4.14 Annex 14 – Baseline Report

Municipality: Plovdiv
Building code:
Building: Medical University, Plovdiv
Sports Hall "Medik"
Address: Bld."Vasil Aprilov" 15A, Plovdiv
Total floor area, m^2: 742

Expected results	Value
Energy saved, MWh/year	31.51
Energy saved, €/year	1 221
CO_2 emissions saved, tco_2/year	0.42
CAPEX, €	8 513
Simple payback period [1], year	6.97

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

4.14.1. Current status of the building

Infrastructure	Description
Commissioned	1964 year
Building structure	Solid reinforced concrete structure with one premise with a large volume (sports hall) and corps with one semi-underground and two overground floors (administration, changing rooms and bathrooms).
Facade walls	Masonry from hallow brick, inside plastered, outside insulated with EPS.
Roof structures	Reinforced concrete structure, insulatied with rockwool.
Basement structures	Floor on the ground (77%); floor of a heated semi-undergraoud floor (19%); floor in contact with external air (4%)
Joinery	Old double glazed PVC joinery with U<= 2.20 W/m2K (33%) New double glazed PVC joinery with U<= 1.70 W/m2K (66%)
Heating	Individual substation for heating, connected to power station of hot water. Good condition of the pipe-line system. Two-pipe system line and forCed circulation. Radiators replaced.
Domestic hot water	DHW feeding by substation of hot water, situated near the building.
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-coditioners, 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

4.14.2. Current energy consumption

Energy	Heating			Electricity		DHW		Total	
Year	Gcal/year	MWh/year	€/year	MWh/year	€/year	MWh/year	€/year	MWh/year	€/year
2012[1]	56.44	65.64	4 008	2.05	161	1.36	83	69.05	4 251
2013	40.10	46.64	2 608	2.40	230	1.36	76	50.40	2 914
2014	29.79	34.64	1 968	2.80	256	1.36	77	38.80	2 301
Average	42.11	48.97	2 861	2.42	215	1.36	79	52.75	3 155

[1] Reference year

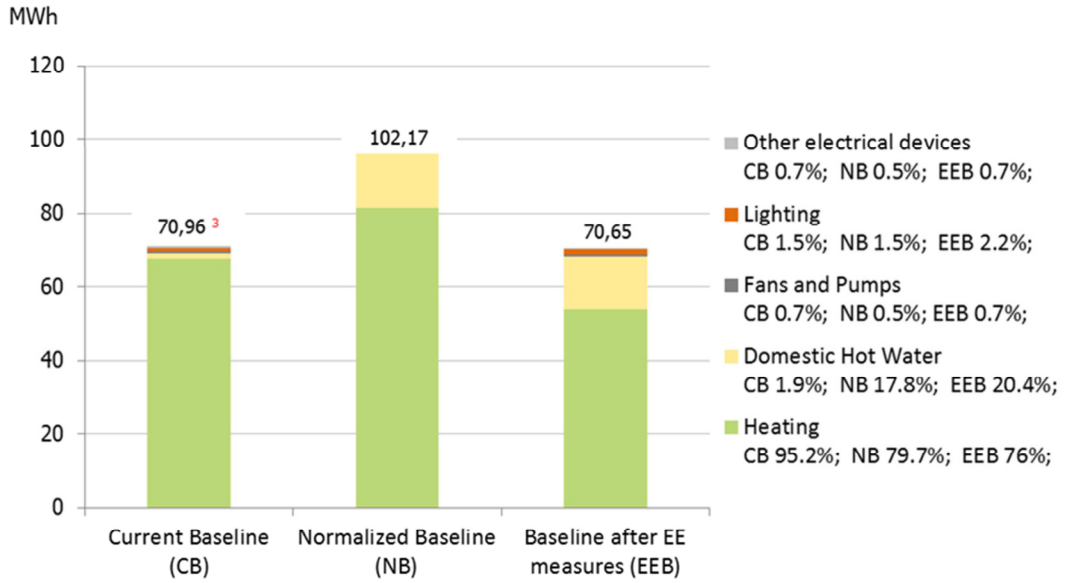
Actual prices of energy sources				
№	Energy source	Measure	Value	Consider since
1	Electricity	€/MWh	77.22	1/11/2015
2	Natural gas	€/MWh	36.29	1/1/2016
3	Central Heating Energy	€/MWh	35.20	1/10/2015

4.14.3. Analysis of the estimated energy savings

Energy saving measures		Energy saved [2]			Capex	Pay-back
№	Discription	MWh/year	€/year	t co_2/year	€	year
1	Switching the heating from local to DHS supply					
	- heating system renovation	27.69	1 006	0.91	6 594	6.18
	- change of energy source	-	60			
2	Switching the DHW from local to DHS supply					
	- connecting subsystem for DHW supply	3.82	139	-0.50	1 919	12.40
	- change of energy source	-	16			
	Total	31.51	1 221	0.42	8 513	6.97

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

4.14.4. Energy consummation share



Parameter			Baseline	
№	Discription	Measure	Current	Normalized [4]
1	Internal temperature	°C	16.9	19.0
2	DHW consumption	l/m^2	40.0	553.0
3	Lighting functioning	%	51.0	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.

4.15.5. Energy saving measures – description

Energy saving measures	Activities	Measure	Price [1] (€)	Quantity	Sum (€)
1. Switching the heating from local to DHS supply	Connecting the new centralized heating system into the existing systems for heating of the building. Isolating of all the new elements.Replacing the compromised sections of the installation. Installation of control valves	psc	1.00	6 500	6 500
	Charge new accession to the central heating	psc	93.82	1	94
	Total ESM 1:				**6 594**
2. Switching the DHW from local to DHS supply	Connecting the subsystem to the exsisting DHW pipelines, thermo isolation of pipelines	m	55.00	25	1 375
	Dismantling of the exsisting 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:				**1 919**
	Total:				**8 513**

[1] Cost assumptions are based on analize 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 charachteristics. All costs are considered at average level - neigther conservative, nor optimistic.

4.14.6 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	12 896	28	27 665	4	2 082
Switching the DHW from local to DHS supply	3 753		3 824		302
Total:	**16 649**	**28**	**31 489**	**4**	**2 383**
CO2 Savings		**0.02**	**0.40**		

Additional activities

Type of Measures	Investments (BGN)
Related to switching the heating from local to DHS supply	1 290
Related to switching the DHW from local to DHS supply	375
Total:	**1 665**

Energy consumption

Items	Object
Type of object	hospital
Gross floor area (sq.m.)	742
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	A
Class of the building after the project	A

Energy Prices (BGN/kWh)	Before the project (historical)	After the project
Electical energy	0.15	0.15
Heat Energy (type of fuel)	0.12	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	**70 869**	**8 531**	**102 089**	**12 276**	**70 651**	**5 220**
Electrical energy	2 060	316	2 572	394	2 572	388
Heat Energy	68 809	8 216	99 517	11 882	68 079	4 832