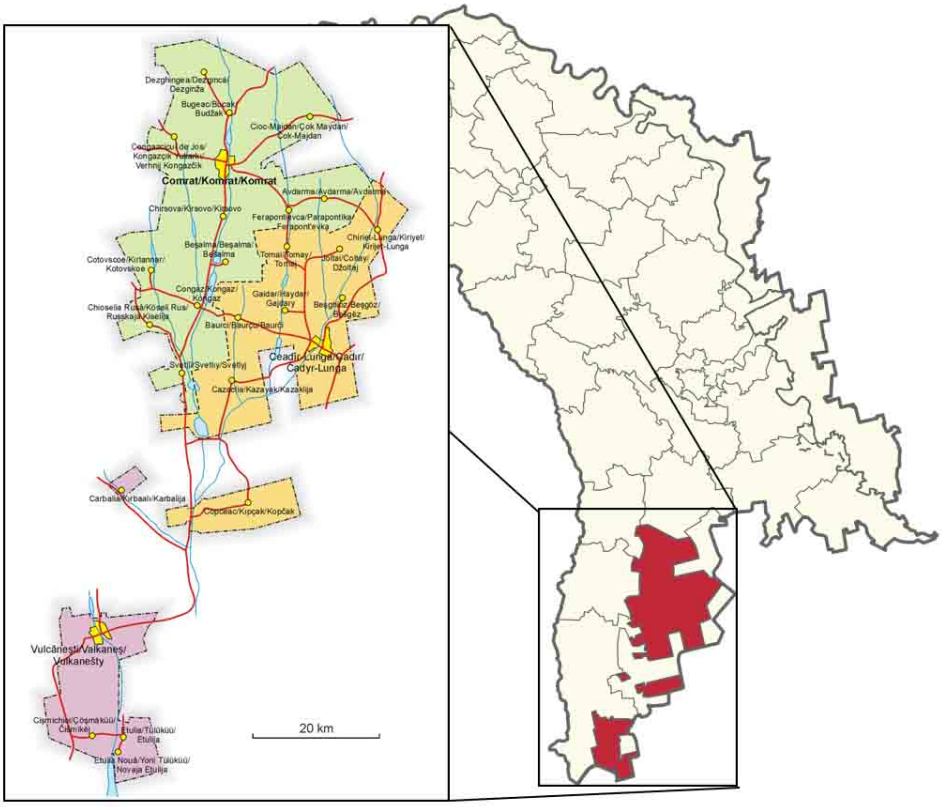
Modernization of the Local Public Services in the Republic of Moldova



Project Concept
(report on walk-through energy audit)

Public Medical Sanitary Institution (hospital), Ceadir-Lunga municipality

May 2018

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Prepared for:

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Project Partners:

Ministry of Agriculture, Regional Development and Environment of the Republic of Moldova North, Center, South and ATU Gagauzia Regional Development Agencies

Comrat, May 2018.

Concept project (report on the walk-through energy audit)

Institution: Public Medical Sanitary Institution (hospital), Ceadir-Lunga municipality

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Foreword

The main goal of the project concept is to increase the efficiency of the energy resources use at the regional level in ATU Gagauzia through the implementation of energy-saving measures and technologies in public buildings.

The objectives of the concept project are:

- *identification of energy saving potential for the specific institution;*
- *facilitation of the decision-making process of the responsible authorities and financial organizations when considering the possibility of investment.*

Specific objectives are:

- *Development and implementation of pilot projects for demonstration of the application of innovative energy efficiency in public buildings;*
- *Informing and training of local stakeholders on energy efficiency issues;*
- *Increase the involvement of the local public authorities and population in the initiatives related to energy efficiency sector;*
- *Developing of a monitoring and replication mechanisms to ensure the reproduction of project results in ATU Gagauzia and in entire country.*

1. Introduction

Rayon Hospital in Ceadir-Lunga municipality is a Public Medical Sanitary Institution aimed at treating patients and providing specialized medical care in stationary conditions.

The institution has 200 beds in the following profiles: therapeutic, neurological, surgical, infectious, children's, intensive care, perinatal center of the second level, diagnostic, X-ray room. The hospital serves the population of the whole district, which involves about 61,000 people.

Photo 1 Rayon Hospital in Ceadir-Lunga municipality, block 2, north-west façade

Photo 2 Block 1 (maternity house), north-west façade

Spatial organization of the institution is decentralized - almost every department is located in a separate building. The complex of buildings was built gradually, the main buildings were built in the 80's and 90's of the last century. The are 424 employees in the hospital.

Photo 3 Surgery, west side view

Photo 4 Hospital complex (Orto photo), Scale 1:1000. Source – www.geoportal.md

Components of the hospital complex (mentioned in photo 4):

1 – obstetric and maternity house block
2 – neurological block

3 – boiler house
4 – laundry
5 – diesel storehouse
6 – storehouse
7 – block of infectious diseases
8 – surgery block
9 – church
10 – children's block
11 – administrative building (not in use at the moment).

2. Energy Consumption

The electricity consumption was 690.695 MWh in 2014 with a decrease to 642.88 MWh in 2016. Between 2014 and 2016, the average electricity demand was 682.337 MWh. It is observed a consumption of electricity of 130 kWh/m2, and this is high value for a hospital.
Gas consumption decreased from 218511 m3 in 2014 to 177718 m3 in 2016, or an average consumption of 200750 m3 of gas per year, or approximatively 390 kWh/m2 per year, this is a high value for a hospital.

Table 1 Energy consumption

Energy	unit	consumption		
		2014	2015	2016
Electricity	kWh	690695	713435	642880
Gas	$м^3$	218018	206511	177718

3. General data on the studied building

3.1 Heating system

The building is heated by the gas boiler house, which is located in the western part of the territory (in photo 4 is indicated under number 3). The thermic agent is going through the external heat networks to all blocks of the hospital. The boiler house was previously designed to provide heating to the hospital itself, as well as neighboring buildings, this explains the presence of 8 boilers that were installed in 1988. At the moment the boiler house is used only for the needs of the hospital and the Health Center of the Ceadir-Lunga municipality (4-storey building to the south of the surgical block). From the boiler house, the thermic agent goes directly to the units through external networks, there are no additional heating points in the buildings.

3.2 Hot water supply system

Hot water is available in all departments and it is produced by electric boilers.

3.3 Fresh water supply and sanitation system

The buildings are supplied with fresh water from the urban water supply system, sewerage system is connected to urban sanitation system.

3.4 Electricity consumption system

The electricity supply is provided by the local distributor of electricity.

3.5 Natural gas supply system

The source of natural gas supply in boiler house is city's natural gas distribution system.
.

3.6 Previously implemented energy efficiency projects

In 2015-2016 the project of thermal insulation of the walls of the surgery and maternity house was implemented, including the replacement of windows and doors, source of financing - the National Fund for Energy Efficiency and local funds. Earlier the children's block was renewed.

3.7 Planned projects for the coming years

Neurological block is under the capital refurbishment process, which include some energy efficiency measures too. In the near future, some small internal refurbishments are planned.

4. Data on the proposed project

4.1 Description of the current situation

The analyzed complex was built step-by-step, the oldest building exists since 1957, the last blocks were built in 1990. In a spatial arrangement, the buildings are compact, all blocks are rectangular, with the exception of the maternity hospital, which is cross-shaped.

4.2 Building proprieties (constructive part)

The older buildings, such as the children's and neurological blocks are built of limestone bearing walls. Maternity and surgery blocks are constructed of reinforced concrete slabs; the frame of the building is stabilized horizontally by a grid of reinforced concrete columns. Internal partitions consist, basically, of a cauldron, gypsum or reinforced concrete panels. The foundations are made of large concrete and limestone blocks.

- Obstetric and maternity block consists of 3 floors and a technical floor. The building does not have a basement. It was built in 1989, according to the type of load-bearing structures it belongs to the posts and beams, the walls are constructed of reinforced concrete slabs, the roof is originally flat, during the renovation of the building it was replaced with a pitched roof. The walls of the building are insulated with XPS (10 cm). The plinth is finished with ceramic tiles.
- Neurological block consists of 2 floors and a technical floor. The building does not have a basement. According to the type of load-bearing structures it belongs to the posts and beams, the walls are constructed of reinforced concrete slabs, the roof is originally flat, during the renovation of the building it was replaced with a pitched roof. At the moment, the block is under the capital refurbishment.
- Boiler house, laundry, diesel storage, storage house and administrative building – all are one-story separate buildings built in 1970-1980. No major refurbishment was carried out for these buildings. The administrative building at the moment is not operated, but can be used after major reparation measures.
- The infectious diseases block is also one-storeyed, built in 1970, is in poor technical condition, the walls are made up from limestone, the roof is flat, at the time of the visit the building was not in operation.
- Surgery block was completely refurbished in 2015. In consists of 3 floors, external walls are insulated, the roof is pitched.
- Children's block consists of 2 floors, the walls of the building are built from limestone, with thermal insulation made of XPS, the roof is originally flat, during the

renovation of the building has been replaced by a pitched roof. There is no basement in this building.

4.3 Windows and doors

In the buildings 1, 2, 8, 10 all the windows are double-glazed from PVC, replaced in the past few years. Also the doors are replaced with PVC constructions. The window seals are properly executed, there is no evident structural degradation. According to experts, the replacement of these structures is beside the purpose.

In the remaining buildings the windows are wooden, glazing in one or two rows. Doors are wooden or metal, without additional insulation.

4.4 Roof

In the buildings 1, 2, 8, 10 the roofs are pitched, wooden framework is in good condition. Under the metal tile covering the waterproofing membranes are installed. The are several clear lights closed with wooden grill and on all the roof perimeter the snow holders are installed. The soft layer of the old flat roof has survived. The rainwater collection system is provided.

In other buildings the roof is pitched with asbestos sheets covering or flat with soft roofing. In the worst condition is the roof of the infectious diseases block.

In the building 1 the works on the thermal insulation of the technical level floor weren't provided (the total floor area of the technical floor is 1741 m^2).

4.5 Heating system

The building is heated by its own boiler house. The boiler house has 8 boilers («Факел» with L-IH type burners, heat output 0.454 Gkal/h, gas flow 67.72 m3/h, and efficiency 90.11%), of which 3 are connected to work (2 in standard mode, one spare boiler). Previously, the boiler house also served nearby buildings, thus all boilers were in demand. At the moment, according to the workers of the boiler room, the 37 kW pump system, supplying the heating medium to the heating system is extremely powerful and energy-intensive, since the pumps have been replaced until the repair of 1,2,8 and the 10-th blocks. The air pump of 55 kW for boilers works 24 hours and requires replacement with modern equipment with lower capacity.

Photo 5 Boiler house (exterior view)

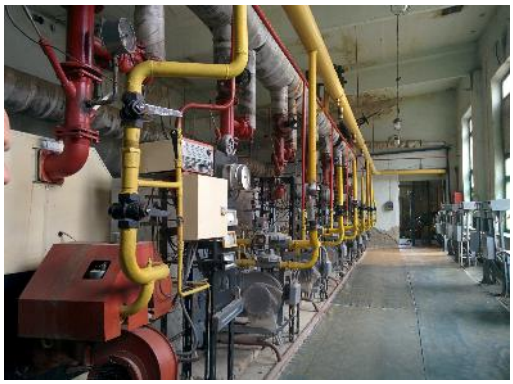


Photo 6 Boiler house (internal view)

From the boiler room, the thermic agent enters the external heat networks, which pass partly underground, partly above it. The pipes are insulated, however there are heat losses. Internal networks and radiators are replaced in the surgery and neurologic blocks; in the maternity house the internal heating network are old type.

Photo 7 External heating network

Photo 8 Radiator in the maternity house

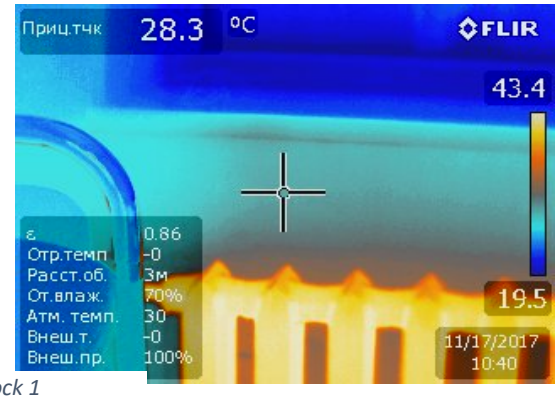


Photo 9 Temperature measurements of the radiator in the block 1

The centralized ventilation system is completely renewed in the surgery and neurological departments, but it is launched extremely rarely in order to save energy. Vent holes for natural ventilation in the walls are present, having a direct access to the technical floor in the block of the hospital. For forced ventilation, take into account that the volume of block 1 is 14624.4 m^3 (calculated from the available data).

Photo 7 Technical level of the block 1

Photo 8 Ventilation box in block 1

4.6 Hot water supply

For the preparation of hot water, electric boilers are used. They are installed in each compartment. The possibility of preparing and supplying hot water from the boiler house was provided earlier, but is not used for economy purposes. Patients have the opportunity to use showers only on schedule time.

Table 2 Characteristics of used boilers

	Volume	Quantity	Installed power (average value)	Working hours per day	Working days
Electric boilers	From 40l to 100l	36 pcs	2,2 kWh	2-4 hours	365

Photo 9 Electric boiler, block 1

Given the current sanitary standards, the calculation of the consumption of hot water per day per bed is 90 liters.

Maximum consumption of hot water per day: 200 places x 90 liters = 1800 liters

4.7 Lighting system

For lighting, fluorescent lamps and incandescent lamps are used in the maternity blocks. In the renovated blocks, energy-saving lighting devices are installed.

Photo 10 and 14 Lighting devices in block 1

Table 3 Sources of lighting in the obstetrics and maternity block

Index	Unit	Value
Number of lights	pcs	580
Type of lights	type	incandescent and luminescent
Average power	W	100

5. Project concept

5.1 Description of the proposed energy efficiency measures

The consultants propose the following list of measures for the thermal rehabilitation of the building:

- Experts propose **thermal isolation of the floor of the technical level** in buildings that are equipped with a new roof, but in which this measure was not held. A heat-insulating layer (mineral wool or rock wool 150mm) and vapour barrier layer should be installed also. The insulation should be finished with a protective layer of cement screed.

  Annual energy savings = **179 MWh/y**
  Estimated investment= 79 324 €

- Provide for the **preparation and supply of hot water by installing solar panels** on the roof of buildings or on the hospital's territory to ensure the uninterrupted supply of shower rooms with hot water in all departments of the medical institution.

  Annual energy savings = 18,6 MWh/y
  Estimated investment= 40 400 €

- **Replace the lighting with LED lamps.** In rooms where special lighting is necessary, general lighting and local, portable one should be provided. **In the corridors, use motion sensors to automatically turn off the lighting in the absence of human traffic.**

  Annual energy savings = **92,8 MWh/y**
  Estimated investment= 20 620 €

Additional measures

- Replacement of old radiators in the housing 1. New radiators should be equipped with thermostatic regulators;
- Set individual heating points for each building (calculate the heat load and calculate the required number of heat points and their optimal location);
- The auxiliary equipment in the boiler house should be replaced after the recalculation of the load on the pumps and install correctly calibrated equipment. It is recommended to introduce this measure only after the introduction of the maximum number of measures of energy efficiency.
- An efficient vventilation should maintain the optimum temperature and the flow of fresh oxygen into the compartments, and there should not be strong airflows in the rooms. The intensity of air exchange should be calculated based on current standards. To ensure comfort, it is recommended to use a centralized ventilation system for the intended purpose. In buildings where the ventilation system has not been updated, it is proposed to install a new ventilation system during the capital refurbishment of the interiors.

5.2 Preliminary assessment of energy saving potential

The calculation of the preliminary final energy consumption for heating is based on a simplified calculation methodology according to the “Energetische Bewertung von

Bestandsgebäuden"; provided by the German Energy Agency. The thermal conductivity of the building elements was estimated based on Moldavian standards and norms and on Consultants experiences.

The preliminary final energy consumption for heating and the estimated saving potential were calculated based on a reference climate, a standard indoor temperature and a basic air ventilation rate.

Note: the results do not necessarily reflect the actual energy consumption of the buildings due to the current poor heating/ventilation comfort in the buildings (e.g. shortened heating period, reduced indoor temperature, poor/no ventilation, etc.).

Table 4 The proposed energy efficiency measures and their characteristics

Proposed measures	Surface, m^2	Annual energy savings, MWh/y	Annual energy savings in €	Investments, €	Reduction of emissions t/CO_2 per year	Payback period, years
Thermal insulation of the technical level floor	1741	179	6 405	61 936	36	12,4
Installation of the solar panels	-	18,6	3 618	40 400	4,1	11,2
Replacement of the lighting devices	-	92,8	10 208	20 620	20,4	2
Total	**1741**	**290,4**	**20 231**	**122 956**	**60,5**	**11,2**

6. Financial analysis

The estimation of the required investment costs was based on the Consultant's experiences (specific investment costs per refurbished element). The Consultant did not request/receive offers from potential supplier's/construction companies. All costs incl. VAT.
The total investment costs were estimated to around **2 520 598 MDL** (**122 956 EURO**)[1].
The share of the energy relevant investments of the total investment is around 50 %.
When considering only the energy relevant investment the payback period is 11,2 years.

7. Preliminary project implementation plan

The description of the steps necessary to implement the described recommendations can be divided into 3 main stages: the development of energy audit of the building, preparation for the implementation of the project and the implementation process itself.

Each stage includes the following actions:

A. Development of energy audit of the building:

- Decision-making on financing of energy audit
- Development of the task of energy audit
- Tender & Energy Audit Contract
- Energy audit
- Designing a design task

B. Preparing for project implementation:

- Decision-making on investment

[1] Exchange rate: 1 EURO = 20,50 MDL (average value for 2017).

- Tender for the development of technical documentation
- Development of technical documentation, approval, tender documents
- Tender for project implementation
- Evaluation of offers, contract
- Coordination of the work plan

C. Implementation of the project:

- Preparation of the working field
- Thermal insulation of the technical level floor
- Installation of the solar panels
- Replacement of the lighting devices
- Staff training, documentation

Upon completion of the implementation of these measures, the building can be put into operation.

The approximate timeframe for the project implementation plan is given in the annex 1.

Recommendations to bring the building in line with sanitary standards

One of the main conditions for the implementation of the energy efficiency project is to bring the hospital building in line with the main provisions of Government Decision Nr.663 of 23.07.2010. This normative act approved the Sanitary Regulations on Hygienic Rules for Public Health Institutions, which establishes requirements for the placement, arrangement, equipment and maintenance of health facilities. In particular, the regulations establish a number of requirements that directly affect the energy efficiency of buildings. These requirements are related to the water supply and sewerage system, the heating and ventilation system, and the building lighting system.

Following requirements (as minim) must be respected by hospital, and should be included in the task for energy audit and task for design.

Hot water demand

- The newly-built, rebuilt and functioning ones must be provided with aqueduct, sewerage and centralized hot water.
- For newly built or rebuilt facilities, a backup system for hot water supply will be provided in the event of damage or performing the current system repair.
- A sanitary block will be provided for one, maximum two salons of the medical sections in the newly built or reconstructed institutions.
- Each surgery section of hospital must be equipped with a shower for the staff/doctors, one shower cabin for 4 surgery rooms.
- In patient section, obstetric and pediatric wards have to be fitted with sanitary filters for staff, with changing rooms and a shower (not less than a cabin for 5 people).
- Shower cabins for staff are based on the calculation: at least one cabin to 10 people in the infectious diseases and tuberculosis departments, and in the other sections - at least one cabin to 15 persons, operating during the maximum number of nurses.

Ventilation system

- The premises of the institutions, except for the operating rooms, besides the mechanical ventilation system (+filters) will also have natural ventilation.
- The relative humidity of the air shall not exceed 60%, the velocity of air movement - 0,15 m / sec.
- The volume of air exfoliated in the salon for a patient will be at least 80 m3 / h.

Electricity demand for lighting

- For illumination of salons (except for children's and psychiatric wards), combined wall lamps (general and local lighting) installed next to each bed.
- In every section of the medical institutions must be a reserve system of artificial illumination, in case of emergency disconnection.
- In order to disinfect air and surfaces in institutions, ultraviolet lamps must be installed.

Area per bed

The regulations establishes as well the standard of area per bed: The area of a box for one bed should have no less than 22 m2.

Calculation of area of the stationary room with 2 or more beds

Section of	Area (minim), m^2 per bed
Infectious and tuberculosis for adults	8,0
Tuberculosis MDR / XDR	13,0
Infectious and tuberculosis for children: - Without places for mothers - with the presence of mothers during the day - with the permanent presence of mothers	 7,0 8,0 10,0
Traumatology - Orthopedics (including rehabilitation treatment), combustion, radiological: - for adults and children's lounges with day-to-day attendance of mothers - for children with the permanent presence of mothers	 10,0 13,0
Intensive and postoperative therapy	13,0
Somate for children: - Without places for mothers - with the presence of mothers during the day - with the permanent presence of mothers	 6,0 7,5 9,5
Psycho-neurological and narcological:	

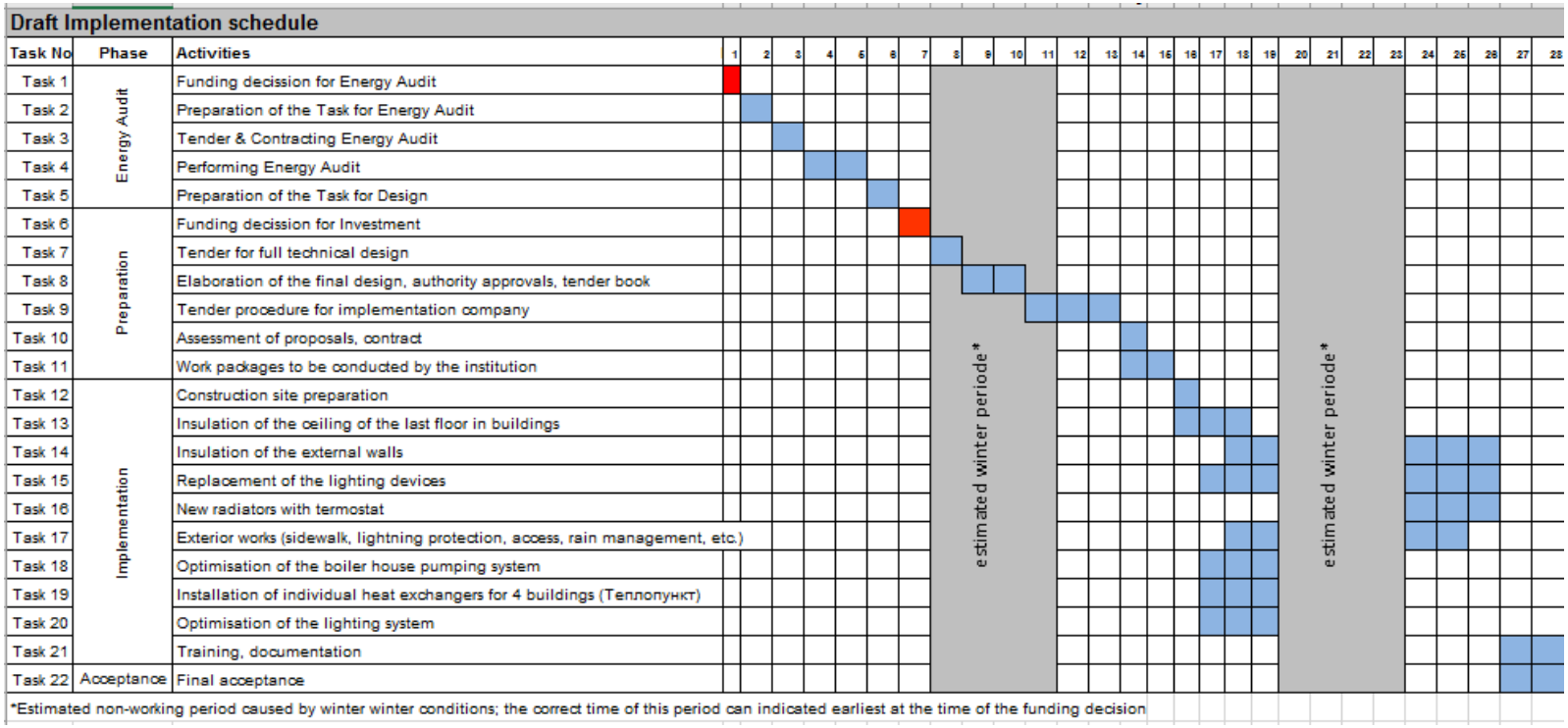
- of general type - of insulin and narcotics	6,0 7,0
Psychiatry for children: - of general type - of supervision	 5,0 6,0
For newborns	3,0
Other in salons with 2 or more beds	7,0
Other in salons with one bed	9,0

It is important to underline that all possible inconsistencies, according to Resolution Nr. 663 of 23.07.2010 on the approval of the Sanitary Regulations on Hygienic Rules for Public Health Institutions (Published on 07/30/2010 in Official Monitor No. 131-134 Article No: 746) and other normative documents should be taken into account at a later stage of development of the task on energy audit and project design task. Before the implementation of the proposed energy efficiency measures, the building should be brought into the line with the Sanitary Regulations on Hygienic Rules for Public Health Institutions

8. Conclusion

As a result of the proposed measures, the expected **energy savings will be 290,4 MWh/y**. Due to this saving, it is estimated that **emissions will decrease** by **60,5 t/CO_2 per year**.

Annex 1


Draft Implementation schedule
Task No
Phase
Activities
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28
Task 1 Energy Audit Funding decission for Energy Audit
Task 2 Preparation of the Task for Energy Audit
Task 3 Tender & Contracting Energy Audit
Task 4 Performing Energy Audit
Task 5 Preparation of the Task for Design
Task 6 Preparation Funding decission for Investment
Task 7 Tender for full technical design
Task 8 Elaboration of the final design, authority approvals, tender book
Task 9 Tender procedure for implementation company
Task 10 Assessment of proposals, contract
Task 11 Work packages to be conducted by the institution
Task 12 Implementation Construction site preparation
Task 13 Insulation of the ceiling of the last floor in buildings
Task 14 Insulation of the external walls
Task 15 Replacement of the lighting devices
Task 16 New radiators with termostat
Task 17 Exterior works (sidewalk, lightning protection, access, rain management, etc.)
Task 18 Optimisation of the boiler house pumping system
Task 19 Installation of individual heat exchangers for 4 buildings (Теплопункт)
Task 20 Optimisation of the lighting system
Task 21 Training, documentation
Task 22 Acceptance Final acceptance
estimated winter periode*
estimated winter periode*
*Estimated non-working period caused by winter winter conditions; the correct time of this period can indicated earliest at the time of the funding decision

Annex 2. Data questionnaire

cooperare germană DEUTSCHE ZUSAMMENARBEIT

giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

Î.M.S.P. S.R. Ceadîr-Lunga
IEŞIRE № 1019
«03» 11 2017

Анкета

по сбору данных для диагностического анализа сектора энергоэффективности в регионе АТО Гагаузии

I. **Общие данные:**

Название населённого пункта / района: **г. Чадыр- Лунга**

Название публичного учреждения: **ПМСУ Чадыр- Лунгская РБ**

Собственности (АТЕ 1-го / 2-го уровня) _____

Год строительства здания публичного учреждения:

№ п/п	Наименование зданий	Год строительства
1.	Акушерский корпус	1989
2.	Неврологический корпус	1993
3.	Гинекологический корпус	1989
4.	Хирургический корпус	1969
5.	Инфекционный корпус	1970
6.	Детский корпус	1970
7.	Морг	1970
8.	Пищеблок -1№27 А	1985
9.	Церковь	1989
10.	Гараж № 28	1991
11.	Котельная № 1	1970
12.	Прачечная № 32	1989
13.	Дизельная	1990
14.	Дизельная № 33	1989
15.	Склад для кослород. Балонов № 17	1957
16.	Проходная № 37	1999
17.	Мастерские для ремонта авто	1990
18.	Трансформаторная № 16	1970
19.	Трансформаторная № 38	1990

Тип строительного материала общественного здания:

- ✓ Бетонные панели
- ✓ Котелец
- Кирпич
- Другой (укажите)

Part A. Общие данные об здании:

Укажите пожалуйста значение для следующих показателей:

	Показатели	Единица измер.	Родильн. Отд.	Неврол. отд	Геникол. корус	Хирург. корпус	Инфекц. корпус	Детский корпус	морг	пищеблок	котельная	прачечная	церковь	дизельная
1.	Количество административного персонала:	*Человек* 4												
2.	Количество рабочего персонала:	*Человек* 419												
3.	Количество пользователей / бенефициаров (дети / студенты / пациенты / клиенты)	человек												
4.	Общая площадь здания	$м^2$	5223	425,8	2170	3876	578,1	2340	142,1	612	515	655	123	65
5.	Количество этажей здания	единицы	3	1	2	3	1	2	1	1	1	1	1	1
6.	Средняя высота каждого этажа	м	12,5	3,4	10,2	12,5	3,3	7,2	3,2	4,7	4,2	6,5	3,2	3,2
7.	Общая площадь внешних стен здания	$м^2$	22 тыс.	1362,0	11067	16150	1907,0	8424,0	455	290	2163	4258	394	210
8.	Количество окон	единицы	233	16	48	138	23	57	7	14	11	13	6	1
9.	Общая площадь окон	$м^2$	796	27	165	367	60	126	22	46	66	32	11	1,1
10.	Общая площадь крыши	$м^2$	2540	596	1573	1873	750	1696	184	890	566	949,0	184	76
11.	Тип крыши:	плоская крыша или скатная крыша	Скатная крыша	Скатная крыша	Скатная крыша	Скатная крыша	Скатная крыша	Скатная крыша	Скатная крыша	Скатная крыша	Плоск.крыша	Скатная крыша	Скатная крыша	Плоск. крыша

Part B. Потребление энергии за последние 2 года (по источнику):

Тип источника энергии	Ед. изм.	Потребление		
		2014	2015	2016
Электричество	кВтч	690695	713435	642880
Дизель (исключить транспортные средства)	Литры	583	974	809
Натуральный газ	$м^3$	218018	206511	177718
Уголь	тонны	-	-	-
Биомасса (древесная щепа, гранулы и т. д.)	$м^3$	-	-	-
Централизованное отопления	Гкал	-	-	-
Другой (укажите) _____		-	-	-

Part C. Энергетические системы

C.1. Тип отопления в здании центральное отопление?

✓ *Центральное отопление*

Электрические индивидуальные обогреватели для каждой комнаты

(Если «a» укажите ответы на вопросы 1.1, 1.2, 1.3, если «b» перейдите к вопросу № 2.

1.1. *Если есть, укажите тип системы отопления:*

✓ *однотрубная система*

двухтрубная система

1.2. *Укажите тип используемого топлива:*

Электричество

✓ *Натуральный газ*

Уголь

Биомасса (древесная щепа, гранулы и т. д.)

1.3. *Укажите мощность* (Гкал) 2*630 Мкал

C.2. Если используются отдельные обогреватели, какого типа они?

-Электрические индивидуальные обогреватели

-Электрические радиаторы

-Кондиционер

-Другие (укажите)_____

C.3. Существует ли в здании центральная система горячего водоснабжения или используется ли отдельные бойлера?

✓ *Центральная система горячего водоснабжения*

✓ *Электрический бойлер*

✓ *Нет горячей воды*

Другой (укажите)_____

C.4. *Есть ли в здании центральная система кондиционирования воздуха или используется отдельная система для каждого помещения?*

✓ *Центральная система кондиционирования (рабочая)*

Центральная система кондиционирования (нерабочая)

Индивидуальная система в каждом помещении (рабочая)

Индивидуальная система в каждом помещении (нерабочая)

Отсутствует вообще

C.5. Есть ли центральная система вентиляции: ☑ *Да ;* или □ Нет.

Какова она?

✓ *принудительный*

✓ *естественный поток*

C.6. Система внутреннего освещения:

Показатели	Ед. изм.	Значение
Количество ламп	единицы	2760
Тип ламп (светодиодные-LED, люминесцентные лампы, лампы накаливания)	тип	Всех типов
Средняя мощность ламп	W	300
система автоматизации освещения	Да / нет	нет

Part D. Описание бойлеров

Количество бойлеров: ___**36**_____

Тип топлива, используемого для бойлеров:

- ✓ ***Электричество, Установленная мощность (кВтч): 79,2 эффективность (%)***
  - Уголь, Установленная мощность (кВтч): _____ эффективность (%)____
  - Газ, Установленная мощность (кВтч): _____ эффективность (%)____
  - Мазут, Установленная мощность (кВтч): _____ эффективность (%)____
  - Дизель, Установленная мощность (кВтч): _____ эффективность (%)____
  - Биомасса, Установленная мощность (кВтч): _____ эффективность (%)____

Part E. Другие единицы потребления энергии

E.1. Духовки (кухни)

Количество духовок, используемых в здании ___**1**____ единиц

Тип потребляемой энергии:

- ✓ ***Электричество***
- Газ
- Другое (просьба указать)

E.2. Существует ли стационарные группы двигателей внутреннего сгорания, электрогенераторы?

Количество электрогенераторов: _____**2**_____

Установленная мощность электрогенераторов (кВт): ___**230**_____

Средние рабочие дни для электрогенератора в год: _____

II. Просьба указать, есть ли проекты энергоэффективности, внедренные в течение последних 5 лет? (если таковые имеются)

Проект	Год внедрения	Донор	Стоимость, тыс. лей
1. Теплоизоляция стен хирургического корпуса и род. дома, замена окон и дверей род. дома	2015-2016	-Фонд энергоэффективности -Контрибуция Исполкома -Контрибуция РБ	-3959 -1091,7 -121,3

Директор ПМСУ

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