



Sustainable Energy Action Plan

Cimislia municipality



Content

1. Introduction	3
1.1 Cimislia municipality	3
2. Overall strategy	4
2.1 Overall CO ₂ reduction target	4
2.2 Long – term vision of Cimislia municipality	4
2.3 Organizational and financial aspects.....	4
3. Energy production	5
3.1. Electricity production.....	5
3.2. Heat production	5
4. Final energy consumption	6
4.1. Electricity consumption	6
4.2. Natural gas consumption.....	7
4.3. Transport.....	7
4.4. Final energy consumption	8
4.5. Energy production and consumption.....	9
5. CO₂ emissions	10
5.1. Electricity	10
5.2. Heating	11
5.3 Transport.....	11
5.4. Baseline emission inventory.....	12
6. SEAP projects	13
6.1. List of projects.....	13
6.2. Schedule of SEAP projects and CO ₂ reduction (in tones).....	16



1. Introduction

The European Union is leading the global fight against climate change and has made it as top priority. The EU committed itself to reducing its overall emissions to at least 20 % below 1990 levels by 2020. Local authorities play a key role in the achievement of the EU's energy and climate objectives. The Covenant of Mayors is a European initiative by which towns, cities and regions voluntarily commit to reducing their CO₂ emissions beyond this 20 % target. This formal commitment is to be achieved through the implementation of Sustainable Energy Action Plans (SEAPs).

The Sustainable Energy Action Plan (SEAP) is a key document that shows how the Cimislia municipality will reach its commitment by 2020. It uses the results of the Baseline Emission Inventory to identify the best fields of action and opportunities for reaching the local authority's CO₂ reduction target.

1.1 Cimislia municipality

Cimislia is a town in the southern part of Moldova, located on the banks of the Cogîlnic River, 73 km from the capital, Chisinau. The urban area of the town covers 208,4 ha; total administrative area - 14,612 ha, including 8,413 ha of agricultural land, orchards, vineyards, arable land. The population of Cimislia is 14200 citizens.



The economy consists mainly of an agro-industrial complex with a well-developed network of manufacturing agricultural products, including meat, dairy, tree-fruit, and grain farming, as well as winemaking. There are over 1,000 companies of which – 512 are farms.

Total length of the roads is 70,8 km between which 12 km are roads of national importance. The Cimislia railroad station, which takes advantage of the broad network of links toward the warehouses of the industrial and commercial companies of the city, is located in the village Mihailovka at a distance of 12 km.



There are 4111 of individual houses and 67 multi apartments in the city. 98 % of the houses are connected to the water supply that is supplied from 10 fountains. Cimislia is 85% gasified. Only 25 % of households are connected to sewerage networks. Electric energy covers 100% of consumers. There are 3 minibuses providing public transportation for 10% of the city population i.e. 1430 persons daily. The transportation is managed by private companies.

2. Overall strategy

2.1 Overall CO₂ reduction target

On the 18 of November, 2011 Gheorghe Raileanu mayor of Cimislia municipality, signed Covenant of Mayors. From that day Cimislia municipality officially committed to reduce CO₂ emissions, until year 2020, at least by 20 % comparing to baseline (2011) year. Year 2011 was year chosen for the baseline year due to quantity and quality of necessary information.

2.2 Long – term vision of Cimislia municipality

Main challenges in achieving goals of Covenant of Mayors in Cimislia municipality:

- Renovation of public and tertiary buildings
- Promoting of biomass usage for heat production
- Promoting of solar power for electricity production
- Promoting of solar energy for heat production
- Modernization of public lighting system

2.3 Organizational and financial aspects

In order to reach goals of Covenant of Mayors properly - the Energy group should be established in Cimislia municipality. Group should consist of different specialists from municipality administration and representatives from local stakeholders (local energy producers, local transport company, etc.). Mayor of Cimislia also must pay serious consideration or could be involved to this work group. Group that would consist up to ten members should have a chairman which would be accountable to mayor. Energy group will create municipal Energy Database, implement schedule of actions and measures and organize monitoring of it.



3. Energy production

3.1. Electricity production

No electricity was produced in Cimislia municipality in baseline year.

3.2. Heat production

District heating system of Cimislia municipality consist one boiler house with three boilers “Bratk” and total power of **1.5 MW**. Boilers are using natural gas, **1082 MWh** of gas were consumed. In baseline year **382,6 MWh** of primary heat energy was produced. Three consumers were connected to district heating system: city hall, tax inspection office, art school. In baseline year these consumers consumed **372.2 MW** of heat energy. District heating energy consumption is shown in figure No.1.

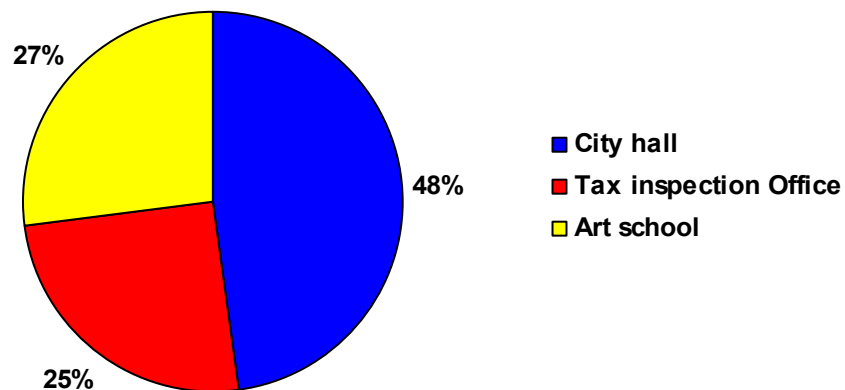


Fig.1. District heating energy consumption

Most of the district heating energy was consumed at city hall.

Rest of the buildings in Cimislia municipality were heated decentrally by the natural gas. **43526.9 MWh** of natural gas was consumed in municipality for heating in baseline years. Distribution of heating energy consumption between sectors is shown in Fig. 2.

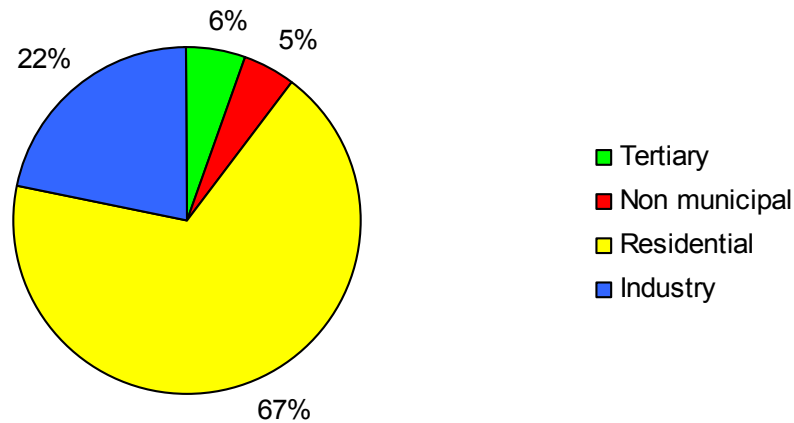


Fig. 2 Heat energy consumption

Most of heating energy consumption was in residential buildings **29304.8 MWh** of natural gas. Industry buildings are also significant consumers natural gas.

4. Final energy consumption

4.1. Electricity consumption

9602.6 MWh of electricity was consumed in Cimislia municipality in baseline year. Distribution of electricity consumption is shown in Fig. 4.

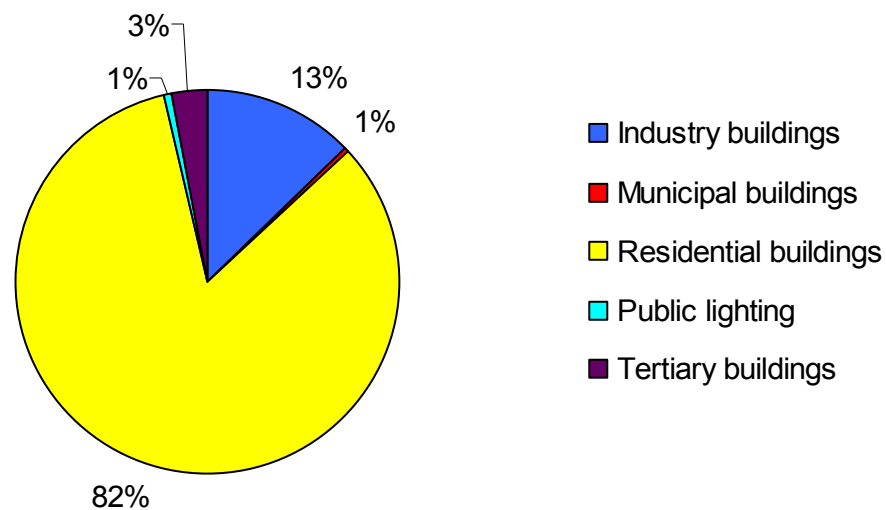


Fig. 4 Electricity consumption

Most of electricity consumption was in residential buildings sector - **7993.3 MWh**, also significant amount of electricity consumed in industry buildings sector – **1214.7 MWh**.

Public lighting network in Cimislia town consisted of 610 lamps in baseline year. All lamps were fluorescent type. **56.6 MWh** of electricity was consumed in public lighting in baseline year.

4.2. Natural gas consumption

5148780 m³ or **48484.5 MWh** of natural gas were consumed in Cimislia municipality in baseline year. Natural gas were used for heating and for other applications. Distribution of natural gas consumption between sectors is shown in Fig. 5.

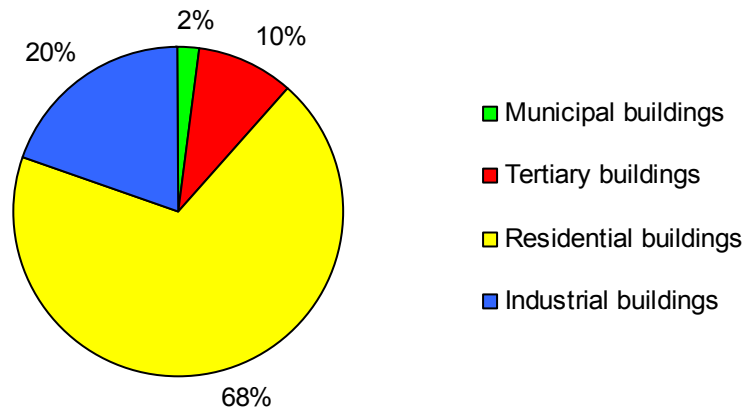


Fig. 5 Natural gas consumption in sectors

Most of natural gas consumption was in residential sector – **3 524 000 m³** or **33184.5 MWh**. Industry sector takes also significant part of natural gas consumption – **1 018 000 m³** or **9586.2 MWh**.

4.3. Transport

In year 2011 two vehicles were exploited in administration by Cimislia town municipality. It consumed **3 558.5 l** of diesel in baseline year. Therefore **35.2 MWh** of energy were consumed. 4380 of private vehicles were registered in Cimislia municipality in baseline year. Municipal public services fleet consists of 10 vehicles (5 tractors, 2 special vehicles, 3 cars). It consumed **13.794.2 l** of diesel and **7975 l** of gasoline, therefore **204.5 MWh** of energy there consumed.

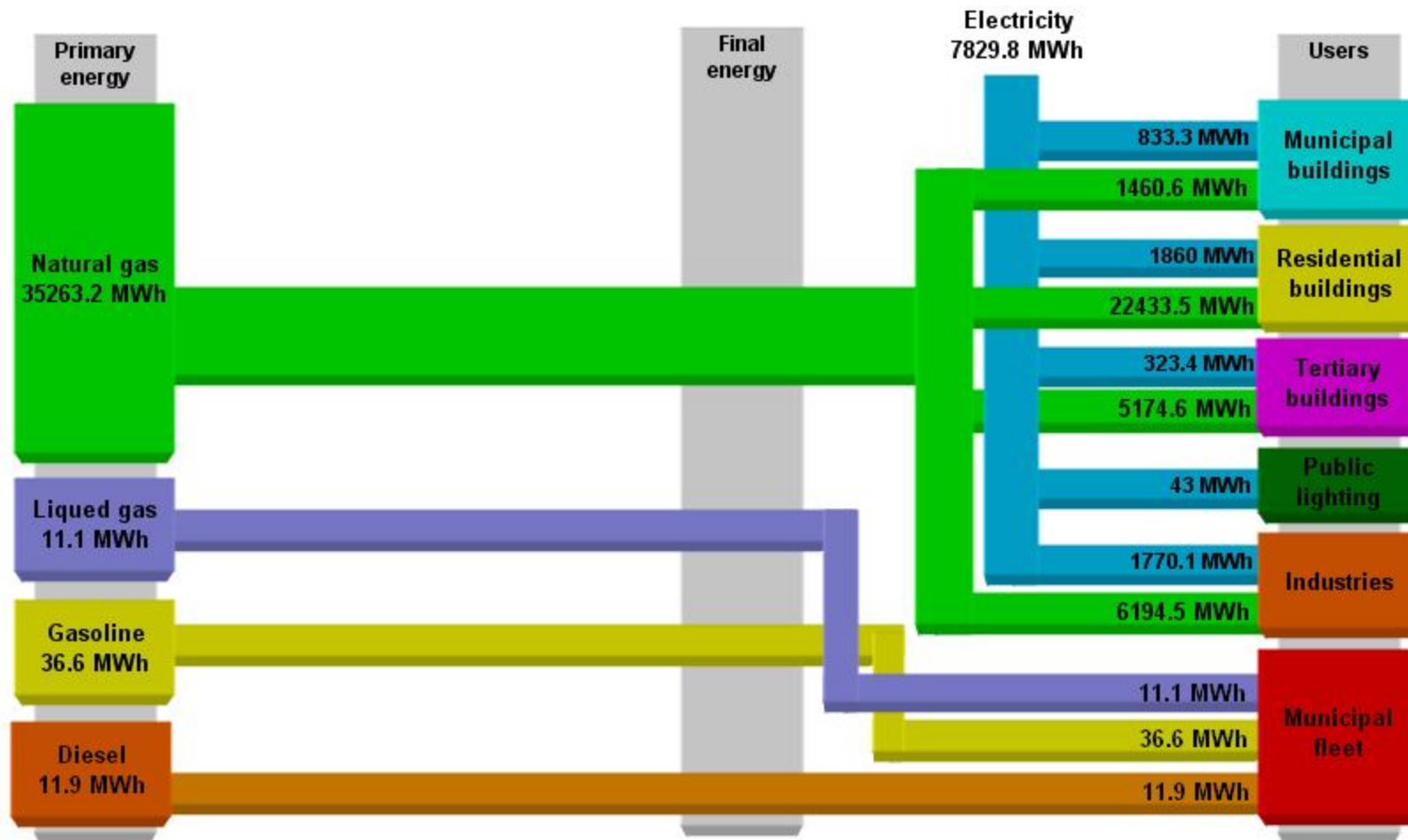
Cimislia municipality has a small infrastructure of public transport, which consists of 3 mini buses. It consumed **12600 l** of diesel, therefore **124.6 MWh** of energy were consumed.



4.4. Final energy consumption

Category	FINAL ENERGY CONSUMPTION [MWh]									
	Electricity	Heat/cold	Fossil fuels			Renewables energies				Total
			Natural gas	Diesel	Gasoline	Biofuel	Other biomass	Solar thermal	Geothermal	
BUILDINGS, EQUIPMENT/FACILITIES AND INDUSTRIES:										
Municipal buildings, equipment/facilities	48.5	372.2								420.7
Tertiary (non municipal) buildings, equipment/facilities	289.4		4631.8							4921.2
Residential buildings	7993.3		33184.5							41177.8
Municipal public lighting	56.6									56.6
Industries (excluding industries involved in the EU Emission trading scheme - ETS)	1214.7		9586.2							10800.9
Subtotal buildings, equipments/facilities and industries	9602.5	372.2	47402.5							57377.2
TRANSPORT:										
Municipal fleet				171.6	68.2					239.8
Public transport				124.6						
Private and commercial transport										
Subtotal transport		0		296.2	68.2					364.4
Total	9602.5	372.2	47402.5	296.2	68.2					57741.6

4.5. Energy production and consumption



5. CO₂ emissions

By becoming member of Covenant of Mayors Cimislia municipality committed to reduce CO₂ emissions in its territory at least by 20 % until year 2020. Overall **15674.3 tones** of CO₂ emissions were emitted in Cimislia municipality in baseline year. Most emissions came from electricity and decentralized heating sectors.

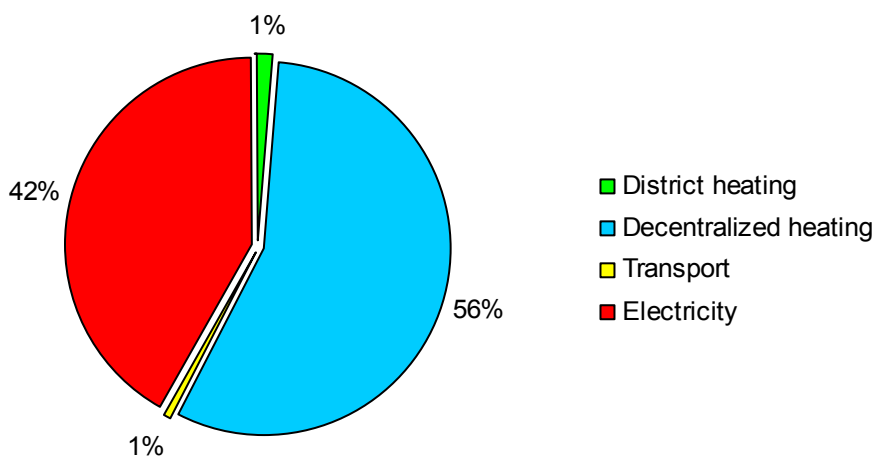


Fig. 5 CO₂ emissions by sectors

In order to achieve goal of Covenant of Mayors – to reduce CO₂ emission until year 2020 at least by 20% - Cimislia municipality should reduce CO₂ emissions in their territory at least by **3135 tones**. Emissions and measures of their reduction in different energy sectors were calculated and shortly described below. If all these measures will be implemented CO₂ emissions will be reduced by **3215.8 tones** or **20.5%**.

5.1. Electricity

In baseline year **9602.5 MWh** of electricity were consumed in Cimislia municipality. Therefore **6568.1 tones** of CO₂ emissions were emitted in baseline year.

CO₂ reduction

It is necessary to produce electricity from renewable energy sources in territory of Cimislia municipality.

It is necessary to create friendly environment for business companies to invest in electricity production from renewable energy sources in territory of Cimislia municipality.

Planned projects:

- It is planned to modernize and expand public lighting facilities and in this way reduce CO₂ emissions by **19.4 tones**.
- *It is planned to build PV power plant on the roof of city hall with 0.05 MW power and 12.8 MWh annual energy productions. Therefore reduction of CO₂ emissions - **8.8 tones**.*
- It's planned to build a high power commercial PV power plant in territory of Cimislia municipality. By implementing this project CO₂ will be reduced by **654 tones**.

5.2. Heating

In baseline year **24621872 m³** of natural gas were consumed in Cimislia municipality. Natural gas was consumed in decentralized heating (for heat production, hot water preparation, cooking etc.) and industry sector. Therefore **8791.6 tones** of CO₂ emissions were emitted. Significant part of CO₂ emissions in heating sector came from residential buildings – **5919.6 tones**.

CO₂ reduction

By replacing boilers, that use natural gas for heat production, to those, that use biofuel or to solar heating systems, it would be possible to reduce CO₂ emissions by **940.2 tones** in heating sector. Renovation of buildings – improving energy efficiency is also important measure to reduce CO₂ emissions in this sector.

Planned projects:

- It's planned to renovate 7 buildings (mostly kindergartens) in Cimislia municipality.
- Installation of biofuel boiler instead of gas boilers. It's planned to reduce CO₂ emissions by **940.2 tones**.
- It's planned to build solar collectors systems on the roof multi apartment buildings and reduce heating needs by 50% and reduce CO₂ emissions by **1515 tones**.

5.3 Transport

In baseline years, municipality fleet consumed **296.2 MWh** of diesel and **17 MWh** of gasoline, therefore **79.1** and **17 tones** of CO₂ were emitted.



5.4. Baseline emission inventory

Category	CO2 emissions [t]/ CO2 equivalent emissions [t]									Total
	Electricity	Heat/cold	Fossil fuels			Renewable energies				
			Natural gas	Diesel	Gasoline	Biofuel	Other biomass	Solar thermal	Geothermal	
BUILDINGS, EQUIPMENT/FACILITIES AND INDUSTRIES:										
Municipal buildings, equipment/facilities	33.2	218.5								251.7
Tertiary (non municipal) buildings, equipment/facilities	197.9		935.6							1133.5
Residential buildings	5467.4		5919.6							11387.0
Municipal public lighting	38.7									38.7
Industries (excluding industries involved in the EU Emission trading scheme - ETS)	830.9		1936.4							2767.3
Subtotal buildings, equipments/facilities and industries	6568.1		8791.6							15578.2
TRANSPORT:										
Municipal fleet				79.1						79.1
Public transport										
Private and commercial transport										
Subtotal transport				79.1						79.1
Total	6568.1		8791.6	79.1						15657.3
Corresponding CO2-emission factors in [t/MWh]	0.684	0.587	0.202	0.267						

6. SEAP projects

6.1. List of projects

No.	Name and a brief description of the project	Project-term (start-end)	Cost, Euro	Expected energy savings, MWh	Production of renewable energy, MWh	CO ₂ reduction
BUILDINGS						
1.	Renovation of kindergarten "Ghiocel"	2014 – 2016	-	7.3	-	1.5
2.	Renovation of kindergarten "Fat Frumos"	2014	-	73.9	-	14.9
3.	Renovation of kindergarten "Scufita Rosie"	2014 - 2015	-	18.3	-	3.7
4.	Renovation of kindergarten "Foisor"	2014 - 2016	-	69.2	-	14
5.	Renovation of kindergarten "Viorica"	2014 - 2016	-	5.6	-	1.1
6.	Renovation of the public library of Cimisia town	2015 - 2016	-	69.8	-	5.6
7.	Modernization of the heating system at "Ghiocel" kindergarten	2015 - 2016	-	1.1	-	0.2
8.	Installation of biofuel boiler at "Fat Frumos" kindergarten	2014	-	-	110.9	22.4

9.	Installation of biofuel boiler at “Viorica” kindergarten	2015 - 2016	-	-	33.8	6.8
10.	Installation of biofuel boiler at “Foisir”	2015 - 2017	-	-	103.8	21
11.	Modernization of the heating system at the Lyceum by A.Puskin	2016 - 2018	-	36.5	-	7.4
12.	Installation of biofuel boilers at the rest of tertiary buildings	2016 - 2020	-	-	4412.6	890
Subtotal				281.7	4661.1	988.6
PUBLIC LIGHTING						
13.	Replacement and extension of public lighting facilities	2014 - 2018	-	28.3	-	19.4
Subtotal				28.3	-	19.4
LOCAL ENERGY PRODUCTION						
14.	Installation of PV power plant on the roof of city hall with 0.05 MW power and 12.8 MWh annual energy production	2016	-	-	12.8	8.8
15.	Installations of solar collectors systems on the roof of multi apartment buildings by covering 50% of heating energy needs	2016 - 2020	-	-	15000	1515
16.	Installation of high power commercial PV electricity plant with 0.45 MWh and 1000 MWh annual energy production	2016 - 2020	-	-	1000	684
Subtotal				-	15912.8	2123.8

	TOTAL	310	20673.9	3215.8
--	--------------	------------	----------------	---------------

6.2. Schedule of SEAP projects and CO₂ reduction (in tones)

Projects	2013	2014	2015	2016	2017	2018	2019	2020
Renovation of kindergarten "Ghiocel"		1.5						
Renovation of kindergarten "Fat Frumos"		14.9						
Renovation of kindergarten "Scufita Rosie"		3.7						
Renovation of kindergarten "Foisir"		14						
Renovation of kindergarten "Viorica"		1.1						
Renovation of the public library of Cimislia town			5.6					
Modernization of the heating system at "Ghiocel" kindergarten			0.2					
Installation of biofuel boiler at "Fat Frumos" kindergarten		22.4						
Installation of biofuel boiler at kindergarten "Viorica" kindergarten			6.8					
Installation of biofuel boiler at kindergarten "Foisir"			21					
Modernization of the heating system at the Lyceum by A.Puskin				7.4				
Installation of biofuel boilers at the rest of tertiary buildings*				890				
Replacement and extension of public lighting facilities		19.4						
Installation of PV power plant on the roof of city hall with 0.05 MW power and 12.8 MWh annual energy production				8.8				
Installation of solar collectors systems on the roof of multi apartment buildings by covering 50% of annual heating needs				1515				
Installation of high power commercial PV electricity plant with power of 0.45 MWh and 1000 MWh of annual energy production				684				