

ANNEX 2: ACTION FICHE REPUBLIC OF MOLDOVA

1. IDENTIFICATION

Title/Number	Energy and biomass project CRIS: ENPI/2010/21781		
Total cost	EUR 14 million		
Method of aid/ implementation	Project approach – joint management		
DAC-code	230 Energy Generation and Supply	Sector	23070 Biomass

2. RATIONALE

2.1. Sector context

The Republic of Moldova, statistically the poorest country in Europe, is highly dependent on energy imports. Whereas petrol and coal sources have been slightly diversified in recent years (Russia, Ukraine, central Asia), natural gas, the main source for heating, is almost 100% imported from Russia. According to the National Bureau of Statistics, in 2007 the country has imported 922.000t carbon equivalents of natural gas, as compared to 122,000t own sources of combustibles. Import prices are rising towards world levels, imposing a severe burden on the population and the economy.

The new Moldovan government that took office on 25.9.2009 has already announced its intention to diversify energy sources. The energy chapter of its government programme *European Integration: Liberty, Democracy, Prosperity 2009-2013* foresees i.a. support for the identification of alternative energy sources by promoting investments in renewable energy. It can partially build on the former government's Energy Strategy 2007-2020 which foresees gradual convergence with EU policies and rules, and the 2007 Law on Renewable Energy, which sets ambitious renewable targets of 6% of energy generation by 2010 and 20% by 2020. Implementation, however, has lagged behind.

There is consensus that wheat straw waste is the Republic of Moldova's renewable energy source with the biggest short- to medium-term potential. The country produces around 0.7 million tonnes of wheat grain per year, resulting in an equal amount of wheat straw. This mostly unused biomass represents an available, substantial and reliable source of renewable energy. Most of the population lives in rural areas where wood and coal are traditionally used for domestic heating. Natural gas is becoming prohibitively expensive. In the difficult winter conditions public buildings such as schools, kindergartens and community centres are usually maintained at uncomfortably low temperatures owing to energy inefficiency and a lack of funds available within local administration budgets for fossil fuels. This causes hardship and is cited as a reason for the drift of people, especially the young, into towns or migration

2.2. Lessons learnt

A recent project, completed under a USD 1 million grant from the Global Environment Facility (GEF), has resulted in the installation of 11 demonstration biomass fuelled heating systems

(2.7MW capacity), based upon licensed local manufacture of Danish design, supplying heat to public buildings in rural communities. Thus there is a good operational basis to show that this technology works and is well received in the rural communities.

Social and economic benefits were very favourable, with evident and considerable reductions in energy costs (up to 50% less as compared to coal and gas) and CO₂e emissions. Heat plants were run at normative levels (maintaining temperature for a full heating system) which led to an increase of comfort levels in schools and participating buildings. The average prime cost of heat for biomass was approximately EUR 5 per GJ (compared to EUR 8.5 per GJ for natural gas) for the generation of approximately 2000GJ per heating season per installation.

The GEF-pilot project pointed to the following key lessons: (i) Well structured contractual arrangements between the contracting parties, the local administration and a local biomass supplier, are critical to ensure a timely and predictable biomass based fuel supply; (ii) Process and technical specification require greater attention to ensure efficient and integrated operations. A detailed review of all the GEF funded demonstration sites carried out in October 2009 by the Framework-consultants who have helped in elaboration of this project has shown that all but one GEF-financed installation (related to the heat distribution network, not the heat plant) are functioning, albeit with various issues that need to be taken into consideration for refining the technical and operational specifications and conditions.

2.3. Complementary actions

The renewable energy from biomass development process in the Republic of Moldova commenced in 2002 with the study *Potential Use of Renewable Energy (Biomass)*. This was followed by interaction with the CEI Renewable Energy Working Group 2002-2005, from which the Moldovan renewable energy (biomass) specification was developed – thermal energy in public buildings. The specification took into account developments, especially in the Ukraine and Balkan countries. The GEF-funded demonstration project *Renewable Energy from Agricultural Wastes* 2005-2008, (REAW) established demonstration sites based upon the CEI system specification.

Relevant on-going actions include the EBRD *Sustainable Energy Financing Facility* that can provide funding for biomass projects of the private sector. The Japanese government has recently funded two biomass heating projects through its 2KR programme, and may be extending the programme (indicative budget USD 6 million). The World Bank Energy II-Project, co-financed by Sida, (USD 45 million) is primarily focused on electricity transmission and energy efficiency in buildings. USAID and the Greek government are also seeking to support the energy sector generally and biomass in particular. DfID/Sida are supporting the operations of the Regional Development Authority, which includes regional development strategies, a process linked to state budget provisions and investment portfolios funded through the regional development fund. All the donor organizations are very supportive of this proposed new EU-project and their good cooperation can be assumed as very likely.

The choice of a project approach results from a need to focus on a specific energy topic which is regarded by the majority of energy related agencies and donors as a topic of considerable long-term potential.

2.4. Donor coordination

The new Government has formed a unit under the State Chancellery which will be responsible for donor coordination. Sector working groups are to be formed at ministry level and chaired by the relevant minister. Energy will be under the Ministry of Economy, but the formal group has yet to be formed.

All donors, including the European Commission, UN, World Bank, Sida, DfiD and EBRD, meet at a monthly coordination meeting as there is a recognised need for a common approach from the donors as well as commitment and political will from the government. During the formulation stage, major donors and stakeholders have been interviewed and fully briefed on this project and there is general enthusiasm and a declared wish to be involved.

3. DESCRIPTION

3.1. Objectives

The overall objective is to contribute to a more secure, competitive and sustainable energy production in the Republic of Moldova through a targeted support to the most viable and readily available local source of renewable energy, namely biomass from agricultural wastes.

The project purpose is to significantly increase the use of renewable energy technology through fuel switching and energy efficiency. This will primarily focus on improving heating comfort levels in rural public sector buildings including schools and community centres by using readily available waste straw supplied from local agricultural enterprises.

3.2. Expected results and main activities

The strategy is to install a sufficient number of straw-fired heating systems so as to establish a market for the heating technology and for baled straw as a reliable and sustainable fuel. Therefore the economic activity in rural areas will be strengthened and local production of biomass stoves raised. Besides the main result of drastically up-scaling the use of low-tech biomass burners for the use of waste straw, innovative sub-projects for the development and demonstration of technology for higher efficiency domestic stoves and briquette production, and possibly the use of biomass for communal heating and co-generation will also be results of the project.

The foreseen project activities include:

- In an inception phase, setting of detailed management structures and signing of a FAFA-agreement with an international organization.
- Review of previous practice and development of selection criteria, application formats and templates for subcontracts. Establishment of M&E-structures.
- Providing a local team that will offer operational support to participating municipalities in running the systems.
- Conducting awareness campaigns to promote the use of biomass.
- Call for proposals targeted at rural villages and municipalities, through the IO.
- Selection of qualified projects
- Capacity building in the technical, managerial and financial capabilities within the companies servicing the system and within the local administrations.
- Energy scans, designing, installation, commissioning and training in the use of approximately 130 biomass heating systems.
- Direct support for the establishment of fuel supply chain
- Research design and installation of domestic multi-fuel heating systems; cogeneration unit and briquette production facility; in selected localities.
- Documentation, research and visibility activities in order to further develop renewable energy markets in the Republic of Moldova.

There is sufficient flexibility in the project funding to allow for the development of a private sector market for contractors wishing to act as fuel suppliers to the heating plants. Straw handling equipment such as balers, trailers and bale handling tractors could be provided under financial

models which have been already well developed by 2KR. This organisation also offers assessment, advice and review of requirements; equipment supply; training; insurance; maintenance and repair; of the fuel cycle inventory. The 2KR model including a revolving fund, provides contractors with access to structured financing for the agricultural sector. Financing is on the basis of hire purchase / lease financing over a 4-year period, with the first instalment up-front. A study of the fuel cycle mechanism would need to be carried out to determine the services arrangement, including financing. The UNDP would be responsible for defining and managing any financial involvement of a partner such as 2KR.

3.3. Risks and assumptions

Based on its government programme and the obvious economic and social advantages of the energetic use of waste wheat straw, we assume that the new administration will give more emphasis to the energy sector and to renewable energy sources in particular and that the local municipalities will show enthusiasm in adopting the new technology.

We further assume that the natural gas price does not fall to a level at which this form of biomass becomes uneconomic. The price differential is large at present so, as far as operating costs are concerned, wheat straw is likely to maintain its cost advantage. We also assume that the purchase and installation costs of the heating plants do not rise at substantially higher rates than typical competing plants such as for gas or coal. The existence of two Moldovan (Gros&Co in Chisinau, Moldagrotehnica in Balti) as well as several foreign producers in the region point to the likelihood of stable or even falling purchase prices. The risk of producer cartels is low in this rather low-tech market.

Fuel cycle risks include weather risks that affect the availability of straw but this should not be a crucial limitation as only around 4-6% (30.000t) of the normal national availability is needed to fuel the heating demand envisaged by the project. Non-mechanisation in the provider- and baler-market would lead to inefficiencies as compared to an ideal scenario of a strong private sector development of the 'filierie' (market for standardised bales of waste straw that could even have export potential), but straw handling and transport also function on a simple manual and tractor/lorry base. Field visits showed that here is no problem with straw provision in the eleven GEF-biomass plants.

3.4. Crosscutting Issues

By installing a new capacity of ca. 35 MW heat-generation based on carbon-neutral biomass, the project will have a substantially positive ecological effect by replacing fossil fuels. There is good international evidence that point-source emissions at the plants is minimal and that operational risks are equally low. There is, however, a need to examine combustion efficiency and gas and particulate matter emissions from the flues. The existing GEF installations can be used to examine and provide data on current operations. An agreed emission performance standard based on the EU standards could be established for the Republic of Moldova which would consider boiler efficiency, emissions and ash disposal.

There will be a significant impact on the well-being of the inhabitants in rural communities. Slightly positive impacts on gender equality, good governance and on human rights are expected.

3.5. Stakeholders

As well as the Ministries of Economy, Environment and Agriculture, several major donors are interested in the potential use of biomass for energy. There are also university departments,

research institutes and NGOs which are directly involved in research and implementation of biomass related projects. In all these organizations there is enthusiasm and experience associated with the possible uses of this wasted resource and there is a general willingness to cooperate with the project. A detailed stakeholder analysis has been carried out (see background materials).

The target beneficiaries will be the rural municipalities which manage the public buildings in the villages. Those heating projects already installed under the GEF-project have demonstrated that the technology is appropriate and works well. The improved comfort conditions, especially in the schools, have been very much appreciated in the villages and rural communities generally. The capacity of the local municipality representatives to organize the operation of the heating plants varies a good deal and there will be a need for capacity building and training for the project to be successful.

4. IMPLEMENTATION ISSUES

4.1. Method of implementation

Implementation shall be by Joint management with UNDP. This organization has been chosen as it has a broad range of experience in the implementation of community infrastructure development projects in rural areas in the Republic of Moldova. The former idea to cooperate with Sweden had to be given up, due to an unexpected withdrawal of Sida from its plans to become an EC-mandated body (not related to this project).

UNDP is party to the Financial and Administrative Framework Agreement between the European Community and the United Nations (FAFA). The Commission has ensured, on the basis of the prior audit conclusions as foreseen in article 53(d) of Council Regulation (EC, Euratom) No 1605/2002, that the management system set up by UNDP offers guarantees equivalent to internationally accepted standards in their accounting, audit, internal control and procurement procedures. Consequently, a joint management agreement with UNDP can be envisaged.

We recommend that there is cooperation with 2KR, the implementing body for long-standing Japanese funded initiatives and the EC Food Security Programme, including the supply and maintenance of agricultural equipment required for a straw-based biomass supply.

4.2. Procurement and grant award procedures

All contracts implementing the action must be awarded and implemented in accordance with the procedures and standard documents laid down and published by the International Organisation concerned.

4.3. Budget and calendar

The project time-frame would be for 48 months, commencing from the signature of the contribution agreement with UNDP.

ACTION FICHE BIOMASS FINANCIAL TABLE		
	Category	EUR
1	Installation of up to 130 biomass heating systems, up to 35MW installed capacity, for district heating in rural communities primarily supplying public buildings and residential apartment blocks if appropriate (incl. reserve)	9,580,000

2	Research, development and intervention: domestic heating sector, cogeneration and briquette manufacture	1,500,000
3	Capacity building at regional and local levels	300,000
4	Promotion campaign	200,000
5	Technical assistance	2,000,000
6	Management fee UNDP 3% (see below)	420,000
	TOTAL BUDGET	14,000,000

UNDP is well placed to implement this project given their array of expertise gained especially in its Integrated Local Development Programme. The organization seems to have effective results-based management and extensive experience with implementing local development, self-government and participatory projects. The UNDP Integrated Local Development Programme team includes experienced management and professional community mobilization experts and engineers with extensive knowledge, including biomass pilot projects in the Republic of Moldova. The UNDP country office, including its operations unit, is highly experienced with large scale procurement, recruitment and inter-relations at national and international level. To support implementation UNDP plans to contribute 4% of the total budget. (Bringing the standard management fee of 7% down to 3%).

4.4. Performance monitoring

The EU Delegation in Chisinau will monitor and supervise the project. The Delegation will monitor the implementation of the assistance on the basis of project visits, meetings with all stakeholders, and regular reports provided by the Contractor. The regional ROM-project with office in Kiev and a branch in Chisinau assists the EC in monitoring and assessing projects in terms of the quality of services provided, results delivered and the achievement of project activities. Applicable EC-standard indicators include: fuel switching (mainly coal and natural gas to biomass); annual emission reductions; heat generation; number of participating businesses; impact on local economy. Verification of specific project performance indicators will result from examining the records of municipalities and educational authorities.

In order to facilitate the management of the project and its monitoring and evaluation, the Contractor, in collaboration with the Commission services and the beneficiaries, will define a detailed set of indicators of achievement of the project activities during the inception phase. Specific performance measures should be chosen because they provide valid, useful, practical and comparable measures of progress towards achieving expected results. They can be quantitative (i.e. measures of quantity, including statistical statements) or qualitative (judgements and perception derived from subjective analysis).

4.5. Evaluation and audit

The project will be subject to annual review, which will assess compliance with conditions and make recommendations on the appropriate level of disbursements. Prior to the completion of the project, the EU Delegation will mandate consultants to carry out an independent final evaluation of the project. Independent reviews that will assess compliance with the conditions/indicators of the Financing Agreement.

4.6. Communication and visibility

The project will endeavour to further enhance the positive image of the EU in the context of its work in the Republic of Moldova. At appropriate milestones during the project duration and after appropriate events, press releases will be issued, in co-operation with the EU Delegation in Chisinau. The EC visibility guidelines will be applied.