



MOLDOVA ENERGY AND BIOMASS PROJECT
A FOUR YEAR PATH
(2011-2014)





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TOTAL BUDGET: EUR 14.56 million

EUR 14 million provided by the European Union
EUR 560,000 provided by the United Nations Development Programme

INTRODUCTION

The Moldova Energy and Biomass Project boosted the launch of a new industry in the Republic of Moldova, namely the production of bioenergy.

The Republic of Moldova is largely dependent (95%) on energy imports. Due to the continuous price increase of imported energy, Moldova has incurred huge debts, which enhanced the country's vulnerability towards foreign suppliers.

Hence, the Moldovan authorities' endeavours were aimed at curbing the country's dependence on traditional energy sources, having replaced the latter with the most affordable alternative energy source for Moldova, i.e. renewable energy from agricultural waste (biomass). Thus, according to the estimates, approximately 1.8 million Gcal of heat could be generated based on the annual straw residues, and this amount is sufficient to heat more than 100,000 two-room apartments or the same number of dwellings with an area of 100 sq.m each. For the sake of comparison, Chisinau CHP-2, the country's largest combined heat and power generation plant, currently supplies 1.0 million Gcal of heat per year to Chisinau City.

If back in 2012 renewable energy sources covered approximately 4% of the gross energy consumption, then by 2020 the government has committed to increase the share of renewable energy sources (RES) to 17%. Already in 2014, thanks to the Energy and Biomass Project endeavours, the capacity of biomass heating plants installed in public institutions and rural households has reached almost 49 MW. The overall impact measures approximately 1% of the country's total energy consumption or 9% of the annual consumption of heat.

The Energy and Biomass Project aims to contribute to a more secure, competitive and sustainable energy production out of biomass, which is the most viable and readily available local source of renewable energy in the Republic of Moldova.

The Moldova Energy and Biomass Project is financed by the European Union and co-financed by the United Nations Development Programme (UNDP). Through its targeted interventions and the national partners' support, it has boosted the launch of a new business activity in the Republic of Moldova, namely the production of bioenergy. The project followed a comprehensive approach to involve public institutions and households, which spend a

great amount of resources to heat buildings during the cold season, as well as the manufacturers of biofuel. Accordingly, the Energy and Biomass Project contributed to market development both for the demand side, by having financed the installation of solid biomass-fired boilers in 144 public institutions across the country, and for the supply side, by having supported financially the producers of biofuel lines out of green waste. Upon the project's completion, the number of pellet and briquette manufacturing companies reached 100, with the overall production capacity of 120,000 tons per year relative to 2,000-3,000 back in 2011.

"The Energy and Biomass Project's blooming success was largely due to the active involvement of the Project Team, with the tangible assistance of national and development partners who accepted and supported the challenge to shift the focus at the right time when the market demanded it. Back in 2011, it seemed that straw bales were the main type of biofuel to be used for heating the public institutions. In the meantime, as the bioenergy production technologies gained momentum, the market shifted its focus to briquette and pellet production, which could be used in automatic boilers, thus ensuring higher comfort to users. In this way, out of the installed heating plants, 15% of them use straw bales, while 85% are briquette and pellet-fired. To ensure successful implementation of biomass heating systems at the community level and to establish a sound local market of biomass energy sources, the Energy and Biomass Project has developed a training package for each implementation stage targeting the municipal leaders and employees, local council members, managers of buildings where biomass heating plants were installed, and boiler operators. All project activities were supported by public awareness-raising events, which promoted the use of biomass and the development of the bioenergy market. Major events such as the bioenergy sector's largest competitions, such as Moldova Eco-Energetica, or the renewable energy-powered "SUN Da-i Fest' concert, contributed to the promotion of field-related initiatives that have been accepted by the population and by the potential beneficiaries." Alexandru Ursul, the Energy and Biomass Project Manager.

PARTNERS' VOICES



Mihail Stratan,
Energy Efficiency Agency Director

Changing People's Perceptions of RES

The European Union has set a 20% energy savings target by 2020 and 20% of energy to be supplied exclusively from renewable sources. The Republic of Moldova has aligned itself to the EU targets via the Energy Strategy 2030, having devised an ambitious action plan that would change our future.

Moldova has an energy intensity level three-fold higher than in the EU. This fact affects the competitiveness of Moldovan products and the end users as well. The Energy and Biomass Project helps us change the perception of citizens of the new opportunities of using RES, build up new

markets and businesses in the rural areas, improve the supply of heat to households and municipal institutions, and develop industrial cogeneration and biomass briquetting.

With the project support, the Energy Efficiency Agency (EEA) unrolled many successful initiatives aimed at developing the biofuel production market through the leasing mechanism, promoting the use of green technologies by households via a grant programme, and awarding the champions of the green energy sector.



Pirkka Tapiola,
Head of the EU Delegation to Moldova

The European Union Will Further Support the Development of Renewable Energy in Moldova

Renewable energy is a great opportunity for the Republic of Moldova to diversify energy supply sources and generate its own energy. Out of the available renewable sources, biomass is the most promising source for Moldova. That is why the European Union took the decision to invest in boosting this new industry for Moldova. After the completion of project activity unrolled for four years I can assert we are content with the project accomplishments. More than 140 public institutions have been equipped with modern heating systems fired with solid fuel, which have

switched to biomass instead of natural gas or coal. At the same time, hundreds of farmers invested in the production of biomass fuel, now deriving additional proceeds from agricultural waste, and several hundred new jobs were created. Last but not least, all these developments diversified the country's energy supply sources.

The European Union will further support renewable energy development in Moldova by implementing the Energy and Biomass Project Phase II (until 2017).



Nicola Harrington-Buhay,
Resident Representative of the UNDP

The Moldova Energy and Biomass Project has Exceeded Expectations and is Unique in its Comprehensiveness

The Moldova Energy and Biomass Project exceeded my expectations, while its achievements are known and appreciated worldwide. This is the first time in my 23-year career in the development area that I have seen a single project tackle so many important aspects: creating jobs in rural settlements, including jobs for women; unrolling educational activities among adults and children; and establishing successful PPPs at the local level, involving foreign experts, etc. Concurrently, the project fostered some structural changes such as the establishment of a whole industry, having expanded the range of usable energy sources that fall under the scope of country energy self-sufficiency targets.

I would like to note the educational initiative implemented by the Energy and Biomass Project. Under this initiative, approximately 19,000 school children were trained on topics related to the use of RES and got acquainted with energy efficiency.

Also I would like to mention the fruitful cooperation with the European Union under this project, and to reiterate the commitment of the United Nations office in Moldova to remain a faithful partner focused on the country's sustainable development to the benefit of all Moldovan citizens.



Valeriu Lazar,
Ex-Deputy Prime Minister, Minister of Economy

The Energy and Biomass Project has had Sound Economic and Social Impacts

The Energy and Biomass Project has had sound economic and social impacts, mainly because it fosters economic growth at the local level and tackles many significant issues for the Republic of Moldova. By having switched from fossil fuels to biomass for municipal and household heating, the country's energy self-sufficiency is promoted as well as moderate/responsible consumption. Several years ago, the agricultural waste used to be incinerated, causing negative environmental impact. Now, the farming entities derive additional proceeds from the sale of agricultural waste, while the pellet and briquette manufacturers have launched new businesses and created new jobs.

As the demand for biomass fuel increased due to the installation of heating plants in public institutions and households, the project took care of the supply side as well by having fostered the development of agricultural waste collection and processing via open competition among private entrepreneurs.

The project activities fall under the green economy concept. The use of this concept in the Republic of Moldova implies a change in vision, especially the vision of entrepreneurs who shall bring an innovative approach to the deployment of natural capital and green services. Hence, I am glad the Energy and Biomass Project implementation term has been extended and will further support change and innovation efforts in the Republic of Moldova.



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- Project and community investment contributions to new heating systems
- New jobs available, energy savings, and reduced CO2 emissions

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- Cogeneration pilot project
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INSTALLATION OF BIOMASS HEATING PLANTS IN PUBLIC INSTITUTIONS

- *Facts and figures relating to beneficiary schools, kindergartens and community centres*
- *Project and community investment contributions to new heating systems*
- *New jobs available, energy savings, and reduced CO2 emissions*

144

schools, kindergartens, and community centres have modern biomass-fired heating systems

90 thousand

people benefit from enhanced green heating comfort

350

new jobs have been established in the rural target communities

182 million MDL

has been invested in solid **biomass-fired heating systems**

28 million MDL

is the **local communities contribution** to switch to biomass-based heating

30 MW

is the **total installed capacity** of heating systems has reached

app. **300** TJ

of **heat** can be generated by 144 biomass-fired heating systems installed in rural settlements

100 million MDL

is the **amount paid to local biomass producers**, thereby avoiding the import of energy resources

30 thousand tones

of **CO2 emissions** are annually reduced

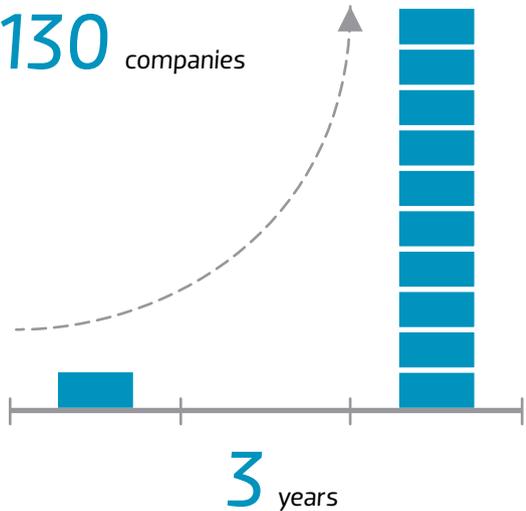
FACTS AND FIGURES ABOUT BENEFICIARY SCHOOLS, KINDERGARTENS, AND COMMUNITY CENTRES

During the past four years of activity, the Energy and Biomass Project installed biomass-fired heating systems in **144 public institutions** in rural communities, including 86 schools, 49 kindergartens, four community centres, three Mayor's Offices, and two vocational schools. As all these public institutions are attended by large numbers of people, the number of beneficiaries of new biomass-based heating systems and improved thermal comfort is pretty large, namely **26,835 children, 4,761 employees and 58,793 parents**, as well as other categories of people, and the overall number of beneficiaries is 90,389 people. The activities of the Energy and Biomass Project in Moldova led to the creation of more than **350 new jobs**. In most cases, the new jobs were established for heating plant operators and solid biofuel producers. In some cases, the biomass heating plants combined with energy efficiency measures enabled the extension of the heated spaces in public institutions, resulting in the opening of new groups for kindergarten children or classrooms in schools, and involving the employment of new educators or teachers.

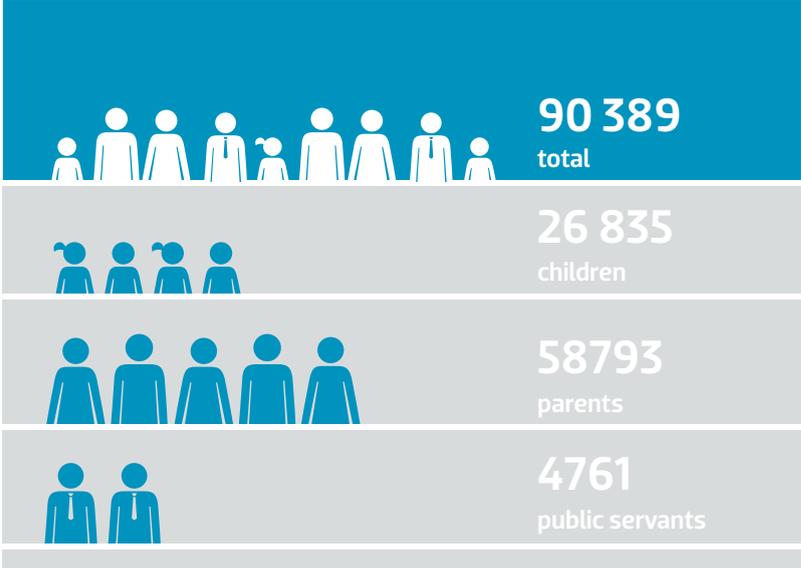
The Energy and Biomass Project has paid due attention to ensuring that kindergartens and schools are duly supplied with quality biofuel. The Energy and Biomass Project has also participated in developing national standards and regulations to support the local biofuel industry. To date, **37 national standards** governing the production and quality of biofuels have been approved by the Government. The regulatory acts will become effective in 2015, but their approval has encouraged local producers to improve the quality of biofuels.

From the outset, the Project actively sought the approval of key stakeholders. Mayors, school principals, teachers and other community leaders were engaged and participated in public awareness campaigns to promote the benefits of biomass-based heating in local communities. The buy-in of these key stakeholders and the public awareness campaign were crucial to the success of the project.

* Full information on each beneficiary community is available in Annex 1, page 52, as well as on the following webpage: www.biomasa.md



▲ The number of briquettes and pellets producers has increased 10 times in 4 years, reaching 130 companies



▲ The beneficiaries of the new heating systems on biomass and of improves thermal comfort

233

localities decided to install biomass heating systems in public institutions

292

intention letters for the installation of the biomass heating systems

270

thousand m²

represents the total area of the public institutions heated with biomass

As a result of the public awareness campaign, 233 mayors requested assistance from the Energy and Biomass Project to install biomass heating plants. From these requests, 225 municipalities were selected to receive assistance. The number of people involved at this stage was 7,725.

The Energy and Biomass Project assisted local communities in identifying the institutions and buildings where the biomass heating systems could have the greatest impact. The project engaged with over 5,000 community inhabitants who participated in the identification stage. After the building(s) where the biomass-based heating units would be installed were identified, representatives from these communities established a project committee to oversee the work. Local citizens were involved in every step of the process, including identifying sources of local financing, installation and subsequent operation of the units. The Energy and Biomass Project oversaw the investment of **MDL 182 million** in European funds that were earmarked for public sector heating systems. In addition, the project and local working committees mobilized over **MDL 28 million** in public and private contributions from local beneficiaries. The biomass boilers that were installed provide heating to over 270,000 square metres of space in local schools and other public buildings.

A wide range of benefits have been derived from the installation of biomass heating systems, including:

- enhanced comfort and productivity
- village energy self-sufficiency
- new job creation related to the maintenance of the system
- soil protection against straw incineration and potential fire
- environmental protection
- the use of advanced heat production technologies
- additional revenue sources for the local budget
- business opportunities for local and regional entrepreneurs, as well as for biofuel producers
- community sustainable development
- capacity-building for efficient use of energy resources
- enhanced community attractiveness for new investments

More than 26 thousand children benefit from improved thermal comfort in kindergartens, due to the heating plants on biomass installed with the support of the Energy and Biomass Project.



All the buildings where biomass heating plants were installed shall have high energy performance indicators to avoid heat losses through building vulnerabilities. To this end, the experts contracted by the Energy and Biomass Project assessed each building and made recommendations on the capacity of the boiler to be installed and suggested building improvements that should be undertaken to enhance energy efficiency.

“To ensure project sustainability it is important that each community gets involved in the implementation process from the very beginning. It is good to see that many communities which have a biomass heating plant installed in one institution have gone further and have biomass boilers installed in other buildings as well at the expense of their own funds or based on the financial resources allocated by the District Council.”, Tatiana Craciun, Senior Community Mobilization Officer at the Moldova Energy and Biomass Project

Indeed, many project beneficiaries went further and, after the heating plant installation, ensured building insulation to avoid heat losses, had photovoltaic (PV) panels installed to supply hot water and electricity independently of national suppliers, or had biomass heating plants installed in other community buildings as well. Here are some striking examples:

- **Carpineni Village, Hancesti District:** three more public buildings have been connected to biomass heating plants, and an increasing number of villagers have switched from traditional stoves to biomass boilers
- **Boghiceni Village, Hancesti District:** a biomass heating plant has been installed in the kindergarten at its own expense and with the money allocated by the District Council
- **Pepeni Village, Sangerei District:** the local community collected the funds necessary to connect the kindergarten to a biomass heating plant

Inhabitants of Verejeni Village, Telenesti District have expanded the biomass heating project by establishing two new kindergarten groups for 45 children, creating seven new jobs.

The schools were previously located in weakening buildings, where just a portion of them would be heated; children crammed near makeshift stoves, having to attend schools in other settlements or even to move to other localities; and there were fewer jobs in the village. Pretty frequently, the installation of biomass boilers in public institutions served as an impetus for the relaunch of such entities and for the creation of comfortable conditions so that people started thinking about village development rather than leaving it.

Switching to biomass-based heating has resulted in greater energy security and significant cost savings invested subsequently in the institution development. The new heating plants installed in rural public buildings are reliable and easy to maintain, with proven efficiency, being manufactured in European countries. The automated high efficiency heating plants (>75%) offer the possibility to regulate and maintain comfortable indoor temperature; the plant operation requires fewer staff members, enabling cost savings.



▲ The school and the kindergarten in the Cotul Morii village, Hancesti district, completely rebuilt after the flooding of 2008 is connected to biomass heating system.

SUCCESS STORY

Calfa Village Kindergarten has Energy Self-sufficiency Thanks to European Funds



Calfa is a village with 1,600 inhabitants in Anenii Noi District and is located closer to Tighina Town than to Chisinau. This is the reason that investors do not line up to launch their businesses in that community. The municipal budget is MDL 2.2 million per year and lacks significant outside investment. Therefore, many village residents have chosen to search for a job abroad.

Nonetheless, the community follows its development path, and the Mayor's office implements many projects aimed at upgrading the locality so that it becomes attractive for its residents.

In 2012, the local authorities decided to renovate the heating system for the local kindergarten and switch from natural gas to biofuel-based heating. Mayor Ludmila Ceaglic applied to the Energy and Biomass Project and obtained a grant worth MDL 800,000 for the installation of an 81 kW biomass heating

plant. The plant is used to heat a two-storey building that contains approximately 700 square metres and is attended by 72 children.

"Since we had the biomass heating plant installed in the kindergarten the number of children catching colds has decreased significantly as we regulate the indoor temperature depending on the outside weather conditions. Also, we addressed the wall condensation-related issue. Now we have optimal thermal comfort within the building. We started to heat the premises on October 8. Also, the kindergarten attendance has increased.", Natalia Grigoras, Kindergarten Manager.

Having switched from natural gas (installed in 2008) to a biomass-based heating system, the energy bill has been reduced by approximately MDL 13,000, although the main advantage is the comfort. Mayor Ceaglic points out the poor quality of the natural gas in Moldova, especially, its heat output.

800 thousand lei

grant for the installation of heating plant

81 kW

capacity of the heating plant

700 m²

heated area

155 children, teachers, parents

beneficiaries of the eco-heating system

"The kindergarten will be heated even if the supply of natural gas is suspended one day. There are three producers of biofuel in Anenii Noi; hence, we have plenty of options to choose from", she said.

In 2013, the pellets were supplied through a direct contract, while in 2014 a public tender was conducted and awarded to a company in Ocnita District, in the far north of Moldova. The supplier was selected because it produced timber pellets with a greater heat output, as well as other parameters that matched the Greek boiler (with 85% efficiency) that is installed in the kindergarten.

"I attended the forum titled "Bioenergy in the Republic of Moldova" organized by the Energy and Biomass Project jointly with the Energy Efficiency Agency in summer 2014, where I met many colleagues who had biomass heating systems installed and shared their experience. I met many fuel producers and suppliers of equipment, with whom I discussed technical details regarding the biomass heating plant operation as well as the requirements for the quality of fuel. Now I require a conformity certificate for the fuel supplied, and I am looking forward to the establishment of a lab so that we could check the fuel quality by ourselves.", Ludmila Ceaglic, Mayor, Calfa Village

According to the Mayor, the heating plant installation event generated significant community interest. People learned about the benefits of biomass heating and donated money, time and effort to repair the building and the surrounding fence.

At present, there are 27 children on the waiting list to attend the kindergarten soon after the family doctors, who have their offices on the ground floor, are relocated to a new building. The Mayor would like the new building to be heated with biomass as well, being connected also to the natural gas pipeline. She is looking forward to a grant from the Romanian Government earmarked for Moldovan kindergartens, to repair and insulate the kindergarten roof. Solar panels are planned



◀ Ludmila Ceaglic, the mayor of Calfa village, has applied to several projects, in order to ensure the community development. Now, she enjoys the results of the efforts made along with the Calfa citizens.

to be installed on the new roof to supply the kindergarten with hot water. Recently, the village school (attended by approximately 140 pupils) was renovated and double-glazed windows and insulation were installed. A biomass heating plant is proposed for the school building and community centre, which is not currently heated.

Recently, with support from the Bureau for Reintegration, the village installed 10 energy-efficient lights on the main street. The cost of the energy used by these lights is only MDL 130 per month. Mayor Ceaglic plans to expand the lighting system, have 60 LED devices installed and pave the six kilometre-long main street. To this end, the Ministry of Transportation and Road Infrastructure has already allocated MDL 36 million to help the citizens of Calfa improve their basic infrastructure.



◀ The boiler on pellets doesn't emit CO₂ and the ash is used as fertilizer on agricultural fields in the village

PRIVATE SECTOR DEVELOPMENT IN THE AREA OF BIOENERGY

- *Businesses engaged in biofuel production that were launched through the leasing mechanism*
- *Biomass-fired boilers available for households at subsidized prices*
- *Cogeneration pilot project*
- *Public-private partnership (PPP) to render bioenergy services*

35

businesses launched and promoted in the sector of solid biofuel manufacturing

100

new jobs created

620

families have biomass boilers installed being refunded the amount of EUR 1,300 at the expense of European funds

30

companies assemble biomass boilers locally and sell them to consumers

7,5 million euros

invested in the construction of a biogas plant in Drochia with a capacity of 7.3 million m³ of biogas per year

21

public institutions from Leova District are heated with biomass based energy, the power being supplied by an economic entity

15 MW

is the **overall** installed **capacity** of heating plants

15 thousand tones

of **CO2 emissions** are being reduced annually

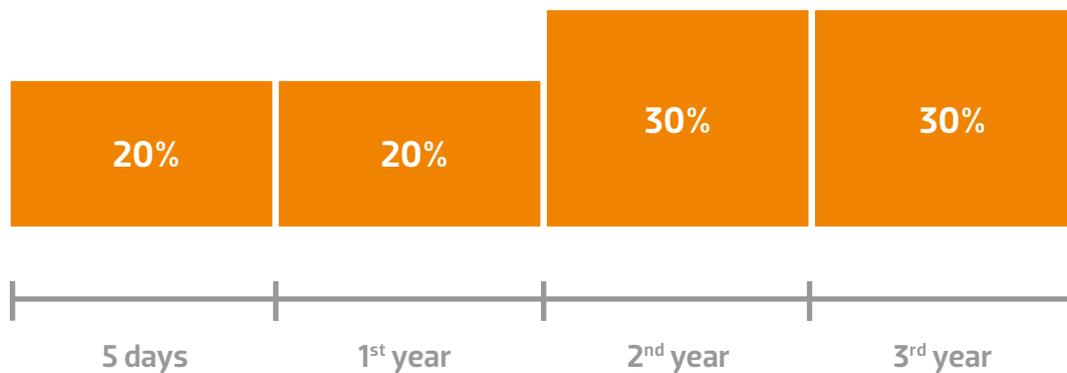
BIOFUEL PRODUCTION BUSINESSES LAUNCHED THROUGH LEASING MECHANISM

1 million EUR
allocated for the development of the biofuel production sector

35
solid biofuel production businesses launched and further developed

100
new jobs created

Leasing reimbursement stages with 0% profit, commission and VAT



◀ Leasing reimbursement stages over a period of 3 years with 0% profit, commission and VAT

The project has established the foundation for the Moldovan bioenergy sector development, which four years ago was at its first step forward. The large number of bioenergy consuming institutions encouraged the launch of biomass fuel producers as well. First of all, the installation of biomass boilers created demand for such piece of equipment that was new on the Moldovan market and represented a pretty good business opportunity for the rural area; second of all, the project provided, under leasing conditions, equipment for straw baling and equipment for briquette and pellet production, having covered the whole value chain: from raw material collection till end product packaging.

To this end, EUR 1 million has been allocated, while an enterprise could receive up to MDL 750,000. Through the 2KR Project Implementation Unit, 19 sets of baling equipment and trails were purchased and installed, while the EEA covered the procurement of 16 pieces of briquetting and pelleting equipment.

The leasing term was three years with zero interest rate, zero commission and zero VAT. The payback was performed in instalments; the first one (20%) was settled five days after the conclusion of the financing agreement, the second instalment (20%) was settled during the first year of activity, and the last two instalments (30% each) are to be settled by the end of the second and of the third years of the leasing term, accordingly.



In 2014, those 100 market active enterprises had the capacity to produce approximately 120,000 tons per year, which is equivalent to over 53 million m³ of natural gas or 80,000 tons of coal.

◀ Briquettes production line

Nicolae Zaharia, MEBP Business Development Officer, says that the private company funding is an attractive and fair mechanism for stimulating the market, and such mechanism has high replication potential.

"Funds were allocated to companies that needed that money, and sustainable impact has been generated. However, many briquette and pellet manufacturing enterprises entered the business with no support from the project, which means that the market is pretty attractive," he says.

Hence, in 2014, those 100 market active enterprises had the capacity to produce approximately 120,000 tons per year, which is equivalent to over 53 million m³ of natural gas or 80,000 tons of coal.

As the supply grew, the Energy and Biomass Project realized the producers needed clear benchmarks in terms of biomass fuel quality. Thus, the project supported the development and approval of 37 voluntary national standards and binding technical regulations to become effective as of 2015. In this way, public institutions and private consumers would

get homogeneous and qualitative biomass fuel. The biofuel package should indicate all relevant data, including the specific weight, calorific value, and the amount of ash.

Hundreds of biofuel producers and consumers attended the National Bioenergy Forum organized on 18 July 2014. The participants had the opportunity to get acquainted with one another, to discuss the issues they encountered and to submit their recommendations regarding bioenergy sector development to the national authorities.

Another event titled "Bio forum, Second Edition", conducted on 4 December 2014, was devoted to the energy crop cultivating sector in the Republic of Moldova. Experts from countries advanced in this area as well as local entrepreneurs who launched the first businesses in energy crop cultivating shared their experience and advice on further development of the bioenergy sector in the Republic of Moldova.

The forum is to be conducted on an annual basis in partnership with the EEA to become a sustainable platform for discussions, identifying solutions for the sector issues and promoting the use of biomass energy in all sectors of the national economy.

Briquettes Produced in Hancesti by a Young Businessman are Sold Throughout the Country



Hancesti Town is steadily growing. New industrial facilities are being built in the field near the bus station. One of these facilities is owned by Nicolae Marin who launched a briquette manufacturing business using wood shavings and sunflower husks. He purchased and installed a briquetting line (made in Ukraine) with the hourly production capacity of 400 kilograms under the leasing programme implemented by the EEA and funded by the Moldova Energy and Biomass Project.

Along with the briquetting line, Prodeco GTN – the company established by Nicolae Marin – purchased a mobile shredder to reduce the size of raw materials prior to their transportation, a sawmill for wood processing that generates part of the wood shavings used for briquetting, and a drier for wood shavings that the businessman designed and installed by himself. As the demand for briquettes is higher during the cold season, the enterprise has diversified its activity, and this fact should help in settling the leasing payments (the second instalment – 20% of the cost of the briquetting line – is due in 2015). Hence, equipment for parquet and floor-laminated board production was also bought to be put into

operation at the end of the cold season, when the demand for briquettes would go down.

Nicolae started to produce briquettes out of wood shavings, and recently has begun the production of briquettes out of sunflower husks, having also identified a larger raw material supplier in Ceadar-Lunga, in the southern region of the country, which is also the main consumer of Prodeco GTN briquettes. **“Firewood is more accessible and affordable in the central region of the country; therefore people feel reticent to switch to briquette heating, and the advantages of the latter need to be further explained and promoted,”** Nicolae says. According to his opinion, pellets can compete with coal, and there is high demand for it due to the coal deficit on the Moldovan market caused by the armed conflict in Ukraine. Briquettes can compete with firewood, which is less expensive, but has the following disadvantages: it needs to be cut and requires larger storage space, while the heat output is uneven. By the way, one of the Prodeco GTN employees is a refugee from the eastern Ukraine who was forced to leave his home country due to the war and get a job in the hometown of his relative.

As Nicolae says, the briquettes, having the properties of conventional timber, have a series of advantages, i.e. they can heat the room with no soot, spark or smoke. More than that, due to their increased density and reduced moisture – approximately 8% – the combustion is even and could maintain the room temperature for a longer time. Therefore, briquette is the ideal fuel for rural residential houses as it requires no continuous monitoring at night and maintains the indoor room temperature overnight.

Although the estimates show a maximum efficiency of costs if the raw material is acquired within a 20km distance from the point of use, this desirable objective is hard to achieve in Hancesti. Even if he bought a mobile shredder, the costs of branch chopping, transporting and drying with the subsequent manufacturing of briquettes are far too large, Nicolae mentions. Hence, his enterprise concluded contracts with a group of enterprises to buy sunflower husks from. An important element that reduces the operation costs is that Nicolae has his own truck to transport, back-and-

forth, the raw materials and briquettes for sale. A large portion of briquettes is supplied directly to end consumers, and the remaining part is packed in bags and sold to distributors. Due to the geographical scattering of consumers, the establishment of a supply chain would be rather costly; therefore, the sale of products via distributors is the best available option, where the discounts granted to distributors are lower than the eventual costs he would have to incur for the own distribution chain.

Nicolae says the new technical regulations with respect to solid biomass quality requirements, to become effective in 2015, are not distressing him as he is confident in the quality of his products. **"We use no additive materials, it is 100% natural, and the quality is reliable"**, Nicolae says, having pointed out that Prodeco GTN does not clear forest fields for briquette production purposes. The briquette production activity is environmentally friendly because the company uses the timber processing waste; besides, less CO₂ is emitted compared to fossil fuels.



▲ Ukrainian briquettes production line, with a production capacity of 400 kg/h

BIOMASS BOILERS AT SUBSIDIZED PRICES FOR HOUSEHOLDS

2.2

620

biomass boilers were provided through the Energy and Biomass Project subsidy programme from European funds

1300 euros

Subsidies are worth EUR 1,300 each for biomass boiler installation in households or small and medium-sized enterprises

30

companies assemble locally biomass boilers and sell them to consumers

12 MW

is the total installed capacity of biomass boilers for households



An operational market presumes that many independent consumers are in place to create competitive demand. As the largest proportion of energy is consumed by the residential sector in the Republic of Moldova (approximately 45%), the Energy and Biomass Project decided to stimulate the use of biomass fuel by private dwellings. Hence, the project provided subsidies worth EUR 1,300 each to every individual willing to switch to biomass-based heating who is the owner of a real estate/micro-enterprise, which is not connected to the district heating. Also, the supply of individual boilers was expanded

by encouraging local boiler production. Hence, the costs have been reduced, on the one hand, and the replacement of imports and new job creation have been supported, on the other hand.

The list of participants willing to register for the biomass boiler subsidy programme comprised 860 individuals, and 620 contracts have been concluded. The programme gained popularity due to the substantial size of the subsidy, efficient promotion campaign, and the easiness of biomass boiler management.

▲ First destination of the caravan of the biomass boilers: Olanesti village, Stefan-Voda district



"Heating with locally produced energy, in the Republic of Moldova, raises my house energy security. My family and I would spend the wintertime in a house heated with green energy, paying less than for gas, but enjoying the same comfort. The boiler we bought thanks to the European funds is automatic; so, I can remotely set the desired indoor temperature depending on the time and day of the week,"

Anatol Fala, a beneficiary of the subsidy programme for the procurement of biomass boilers, says.

"The programme has attained its target, while at a certain time the number of applications exceeded the possibility to provide subsidies. Initially people just did not take it seriously that someone would give them a subsidy worth EUR 1,300 requiring nothing. Such programmes should be developed in different areas as to promote the state policy," Nicolae Zaharia stresses.

However, there are also some lessons learned to be considered during Phase II of the Energy and Biomass Project. First of all, thorough technical and social criteria should be developed for the subsidy allocation so that a fair balance is set between the advanced technologies that increase the boiler cost and limit the group of beneficiaries to the level of relatively wealthy families, on the one hand, and the social criteria that allow a wide range of families to afford biomass heating and get subsidies, on the other hand. Also, such subsidies should also be provided for other RES that could be installed in a household such as PV panels or solar collectors.

The Moldova Energy and Biomass Project aims to stimulate and increase the added value produced in the country and replace the imports. To this end, a programme has

been launched to support the companies producing or assembling biomass boilers locally, using parts manufactured by famous European producers from such countries as Germany, Poland, Czech Republic, Romania, Latvia and Greece. **Approximately 30 companies have already embarked on this programme and offer a wide range of biomass-fired boilers to end users.** At least one of those enterprises assembles boilers in full, using parts imported or manufactured independently, while several other enterprises assemble locally up to 70% of the boilers offered for sale. Companies that assemble boilers can derive double advantages. First of all, by importing the boiler parts and assembling them in Moldova, they can save up to 10–15% of the cost relative to the price of the ready-to-install boilers. Second of all, companies managed to get grants from the Energy and Biomass Project worth EUR 20,000, but not more than 40% of the transaction cost, for the procurement of special-purpose machinery necessary to assemble boilers locally. Such investments make the production more efficient and reduce the future operational costs: they either reduce the energy bill or improve the work environmental conditions.

COGENERATION PILOT PROJECT

2.3

7.5
million euros

invested in the construction of a biogas plant in Drochia

7.3
million m³

Production capacity of 7.3 million m³ of biogas per year with 51% content of methane

70
thousand tons

biodegradable waste are converted into energy each year

15 %

reduction in the oil consumption as part of the sugar production process by Südzucker Moldova



◀ The biofuel factory has a production capacity of 7.3 million m³ of biofuel per year with a 51% methane content.

Cogeneration means combined heat and power (CHP) production as part of the same process. In general, the CHP is more efficient (by 10%) than the separate production of heat and power in terms of primary energy consumption. Heat is considered to be a secondary product that helps pay back the investment, while the generator capacity is determined by the installed power capacity.

The Energy and Biomass Project aimed to prove that cogeneration is feasible in the Republic of Moldova, regardless of the type of biomass used. To this end, Südzucker Moldova, a sugar producer with German capital, was selected out of several available options. The company has a sugar factory in Drochia and CHP plants constructed during the Soviet era.

Südzucker Moldova built, commissioned and put into operation a biogas plant in September 2013. The plant is operated based on sugar beet processing waste/draff. The company invested EUR 7.5 million to build the plant, which would allow it to reduce the consumption of natural gas by up to 15% per year.

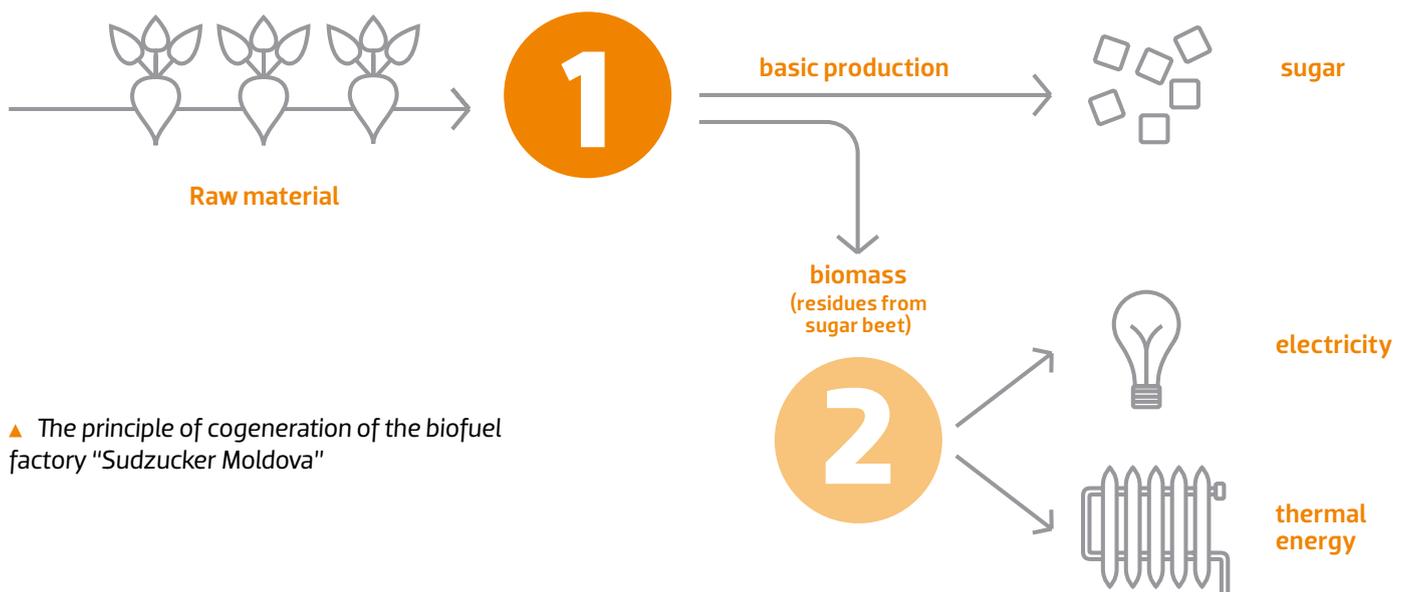
"The fuel price went up tenfold in the past 14 years. Since 1999, when Südzucker took over the sugar factories, and up until now we managed to halve the energy consumption. The biogas plant is the next step in this direction. It would help us reduce significantly the consumption of natural gas," Octavian Armasu, a member of the Südzucker Board of Directors, says.

The biogas plant has the installed capacity of 7.3 million m³ of biogas per year, with 51% content of methane. The fuel is produced on the basis of sugar beet draff generated by Südzucker factories and covers approximately 15% of the company energy needs. The CHP plant generates both heat and power for its own needs during the production season, while beyond it the power is supplied to the power distribution grid. Südzucker supplied 12.5 million kWh of green energy throughout 2014, and this led to reduction in greenhouse gas emissions by 5,300 tons of CO₂.

The pressed sugar beet pulp/draff would be used during the first two years, and, subsequently, all sugar beet processing organic waste would be used for biogas generation. Hence, the produced biogas would be burned in the factory boiler along with the natural gas bought by Südzucker Moldova, and the generated energy and steam would be used in the sugar production process. The investment payback period is estimated at five years.

The Energy and Biomass Project bought a combustion engine worth USD 150,000 to support this cogeneration initiative. The engine is operated using sugar beet draff.

Nonetheless, the industrial cogeneration is rather expensive for the Republic of Moldova: the installation of 1MW capacity requires approximately EUR 1 million, while most of the companies are not ready to invest such large amounts of money for such projects. Therefore, for the Energy and Biomass Project Phase II it has been decided to develop a guide containing the relevant procedures for launching a cogeneration project, the design requirements, the setting and approval of tariffs for the produced power, etc. The guide would include answers to frequently asked questions about the companies eligible to implement cogeneration projects, the minimum feasible capacity of a generation plant, etc.



▲ The principle of cogeneration of the biofuel factory "Sudzucker Moldova"

21

public institutions in Leova District connected to biomass heating

4 MW

Total installed capacity of heating systems

54

new jobs created

Increased heating comfort for pupils and teachers

Maintenance, storage, operation costs, etc. covered by the private partner

997 MDL

Monthly bill of MDL 997 for 1 Gcal, less than the production cost based on gas or coal

500 thousand euros

Private investment of 500,000 Euro

11 years

The period private partner will manage the heating plants for a period of 11 years

In many European states, such as Austria, Poland, Latvia, and Denmark, the solid biomass fuel is used at industrial level. Entire neighborhoods are heated, during the cold season of the year, with heat produced by a private economic entity, often in partnership with public authorities. The Energy and Biomass Project launched a pilot PPP initiative, aimed at establishing a network of public institutions heated with biomass and, at the same time, outsourcing and unifying the maintenance operations of the heating plants. In this way, public authorities can save money and human resources on the maintenance of heating plants, fuel storage and handling, etc., all these operations being managed by the economic entity.

In May 2014, the first service for biomass-based heat delivery through PPP was launched in Leova District. This district was selected for the pilot project, whereas 12 districts participated in the competition with 15 projects. The company Green Farm LLC, selected as a result of a competition conducted by the local authority, committed to invest half a million Euro in the installation of biomass-fired boilers in 19 public institutions in the district, which it will manage for a period of 11 years. It is responsible for the fuel supply to the heating plants and their proper operation, and the local authorities will pay MDL 997 for each supplied Gcal.



◀ One of the beneficiary institutions of the first Private-Public Partnership in bioenergy service provision



In May 2014, the first service for biomass-based heat delivery through PPP was launched in Leova District. This district was selected for the pilot project, whereas 12 districts participated in the competition with 15 projects.

"We will hire and pay salaries to the operators of these heating plants and will supply biofuel throughout the heating season. As part of the PPP we will produce between 6,000 and 9,000 Gcal of energy annually, which will be supplied at attractive costs," Valeriu Plesca, Green Farm Director, says.

After the installation of 19 new heating plants, Leova District became a leader in terms of the number of biomass heating plants, with a total number of 25 biomass-based heating plants in public institutions with a total capacity of 4 MW.

"It is the first district in the Republic of Moldova that created a PPP between the District Council and an economic entity, developing the infrastructure of thermal power from biomass sources and creating integrated services for the management thereof," Eufrosinia Gretu, Leova District Chairman, says.

The PPPs in the field of biomass-based heating of public institutions present a series of advantages for local public authorities, these being exempted from the complicated

procedures of public procurement and management of industrially dangerous objects, requiring knowledge and maintenance. At the same time, there are advantages for the private economic entity, the latter having the possibility to contract large volumes of fuel, thus having a long-term market.

The experts believe that the PPP in Leova District was properly established and it is innovative for the Republic of Moldova. At the next stage, such a PPP could be further extended in terms of energy efficiency measures in partnership with energy service companies. The companies will invest in building envelopes, window replacements, etc., and the financial resources saved will be shared between the private partner and the local public authority.

A study on the potential replication of the PPP from Leova District conducted by the Energy and Biomass Project will show the biomass potential in districts. It will propose specific methodologies and questionnaires for districts to prepare for the launch of another seven PPPs at the stage of project extension.

TRAINING AND EDUCATION

- *Training sessions offered to local government representatives, managers of public institutions, biofuel manufacturers, and biomass boiler operators*
- *Educational initiative to promote renewables and energy efficiency*
- *Summer Camp ENERGEL*

1765

local public administration (LPA) representatives learned about the local fund collection techniques, gathering more than MDL 28 million as a local contribution

2819

mayors and managers of public institutions know how to use and to multiply eco-technologies

376

operators from 127 communities learned how to operate the biomass-based heating system

413

agricultural entrepreneurs know how to transform the wastes into an economic product

352

schools became part of the educational initiative on RES and energy efficiency

19000

pupils participated in the courses on renewables and energy efficiency

272

children participated in the ENERGEL Summer Camp between 2011 and 2014

Trainings for Local Public Authorities, Institution Managers, Biofuel Producers and Biomass Boiler Operators

Such participatory trainings are very important, since they explain to the community the advantages of biomass heating and gather supporters among the community, who can facilitate the system operation in the future.



Each stage of the project implementation was accompanied by a complex agenda of trainings, which ensured a proper functioning of implemented initiatives and their sustainability. At the stage of project evaluation, in view of switching the local public institutions to biomass heating, the Energy and Biomass Project organized trainings on community and local resource mobilization for local public authorities and local committee members. **Approximately 1,765 LPA representatives, including 1,253 women, gained practical skills on local contribution collection during the implementation of a project,** establishment of partnerships with local stakeholders and participatory evaluation of project proposals. As a result, the community obtained a plan on people mobilization and collection of local investment for the implementation of the project on installation of biomass-based heating plants in public institutions. Such participatory trainings are very important, since they explain to the community the advantages of biomass heating and gather supporters among the community, who can facilitate the system operation in the future.

Another training module for local public authorities is organized at the implementation stage of the project on installation of the biomass-based heating plant. This envisages the development of a project management plan, which includes ensuring the local contribution, provision of fuel supply to the institution, monitoring and project transparency. Following the completion of the biomass heating plant installation works, the community becomes responsible for the proper operation of the heating plant installed and the heating system, overall. In this context, the community representatives are involved in a training seminar, where the key stakeholders identify concrete actions and the persons responsible for their implementation; they also determine the necessary sources and their coverage. Therefore, approximately 1,592 beneficiaries at local level, including 1,152 women, participated in such trainings and developed 127 local projects. All these aspects are reflected in the projects' sustainability plans on biomass heating of public institutions in beneficiary communities.



Energy and Biomass Project offers trainings for the contractors interested in briquettes and pellets production business. For this purpose a Practical Guide for Biomass Fuel Providers was elaborated and was offered to all interested stakeholders on www.biomasa.md website.

1.227

persons have benefited of a specialized training

376

operators participated in practical training during 2011-2014

410

farmers were trained on mechanization modalities of plant waste collection

Local authorities also benefit from specialized training aimed at assimilating the new technologies and the use of biomass boilers, as well as gaining knowledge and skills on the normative and institutional framework in the energy efficiency sector, possibilities of diversifying the energy sources at local level, estimating the biomass potential in the rayon and identifying the modalities of its use. The specialized training offers, also, specific knowledge on the parameters of the main types of boilers and their technological process, the price-quality correlation for biomass fuel and the possibilities of attracting new investments in the community. 1,227 persons benefited from such training.

The boiler operators are trained on how to properly and efficiently operate the heating systems in public institutions. Those two trainings – theoretical and practical – provide them with a critical set of knowledge in general sectors, such as types of biomass fuel production technologies and technological flow, and also with specific knowledge such as measuring of fuel quality parameters, procurement planning, problems that may arise in their exploitation and firefighting security measures. The practical training improves the operators' knowledge of heating network and thermal point exploitation,

preparation of the equipment for the heating season and its conservation at the end of the season, servicing of the heating plant, etc. **In the period 2011-2014, 376 operators from 127 communities were trained.**

Fuel supply in sufficient quantities and of good quality is vital for the proper operation of the biomass-based heating systems. Therefore, besides financial incentives for fuel producers, the Energy and Biomass Project offers trainings for entrepreneurs who wish to start a business producing pellets or briquettes. The project developed a practical guide for biomass fuel suppliers and made it available to all interested persons at www.biomasa.md, along with other informative materials, and it offers specialized courses for agricultural producers on using vegetal wastes for biomass fuel production. Over 410 agricultural producers, including 91 women, have been trained on automated modalities of vegetal waste collection and the process of raw material collection and storage, on financial models and investment payback models, pellet and briquette production technologies and equipment, etc. This set of knowledge allows the economic entities to develop a sustainable business, envisaging all the risks and the needs of such activities.

We learned how to mobilize the community

Dorin Pinte,
Mayor of Pepeni, Singerei:

"At trainings we learned how to mobilize the community, and how to write a project plan and ensure its sustainability. The trainings helped us choose a good supplier of briquettes, which we buy from producers in Balti and Telenesti. It was an extraordinary help. All installations purchased with the support of the Energy and Biomass Project work perfectly. To better tell how pleased I am, I would like to say that I installed a solid biomass-fired boiler at home and I have no words to describe the feeling of having the possibility to heat the entire house in a rural area. Due to the support of the Energy Efficiency Fund, we installed a biomass heating plant in the Mayor's office and are now preparing to switch the second kindergarten to biomass fuel."

We know how to choose quality pellets

Ludmila Jicol,
Director of Gymnasium
in v. Bratuleni, Nisporeni District:

"The training provided by the Energy and Biomass Project was very necessary as, besides the benefits of biomass heating, we have been trained on how to use the heating plant as to not damage the boiler and have maximal efficiency. The operator cleans the combustion space weekly, and stores the pellets in a dry and airy warehouse, which we built last summer, thus ensuring their optimal humidity. We have been trained on how to choose the pellets appropriate for our boiler, operating on wood waste pellets. Presently, we are at the second stage of the project and focus on the energy efficiency of the building – thermal isolation of walls and ceilings, and window replacement."

The training helped us correctly choose the biofuel production technology

Roman Smolnitchi,
co-founder of a briquetting
line in Ghidighici Town,
Chisinau Municipality:

"We benefited from several trainings organized by the Energy and Biomass Project, including one on biomass processing technology, which helped us choose correctly the equipment for the briquetting line. Also, there were other short-term training sessions organized for equipment operators or for the purpose of discussing the legal framework and the issues related to biomass fuel quality. The Biomass Forum was very useful as we met with other producers, presented our products and received a lot of information about potential customers – public institutions, companies."

We comply with the procedures described in the boiler operation manual

Denis Bejenari,
boiler operator in Gymnasium
in v. Soldanesti, Nisporeni District:

"We have been trained by the engineers of the Energy and Biomass Project on heating plant operation and safety techniques. The trainings were very useful and we comply with the procedures that we have been trained on. Now, I organize weekly trainings with the operators as to remind them about the heating plant panel, the chimney cleaning procedures, etc. Our boiler has a heating capacity of approximately 2,000 square metres and the gymnasium is over 1,200 square metres, therefore we have a good capacity reserve and had no problems in its operation. It is more convenient than a coal-fired boiler and even a gas boiler."

EDUCATIONAL INITIATIVE PROMOTING RENEWABLE ENERGY AND ENERGY EFFICIENCY

352

schools became part of the educational initiative on RES and energy efficiency

19.000

pupils participated in renewables and energy efficiency courses

272

children participated in the ENERGEL Summer Camp between 2012 and 2014

The change of the attitude should begin from the most fundamental level of the society and the youth education in schools was shown to be one of the most efficient approaches in the implementation of sustainable changes.

Therefore, the Energy and Biomass Project launched an educational initiative on renewable energy in all the schools from the project's beneficiary communities. The course will teach children from 7 to 8 grades how the sun, the water, the wind and the planets can help save money and energy. It will promote the use of RES, in particular, biomass, and the rational use of energy resources through energy conservation practices and energy efficiency.

"A children's manual and a guide on RES have been developed with the project's support for the teachers participating in the educational initiative. The manuals are used in the optional courses taught in schools from rural areas, such as Environmental Education, the Human and the Environment, and Education for Community

Development. As of 2013 the renewables and energy efficiency course was introduced in the list of optional subjects by a decision of the Ministry of Education and it is accessible to all schools in the Republic of Moldova", Victoria Ignat, Capacity-Building Specialist of the Energy and Biomass Project, says.

The teachers and the children are involved in practical activities such as construction of layouts of plants using renewable energy and exhibitions, movie nights, discussion and debate clubs on different topics related to alternative energy, study visits to biomass heating plants, webinar lessons, research and practical works, which they present to colleagues, parents and community members. The most active pupils are selected to participate in the ENERGEL Summer Camp, which has been organized since 2012.

The educational initiative is implemented together with the Institute of Continuing Education and the Republican Centre for Children "Gutta-Club".



In 2013, the course was introduced, by an order of the Ministry of Education, as an optional subject in schools

ENERGEL Summer Camp Gathers Together Eco-Energy Advocates

The ENERGEL Summer Camp is part of the educational initiative on RES, in which the most active children are selected from schools where this subject is taught. The children spend 10 days, full of practical and innovative activities, in the camp. The trainings and the lessons are led by teachers of physics, biology or other subjects, who are experienced in teaching subjects related to renewables; the children also benefit from visits made by officials of big energy production and supply institutions.

The summer camp is organized in partnership with the Republican Centre for Children "Gutta-Club". Every year a new location is selected: in 2012 Talmaza Village, Stefan Voda District, in 2013 Ivancea, Orhei District, and in 2014 Raculesti Village, Criuleni District.

In addition to the knowledge on how to use the energy of nature, whose promoters participate in this summer camp, the children make new friends and have fun by organizing concerts of musical bands from Chisinau.

"It is an extremely necessary initiative. It is important that each child, teenager, adult understands how important it is to use the sources of the nature in order to produce energy, be friends with nature, and not waste energy when you consume it. FurioSnails supports fully this initiative. Being eco is cool", Lilian Severin, FurioSnails band member and one of the participating guests at ENERGEL Summer Camp, is convinced.



▲ 2013 – Ivancea village, Orhei district



▲ 2014 – Raculesti village, Criuleni district



7 – 16 June 2012,
v. Talmază,
district Stefan Voda

7 June, Thursday, first day of the summer camp:

I am one of 80 children, who came to a delightfully beautiful place, where nature is your neighbour and you are cut off from the modern informational technologies: the mobile telephone is out of coverage here and the Internet is on vacation. Obviously excited, in process of accommodation and curious to learn what will happen to them next. It is their first time in an eco summer camp, like me, though.

8 June, Friday, official opening of the ENERGEL Summer Camp:

Important day. Guests, men and women, came from the Ministry of Education, EEA, District Council and ... FurioSnails. Arriving in the children's world the adults played by their rules: they took a test on renewable energy and energy efficiency. Thereafter, everyone went to a stadium to watch the FurioSnails outdoor concert, where we sang, danced and participated in ad hoc competitions. CDs with FurioSnails albums, T-shirts with their autographs written in marker or pen, photographs and many impressions – this is what the FurioSnails guys have left behind.

9 June, Saturday:

Following the habits of the summer camp, we grouped into teams of 20 children each. A symbolic figure, 20-20-20 represents the Strategy – the European Union states' commitment to switch to renewable energy, reduce fossil fuel consumption and increase energy efficiency. Therefore, we have four teams of children in the ENERGEL Summer Camp, called Energy, On-Fire, Bioterra, and ProEnergy.

10 June, Sunday:

Visit to the Green Museum in Stefan Voda and the consultancy, information and environmental education centre. The centre director talked passionately about ecology, the environment, global warming and the natural resources of Stefan Voda. In the evening, the children organized a show "What? Where? When?" on alternative energy topics, of course.

11 June, Monday:

The first team – 20 children – made a visit to v. Popeasca, Stefan Voda District, to the house of Mr. Anton Port. He is a physics teacher, a man who "privatized the sun, the wind and the water" over a period of 20 years. "I was not married and did not have a home, but I already knew that I will have a wind turbine in my courtyard." Mr. Port remembers how, exactly at their age, he was overwhelmed by the idea of producing energy from the wind, the sun, the water, the biomass. This is exactly what happened.

12 June, Tuesday:

A conference on promotion of renewable energy and energy efficiency was organized in the camp. We made presentations about power and the benefits of green energy and economical energy consumption, followed by a question-and-answer session. As of today, we have the mission to collect waste, and plastic products for a fashion show with clothes made of waste. The top models will obviously be the girls and the boys from the camp.

13 June, Wednesday:

Today we built, together with Mr. Anton Port and other experts on wind energy, an installation generating electricity from wind power and installed it on the roof of a building of the summer camp. In the evening we decided to make ENERGEL, the mascot of the summer camp and the manual on RES, the central hero of a theatre play. The idea was accepted by everyone. Who will write the play? It was decided that each team will create its own story about ENERGEL and the best fragments will be integrated into the final show performed by the text authors. Running after inspiration...

14 June, Thursday:

Another full day. We all went to Stefan Voda to clean off the garbage from the stadium and the neighbouring park. Though recognized as a clean town, there was sufficient garbage to fill up a tractor and a garbage collection machine.

15 June, Friday:

The fashion show with clothes made of PET, plastic glasses and plates, garbage bags, paper, etc. The final rehearsal of the show Energel's Adventures: a complex plays involving 24 young actors. The last preparations for the actors' clothing/wardrobe made of the same sources as the fashion show.

16 June, Saturday:

The last day in the summer camp. The premiere of the great show. It is a play in which Energel together with his friend Gutta travel by car into the future and arrive to a dark Moldova, with no light, little oxygen and a lot of dust. Here they meet the scientist CO₂, the one who brought the country to that state of nightmare, and they decide that they can prevent the disaster. Finally, they run away from the year 2210, come back to 2012 and re-arrange things: use renewable energy, reduce gas and coal consumption, and make savings from energy consumption. After the show, which involved children and adults as actors, the winners of the ENERGEL Summer Camp, selected by the children from the camp, were awarded.

8 days full of activities, with agendas more loaded than in school, but more impressive and memorable. "We are a team and I cannot imagine that tomorrow I will be without them". "Being eco is cool" – with these words, those 80 champions, promoters of renewable energy and energy efficiency, left the ENERGEL Summer Camp.

COMMUNICATION

- *How to make a change in four years?*
- *Innovative initiatives: SUN Da-I Fest, Biomass Boilers Caravan*
- *Moldova Eco-Energetica: meeting place of eco-energy sector champions*

1 million

people covered by communication of the Energy and Biomass Project

12

video and videography spots promoting biomass energy broadcasted on TV, radio, and online communication networks

50 thousand

brochures, booklets, and posters about benefits of bioenergy distributed throughout the country

2000

reports on TV and radio, and in newspapers and web pages

3

editions of the Moldova Eco-Energetica Competition organized

180

projects enlisted for the competition

48

successful projects granted awards at the Gala of Awards Moldova Eco-Energetica

www.biomasa.md

unique communication platform in the bioenergy sector of the Republic of Moldova



The Energy and Biomass Project started its communication activity from a clean slate. The project was launched in a period when people did not know what biomass energy meant. There were no examples of using modern biomass-based technologies in the public and private sectors, while the biofuel production market was in an incipient stage of development.

The mandate of the project was not only to inform people about biomass energy and project activities, but to also change the attitude of a country with relatively conservative thinking in the area of renewable fuels. Due to integrated communication, which,

in addition to remote communication actions envisions inter-personal communication, direct contact with target groups, mobilization of communities, and partnership with and support from decision makers, the project managed to demonstrate that agricultural waste constitutes a source of income for agricultural workers, that solid biomass processing is a business opportunity, and that biomass-based heating is a source of comfort and savings for the population, as well as a source of increasing the energy independence of the country.

Video communication

Video communication covered the entire country. According to surveys, television remains the main information source for the population of the Republic of Moldova. The project developed a number of video spots on biomass energy promotion, but also the project initiatives, such as the programme for subsidizing household biomass boilers or for participating in the SUN Da-I Fest, where the musicians powered their instruments from alternative energy sources.

Video products have been distributed to partner national TV stations with countrywide coverage. **12 video and audio spots & infographic &**

animated spots promoted the economic, social, and environmental benefits of using biomass energy. The spots were broadcast on national and regional TV stations, social networks and websites.

Almost one thousand TV reports and programmes have been produced on topics related to project activities, success stories of people heating their houses with biomass energy, success stories of schools and kindergartens that moved from gas and coal-based heating to biomass-based heating, and businesses launched in biofuel production, etc.

Printed communication



Printed communication: brochures, booklets, and posters about bioenergy benefits with a total circulation number of **over 50,000 copies were distributed throughout the country.** The messages and content of printed material were developed depending on the needs of each separate target group. Printed materials were distributed during activities organized by the project, as well as during other public events with project participation, constituting a support tool in the communication actions carried out, rather than a unitary communication product.

Web communication

The transparency of project activities and the visibility of its results are ensured by the dedicated web page www.biomasa.md, developed within the web page of the Agency for Energy Efficiency, and conceived as a unique web communication platform dedicated to biomass energy in the Republic of Moldova. All information available on the website is accessible in the Romanian and English languages, while the electronic newsletters posted therein are also available in the Russian language.

The project electronic newsletters, issued every two months, also represent an information platform for beneficiaries, partners, and institutions active in the sector about the project activities and results. During the project activity, there were developed **18 issues of the electronic newsletter in Romanian, Russian, and English.**

Public events

Public events, with small exceptions, were organized in the field or in demo locations for biomass energy based technologies. In those four years of activity, the project organized and participated in 70 public events carried out in all the regions of the country, covering all the project beneficiary segments.

The project carried out innovative communication initiatives that proved to be very successful. Among these are:

- The caravan of biomass boilers:
- SMS campaign
- SUN DA-I Fest

The promotion of the subsidy programme is one of the complex communication examples applied by the Energy and Biomass Project. In addition to the programme launching event and periodic press releases about programme news, the project targeted direct beneficiaries by sending them SMSs about programme

conditions, and went to their communities to show in practice how the biomass-based technologies operate. Thus, in less than two months, over 600 families filed requests for installing biomass-fired boilers in their own houses, covering the budget ceiling designed for this programme.

"Starting in October 2013, we heat our house with biomass energy. We bought the boiler in the same month, as a response to the offer of the Energy and Biomass Project that we found out about in mass media. The first heating season showed encouraging figures, recording about 40% in savings compared to the gas price we used to pay previously. In addition to obvious savings in money terms, the biomass-based heating makes us feel secure, as the pellets and briquettes we use are produced in the Republic of Moldova", Larisa Seu, one of the programme beneficiaries, stated.



▲ Caravan of the biomass boilers
Balti town, 2014



▲ SUN DA-I Fest 2014

SUN DA-I Fest:

the first concert supplied with solar energy, which has been organized for two years already. This was an initiative of the Moldova Energy and Biomass Project, jointly with the FurioSnails band and the EEA. In addition to the live concert with instruments supplied with solar energy, the promoters of renewable energy exhibited in the open air wind turbines, solar collectors, PV panels, geothermal pumps, and biomass-fired boilers. Young people presented innovations that help us produce green energy and reduce the energy consumption.

The visitors could participate in a master class entitled "Giving a second life to waste", while children painted a block of houses built from recycled cardboard. People fond of engines had the possibility to make a tour through the central part by driving one of the four motorcycles operating on solar energy. Office supplies produced from eco-materials, biodegradable or recycled materials, as well as handmade products produced from natural materials, were exhibited for sale.

The caravan of biomass boilers:

covered several districts from the north, south, and centre of the Republic of Moldova. During mobile exhibitions, people could see on their own how the biomass-fired boilers operate and the types of biofuel produced in the Republic of Moldova. They also received complete information about the subsidy programme, boiler market offer, the potential of biomass energy, and activities of the Energy and Biomass Project.

SMS campaign:

for the promotion of the subsidy programme for purchasing household biomass-fired boilers. The project launched an SMS information campaign in partnership with mobile telephony operator Moldcell, by which thousands of subscribers from the regions of the country were informed about the opportunity to receive a subsidy in the amount of 1,300 EUR for purchasing and installing a biomass-fired boiler.

The visibility of the Energy and Biomass Project outside the country:

The project's intensive communication and promotion activities make the project visible outside the borders of the Republic of Moldova.

- **Success story of the project in the UNDP regional publication "Empowering Lives. Building Resilience":**

for two consecutive years, the Energy and Biomass Project accomplishments have been reflected in the publication "Empowering Lives. Building Resilience", developed by the UNDP Regional Office for Europe and Commonwealth of Independent States countries, which embeds the success stories of UNDP projects implemented in Eastern Europe and Central Asia. Publicly launched within the festive events organized at the United Nations Headquarters in New York, the publication includes success stories of the Energy and Biomass Project in the Republic of Moldova, highlighting the successful partnership between the Moldovan Government, UNDP, and the EU in

making sustainable energy accessible for all. The publication is available at: http://www.undp.org/content/dam/undp/library/Cross-Practice%20generic%20theme/UNDP_RBEC_SuccessStories_v3.PDF

- **The story of the first woman managing a briquetting business in the Republic of Moldova promoted in New York:**

Ludmila Abramciuc, Manager of the briquetting line Ecobricheta, a beneficiary of the leasing programme, was part of the global gender equality promotion campaign launched on 8 March at UNDP headquarters in New York with the message "Equality for Women Means Progress for All"

- **SUN Da-I Fest at United Nations Radio in New York**

- **Energy and Biomass Project Promoted on Bloomberg (leading global web portal on energy-related subjects)**



▲ Magazine "Empowering Lives. Building Resilience", elaborated by the Regional UNDP Bureau in Europe and CIS



MOLDOVA ECO-ENERGETICA, MEETING PLACE OF ENERGY SECTOR CHAMPIONS

3

editions of the Moldova Eco-Energetica Competition organized

180

projects enlisted for the competition

48

successful projects on using and promoting RES and energy efficiency have been awarded at the Gala of Awards Moldova Eco-Energetica, editions of 2012, 2013, and 2014

2

new components launched in 2014: Eco-Responsible Technologies and Eco-Responsible Ideas

Institutions, private or public companies, individuals and enthusiasts of energy efficiency and RES must know each other and share their experience, demonstrate the results achieved, becoming thus an example to follow for those who want to join the eco-promoters group. The national competition Moldova Eco-Energetica, which ends with a Gala of Awards Moldova Eco-Energetica, undertook to become an event gathering the champions in the eco-energy sector and promoting them before the entire society.

The competition Moldova Eco-Energetica was launched in 2012, at the initiative of the Energy and Biomass Project. It was organized jointly

with the Ministry of Economy and the EEA, which, starting in 2015, are taking over the organization of the entire event.

The competition is open to all public institutions, public sector representatives, NGOs, foundations, initiative groups, mass media, the academic sector and individuals that have successfully implemented notable innovative and ambitious initiatives in the renewable energy and energy efficiency sector. The participants compete in nine categories, including 12 sub-categories, representing all forms of using renewable energy and energy efficiency, as well as categories for their promotion.

The participants to the contest are competing for 9 categories, including 12 sub-categories, that represent all the used renewable energy forms, as well as categories of their promotion.

- **The Best Project on Solar Energy:**
 - Photovoltaic
 - Heat
- **The Best Project on Wind Energy**
- **The Best Project on Bioenergy:**
 - Production of solid biofuels
 - Production of liquid biofuels
 - Assembling and/or installation of equipment associated with bioenergy production
 - Production of heat power
 - Production of energy by cogeneration
- **The Best Project on Hydraulic Energy**
- **The Best Project on Geothermal Energy**
- **The Best Project on Energy Efficiency:**
 - Energy Sector
 - Industrial Sector
 - Constructions Sector
 - Transport Sector
 - Public Sector
- **The Best Communication Initiative**
- **The Best Educational Initiative**
- **The Best Youth Initiative**
- **Special Prize**

In the first three editions, the competition Moldova Eco-Energetica gathered over 200 successful projects on renewable energy and energy efficiency, 52 of which were designated winners. The winners were selected as a result of a complex evaluation process carried out by independent experts from the sector, grouped in four thematic evaluation panels. Each panel included persons representing government institutions related to the renewable energy and energy efficiency area, renowned specialists from the energy sector, representatives of the academic sector and civil society, journalists, mass media and communication experts. The applications enlisted in the competition were examined in three stages, based on the Regulation for Competition Organization: (1) evaluation by the evaluation panel of applications filed, (2) verification visit in the field for the first three applications selected in each category, and (3) decision of the Coordination Council.

In 2014, the competition Moldova Eco-Energetica was extended by two new components: the Competition of Eco-Responsible Technologies and the Fair for Financing Eco-Responsible Project Ideas. The initiative belongs to the Ministry of Economy and the EEA, and comes as a logical addition to the competition that, starting in 2014, has granted awards for Eco-Responsible Stories, Technologies, and Ideas. In 2014, in addition to those 14 successful projects in using and promoting eco-energy and energy efficiency, five companies developing the Moldovan market of eco-responsible technologies received trophies of merit, while an eco-responsible project idea benefited from crediting guarantee by a commercial bank, the state playing the role of transaction guarantor.



▲ Moldova Eco-Energetica 2013

◀ The trophy of the Molodva Eco-Energetica contest

"The magnitude of the Moldova Eco-Energetica competition demonstrates that the energy efficiency and RES sector is developing very fast, and this fact helps us increase the competitiveness of the national economy and makes us more independent in energy", Mihail Stratan, the Director of the EEA, stated.

The winners of the competition Moldova Eco-Energetica were made known and awarded trophies and valuable prizes at the Gala of Awards Moldova Eco-Energetica, which is traditionally organized on the first Friday of December, in Chisinau.

Pirkka Tapiola, Head of the European Union delegation to the Republic of Moldova, stated that Moldova Eco-Energetica became a nice tradition for the Republic of Moldova, contributing to energy sector modernization. ***"I want to extend congratulations to all participants of the competition. It is a message of gratitude for your innovative projects that help transform the energy sector together with the view to ensure cheaper, safer, and cleaner energy for all the citizens of the Republic of Moldova".***

Due to the partnership and teamwork from the first edition, starting in 2015, the competition and gala of awards will be fully taken over by the Ministry of Economy and the EEA.



▲ Moldova Eco-Energetica 2012



▲ Moldova Eco-Energetica 2011



The Sun Performed a Concert in the Republic of Moldova

SUN DA-I Fest Declared the Best Communication Initiative at the Gala of Awards Moldova Eco-Energetica 2013



SUN DA-I Fest, what a wonderful idea!

An idea by which the FurioSnails rock band made itself remarked and awarded a prize at Moldova Eco-Energetica Award Ceremony. How can this be possible, and what is the connection between a music band and this sector? The answer is simple. During the concert of 28 April the boys connected their sound equipment "directly to the sun", using about 50% of the energy needed from PV elements.

One may say they performed upon the order of a heavenly star. The first concert performed in the Republic of Moldova powered by solar energy was an urban event for promoting alternative energy sources, later on announced as the Best Youth Communication Initiative within the Moldova Eco-Energetica 2013 Competition. Besides the main objective of the action initiated by FurioSnails band, the

Energy and Biomass Project, and the EEA, which illustrated how solar energy can be used in the most unexpected circumstances and activities, it should be noted that the project was a complex one and had several effects. The first one was the promotion of energy efficiency in society, especially among young people. This project started with a promotional campaign supported by its mass media partners. Video spots with involved musicians, billboards in several sites of the city, participation in TV programmes, and post-event articles – all these generated a broad outreach effort that lasted for several weeks before and after the concert.

There can be no doubt the message conveyed convinced those who accepted the invitation and were present on that April day on the terrace near the ARTICO Centre for Children and Youth. They saw with their own eyes

▲ SUN DA-I Fest 2013



▲ SUN DA-I Fest 2014

the decorations of PV panels on whose background the musicians performed, as well as heard with their own ears the message coming from the main partners who supported the SUN DA-I Fest: the EU delegation to the Republic of Moldova, UNDP, the EEA, Moldcell Company, Solartech Energy, etc.

"The edition of this year is a start. In 2014, we undertake to organize a concert supplied to a larger extent by renewable energy. We want to promote alternative energy resources. We want the Republic of Moldova to reduce its dependency on foreign energy resources suppliers, by producing our own energy from the sun, wind, water, and biomass", Lilian Severin, the vocalist of FurioSnails, stated.

So said, and so done. The second edition of SUN DA-I Fest gained momentum, turning into a festival of eco-technologies and products that gathered thousands of renewable energy supporters. The festival participants saw live how renewable energy technologies (wind turbines, solar collectors, PV panels, geothermal pumps, and biomass boilers) look and operate, and learned the stories of people heating their houses with geothermal and biomass energy, using solar and wind energy to light their houses, and having hot water

due to solar energy. The young enthusiasts also presented their innovations, which help us produce clean energy and reduce energy consumption and bills.

The festival also hosted a fair of artisans fond of authentic items, who exhibited for sale decorative objects, jewellery, and paintings created with natural materials. Eco-lovers could buy notebooks, pens made of recycled cardboard, table clocks supplied by solar energy and hydropower, and solar chargers for mobile phones. The visitors participated in master classes for waste recycling, sewed bags out of publicity banners, and painted an urban building block built out of recycled cardboard. Rally fans took a tour around Stefan cel Mare Public Garden, driving four motorcycles that consumed solar energy instead of gasoline or diesel oil. All these obviously took place against the background of the live concert performed by the bands Concordia, Univox, Laura Bodorin, Winona Ryderz, FurioSnails, and Toulouse Lautrec (Romania), whose musical instruments were supplied with solar energy.

The PV panels were provided for free by the French Company Solar-Tech, specialized in the installation of PV panels in the Republic of Moldova.

ANNEXES

- Heating systems installed in rural public institutions within Energy and Biomass Project in Moldova, other European funds
- The list of the companies that have purchased leased equipment for the production of briquettes and pellets from EU-UNDP "Energy and Biomass" Project funds
- List of Companies that have purchased leased baling equipment and trailers for biomass transportation from the EU-UNDP „Energy and Biomass" Project funds
- The list of he registered companies to assemble biomass boilers within the Subsidy Program for the households

Heating systems installed in rural public institutions within Energy and Biomass Project in Moldova, other European funds

Nr	Village	Public institution	Heated area (m ²)	Boiler plant capacity (kW)	Type of boiler	Boiler's efficiency %	Country of origine	Type of biomass fuel	Capital Investments		Project's beneficiaries		
									MEBP Project's support: USD	Community contribution: MDL	direct	incl. children indirect	
1 District STEFAN VODA – approved on 25.08.2011													
1	Ermoclia	kindergarten	1300	150	RAU-2-181	84	Moldova	straw bales	93 687	426 015	203	170	255
2	Palanca	school	3440	300	RAU-2-330	84	Moldova	straw bales	120 041	172 842	220	181	272
3	Crocmaş	kindergarten	1900	190	RAU-2-250	84	Moldova	straw bales	99 340	184 745	175	140	210
4	Purcari (Viisoara)	gymnasium	2050	250	RAU-2-250	84	Moldova	straw bales	99 120	206 193	104	81	122
5	Rascaeti	kindergarten	1140	140	2 x HO-90	84	Moldova	straw bales	80 946	182 741	89	70	105
6	Talmază	gymnasium	2890	300	RAU-331	82	Ukraine	straw bales	110 200	231 593	703	606	907
		kindergarten	1231	150	RAU-151	82	Ukraine	straw bales	87 250				
7	Copceac	school	3180	340	Rau-331	82	Ukraine	straw bales	110 350	314 476	472	403	605
8	Popeasca	school	2850	300	RAU-331	82	Ukraine	straw bales	110 350	301 512	538	425	725
		kindergarten	1510	150	RAU-151	82	Ukraine	straw bales	87 150				
9	Olanesti	school	4640	400	RAU-2-451	84	Moldova	straw bales	115 637	178 264	598	530	795
TOTAL: 11 public institutions									1 114 071	2 198 381	3 102	2 606	3 996
2 District LEOVA – approved on 25.08.2011													
10	Cazangic	kindergarten	2100	190	ACU-190	84	Moldova	straw bales	88 790	183 631	71	60	90
11	Seliste	kindergarten	230	25	ThermostalMCL	87	Greece	briquettes/pelletes	19 300	119 950	26	20	30
12	Sarata Noua	school	3320	340	ACU-340	84	Moldova	straw bales	119 600	461 096	273	225	337
		kindergarten	1150	150	ACU-130	84	Moldova	straw bales	89 790				
TOTAL: 4 public institutions									317 480	764 677	370	305	457
3 District CANTEMIR – approved on 25.08.11													
13	Antonesti	school	3000	250	ACU-250	84	Moldova	straw bales	103 890	463 622	163	128	192
14	Tiganca	school	2120	340	RAU-331	82	Ukraine	straw bales	148 350	274 625	391	334	501
		kindergarten	690										

15	Larguta	kindergarten	1380	150	RAU-151	82	Ukraine	straw bales	88 000	352 199	180	151	227
TOTAL: public institutions			7190	740					340 240	1 090 446	734	613	920
4 UTA GAGAUZ YERI – approved on 25.08.11													
16	Copceac	school	4700	600	RAU-600	82	Ukraine	straw bales	126 450	447 320	1208	997	1796
17	Carbalia	community center	310	80	2 x 40, Weisman Vitilig-200	92	Germany	briquettes	58 050	59 620	555	110	0
TOTAL: 3 public institutions			6610	830					291 650	506 940	1763	1107	1495
5 District HINCESTI – approved on 04.11.2011													
18	Carpineni	gymnasium-kindergarten	1950	160	2x80 Thermostal MCL	87	Greece	briquettes/pelletes	66 270	604 338	207	183	275
19	Crasnoarmeisoe	kindergarten	1800	256	ThermostalMCL	87	Greece	briquettes/pelletes	73 270	696 515	95	70	105
20	Dancu	kindergarten	200	25	ThermostalMCL	87	Greece	briquettes/pelletes	24 610	74 137	58	50	75
21	Draguseni Noi	gymnasium	2050	200	2x100 ThermostalMCL	87	Greece	briquettes/pelletes	63 850	377 762	231	205	308
22	Loganesti	lyceum	3100	300	ACU-340	84	Moldova	straw bales	116 610	371 255	476	420	630
23	Boghiceni	gymnasium	2100	200	2x100 ThermostalMCL	87	Greece	briquettes/pelletes	72 110	274 046	325	275	413
TOTAL: 6 public institutions			11200	1141					416 700	2 398 053	1392	1203	1806
6 District TELENESI – approved on 04.11.2011													
24	Chistelnita	lyceum	3400	300	RAU-331	82	Ukraine	straw bales	114 250	251 443	488	420	630
25	Saratenii Vechi	lyceum	5400	600	RAU-600	82	Ukraine	straw bales	120 350	330 180	439	370	555
26	Verejeni	kindergarten	1240	120	2x60 Thermostal MCL	87	Greece	briquettes	48 301	151 298	121	100	150
TOTAL: 3 public institutions			10040	1020					282 901	732 921	1048	890	1335
7 District SANGEREI – approved on 04.11.2011													
27	Alexandreni	gymnasium	3200	340	ACU-340	84	Moldova	straw bales	119 100	278 507	197	161	242
28	Biliceni Noi	gymnasium	900	110	1x75; 1x35 ThermostalMCL	87	Greece	briquettes	75 200	192 781	88	65	98

Nr	Village	Public institution	Heated area (m ²)	Boiler plant capacity (kW)	Type of boiler	Boiler's efficiency %	Country of origine	Type of biomass fuel	Capital investments		Project's beneficiaries		
									MEBP Pro-ject's support: USD	Community contribution: MDL	direct	incl. children indirect	
29	Bursuceni	gymnasium kindergarten	640 350	138	MCL-BIO 80 MCL-BIO 40	87	Greece Greece	briquettes/pelletes	90 590	166 376	190	152 390	
30	Dumbravita	gymnasium kindergarten	2700 870	340	1x160; 1x180 Thermostat MCL	87	Greece Greece	briquettes/pelletes	147140	233 368	371	335 502	
31	Pepeni	kindergarten	360	70	2x35 Thermostat MCL BIO	87	Greece	briquettes/pelletes	58 300	490 784	64	56 84	
TOTAL: 7 public institutions									490 330	1 361 816	910	769	1 154
8 District FALESTI – approved on 04.11.2011													
32	Bocani	gymnasium	3380	300	RAU-331	82	Ukraine	straw bales	117 100	250 479	194	154 231	
33	Marandeni	lyceum	3150	300		82	Ukraine	straw bales	116 800	293 256	372	320 480	
34	Navirnet	lyceum	3150	300	3x100 Thermostat MCL	87	Greece	briquettes	68 450	182 183	437	385 578	
35	Pruteni	gymnasium	3700	340	RAU-331	82	Ukraine	straw bales	120 300	223 149	272	240 360	
TOTAL: 4 public institutions									422 650	949 067	1 275	1 099	1 649
9 District GLODENI – approved on 23.03.2012													
36	Camenca	primaria	285	40	1xMCL-B-40	85	Greece	briquettes	38 160	148 446	10	168 1143	
37	Cuhnesti	lyceum	6250	2x232=464	2xMCL-B-200	85	Greece	briquettes	144 680	469 226	508	450 675	
38	Fundurii Vechi	lyceum kindergarten	3875 196	232+69=301	MCL-B-200 MCL-B-60	85	Greece	briquettes	96 651	403 074	502	435 652	
39	Petrunea	lyceum	2780	2x139=278	2xMCL-B-120	85	Greece	briquettes	88 110	348 632	351	307 460	
40	Ustia	gymnasium	3221	2x174=348	2xMCL-B-150	85	Greece	briquettes	93 175	261 701	247	212 318	
TOTAL: 6 public institutions									473 620	1 631 079	1 618	1 572	3 238
10 District DONDUSENI – approved on 23.03.2012													

41	Baraboi	lyceum	3742	174	139	MCL-B-150 MCL-B-120	85	Greece	briquettes	125 703			
		lyceum	677	70		MCL-B-70	85	Greece	briquettes	29 113	335 835	631	560 3310
		community center	1700	116		MCL-B-100	85	Greece	briquettes	46 586			
42	Corbu	gymnasium	1156	116		MCL-B-100	85	Greece	briquettes	64 080	207 085	129	98 147
43	Criscauti	gymnasium	1419	190		RAU-2-181/M	80	Moldova	straw bales	106 672	290 308	133	106 159
44	Sudarca	kindergarten	585	58		MCL-B-50	85	Greece	briquettes	51 054	206 943	295	246 369
45	Taul	dormitory #1	4954	450		RAU-2-451/M	80	Moldova	straw bales	151 425	280 196	465	394 697
TOTAL: 6 public institutions			14233	1313						574 633	1 320 367	1653	1404 4682

11 District SOROCA – approved on 23.03.2012

46	Badiceni	primaria	240	46		MCLN-B-42	87	Greece	briquettes	43 400	11 096	212	202 2830
47	Iorjita	gymnasium	1672	2x115=230		2xMCLN-B 90	87	Greece	briquettes	85 679	227 953	145	110 165
		kindergarten	260	2x46=92		2xMCLN-B-42	87	Greece	briquettes	34 271			
48	Niorcani	school-kindergarten	300	46		MCLN-B-42	87	Greece	briquettes	65 800	53 235	73	65 95
49	Schineni	kindergarten	580	81		MCL-B-70	85	Greece	briquettes	50 850	245 420	59	45 67
50	Solcani	kindergarten	762	115		MCLN-B-90	87	Greece	briquettes	58 870	401 692	77	60 90
51	Visoca	lyceum	2600	208+116=324		MCLN-B 180 MCL-B 90	87	Greece	briquettes	186 040	379 179	366	320 2455
		community center	1600	2x81=162		MCL-B 70	85	Greece	briquettes				
TOTAL: 8 public institutions			8014	1096						524 910	1 318 575	932	802 5702

12 District RISCANI – approved on 23.03.2012

52	Alunis	gymnasium	2500	350		MCL-B-300	85	Greece	briquettes	91 431	193 201	324	260 390
		kindergarten	215				85	Greece	briquettes				
53	Boroseni Noi	gymnasium	1560	174		MCL-B-150	85	Greece	briquettes	72 816	158 585	179	152 228
54	Duruitoarea Noua	kindergarten	722	81		MCL-B-70	85	Greece	briquettes	54 703	143 353	67	54 100
55	Galaseni	gymnasium	1856	208		MCL-B-180	85	Greece	briquettes	70 052	354 303	186	145 217
		kindergarten	552	2x32=64		2xMCL-B-32	85	Greece	briquettes	20 566			

Nr	Village	Public institution	Heated area (m ²)	Boiler plant capacity (kW)	Type of boiler	Boiler's efficiency %	Country of origine	Type of biomass fuel	Capital investments		Project's beneficiaries		
									MEBP Project's support: USD	Community contribution: MDL	direct	incl. children indirect	
56	Mihaileni	lyceum kindergarten Nr. 1	2765 260	291 2x32=64	MCL-B-250 2xMCL-B-32	85 85	Greece Greece	briquettes briquettes	105 978 19 106	333 903	391	339 508	
57	Saptebani	gymnasium	2000	2x100=200	2xMCL-B-100	85	Greece	briquettes	68 523	248 515	146	116 174	
58	Stiubeieni	gymnasium	560	2x70=140	2xMCL-B-60	85	Greece	briquettes/pelletes	68 338	123 166	92	69 103	
TOTAL: 10 public institutions									571 513	1 555 026	1 385	1 135	1 720
13 District SOLDANESTI - approved on 29.06.2012													
59	Cusmirca	lyceum	1800	208	MCL-B-180	85	Greece	briquettes	87 987	143 354	329	287 430	
60	Parcani	kindergarten	460	58	MCL-B-50	85	Greece	briquettes	63 031	169 697	119	104 399	
61	Sestaci	gymnasium	704	139	MCL-B-120	85	Greece	briquettes	82 455	144 257	140	123 184	
62	Vadul Rascov	lyceum	2816	291	MCL-B-250	85	Greece	briquettes	100 904	185 636	197	160 240	
63	Climautii de Jos	gymnasium	762	93	MCL-B-80	85	Greece	briquettes	71 960	71 263	143	117 176	
TOTAL: 5 public institutions									406 337	714 207	928	791	1 429
14 District REZINA - approved on 29.06.2012													
64	Echimauti	lyceum	2500	291	MCL-B-250	85	Greece	briquettes	88 650	138 660	345	300 450	
65	Sircova	gymnasium- kindergarten	3459	372	2xMCL.B.170	85	Greece	pelletes	106 300	688 401	285	249 374	
66	Tareuca	gymnasium kindergarten	1145 780	174 104	MCL-B-150 MCLN-B-80	85 85	Greece Greece	pelletes pelletes	167 350	216 086	231	193 289	
67	Tahnauti	gymnasium	1169	174	MCL-B-150	85	Greece	pelletes	87 700	211 415	113	90 135	
TOTAL: 5 public institutions									450 000	1 254 562	974	832	1 248
15 District ORHEI - approved on 29.06.2012													
68	Biesti	kindergarten	894	116	MCLN-B90	85	Greece	briquettes	97 330	296 723	118	96 177	
69	Camencea	gymnasium	2427	291	MCL-B-250	85	Greece	briquettes	112 880	178 448	139	117 175	
70	Mitoc	gymnasium	2643	349	MCL-B-300	85	Greece	briquettes	106 110	147 421	214	186 279	

71	Morozeni	health center	972	93	MCL-B-80	85	Greece	briquettes	87 240	108 247	6 934	691	0
TOTAL: 4 public institutions			6 936	849					403 560	730 839	74 05	1090	631
16 District UNGHENI – approved on 29.06.2012													
72	Bumbata	gymnasium	2 730	293	MCL-B-250	85	Greece	briquettes	103 326	229 750	272	230	345
73	Busila	gymnasium	1 981	208	MCL-B-180	85	Greece	briquettes	89 503	127 949	310	275	412
74	Floritoala Veche	kindergarten	870	116	MCLN-B90	85	Greece	briquettes	65 543	173 730	94	80	120
75	Zagarancea	gymnasium	1 972	208	MCL-B-180	85	Greece	briquettes	77 925	111 603	182	150	225
76	Valea Mare	gymnasium	2 642	293	MCL-B-250	85	Greece	briquettes	92 668	142 502	230	200	300
77	Sculeni	lyceum	4 008	464	2xMCL-B-200	85	Greece	briquettes	123 705	235 082	667	587	880
TOTAL: 6 public institutions			14 203	1 582					552 670	1 020 616	17 55	15 22	22 82
17 District ANENII NOI – approved on 29.06.2012													
78	Calfa	kindergarten	800	81	MCL-B-70	85	Greece	briquettes/pelletes	63 722	88 165	72	55	83
79	Hirbovat	primary school	2 175	291	MCL-B-250	85	Greece	briquettes/pelletes	96 534	190 934	232	196	294
80	Varnita	lyceum	3 070	406	MCL-B-360	85	Greece	briquettes/pelletes	122 255	187 020	460	410	615
81	Zolotievca	gymnasium	1 035	139	MCL-B-120	85	Greece	briquettes	68 142	232 261	118	95	143
TOTAL: 4 public institutions			7 080	917					350 653	698 380	882	756	1 135
18 District CANTEMIR – Costangalia, District LEOVA – Tomaiul Nou – approved on 29.06.2012													
82	Costangalia	gymnasium	2 580	290	2xMCL-B-130	85	Greece	briquettes	94 839	142 727	130	102	223
83	Tomaiul Nou	school-kindergarten	600	81	MCL-B-70	85	Greece	briquettes	64 253	194 413	50	41	62
TOTAL: 2 public institutions			3 180	371					159 092	337 140	180	143	285
19 District HINCESTI – approved on 03.08.2012													
84	Cotul Morii	school-kindergarten	2 741	240	2xMCL-B120	85	Greece	briquettes	88 647	133 465	257	225	1 228
TOTAL: 1 public institution			2 741	240					88 647	133 465	257	225	1 228

Nr	Village	Public institution	Heated area (m ²)	Boiler plant capacity (kW)	Type of boiler	Boiler's efficiency %	Country of origine	Type of biomass fuel	Capital investments MEBP Pro-ject's support: USD	Community contribution: MDL	Project's beneficiaries direct incl. children indirect
20 District BASARABESCA - approved on 28.09.2012											
85	Iordanovca	gymnasium	1860	212	D'Alessandro Termomecanica, Tip CSL 80	85	Italy	briquettes	120 000	111 255	139 110 165
TOTAL: 1 public institution			1860	212					120 000	111 255	139 110 165
21 District CAHUL - approved on 28.09.2012											
86	Andrusul de Jos	kindergarten	1383	174	MCL -150	85	Greece	briquettes	79 050	115 413	149 120 180
87	Andrusul de Sus	kindergarten	1280	174	MCL -150	85	Greece	briquettes	81 050	244 444	128 105 158
88	Chircani	gymnasium	2230	232	MCL -200	85	Greece	briquettes	83 950	129 848	118 90 135
89	Cislita-Prut	kindergarten	390	58	MCL-B 50	85	Greece	briquettes	62 179	62 928	46 30 45
90	Doina	gymnasium	1563	174	MCL -150	85	Greece	briquettes	88 150	149 320	207 162 243
91	Giurgiulesti	lyceum	3247	406	MCL-B 350	85	Greece	briquettes	131 912	138 870	477 410 615
92	Vadul lui Isac	kindergarten	1512	174	MCL-B 150	85	Greece	briquettes	105 492	136 870	137 102 153
93	Valeni	gymnasium	3108	349	MCL-B 300	85	Greece	briquettes	120 012	133 326	403 340 510
TOTAL: 8 public institutions			14713	1741					751 795	1111 019	1665 1359 2039
22 District CIMISLIA - approved on 28.09.2012											
94	Costangalia	school-kindergarten	1501	174	MCL 150	85	Greece	briquettes	75 650	183 202	141 111 167
95	Javgur	school-kindergarten	3578	349	MCL-300	85	Greece	briquettes	91 750	173 590	272 229 344
96	Mihalovca	lyceum	4646	465	MCL-400	85	Greece	briquettes	88 100	286 807	500 438 657
97	Porumbrei	gymnasium	2169	208	MCL-180	85	Greece	briquettes	79 300	176 762	239 203 305
TOTAL: 4 public institutions			11894	1196					334 800	820 361	1152 981 1473
23 District FLORESTI - approved on 28.09.2012											
98	Gura Cainerului	school-kindergarten	2077	208	MCL-B180	85	Greece	briquettes/pelletes	109 226	115 701	271 230 345

99	Cuhurestii de Sus	kindergarten	817	104	MCL-B80	85	Greece	briquettes/pelletes	76 176	126 501	68	50	75
100	Izvoare	gymnasium	2000	232	MCL-B200	85	Greece	briquettes/pelletes	100 316	125 602	195	145	218
101	Prodanesti	gymnasium	2850	293	MCL-B250	85	Greece	briquettes/pelletes	101 218	147 080	292	253	380
102	Stefanesti	kindergarten	709	104	MCL-B80	85	Greece	briquettes/pelletes	76 603	126 761	93	75	113
		TOTAL: 5 public institutions	8453	941					463 539	641 645	919	753	1131
24 UTA GAGAUZ YERI – approved on 28.09.2012													
103	Gaidar	gymnasium kindergarten	3020 1112	522	MCL 450	85	Greece	briquettes	152 300	296 805	511	441	779
104	Tomai	kindergarten	790	94	D'Alessandro, Tip CSL 80, Termomecanica	85	Italy	briquettes	192 900	275 000	739	636	1354
		TOTAL: 4 public institutions	8252	965					345 200	571 805	1250	1077	2133
25 District CALARASI – approved on 15.04.2013													
105	Hirbovat	kindergarten	368	80	Galmet 2x40	87	Poland	briquettes/pelletes	71 908	100 900	29	20	30
106	Saseni	lyceum	3100	300	D'Alessandro, 2x150	87/95	Italy	briquettes/pelletes	110 408	194 032	386	321	782
		TOTAL: 2 public institutions	3468	380					182 316	294 932	415	341	812
26 District CAUSENI – approved on 15.04.2013													
107	Ciufiesti	gymnasium	1374	180	D'Alessandro, 1x100, 1x80	87/95	Italy	briquettes/pelletes	110 818	125 532	206	170	255
108	Cîrnatenii Noi	kindergarten	1170	120	Galmet 2x60	87	Poland	briquettes/pelletes	91 451	119 447	80	65	98
109	Tanatarii Noi	gymnasium	2257	240	D'Alessandro, 1x140, 1x100	87/95	Italy	briquettes/pelletes	134 474	314 846	176	150	225
		TOTAL: 3 public institutions	4801	540					336 742	559 825	462	385	578
27 District IALOVENI – approved on 15.04.2013													
110	Rusestii Vechi	primary school- kindergarten	112	30	Galmet 1x30	87	Poland	briquettes/pelletes	71 320	53 850	54	46	69
		TOTAL: 1 public institutions	112	30					71 320	53 850	54	46	69

Nr	Village	Public institution	Heated area (m ²)	Boiler plant capacity (kW)	Type of boiler	Boiler's efficiency %	Country of origine	Type of biomass fuel	Capital investments MEBP Pro-ject's support: USD	Community contribution: MDL	Project's beneficiaries direct incl. children indirect
28 District NISPORENI – approved on 15.04.2013											
111	Bratuleni	gymnasium	2900	300	D'Alessandro, 2x150	87/95	Italy	briquettes/pelletes	104 378	530 172	273 236 354
112	Soltanesti	gymnasium	2360	300	D'Alessandro, 2x150	87/95	Italy	briquettes/pelletes	104 378	177 706	194 161 242
TOTAL: 2 public institutions									208 756	707 878	467 397 596
29 District STRASENI – approved on 15.04.2013											
113	Micleuseni	lyceum	1774	230	D'Alessandro, 1x230	87/95	Italy	briquettes/pelletes	100 632	130 611	371 325 488
114	Vorniceni	kindergarten	1074	120	Galmet 2x60	87	Poland	briquettes/pelletes	104 847	153 062	171 140 210
TOTAL: 2 public institutions									205 479	283 673	542 465 698
30 District TARACLIA – approved on 15.04.2013											
115	Cairaclia	kindergarten	815	120	Galmet 2x60	87	Poland	briquettes/pelletes	102 900	174 655	104 83 125
116	Cealtic	kindergarten	425	40	Galmet 1x40	87	Poland	briquettes/pelletes	93 000	98 136	49 37 56
117	Ciumai	vocational school nr.13	1550	230	D'Alessandro, 2x115	87/95	Italy	briquettes/pelletes	111 600	177 903	158 120 180
118	Novoseolovca	kindergarten	805	120	Galmet 2x60	87	Poland	briquettes/pelletes	108 300	138 244	122 95 143
TOTAL: 4 public institutions									415 800	588 938	433 335 504
31 District BRICENI – approved on 26.07.2013											
119	Cotiujeni	kindergarten	1228	125	SAS ECO 1X125	85	Poland	briquettes/pelletes	58 966	86 538	142 120 180
120	Grimancauti	kindergarten	1720	180	SAS AGRO ECO 2X90	87	Poland	briquettes/pelletes	73 018	255 432	134 120 180
TOTAL: 2 public institutions									131 984	341 970	276 240 360

32 Raionul CRIULENI – approved on 26.07.2013

121	Baltata	gymnasium	2000	275	SAS ECO 1X 125, 1X150	85	Poland	briquettes/pelletes	87 522	513 317	254	220	330
TOTAL: 1 public institution										513 317	254	220	330

33 District DROCHIA – approved on 26.07.2013

122	Nicoreni	gymnasium	2211	250	SAS ECO 2X 125	85	Poland	briquettes/pelletes	74 109	112 797	322	289	434
TOTAL: 1 public institution										112 797	322	289	434

34 District DUBASARI – approved on 26.07.2013

123	Cocieri	kindergarten	3089	300	SAS AGRO ECO 3X100	85	Poland	briquettes/pelletes	101 284	218 846	198	150	225
124	Ustia	mayor office	273	42	SAS AGRO ECO 1X 42	85	Poland	briquettes/pelletes	46 108	78 940	3830	531	0
TOTAL: 2 public institutions										147 392	4028	681	225

35 District EDINET – approved on 26.07.2013

125	Parcova	gymnasium	1391	200	SAS AGRO ECO 2X100	87	Poland	briquettes/pelletes	84 039	316 853	236	210	315	
126	Ruseni	kindergarten	489	78	SAS AGRO ECO 1X 78	85	Poland	briquettes/pelletes	48 695	181 972	81	60	90	
TOTAL: 2 public institutions										132 734	498 825	317	270	405

36 District OCNITA – approved on 26.07.2013

127	Hadarauti	kindergarten	418	48	SAS AGRO ECO 1X 48	85	Poland	briquettes/pelletes	45 376	59 353	64	52	78	
TOTAL: 1 public institution										45 376	59 353	64	52	78

TOTAL:
144 public institutions
(127 community)

12 286 520

28 285 786

41 322

26 865

48 356

270 025

29 622

41 322

26 865

48 356

The list of the companies that have purchased the lease equipment for the production of briquettes and pellets from EU-UNDP "Energy and Biomass" project funds

(Equipment provided from the EU funds through the Energy Efficiency Agency)

Nr.	Name of the company	Producing address	The type of the fuel produced	Used raw material	Equipment origin
1	LLC Biovista	district Rezina, village Păpăuți	briquettes	straw	Ukraine
2	IE Teaca Igor	district Leova, village Tigheci	briquettes	straw / sawdust	Czech Republic
3	LLC Braga TV	district Ialoveni, village Horești	briquettes	straw / sawdust	Ukraine
4	LLC Ecobricheta	mun. Bălți, 8 Glinka str.	briquettes	straw / sawdust	Ukraine
5	LLC Agrobiobrichet	district Ștefan Vodă, village Feștețița	briquettes	straw	Ukraine
6	LLC Green Energo	district Ungheni, village Pîrlița	briquettes	straw	Ukraine
7	LLC Biox-Comert	mun. Chișinău, village Mileștii Mici	briquettes	sawdust	Germany
8	LLC Nordbric-Grup	mun. Chișinău, village Ghidighici	briquettes	sawdust	Germany
9	LLC Bioecotur	district Basarabeasca, village Abaclia	briquettes	straw	Ukraine
10	LLC Agrobiobrichet	district Ștefan Vodă, village Feștețița	briquettes	straw	Ukraine
11	LLC Iani-Elena	mun. Chișinău, village Ghidighici	briquettes	sawdust	Germany
12	IE Marin Tatiana	Hîncești town, 11A Cogîlnic str.	briquettes	sawdust	Ukraine
13	LLC Mile Com	mun. Chișinău, village Ghidighici	briquettes	straw / sawdust	Poland
14	LLC Valemat	district Anenii Noi, village Geamăna	briquettes	straw / sawdust	Holland
15	LLC SG Green Farm	Căușeni town, 121Tighinei str.	briquettes	straw	Poland
16	Energoconstructia SA	mun. Chișinău, 2/1Transnistria str.	pelletes	straw / sawdust	Ukraine

List of Companies that have purchased leased baling equipment and trailers for biomass transportation from the EU-UNDP „Energy and Biomass” Project funds

(Equipment provided from the European Funds through the Implementation Unit and Increasing Food Production Project Management 2KR)

Nr.	Name of the Company	Leased equipment	Quantity
1	AF "Girlea Andrei Pavel"	Bale and trailer	2
2	LLC "Carahasani Agro"	Bale	1
3	LLC "Magistrala Nistru"	Trailer	1
4	LLC "Fidel Agro"	Bale	1
5	AF "Rusu Mihail Ilie"	Trailer	1
6	AF "Rotari Piotr"	Bale	1
7	Bratuseni Zootechnical College	Bale	1
8	LLC "CAP Eliton Cim"	Bale	1
9	AF "Girlea Andrei Pavel"	Bale	1
10	LLC "Techagrosor"	Bale	1
11	LLC "Oclanda Agro"	Bale	1
12	LLC "Chetro-Agro"	Bale	1
13	LLC "Damiagro"	Bale	1
14	AF "Baciu Dumitru"	Bale	1
15	AF "Volcov Dumitru"	Bale	No.
16	AF "Popovici Gheorghe"	Bale	1
17	S.A. "Avicola"	Bale	1
18	LLC "Mivdav"	Bale	1
19	LLC "Magistrala Nistru"	Trailer	1

The list of the registered companies to assemble biomass boilers within the Subsidy Program for the households.

No	Name of the Company	Web Page	Email	Technology origin	Type of Boiler
1	LLC „Amber-Term“	www.amber.md	amber-term@mail.ru	Turkey, Italy	Briquettes, Pelletes, Combined;
2	LLC „Bemas Grup“		office@bemasgroup.com	Italy	Briquettes, Pelletes, Combined;
3	LLC "Bioterm-Stil"	www.bioterm.md	bioterm.md@mail.ru	Poland	Briquettes, Pelletes, Combined;
4	LLC "Chiose-Com"		termostarmd@gmail.com	Poland	Briquettes, Pelletes, Combined;
5	LLC "Climatec"		climatec@mail.ru	Poland	Briquettes, Pelletes, Combined;
6	LLC "Comter-moipmex"	www.teploimport.md	teploimport@starnet.md	Czech Republic	Briquettes, Pelletes, Combined;
7	LLC „Consistcom“		consistcom@mail.ru	Turkey, Italy	Briquettes, Pelletes, Combined;
8	LLC „Cvadro Therm“	www.cvadro.md	info@cvadro.md	Slovenia, Italy	Briquettes, Pelletes, Combined;
9	„DarnicGaz“ SA	www.darnicgaz.md	info@darnicgaz.md	Lithuania, Grecia	Briquettes, Pelletes, Combined;
10	LLC „Diolum“		diolum@mail.md, minstroj@yahoo.com	Czech Republic	Briquettes, Pelletes, Combined;
11	LLC „EcoPractic“	www.ecopractic.md	office@ecopractic.md	Poland	Briquettes, Pelletes, Combined;
12	LLC „Amber-Term“		ecotexprim@gmail.com	Czech Republic	Briquettes, Pelletes, Combined;
13	LLC "Gros & Co. International"	www.bioindustrie.md	cazanebiomasa@yahoo.com	Poland, Romania	Briquettes, Pelletes, Combined;
14	LLC "Instalco"		instalco@mail.ru	Czech Republic	Briquettes, Pelletes, Combined;
15	LLC „Laiola“	www.laiola.md	info@laiola.md; igor.cojoharenco@gmail.com; vrabie.oleg@laiola.md	Germania, Poland	Briquettes, Pelletes, Combined;

No	Name of the Company	Web Page	Email	Technology origin	Type of Boiler
16	LLC „Metal Supply Masters"		ecaterina.alexandru@gmail.com	Lituania	Briquettes, Pelletes, Combined;
17	LLC "Manobisan"	www.manopera.md	iurie.lopatenco@manopera.md	Italia	Briquettes, Pelletes, Combined;
18	„Moldagrotehnica" SA	www.moldagrotehnica.md	marketing@moldagrotehnica.md	Moldova	Briquettes, Pelletes, Combined;
19	LLC „Pantehno Nord"		vpanchuk@hotmail.com	Moldova	Briquettes, Pelletes, Combined;
20	LLC "Plastfer"		sergocncustom@mai.ru	Ungaria	Pelete
21	LLC „Polimer Gaz Constructii"		pgconstructii@mail.ru	Grecia	Briquettes, Pelletes, Combined;
22	LLC "Ricas&P"		termikamoldova@gmail.com	Italia	Briquettes, Pelletes, Combined;
23	LLC „Metal Supply Masters"		bio200955@mail.ru	Italia, Polonia, Cehia	Briquettes, Pelletes, Combined;
24	LLC "Sistem Invicta"		tihonsec@mail.ru	Polonia	Briquettes, Pelletes, Combined;
25	LLC "Smart Energy Solution"	www.bioflame.md	alexei_sergey@yahoo.md	Moldova	Briquettes, Pelletes, Combined;
26	LLC „Stafolet"		stafolet@mail.ru	Polonia	Brichete,Pelete, Combinat;
27	LLC "Termoplus Grup"		biuro@defro.md	Polonia	Briquettes, Pelletes, Combined;
28	LLC "Termostal Imex"	www.termostal.md	nicolai.latus@termostal.md	Lituania, Italia	Briquettes, Pelletes, Combined;
29	LLC "Vilocomstil"		vilocom@mail.ru	Cehia	Briquettes, Pelletes, Combined;
30	LLC "Tresmus Grup"	www.metroterm.md	tresmusgrup@gmail.com	Polonia	Briquettes, Pelletes, Combined;

