

Lighting replacement with LED: YES
Building monitoring system: YES

<u>Planned actions to improve the energy efficiency of the building:</u>
Walls insulation: NO
Roof insulation: YES
Windows replacement: YES
Doors replacement: NO
Heating system modernization:
- Replacement of central heating source: NO

Modernization of central heating source: NO
Replacement of central heating installation: NO
Radiators replacement: NO
Thermostatic valves installation: NO
Domestic hot water system modernization: NO
RES installation:
Photovoltaic installation: YES
Solar collectors: NO
Heat pump: NO
Lighting replacement with LED: YES
Building monitoring system: YES

2.5.8. Source of information

From the municipality of Podgórzyn

2.6. Muzeum hasičské techniky Chrastava

2.6.1. Basic information

Building address: Bílokostelecká 1, 463 31 Chrastava
Owner: The town of Chrastava
Year of building: 1992
Type of building (School, public utility ect.): museum
Gross building area: 1651
Net building area:
Heated building area: 975
Cubature (volume): 6200
Number of users: -
Energy audit: NO
Technical documentation: YES

2.6.2. Energy data

2.6.2.1. Central heating system:

Type of source (boiler, heating network ect.): electric heaters
Source power [kW]: 10
Energy efficiency of source [%]: 85
Type of radiators: electric
Type of pipes (material): No pipes
Thermostatic valves: NO
Riser control valves – NO
Automatic air vents In radiators – NO
Isolation of pipes: NO
Heat meters: NO
Energy efficiency of heating system [%]: 85

2.6.2.2. Domestic hot water system

Type of source: boiler
Source power [kW]: 6363
Energy efficiency of source [%]: 85
Type of pipes (material): no data
Riser control valves – NO
Water meter: YES
Energy efficiency of domestic hot water preparation system [%]: 85

2.6.2.3. Energy consumption

Annual energy usage for central heating (GJ/year): no data
Annual energy usage for domestic hot water (GJ/year): no data
Average usage of hot water [m^3]: 88
Costs of heating (central heating + domestic hot water): no data
Electricity consumption [MWh/year]: 0,623

2.6.3. External partitions

2.6.3.1. Walls

South envelope surface area: 312 m^2
North envelope surface area: 312 m^2
East envelope surface area: 84 m^2
West envelope surface area: 84 m^2
Walls of the basement area (*if applicable*): 140 m^2
Envelope material layers (*If envelopes has different layers, show in separate tables)*:

No.	Material	Thickness [m]	Thermal conductivity [W/mK]	Heat transfer coefficient for external wall [W/m^{2}K]	Defined heat transfer coefficient for external wall (normative coefficient) [W/m^{2}K]
1	stone, brick	0,6			0,2
2					
3					

2.6.3.2. Roof, flat roof or a ceiling under an unheated attic.

Type of roof (flat, pent, gable, hip, multihip, tented, half-hipped, mansard): tented roof
Roof slope and direction [°]: 40, East, West
Roofing (tile, metal tile ect.): sheet metal
Total surface area: 750
Envelope material (layers):

No.	Material	Thickness [m]	Thermal conductivity [W/mK]	Heat transfer coefficient for external wall [W/m^{2}K]	Defined heat transfer coefficient for external wall (normative coefficient) [W/m^{2}K]
1					0,15
2					
3					

2.6.3.3. Ground floor/floor above the unheated basement/basement floor

Total surface area: 1651
Envelope material (layers):

No.	Material	Thickness [m]	Thermal conductivity [W/mK]	Heat transfer coefficient for external wall [W/m^{2}K]	Defined heat transfer coefficient for external wall (normative coefficient) [W/m^{2}K]
1	concrete	0,2		0,14	0,359
2					
3					

2.6.3.4. Window joinery

2.6.3.4.1. Windows

No.	Type	Material	Window surface [m^2]	Quantity	Total windows surface [m^2]	Diffusers	Thermal conductivity [W/mK]
1	PVC	plastic	1,3	52	62,4	NO	1,3
2							

Defined heat transfer coefficient for external window (normative coefficient) [W/m^{2}K]: 0,9

2.6.3.4.2. Doors

No.	Material	Door surface [m^2]	Quantity	Total doors surface [m^2]	Thermal conductivity [W/mK]	Defined heat transfer coefficient for external wall (normative coefficient) [W/m^2K]
1	plastic	3,78	1	3,78	1,3	0,9

2.6.4. Ventilation

Type of ventilation *(e.g. natural, mechanical, mechanical with heat recovery, mixed)*:

2.6.5. Lighting

Lighting type(e.g. LED, bulbs, fluorescent lamps): no data
Number of lighting points: no data
Power of lighting points [kW]: no data

2.6.6. Renewable Energy Sources

Photovoltaic installation: NO
if YES, power of installation [kWp]: ……..
Solar collectors: NO
if YES, number of collectors in installation[amount]: ……..
Heat pump: NO
If YES, type: ……., power: ……, COP: ……..

2.6.7. Energy indicators and building energy status

Utility energy (EU): no data [kWh/m^2/year]
Final energy demand (EK): 0,37 [kWh/m^2/year]
Primary energy (EP): no data [kWh/m^2/year]

Energy class of buildings: no data

<u>Needed actions to improve the energy efficiency of the building:</u>
Walls insulation: NO
Roof insulation:NO
Windows replacement: NO
Doors replacement: NO
Heating system modernization:NO
- Replacement of central heating source: NO
- Modernization of central heating source:NO
- Replacement of central heating installation:NO
- Radiators replacement: NO
- Thermostatic valves installation: NO

Domestic hot water system modernization: NO

RES installation:NO
- Photovoltaic installation: NO
- Solar collectors: NO
- Heat pump: NO

Lighting replacement with LED: NO
Building monitoring system: NO

Planned actions to improve the energy efficiency of the building:
Walls insulation: NO
Roof insulation: NO
Windows replacement: NO
Doors replacement: NO
Heating system modernization:
- Replacement of central heating source: NO
- Modernization of central heating source: NO
- Replacement of central heating installation: NO
- Radiators replacement: NO
- Thermostatic valves installation: NO

Domestic hot water system modernization: NO
RES installation:
- Photovoltaic installation: NO
- Solar collectors: NO
- Heat pump: NO

Lighting replacement with LED: NO
Building monitoring system: NO

2.6.8. Source of information

From the town of Chrastava

2.7. *Azylový dům*

2.7.1. Basic information

Building address: Soudní 453, 463 31 Chrastava
Owner: The town of Chrastava
Year of building: 1995
Type of building (School, public utility ect.): public utility
Gross building area: 1065
Net building area: no data
Heated building area: no data
Cubature (volume): 4260
Number of users: 12
Energy audit: NO
Technical documentation: NO

2.7.2. Energy data

2.7.2.1. Central heating system:

Type of source (boiler, heating network ect.): electric heaters
Source power [kW]: 12x 10kW
Energy efficiency of source [%]: 95
Type of radiators: electric
Type of pipes (material): no pipes
Thermostatic valves: NO
Riser control valves – NO
Automatic air vents In radiators – NO
Isolation of pipes: no pipes

Heat meters: NO
Energy efficiency of heating system [%]: 85

2.7.2.2. Domestic hot water system

Type of source: electric boiler
Source power [kW]: 2,2
Energy efficiency of source [%]: 85
Type of pipes (material)
Riser control valves – NO
Water meter: YES
Energy efficiency of domestic hot water preparation system [%]: 81

2.7.2.3. Energy consumption

Electricity consumption[MWh/year]: 6

2.7.3. External partitions

2.7.3.1. Walls

South envelope surface area: 269
North envelope surface area: 269
East envelope surface area: 110
West envelope surface area: 110
Walls of the basement area (*if applicable*): 260
Envelope material layers (*If envelopes has different layers, show in separate tables)*:

No.	Material	Thickness [m]	Thermal conductivity [W/mK]	Heat transfer coefficient for external wall [W/m^{2}K]	Defined heat transfer coefficient for external wall (normative coefficient) [W/m^{2}K]
1	brick, stone	0,6		2,3	0,2
2	brick, stone in basment	0,75			
3	plaster				

2.7.3.2. Roof, flat roof or a ceiling under an unheated attic.

Type of roof (flat, pent, gable, hip, multihip, tented, half-hipped, mansard): tented roof
Roof slope and direction [°]: 40
Roofing (tile, metal tile ect.): clay tiles
Total surface area: 720
Envelope material (layers):

No.	Material	Thickness [m]	Thermal conductivity [W/mK]	Heat transfer coefficient for	Defined heat transfer coefficient for external

				external wall [W/m^{2}K]	wall (normative coefficient) [W/m^{2}K]
1	Tiles without insulation	0,04		2,8	0,15

2.7.3.3. Ground floor/floor above the unheated basement/basement floor

Total surface area: 51,45

Envelope material (layers):

No.	Material	Thickness [m]	Thermal conductivity [W/mK]	Heat transfer coefficient for external wall [W/m^{2}K]	Defined heat transfer coefficient for external wall (normative coefficient) [W/m^{2}K]
1	concrete slabs, floor tiles	0,3		3,1	0,359

2.7.3.4. Window joinery

2.7.3.4.1. Windows

No.	Type	Material	Window surface [m^2]	Quantity	Total windows surface [m^2]	Diffusers	Thermal conductivity [W/mK]
1	opening	wood	1,8	52	93,6	NO	2,35
2							

Defined heat transfer coefficient for external window (normative coefficient) [W/m^{2}K]: 0,9

2.7.3.4.2. Doors

No.	Material	Door surface [m^2]	Quantity	Total doors surface [m^2]	Thermal conductivity [W/mK]	Defined heat transfer coefficient for external wall (normative coefficient) [W/m^{2}K]
1	wood	4,41	2	8,82	2,4	0,9

2.7.4. Ventilation

Type of ventilation *(e.g. natural, mechanical, mechanical with heat recovery, mixed)*: no data

2.7.5. Energy indicators and building energy status

Final energy demand (EK): 5,63 [kWh/m^2/year]

Needed actions to improve the energy efficiency of the building:
Walls insulation: NO
Roof insulation:NO
Windows replacement: NO
Doors replacement: NO
Heating system modernization:NO
- Replacement of central heating source: NO
- Modernization of central heating source:NO
- Replacement of central heating installation:NO
- Radiators replacement: NO
- Thermostatic valves installation: NO

Domestic hot water system modernization: NO
RES installation:YES
- Photovoltaic installation: NO
- Solar collectors: YES
- Heat pump: NO

Lighting replacement with LED: NO
Building monitoring system: NO

Planned actions to improve the energy efficiency of the building:
Walls insulation: NO
Roof insulation: NO
Windows replacement: NO
Doors replacement: NO
Heating system modernization:
- Replacement of central heating source: NO
- Modernization of central heating source: NO
- Replacement of central heating installation: NO
- Radiators replacement: NO
- Thermostatic valves installation: NO

Domestic hot water system modernization: NO
RES installation:
- Photovoltaic installation: NO
- Solar collectors: NO
- Heat pump: NO

Lighting replacement with LED: NO
Building monitoring system: NO

2.7.6. Source of information

From the town of Chrastava

2.8. *Městské Kino Chrastava*

2.8.1. Basic information

Building address: Turpišova 236, 463 31 Chrastava
Owner: The town of Chrastava
Year of building: 1992
Type of building (School, public utility ect.): cultural institution
Gross building area: 560
Heated building area: 560
Cubature (volume): 2105

2.8.2. Energy data

2.8.2.1. Central heating system:

Type of source (boiler, heating network ect.): boiler, network
Source power [kW]: 84
Energy efficiency of source: 73
Type of radiators: Steel radiators
Type of pipes (material): steel
Thermostatic valves: NO
Riser control valves –NO
Automatic air vents In radiators – NO
Isolation of pipes: YES
Heat meters: YES
Energy efficiency of heating system [%]: 70

2.8.2.2. Domestic hot water system

Type of source:
Source power [kW]: no data
Energy efficiency of source [%]: no data
Type of pipes (material): no data
Riser control valves – no data
Water meter: YES
Energy efficiency of domestic hot water preparation system [%]: no data

2.8.2.3. Energy consumption

Annual energy usage for central heating (GJ/year): no data
Annual energy usage for domestic hot water (GJ/year): no data
Average usage of hot water [m^3]: no data
Costs of heating (central heating + domestic hot water): no data
Electricity consumption[MWh/year]: no data

2.8.3. External partitions

2.8.3.1. Walls

South envelope surface area: 245
North envelope surface area: 244
East envelope surface area: 216
West envelope surface area: 124
Walls of the basement area (*if applicable*): ……
Envelope material layers (*If envelopes has different layers, show in separate tables)*:

No.	Material	Thickness [m]	Thermal conductivity [W/mK]	Heat transfer coefficient for external wall [W/m^2K]	Defined heat transfer coefficient for external wall (normative coefficient) [W/m^2K]
1	brick	0,5	1	0,8	0,2
2					
3					

2.8.3.2. Roof, flat roof or a ceiling under an unheated attic.

Type of roof (flat, pent, gable, hip, multihip, tented, half-hipped, mansard): tented, flat
Roof slope and direction [°]: West-East
Roofing (tile, metal tile ect.): sheet metal
Total surface area: 655
Envelope material (layers):

No.	Material	Thickness [m]	Thermal conductivity [W/mK]	Heat transfer coefficient for external wall [W/m^2K]	Defined heat transfer coefficient for external wall (normative coefficient) [W/m^2K]
1	sheet metal	0,3	2,8	0,9	0,15

2					
3					

2.8.3.3. Ground floor/floor above the unheated basement/basement floor

Total surface area: 560

Envelope material (layers):

No.	Material	Thickness [m]	Thermal conductivity [W/mK]	Heat transfer coefficient for external wall [W/m^{2}K]	Defined heat transfer coefficient for external wall (normative coefficient) [W/m^{2}K]
1	concrete	0,3		1,1	1,1
2					
3					

2.8.3.4. Window joinery

2.8.3.4.1. Windows

No.	Type	Material	Window surface [m^2]	Quantity	Total windows surface [m^2]	Diffusers	Thermal conductivity [W/mK]
1	plastic	plastic	2,4	14	33,6	NO	1,2
2							

Defined heat transfer coefficient for external window (normative coefficient) [W/m^{2}K]: 0,9

2.8.3.4.2. Doors

No.	Material	Door surface [m^2]	Quantity	Total doors surface [m^2]	Thermal conductivity [W/mK]	Defined heat transfer coefficient for external wall (normative coefficient) [W/m^{2}K]
1	wood	2,92	2	5,84	1,8	0,9

2.8.4. Ventilation

Type of ventilation *(e.g. natural, mechanical, mechanical with heat recovery, mixed)*: no data

2.8.5. Energy indicators and building energy status

Utility energy (EU): no data [kWh/m^2/year]

Final energy demand (EK): no data [kWh/m^2/year]

Primary energy (EP): no data [kWh/m^2/year]

Energy class of buildings: no data

Needed actions to improve the energy efficiency of the building:
Walls insulation: YES
Roof insulation:NO
Windows replacement: NO
Doors replacement: NO
Heating system modernization:NO
- Replacement of central heating source: NO
- Modernization of central heating source:NO
- Replacement of central heating installation:NO
- Radiators replacement: NO
- Thermostatic valves installation: NO

Domestic hot water system modernization: NO
RES installation:NO
- Photovoltaic installation: NO
- Solar collectors: NO
- Heat pump: NO

Lighting replacement with LED: NO
Building monitoring system: NO

Planned actions to improve the energy efficiency of the building:
Walls insulation: NO
Roof insulation: NO
Windows replacement: NO
Doors replacement: NO
Heating system modernization:
- Replacement of central heating source: NO
- Modernization of central heating source: NO
- Replacement of central heating installation: NO
- Radiators replacement: NO
- Thermostatic valves installation: NO

Domestic hot water system modernization: NO
RES installation:
- Photovoltaic installation: NO
- Solar collectors: NO
- Heat pump: NO

Lighting replacement with LED: NO
Building monitoring system: NO

2.8.6. Source of information

From the town of Chrastava.

2.9. *Bytový Dům Chrastava*

2.9.1. Basic information

Building address: nám. 1. máje 250, 463 31 Chrastava
Owner: The town of Chrastava
Year of building: 1992
Type of building (School, public utility ect.): residential
Gross building area: 325
Heated building area: 325
Cubature (volume): 1624
Number of users: 5

2.9.2. Energy data

2.9.2.1. Central heating system:

Type of source (boiler, heating network ect.): gas boiler
Source power [kW]: 70
Energy efficiency of source [%]: 83
Type of radiators: panel radiators
Type of pipes (material): steel
Thermostatic valves: YES
Riser control valves –NO
Automatic air vents In radiators –NO
Isolation of pipes: YES
Heat meters: NO
Energy efficiency of heating system [%]: 70

2.9.2.2. Energy consumption

Average usage of hot water [m^3]: 116

2.9.3. External partitions

2.9.3.1. Walls

South envelope surface area: 161
North envelope surface area: 175
East envelope surface area: 85
West envelope surface area: 82
Walls of the basement area (*if applicable*): 270
Envelope material layers (*If envelopes has different layers, show in separate tables)*:

No.	Material	Thickness [m]	Thermal conductivity [W/mK]	Heat transfer coefficient for external wall [W/m^2K]	Defined heat transfer coefficient for external wall (normative coefficient) [W/m^2K]
1	brick	0,5	1,8	1,2	0,2
2	brick -basement walls	0,65	1,8		
3					

2.9.3.2. Roof, flat roof or a ceiling under an unheated attic.

Type of roof (flat, pent, gable, hip, multihip, tented, half-hipped, mansard): tented roof
Roof slope and direction [°]: 40, east-west
Roofing (tile, metal tile ect.): sheet metal
Total surface area: 501
Envelope material (layers):

No.	Material	Thickness [m]	Thermal conductivity [W/mK]	Heat transfer coefficient for external wall [W/m^2K]	Defined heat transfer coefficient for external wall (normative coefficient) [W/m^2K]
1	sheet metal	0,3	2,1	1,1	0,15
2					
3					

2.9.3.3. Ground floor/floor above the unheated basement/basement floor

Total surface area: 132
Envelope material (layers):

No.	Material	Thickness [m]	Thermal conductivity [W/mK]	Heat transfer coefficient for external wall [W/m^2K]	Defined heat transfer coefficient for external wall (normative coefficient) [W/m^2K]

1	concrete	0,25	0,1	0,2	0,6
2					
3					

2.9.3.4. Window joinery

2.9.3.4.1. Windows

No.	Type	Material	Window surface [m^2]	Quantity	Total windows surface [m^2]	Diffusers	Thermal conductivity [W/mK]
1	Plastic	Plastic	1,92	31	59,52	NO	1,2
2							

Defined heat transfer coefficient for external window (normative coefficient) [W/m^2K]: 0,9

2.9.3.4.2. Doors

No.	Material	Door surface [m^2]	Quantity	Total doors surface [m^2]	Thermal conductivity [W/mK]	Defined heat transfer coefficient for external wall (normative coefficient) [W/m^2K]
1	plastic	2,76	5	13,8	1,2	0,9

2.9.4. Ventilation

Type of ventilation *(e.g. natural, mechanical, mechanical with heat recovery, mixed)*: no data

2.9.5. Energy indicators and building energy status

Utility energy (EU): no data [kWh/m^2/year]
Final energy demand (EK): no data [kWh/m^2/year]
Primary energy (EP): no data [kWh/m^2/year]

Energy class of buildings: no data

<u>Needed actions to improve the energy efficiency of the building:</u>
Walls insulation: YES
Roof insulation: YES
Windows replacement: YES
Doors replacement: NO
Heating system modernization:NO
Replacement of central heating source: NO
Modernization of central heating source:NO

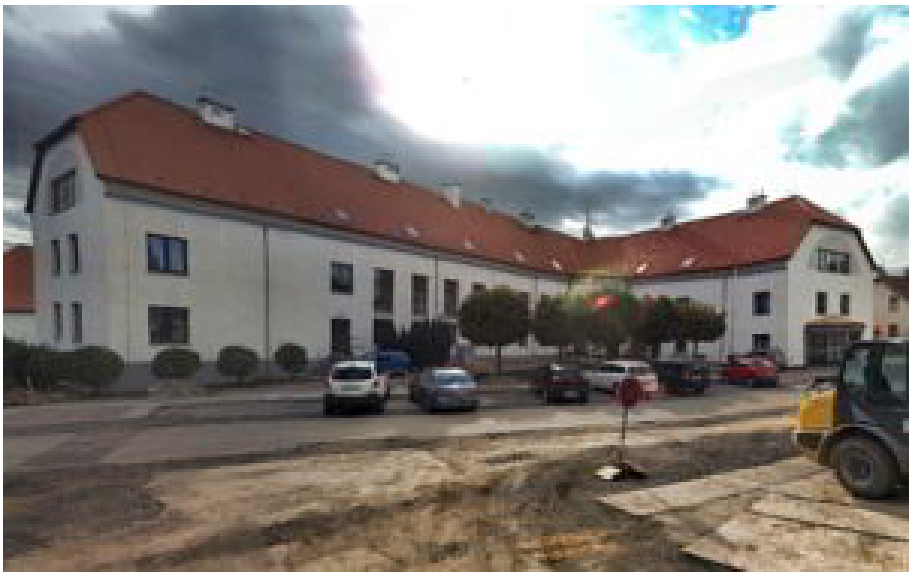
Replacement of central heating installation:NO
Radiators replacement: NO
Thermostatic valves installation: NO
Domestic hot water system modernization: NO
RES installation:YES
Photovoltaic installation: NO
Solar collectors: YES
Heat pump: NO
Lighting replacement with LED: NO
Building monitoring system: NO

Planned actions to improve the energy efficiency of the building:
Walls insulation: NO
Roof insulation: NO
Windows replacement: NO
Doors replacement: NO
Heating system modernization:
Replacement of central heating source: NO
Modernization of central heating source: NO
Replacement of central heating installation: NO
Radiators replacement: NO
Thermostatic valves installation: NO
Domestic hot water system modernization: NO
RES installation:
Photovoltaic installation: NO
Solar collectors: NO
Heat pump: NO
Lighting replacement with LED: NO
Building monitoring system: NO

2.9.6. Source of information

From the town of Chrastava.

2.10. Dům s pečovatelskou službou



2.10.1. Basic information

Building address: Bílokostelecká 66, 463 31 Chrastava
Owner: The town of Chrastava
Year of building: 1993
Type of building (School, public utility ect.): public utility
Gross building area: 2223
Cubature (volume): 7780
Number of users: 35
Energy audit: YES
Technical documentation: YES

2.10.2. Energy data

2.10.2.1. Central heating system:

Type of source (boiler, heating network ect.): heating network
Source power [kW]:
Energy efficiency of source [%]: 84
Type of radiators: panel radiators
Type of pipes (material): copper
Thermostatic valves: YES
Riser control valves – NO
Automatic air vents In radiators – NO
Isolation of pipes: YES
Heat meters: YES
Energy efficiency of heating system [%]: 74

2.10.2.2. Domestic hot water system

Type of source: boiler
Source power [kW]: 3,117
Energy efficiency of source [%]: 75
Riser control valves – NO
Water meter: YES
Energy efficiency of domestic hot water preparation system [%]: 72

2.10.2.3. Energy consumption

Annual energy usage for central heating (GJ/year): 1071
Average usage of hot water [m^3]: 273
Costs of heating (central heating + domestic hot water): 21 100,00
Electricity consumption[MWh/year]: 6,861

2.10.3. External partitions

2.10.3.1. Walls

South envelope surface area: 378
North envelope surface area:399
East envelope surface area: 203
West envelope surface area: 280
Walls of the basement area (*if applicable*): 438
Envelope material layers (*If envelopes has different layers, show in separate tables)*:

No.	Material	Thickness [m]	Thermal conductivity [W/mK]	Heat transfer coefficient for external wall [W/m^2K]	Defined heat transfer coefficient for external wall (normative coefficient) [W/m^2K]
1	EPS	0,2	0,2	0,8	0,2
2					
3					

2.10.3.2. Roof, flat roof or a ceiling under an unheated attic.

Type of roof (flat, pent, gable, hip, multihip, tented, half-hipped, mansard): tented roof
Roof slope and direction [°]: 40
Roofing (tile, metal tile ect.): sheet metal
Total surface area: 1290
Envelope material (layers):

No.	Material	Thickness [m]	Thermal conductivity [W/mK]	Heat transfer coefficient for external wall [W/m^2K]	Defined heat transfer coefficient for external wall (normative coefficient) [W/m^2K]
1	sheet metal	0,001		0,35	0,15
2	wool	0,25			
3	SDK	0,0125			

2.10.3.3. Ground floor/floor above the unheated basement/basement floor

Total surface area:

Envelope material (layers):

No.	Material	Thickness [m]	Thermal conductivity [W/mK]	Heat transfer coefficient for external wall [W/m^{2}K]	Defined heat transfer coefficient for external wall (normative coefficient) [W/m^{2}K]
1					0,359
2					
3					

2.10.3.4. Window joinery

2.10.3.4.1. Windows

No.	Type	Material	Window surface [m^2]	Quantity	Total windows surface [m^2]	Diffusers	Thermal conductivity [W/mK]
1	opening	PVC	3,4	182	620	NO	1,2
2	roof, in the wall	wood, plastic	2,7	90	245	NO	1,2

Defined heat transfer coefficient for external window (normative coefficient) [W/m^{2}K]: 0,9

2.10.3.4.2. Doors

No.	Material	Door surface [m^2]	Quantity	Total doors surface [m^2]	Thermal conductivity [W/mK]	Defined heat transfer coefficient for external wall (normative coefficient) [W/m^{2}K]
1	PVC	4,1	35	145	1,2	0,9

2.10.4. Ventilation

Type of ventilation *(e.g. natural, mechanical, mechanical with heat recovery, mixed)*: no data

2.10.5. Energy indicators and building energy status

Final energy demand (EK): 3,08 [kWh/m^2/year]

<u>Needed actions to improve the energy efficiency of the building:</u>
Walls insulation: NO
Roof insulation:NO

Windows replacement: NO
Doors replacement: NO
Heating system modernization:NO
- Replacement of central heating source: NO
- Modernization of central heating source:NO
- Replacement of central heating installation:NO
- Radiators replacement: NO
- Thermostatic valves installation: NO

Domestic hot water system modernization: NO
RES installation: NO
- Photovoltaic installation: NO
- Solar collectors: NO
- Heat pump: NO

Lighting replacement with LED: NO
Building monitoring system: NO

<u>Planned actions to improve the energy efficiency of the building:</u>
Walls insulation: NO
Roof insulation: NO
Windows replacement: NO
Doors replacement: NO
Heating system modernization:
- Replacement of central heating source: NO
- Modernization of central heating source: NO
- Replacement of central heating installation: NO
- Radiators replacement: NO
- Thermostatic valves installation: NO

Domestic hot water system modernization: NO
RES installation:
- Photovoltaic installation: NO
- Solar collectors: NO
- Heat pump: NO

Lighting replacement with LED: NO
Building monitoring system: NO

2.10.6. Source of information

From the town of Chrastava

2.11. Základní škola Chrastava

2.11.1. Basic information

Building address: Revoluční 442
Owner: The town of Chrastava
Year of building: 1908
Type of building (School, public utility ect.): school
Gross building area: 325
Net building area:
Heated building area: 325
Cubature (volume): 1624
Number of users: 5
Energy audit: YES
Technical documentation: YES

2.11.2. Energy data

2.11.2.1. Central heating system:

Type of source (boiler, heating network ect.): heating network
Source power [kW]: 70
Energy efficiency of source [%]: 85
Type of radiators: ribbed radiator
Type of pipes (material): steel
Thermostatic valves: NO
Riser control valves – NO
Automatic air vents In radiators – NO
Isolation of pipes: NO

Heat meters: YES
Energy efficiency of heating system [%]: 70

2.11.2.2. Domestic hot water system

Type of source network
Source power [kW]: 2500
Energy efficiency of source [%]: 68
Type of pipes (material): no data
Riser control valves – NO
Water meter: NO
Energy efficiency of domestic hot water preparation system [%]: 65

2.11.2.3. Energy consumption

Annual energy usage for central heating (GJ/year): 602
Annual energy usage for domestic hot water (GJ/year): 9
Average usage of hot water [m^3]: 250
Costs of heating (central heating + domestic hot water): 13504,4
Electricity consumption[MWh/year]: 33,23

2.11.3. External partitions

2.11.3.1. Walls

South envelope surface area: 368
North envelope surface area: 135
East envelope surface area: 135
West envelope surface area: 459
Walls of the basement area (*if applicable*): 380
Envelope material layers (*If envelopes has different layers, show in separate tables)*:

No.	Material	Thickness [m]	Thermal conductivity [W/mK]	Heat transfer coefficient for external wall [W/m^2K]	Defined heat transfer coefficient for external wall (normative coefficient) [W/m^2K]
1	brick	0,6	1,8	1,2	0,41
2					
3					

2.11.3.2. Roof, flat roof or a ceiling under an unheated attic.

Type of roof (flat, pent, gable, hip, multihip, tented, half-hipped, mansard): tented roof
Roof slope and direction [°]: 40 degrees, east-west
Roofing (tile, metal tile ect.): eternit template
Total surface area: 960
Envelope material (layers):

No.	Material	Thickness [m]	Thermal conductivity [W/mK]	Heat transfer coefficient for	Defined heat transfer coefficient for external

				external wall [W/m^{2}K]	wall (normative coefficient) [W/m^{2}K]
1	eternit	0,01	2,1	1,1	0,15
2					
3					
4					

2.11.3.3. Ground floor/floor above the unheated basement/basement floor

Total surface area: 132

Envelope material (layers):

No.	Material	Thickness [m]	Thermal conductivity [W/mK]	Heat transfer coefficient for external wall [W/m^{2}K]	Defined heat transfer coefficient for external wall (normative coefficient) [W/m^{2}K]
1	concrete	0,25	0,1	0,2	0,6
2					
3					

2.11.3.4. Window joinery

2.11.3.4.1. Windows

No.	Type	Material	Window surface [m^2]	Quantity	Total windows surface [m^2]	Diffusers	Thermal conductivity [W/mK]
1	wood	wood	1,85	74	137	NO	1,2
2							

Defined heat transfer coefficient for external window (normative coefficient) [W/m^{2}K]: 0,9

2.11.3.4.2. Doors

No.	Material	Door surface [m^2]	Quantity	Total doors surface [m^2]	Thermal conductivity [W/mK]	Defined heat transfer coefficient for external wall (normative coefficient) [W/m^{2}K]
1	wood	2	58	116	1,2	0,9

2.11.4. Ventilation

Type of ventilation *(e.g. natural, mechanical, mechanical with heat recovery, mixed)*: no ventilation

2.11.5. Lighting

Lighting type(e.g. LED, bulbs, fluorescent lamps): no data

Number of lighting points: no data

Power of lighting points [kW]: no data

2.11.6. Renewable Energy Sources

Photovoltaic installation: NO
if YES, power of installation [kWp]: ……..
Solar collectors: NO
if YES, number of collectors in installation[amount]: ……..
Heat pump: NO
If YES, type: ……., power: ……, COP: ……..

2.11.7. Energy indicators and building energy status

Utility energy (EU): no data [kWh/m^2/year]
Final energy demand (EK): no data [kWh/m^2/year]
Primary energy (EP): no data [kWh/m^2/year]

Energy class of buildings: F

<u>Needed actions to improve the energy efficiency of the building:</u>
Walls insulation: YES
Roof insulation: YES
Windows replacement: YES
Doors replacement: YES
Heating system modernization:
- Replacement of central heating source: NO
- Modernization of central heating source: NO
- Replacement of central heating installation: YES
- Radiators replacement: YES
- Thermostatic valves installation: YES

Domestic hot water system modernization: YES
RES installation:
- Photovoltaic installation: NO
- Solar collectors: NO
- Heat pump: NO

Lighting replacement with LED: YES
Building monitoring system: YES

<u>Planned actions to improve the energy efficiency of the building:</u>
Walls insulation: YES
Roof insulation: YES
Windows replacement: YES
Doors replacement: YES
Heating system modernization:
- Replacement of central heating source: NO
- Modernization of central heating source: NO
- Replacement of central heating installation: YES

Radiators replacement: YES
Thermostatic valves installation: YES
Domestic hot water system modernization: YES
RES installation:
Photovoltaic installation: NO
Solar collectors: NO
Heat pump: NO
Lighting replacement with LED: YES
Building monitoring system: YES

2.11.8. Source of information

From the town of Chrastava

3. Spatial/non-spatial data availability for region.

The spatial data for Podgórzyn/Poland was obtained from the Head Office of Geodesy and Cartography in Poland. For the Chrastava/Czech Republic, the spatial data was delivered by municipality from Czech Office for Surveying, Mapping and Cadastre.

The non-spatial data for both Pilot Actions were collected through direct contact with communes.

Table1. Source of spatial and non-spatial data for Pilot Action

Country / Pilot action	Dataset / Source	Types of data	Owner	Access	
				Public	For PA
Poland	**Podgórzyn (EUWT – PA3)**				
	OpenStreetMap	2D geometries of building footprints *(vector data with attributes)*	-	**YES**	**YES**
	Topographic database	LiDAR point clouds in xyz format	**National Authority** (Head Office of Geodesy and Cartography in Poland)	**NO**	**YES**
	Technical documentation of PA buildings	- age of construction - type of energy system (electricity and heat consumption) - envelope materials - high of the building - etc.	**Local Authority** (Municipality of Podgórzyn)	**NO**	**YES**
Czech Republic – Chrastava (PA3)	Topographic database	LiDAR point clouds in xyz format	**National Authority** (Czech Office for Surveying, Mapping and Cadastre)	**NO**	**YES**
	OpenStreetMap	2D geometries of building footprints *(vector data with attributes)*	-	**YES**	**YES**
	Technical documentation of PA buildings	Data about construction, sanitary and electrical installations, room dimension, used materials etc.	**Local Authority** (City of Chrastava)	**NO**	**YES**

4. TARGET-CE tools planned to be used in buildings

No.	Name of building	Type of building	Tools used in PA	Scope of tool usage
1	*Primary School in Ścięgny*	school	GreenSoul Sticker OnePlace-3DEMS	behavior change by placing selected stickers (results from GreenSoul project); visualization of the building in LOD2 within 3DEMS tools together with energy-related information (BOOSTEE-CE project)
2	*School and Kindergarten Complex in Miłków*	school	GreenSoul Sticker; OnePlace-3DEMS	behavior change by placing selected stickers (results from GreenSoul project); visualization of the building in LOD2 within 3DEMS tools together with energy-related information (BOOSTEE-CE project)
3	*Municipality Office in Podgórzyn*	public utility	GreenSoul Sticker; OnePlace-3DEMS	behavior change by placing selected stickers (results from GreenSoul project); visualization of the building in LOD2 within 3DEMS tools together with energy-related information (BOOSTEE-CE project)
4	*Nursing home in Chrastava*	public utility	GreenSoul Sticker; OnePlace-3DEMS	behavior change by placing selected stickers (results from GreenSoul project); visualization of the building in LOD2 within 3DEMS tools together with energy-related information (BOOSTEE-CE project)
5	*Cinema in Chrastava*	cultural institution	GreenSoul Sticker; OnePlace-3DEMS	behavior change by placing selected stickers (results from GreenSoul project); visualization of the building in LOD2 within 3DEMS tools together with energy-related information (BOOSTEE-CE project)
6	*House for single mothers in Chrastava*	public utility	GreenSoul Sticker OnePlace-3DEMS	behavior change by placing selected stickers (results from GreenSoul project); visualization of the building in LOD2 within 3DEMS tools together with energy-related information (BOOSTEE-CE project)

7	*Karkonoska Agencja Rozwoju Regionalnego S.A. KARR S.A.*	public utility	GreenSoul Sticker	behavior change by placing selected stickers (results from GreenSoul project)
8	*EUWT NOVUM office*	public utility	GreenSoul Sticker	behavior change by placing selected stickers (results from GreenSoul project)
9	*Passive school in Podgórzyn*	school	ENERGY@SCHOOL trainings GreenSoul Sticker OnePlace-3DEMS	behavior change by placing selected stickers (results from GreenSoul project); visualization of the building in LOD2 within 3DEMS tools together with energy-related information (BOOSTEE-CE project). If the pandemic situation in both countries will allow to perform the activities, then it is planned to use the training materials from ENERGY@SCHOOL project to perform the cross-border training with the pupils.
10	*Primary School in Chrastava*	school	ENERGY@SCHOOL trainings GreenSoul Sticker OnePlace-3DEMS	behavior change by placing selected stickers (results from GreenSoul project); visualization of the building in LOD2 within 3DEMS tools together with energy-related information (BOOSTEE-CE project). If the pandemic situation in both countries will allow to perform the activities, then it is planned to use the training materials from ENERGY@SCHOOL project to perform the cross-border training with the pupils.
11	*Museum of fire equipment in Chrastava*	museum	OnePlace-3DEMS	visualization of the building in LOD2 within 3DEMS tools together with energy-related information (BOOSTEE-CE project).
12	*Communal Public Library of the Podgórzyn Commune, Branch in Miłków*		OnePlace-3DEMS	visualization of the building in LOD2 within 3DEMS tools together with energy-related information (BOOSTEE-CE project).
13	*Apartment building in Chrastava*		OnePlace-3DEMS	visualization of the building in LOD2 within 3DEMS tools together with energy-related information (BOOSTEE-CE project).

5. PA implementation schedule

Implementation & testing of capitalized solutions in the cross-border PL/CZ area (PA3)					
No.	Phase	Phase description	Start of phase	End of phase	Resources needed
1.	design of stickers	graphic design of the Polish version of stickers, adding a few dedicated to selected pilot buildings	01.2021	02.2021	stickers from the GreenSoul project
2.	market research	determining the approximate order price for printing stickers and determining the public procurement procedure to be used	03.2021	03.2021	-
3.	printing of stickers	ordering the printing of stickers and collecting the finished products from the contractor	04.2021	04.2021	budget
4.	distribution of stickers	placement of stickers in pilot buildings	06.2021	06.2021	stickers
5.	ENERGY@SCHOOL trainings (if the pandemic situation will allow organize the trainings in the school)	conducting trainings	01.2022	03.2022	training materials
6.	Thermal images	Thermal images will be done for the PA buildings	winter 2021/2022	winter 2021/2022	budget

6. Collaboration with stakeholders

Stakeholder groups	Role and responsibility	Involvement
users of pilot buildings in Podgórzyn	employees, visitors	filling out the questionnaires from GreenSoul project "Energy-related behaviour in public buildings"
users of pilot buildings in Chrastava	employees, visitors	filling out the questionnaires from GreenSoul project "Energy-related behaviour in public buildings"

employees of KARR S.A.	employees	filling out the questionnaires from GreenSoul project "Energy-related behaviour in public buildings"
the authorities of the Podgórzyn commune	the authorities	cooperation in collecting data for 3dems
the authorities of the Chrastava commune	the authorities	cooperation in collecting data for 3dems

7. Foreseen problems and possibility of mitigation actions implementation

The problem with the stickers may appear at the stage of their distribution, the COVID-19 pandemic may lead to a restriction of entry into pilot buildings, in such a case, it will be possible to hand over the stickers to employees of these buildings for self-placement.
ENERGY @ SCHOOL training will be conducted only if the epidemiological situation allows it, if it is not possible, we will provide schools materials for environmental education.

8. Monitoring strategy

The impact of stickers on the change in the behavior of users and employees of selected buildings will be verified by resending surveys "Energy-related behaviour in public buildings" and analyzing their results. The data for OnePlace 3DEMS tool was collected and if any new data or new changes appear the database will be updated.
The EUWT NOVUM is in contact with both municipalities in order to follow the pilot action.

9. Conclusion

The spatial and non-spatial data for the 3DEMS tool was successfully delivered to Work Package Leader. In order to capitalize the GreenSoul project results, the questionnaires and as well the stickers were tailored and adapted to the new pilot region. The new design of the stickers was developed and printed in order to distribute them to selected pilot buildings. The ENERGY@SCHOOL training within the Communication Package relay on the pandemic situation at the beginning of 2022.