

4.11 Annex 11 - Baseline Report

Municipality: Plovdiv
 Building code:
 Building: UHAT „Sv.Georgi“ EAD
 Clinic of Infectious Diseases, block 4 (Administration)
 Address: Bld. "Peshtersko shose" 66, Plovdiv
 Total floor area, m²: 2 503



Expected results	Value
Energy saved, MWh/year	332.65
Energy saved, €/year	12 558
CO ₂ emissions saved, tco ₂ /year	58.47
CAPEX, €	115 141
Simple payback period ¹ , year	9.17

¹ Simple payback including cost price of materials, labor, mechanization, profit and not including cost of finance.

4.11.1. Current status of the building

Infrastructure	Description
Commissioned	1958 year
Building structure	Solid reinforced concrete structure with one semi-underground and two overground floors. In the basement are located technical premises. On the first and the second floors is situated administration, lecture rooms, bathrooms. The lofts are not used, not heated.
Facade walls	Basement - Concrete, inside plastered, outside with mosaic. Overground floors - masonry with solid brick, both sides plastered The visible condition of all facade walls is good, but without heat insulation.
Roof structures	Concrete structure with a roof of a wooden edging, covered with roof tiles. Unusable lofts. The visible condition of the roof is good, but without heat insulation.
Floor structures	Floor over non-heated semi-underground floor, without heat insulation.
Joinery	Wooden joined joinery.
Heating	Individual substation for heating, connected to power station of hot water. Bad condition of the circulation pumps and metering valves. Two-pipe system line and forced circulation. Radiators of cast iron, not fully functioning. There is no heat armature for regulation.
Domestic hot water	The hot water supply is implemented by a plate heat exchanger and a water heat accumulator. The water temperature regulation is controlled automatically by thermostat.
Electric appliances and lighting	Appliances, affecting and non-affecting the heating; Lighting with luminescent lamps and incandescent lamps.
Air conditioning and ventilation	There is no ventilating system. Few rooms conditioned by individual air-conditioners, split system.
Operational hours	Residents: 9 hours a day, 5 days a week, excluding holidays Heating: 24 hours a day, 7 days a week, including holidays

4.11.2. Current energy consumption

Energy	Heating			Electricity		DHW		Total		
	Year	Gcal/year	MWh/year	€/year	MWh/year	€/year	MWh/year	€/year	MWh/year	€/year
2012										
2013		194.31	225.98	10 588	52.03	752	2.87	134	280.88	11 474
2014 ¹		195.07	226.87	8 742	38.41	864	2.87	110	268.15	9 717
Average		194.69	226.43	9 665	45.22	808	2.87	122	274.52	10 596

¹ Reference year

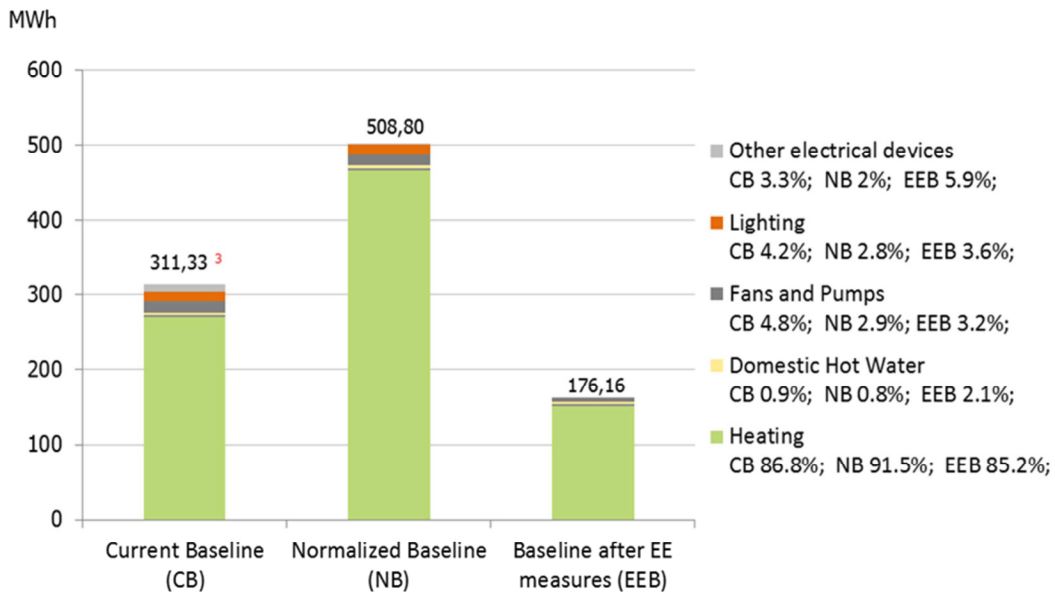
Actual prices of energy sources				
Nº	Energy source	Measure	Value	Consider since
1	Electricity	€/MWh	77.22	1/11/2015
2	Natural gas	€/MWh	36.29	1/1/2016
3	Central Heating Energy	€/MWh	35.20	1/10/2015

4.11.3. Analysis of the estimated energy savings

Nº	Discription	Energy saving measures			Energy saved ²			Capex	Pay-back
		MWh/year	€/year	t co ₂ /year	€	year			
1	Insulation of external walls	82.81	3 005	16.73	33 824	11.26			
2	Roof insulation	68.13	2 472	13.76	31 963	12.93			
3	ESM on basement	9.26	336	1.87	4 882	14.53			
4	Joinery replacement	65.08	2 362	13.15	36 977	15.66			
5	Switching the heating from local to DHS supply								
	- heating system renovation	99.59	3 614	6.59	2 666	0.70			
	- change of energy source	-	168						
7	Lighting measure	7.78	601	6.37	4 830	8.04			
	Total	332.65	12 558	58.47	115 141	9.17			

² The amount of the energy savings is calculated according to the normalized value of the base consumption.

4.11.4. Energy consumption share



Parameter			Baseline	
Nº	Discription	Measure	Current	Normalized ⁴
1	Internal temperature	°C	13.2	21.0
2	DHW consumption	l/m ²	24.0	36.0
3	Lighting functioning	%	62.0	100.0

³ The difference between the numbers arising from the invoices and the software comes by technological deviation in the degree-days, used in modelling. According the methodology approved by the norm.

⁴ Values come from the norm according to type and functioning of the building, number of persons inside, etc.

4.11.5. Energy saving measures - description

Energy saving measures	Activities	Measure	Price ¹ (€)	Quantity	Sum (€)
1. Insulation of external walls	Preliminary preparation of external walls	m ²	4.62	970	4 481
	Thermal insulation EPS 10 cm, flipping edges with safety profiles; plugging 8 pcs. / m ²	m ²	21.37	970	20 729
	Plastering two layers of "scratched" mineral plaster	m ²	6.29	970	6 101
	Collection, transport and disposal of construction waste to landfill up to 20 kilometers.	m ²	2.59	970	2 512
	Total ESM 1:				
2. Roof insulation	Preliminary preparation of roof	m ²	0.72	1 251	901
	Thermal insulation EPS 10 cm on roof, covered with plaster	m ²	19.28	1 251	24 119
	Stucco 4 cm., reinforced with welded mesh	m ²	4.25	1 251	5 317
	Collection, transport and disposal of construction waste to landfill up to 20 kilometers.	m ²	1.30	1 251	1 626
	Total ESM 2:				
3. ESM on basement	Preliminary preparation of external walls	m ²	4.62	140	647
	Thermal insulation EPS 10 cm, flipping edges with safety profiles; plugging 8 pcs. / m ²	m ²	21.37	140	2 992
	Plastering two layers of "scratched" mineral plaster	m ²	6.29	140	881
	Collection, transport and disposal of construction waste to landfill up to 20 kilometers.	m ²	2.59	140	363
	Total ESM 3:				
4. Joinery replacement	Mounting PVC windows with double panes (one multigrade and one float glass), exterior and interior window panels and anti-mosquito nets to the opening parts	m ²	88.61	353	31 279
	Sealing, patching and flipping edges ; plastering and painting from inside	m ²	10.6	353	3 742
	Dismantling of old joinery, collection, transport and disposal of construction waste to landfill up to 20 kilometers.	m ²	5.54	353	1 956
	Total ESM 4:				
5. Switching the heating from local to DHS supply	Connecting the new centralized heating system into the existing systems for heating and DHW of the building. Isolating of all the new elements.	psc	1.00	2 503	2 503
	Charge new accession to the central heating	psc	162.59	1	163
	Total ESM 5:				

6. Lighting measure	Dismantling of luminaire, removing transformers and chokes	psc	2.81	145	407
	Removing fluorescent cigars, supply and mounting of LED cigars	psc	10.74	355	3 813
	Installation of luminaire back	psc	2.30	145	334
	Dismantling of incandescent lamp, supply and installation of energy saving lamp	psc	3.58	60	215
	Collection, transport and disposal of lighting waste to landfill up to 20 kilometers.	m ³	30.68	2	61
	Total ESM 6:				
Total:					115 141

¹ Cost assumptions are based on analyze of normal practice of local contractors and usage of the guide prices in construction - the last published edition (01.2016). Usage of trade marks is not permitted by the regulator. All the materials has to be chosen by their basic characteristics. All costs are considered at average level - neither conservative, nor optimistic.

4.11.6. Information about investment and savings according measures applied

Energy efficient measures

Type of Measures	Investments (BGN)	Savings (kW/h)		Savings (BGN)	
		Electrical Energy	Heat energy	Electrical Energy	Heat energy
Insulation of external walls	66 154		82 812		5 878
Roof insulation	62 514		68 127		4 835
ESM on basement	9 548		9 256		657
Joinery replacement	72 320		65 081		4 619
Switching the heating from local to DHS supply	5 222		99 590		7 397
Lighting measure	9 445	7 776		1 174	
Total:	225 203	7 776	324 866	1 174	23 386
CO2 Savings		6.37	52.09		

Additional activities

Type of Measures	Investments (BGN)
Related to external walls ESM	6 615
Related to roof ESM	6 251
Related to basement ESM	955
Related to joinery replacement	7 232
Related to switching the heating from local to DHS supply	522
Related to Lighting ESM	945
Total:	22 520

Energy consumption

Items	Object
Type of object	hospital
Gross floor area (sq.m.)	2503
Type of heat energy before the project	Natural gas
Type of heat energy after the project	Central Heating Energy
Class of the building before the project	D
Class of the building after the project	B

Energy Prices (BGN/kWh)	Before the project (historical)	After the project
Electical energy	0.04	0.15
Heat Energy (type of fuel)	0.08	0.07
Example: Diesel		
Example: Gas		



Object 1	Pre-project Consumption		Normalized consumption		Consumption after the project	
	kWh	BGN	kWh	BGN	kWh	BGN
Total consumption	311 432	22 267	508 796	37 111	176 155	14 308
Electrical energy	38 384	1 689	39 378	1 733	22 413	3 396
Heat Energy	273 048	20 579	469 418	35 378	153 742	10 912