

4.2 Annex 2 - Baseline Report

Municipality: Plovdiv
 Building code:
 Building: UHAT „Sv.Georgi“ EAD
 Clinic for skin diseases
 Address: Bld.“Vasil Aprilov” 15A, Plovdiv
 Total floor area, m²: 1 194



Expected results	Value
Energy saved, MWh/year	224.71
Energy saved, €/year	8 508
CO ₂ emissions saved, tco ₂ /year	48.21
CAPEX, €	34 880
Simple payback period ¹ , year	4.10

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

4.2.1. Current status of the building

Infrastructure	Description
Commissioned	1929 year
Building structure	Structure with two corpuses. Main corpus is with two overground floors. The adjoined corpus is with one overground floor. The floor structures are wooden beams. On the first floor are situated doctor's offices, laboratories, dining room, kitchen, substation and bathrooms; on the second are hospital rooms, manipulation room, computer room and bathroom.
Facade walls	Facade walls - masonry of solid bricks, insides plastered. Outside insulated with EPS 8 cm. The visible condition of all facade walls is excellent.
Roof structures	The main corpus has a wooden structure (insulated between beams) with a roof of a wooden edging, covered with roof tiles. The adjoined corpus has a warm reinforced concrete roof, insulated with EPS 8 cm. The visible condition of the roof is good. The lofts are unused.
Basement structures	Floor on the ground
Joinery	Double glazed PVC joinery
Heating	Individual substation for heating, connected to power station of water vapour. Bad condition of the pipe-line system - insulation partially torn, leakage. 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 DHW system works with an external boiler, heated up by power station of water vapour. Thermal isolation with torn places.
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: 24 hours a day, 7 days a week, including holidays Heating: the same as residents

4.2.2. Current energy consumption

Energy	Heating			Electricity		DHW		Total		
	Year	Gcal/year	MWh/year	€/year	MWh/year	€/year	MWh/year	€/year	MWh/year	€/year
	2012	182.60	212.36	10 243	75.01	6 744	121.57	5 864	408.94	22 850
	2013	15.74	18.31	8 492	36.66	3 526	12.16	5 637	67.13	17 656
	2014 ¹	182.63	212.40	9 787	34.17	2 422	121.57	5 606	368.14	17 814
	Average	126.99	147.69	9 507	48.61	4 231	85.10	5 702	281.40	19 440

¹ Reference year

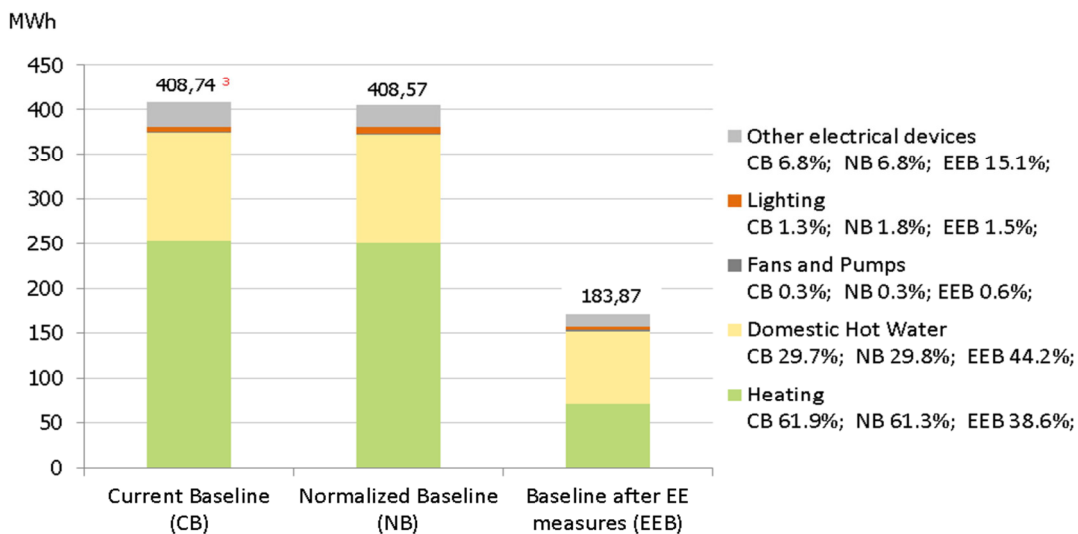
Actual prices of energy sources				
Nº	Energy source	Measure	Value	Consider since
1	Electricity	€/MWh	77.22	1/11/2015
2	Natural gas	€/MWh	36.29	1/1/2016
3	Central Heating Energy	€/MWh	35.20	1/10/2015

4.2.3. Analysis of the estimated energy savings

Energy saving measures		Energy saved ²			Capex	Pay-back
Nº	Discription	MWh/year	€/year	t co ₂ /year	€	year
1	Switching the heating from local to DHS supply					
	- heating system renovation	179.72	6 522	36.30	30 720	4.65
	- change of energy source	-	78			
2	Switching the DHW from local to DHS supply					
	- connecting subsystem for DHW supply	40.41	1 466	8.16	1 919	1.23
	- change of energy source	-	89			
3	Lighting measure	4.58	353	3.75	2 241	6.35
Total		224.71	8 508	48.21	34 880	4.10

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

4.2.4. Energy consumption share



Parameter			Baseline	
No	Description	Measure	Current	Normalized ⁴
1	Internal temperature	°C	27.0	27.0
2	DHW consumption	l/m ²	1782.0	1 782.0
3	Lighting functioning	%	64.0	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 norm according to type and functioning of the building, number of persons inside, etc.

4.2.5. Energy saving measures - description

Energy saving measures	Activities	Measure	Price ¹ (€)	Quantity	Sum (€)
1. Switching the heating from local to DHS supply	Design of a new HVAC project for reconstruction - stage: technical level	m ²	0.75	1 194	896
	Dismantling of pipelines and radiators, iollection, transport and disposal of waste to landfill up to 20 kilometers	m ²	0.90	1 194	1 075
	Supply and installation of fan coils (Q heat / cool = 4,2 / 1,5kW) equipped with three-way valve for two-pipeline system	m ²	3.80	1 194	4 537
	Supply and mounting of a new pipeline system thermo-isolated for the heating system	m ²	16.70	1 194	19 940
	Supply and installation of pipelines for the condensate and connect the fan coil units to the internal electro grid	m ²	1.00	1 194	1 194
	Supply and installation of water collector and distributor with fittings and thermo insulation	m ²	1.00	1 194	1 194
	Supply and mounting of plasterboard decorations, mineral wadding isolated	m ²	0.40	1 194	478
	Supply and installation of a an automated system for the HVAC monitoring	m ²	1.10	1 194	1 313
	Charge new accession to the central heating	psc	93.82	1	94
	Total ESM 1:				
2. Switching the DHW from local to DHS supply	Connecting the subsystem to the existing DHW pipelines, thermo isolation of pipelines	m	55.00	25	1 375
	Dismantling of the existing boiler and pipeline connections, transport and disposal of waste to landfill up to 20 kilometers	m	15.00	30	450
	Charge new accession to the DHS	psc	93.82	1	94
	Total ESM 2:				
3. Lighting measure	Dismantling of luminaires (whole units)	psc	2.81	56	157
	Removing fluorescent cigars, supply and mounting of LED cigars	psc	10.74	169	1 815
	Installation of luminaire back	psc	2.30	56	129
	Dismantling of incandescent lamps, supply and installation of energy saving lamps	psc	3.58	22	79
	Collection, transport and disposal of lighting waste to landfill up to 20 kilometers	m ³	30.68	2	61
	Total ESM 3:				
Total:					34 880

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 - neighter conservative, nor optimistic.

4.2.6. Information about investments and savings according to the measures applying

Energy efficient measures

Type of Measures	Investments (BGN)	Savings (kW/h)		Savings (BGN)	
		Electrical Energy	Heat energy	Electrical Energy	Heat energy
Switching the heating from local to DHS supply	60 083		179 716		12 908
Switching the DHW from local to DHS supply	3 753		40 410		3 041
Lighting measure	4 384	4 576		691	
Total:	68 220	4 576	220 126	691	15 949
CO2 Savings		3.75	44.46		

Additional activities

Type of Measures	Investments (BGN)
Related to switching the heating from local to DHS supply	6 008
Related to switching the DHW from local to DHS supply	375
Related to Lighting ESM	438
Total:	6 822

Energy consumption

Items	Object
Type of object	hospital
Gross floor area (sq.m.)	1 194
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
Electrical energy	0.14	0.15
Heat Energy (type of fuel)	0.09	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	408 735	38 427	408 573	38 505	183 870	15 575
Electrical energy	34 194	4 719	36 112	4 983	31 536	4 763
Heat Energy	374 541	33 709	372 461	33 521	152 334	10 812