



United Nations Development Programme

Country: Moldova

Project Document

Project Title	Moldova Energy and Biomass Project
UNDAF Outcome(s):	UNDAF Outcome 3: By 2011, vulnerable groups in poor rural and urban areas take advantage of sustainable socioeconomic development opportunities through adequate regional and local policies implemented by Local Public Authorities (LPAs) and partners.
Expected CP Outcome(s): <i>(Those linked to the project and extracted from the CP)</i>	3.2 New businesses and jobs are created in targeted poor rural and urban areas Output 1: Municipal biomass heating and fuel supply markets established (work package 1) Output 2: Foundations laid for establishment of efficient household heating, industrial cogeneration and biomass briquetting markets (work package 2) Output 3: Capacity built for growth of biomass markets at regional and local levels (work package 3) Output 4: The opportunities and benefits of biomass energy for Moldova are well known locally, and visibility of project results promoted (work package 4)
Expected Output(s): <i>(Those that will result from the project)</i>	
Implementing Partner:	Ministry of Economy
Responsible Parties:	UNDP

Brief Description

The Moldova Energy and Biomass Project, a 4 year 14.56 million EUR project aims to contribute to a more secure, competitive and sustainable energy production in the Republic of Moldova through targeted support to the most viable and readily available local source of renewable energy, namely biomass from agricultural wastes. It project consists of 4 interrelated outputs: 1: Municipal biomass heating and fuel supply markets established; 2: Foundations laid for establishment of efficient household heating, industrial cogeneration and biomass briquetting markets; 3: Capacity for local growth of biomass markets at regional and local levels is built; and 4: The opportunities and benefits of biomass energy for Moldova are well known locally, and visibility of project results promoted.

Programme Period:	2007 - 2012	Total resources required	€14.56 million
Key Result Area (Strategic Plan) and the environment for sustainable development: Strengthened capacity of local institutions to manage the environment and expand environment and energy services, especially to the poor	4.4 Managing energy	Total allocated resources:	_____
Atlas Award ID:	_____	• Regular	€ 560,000
Start date:	January 2011	• Other:	_____
End Date	December 2014	○ EC	€14 million
PAC Meeting Date	_____	○ Donor	_____
Management Arrangements	NEX	○ Donor	_____
		○ Government	_____
		Unfunded budget:	_____
		In-kind Contributions	_____

Agreed by Valeriu LAZAR, Deputy Prime Minister, Minister of Economy of RM

Agreed by Matilda DIMOVSKA, Deputy Resident Representative, UNDP

NARRATIVE SUMMARY OF OBJECTIVES AND OUTPUTS

The Moldova Energy and Biomass Project, a 4 year 14.56 million EUR project, funded by the European Commission and UNDP and implemented by UNDP aims to contribute to a more secure, competitive and sustainable energy production in the Republic of Moldova through targeted support to the most viable and readily available local source of renewable energy, namely biomass from agricultural wastes.

The project purpose is to increase the use of renewable energy technology significantly through fuel switching and energy efficiency.

The project primarily focuses 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. The project will also stimulate local markets for improved household heating, industrial cogeneration, and biomass-based briquetting, as well as raise local capacity in the biomass sector, and promote the benefits of biomass energy and the project.

The project consists of four inter-related outputs (work packages) as follows:

- **Output 1: Municipal biomass heating and fuel supply markets established (work package 1)** will aim to improve municipal heating of public buildings in rural areas and establish related fuel supply markets. Under this output 130 thermal heating systems primarily burning straw will be installed totalling about 35 MW_{th} (average installed capacity of approx. 300 kW_{th}) for the provision of heating for public buildings in rural communities in Moldova (indicative activity 1.1). Supporting this, market mechanisms will be used to support the involvement of local fuel suppliers to prepare, store and supply the fuel needed for the installed heating plants (activity 1.2). Very focused low-cost actions on policy, regulation, and contracting to support the market environment will make a third, minor output under output 1 (activity 1.3).
- **Output 2: Foundations laid for establishment of efficient household heating, industrial cogeneration and biomass briquetting markets (work package 2)** will focus on three emerging technology options for biomass energy in Moldova, which will be assessed, developed, and piloted. Activity 2.1 will focus on domestic heating in rural areas, addressing the need for improved efficiency of heating and possibly cooking. Activity 2.2 will support the deployment of industrial co-generation based on feedstocks from agri-industry, and activity 2.3 will pilot and demonstrate biomass briquetting.
- **Output 3: Capacity for growth of biomass markets at regional and local levels is built in Moldova (work package 3)** aims to ensure that the benefits of biomass energy demonstrated and deployed under outputs 1 and 2 are delivered in a lasting and long-term way and that local capacities for further replication is ensured. For each stakeholder type to be reached under output 3, the first step will be the development of training materials, to be placed in the public domain. These materials, to be updated and improved each year, will provide an accessible repository of key information, and will be used either in the training to be delivered under outputs 1 & 2 or in sub-activities under output 3. The stakeholders to be targeted include: municipal management including mayors, civil servants, and teachers; straw-fired boiler operators; fuel suppliers; and school children.
- **Output 4: The opportunities and benefits of biomass energy for Moldova are well known locally, and visibility of project results promoted (work package 4)** will facilitate widespread dissemination on the general and specific advantages and impacts of using biomass energy in Moldova. During the inception phase of the project, a communication and visibility plan will be elaborated and agreed between the EUD and UNDP in promotion of the visibility of project results and positive impacts of the partnership.

I. SITUATION ANALYSIS

The Republic of Moldova is highly dependent on energy imports. About 97% of Moldova's energy needs (fossil fuels and electricity) are imported, all from Russia and in addition there are large accumulated debts. 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 equivalent of natural gas, as compared to 122,000t of own sources fuels. Import prices are rising steadily, towards world levels, imposing a severe burden on the population and the economy. The energy sector is key to the Moldovan economy and thus is vital to the successful implementation of the national economy development programme.

The Energy Strategy of the Republic of Moldova deals with objectives, measures and activities oriented towards a more efficient, competitive and reliable national energy industry whilst ensuring the country's energy security, the upgrading of energy-related infrastructure, improved energy efficiency and use of renewable energy sources, and its integration into the European energy market. This strategy is part of the National Development Strategy for 2008-2011 and the Government Activity Program for 2009-2013 as well as the European Union - Republic of Moldova Neighbourhood Action Plan and is generally in line with the energy *EU acquis*. These are completed by the Economic Stabilization and Recovery Programme 2009-2011, adopted in November 2009, which provides for measures to attract more private investments to the energy sector. There is thus a detailed strategic framework in place which is aligned to the energy objectives of the European Union.

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 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. Energy efficiency is given appropriate priority, the Energy Efficiency Law and draft National Programme for Energy Efficiency 2010-2020, developed by the government in the first half of 2010, being in its final stage of approval in the Parliament.

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.

The detailed analysis of the availability and potential of alternative energy in Moldova began with a study financed under the Austrian Global Environment Consultant Trust Fund, which was completed in September 2002: Moldova – 'Renewable Energy (Biomass) Sector Study, Potential Use of Renewable Energy (Biomass) in Moldova'.

The conclusions of this study were taken up and developed through the Central European Initiative (CEI), Working Group on Renewable Energy, which provided for an exchange of experience with CEI countries. During the period 2002-2004 the Moldova Proposal was developed and presented during CEI Round Tables and Forums in Kiev, Skopje, Warsaw and Vienna.

The Biomass Centre in Kiev cooperated in developing the biomass proposal for Moldova, including hosting site visits in the Ukraine, development of technical documentation as well as carrying out energy audits in public buildings in Moldova. The final proposal was presented in Vienna in November 2004, 'Financing energy efficiency and fuel switching measures for buildings in rural areas'.

This process was further developed in the period 2004-2005, through the World Bank, resulting in a project proposal for the GEF, 'Renewable Energy from Agricultural Wastes', which was completed in February 2005. The proposal was accepted and a grant of \$972,920 (Grant No: TF 055292) was approved and implemented by the World Bank's implementation unit in Chisinau (CAPMU).

The Renewable Energy from Agricultural Wastes Project set out to pave the way for a broad implementation of biomass as an energy source in Moldova, with a special focus on straw, by removing barriers for the use of renewable energy from agricultural wastes in Moldova, and reduction of the high implementation costs of such energy technologies.

The GEF project established eleven demonstration pilot installations in eight locations with an installed capacity of 2.72MWth, using straw as an energy source. Ancillary activities also involved setting up a Carbon Finance Unit within the Ministry of Ecology and the conclusion of an Emission Reduction Purchase Agreement that included a bundle of 106 biomass installations for an intended roll-out after the GEF Project.

The GEF Project was based upon heat plants produced first in the Ukraine and then Moldova using proven Danish designs, supplying heat to public buildings in rural communities. The biomass fuel cycle was mainly supported by the provision of straw balers supplied through the 2KR, the agricultural mechanisation and farmer support programme established by the Government of Japan. The GEF project showed a good operational basis and demonstrated that the technology worked and was well received in the rural communities.

Beneficiaries for the GEF installations were selected on the basis of social, agricultural and environmental assessments. The general profile of a beneficiary was that the building(s) to be heated had already been thermally upgraded (usually as a result of an MSIF – Moldova Social Investment Fund project), that the Primaria had a good track record of community development and that there was a nearby agricultural enterprise that was both well managed, stable and with a well structured arable operation.

Social and economic benefits were very favourable, with evident and considerable reductions in energy costs (up to 50% less as compared to coal and 70% compared to natural gas) and GHG emissions. Heat plants were run at normative levels (maintaining temperature for a full heating season) which led to an increase of comfort levels in schools and participating buildings.

The GEF supported development pointed to two key lessons:

- Well structured 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;
- Process and technical specification require attention to ensure efficient and integrated operations.

The GEF project was finalised in 2008, followed by a further demonstration installation (300kWth), financed by JICA and implemented by the 2KR implementation unit in Moldova.

Thermal Energy from biomass (agricultural wastes)

The total population as of January 2008, was around 3.5 million, of which 2.1 million (59%) lived in rural areas. There are 1,680 rural settlements in Moldova (including Transnistria region and Gagauzia), administered through 658 local administrations. Planned reforms will result in the reduction of the number of public administrations (Primaria), with devolution of fiscal responsibility

to local level, with central responsibility for infrastructure and national services including health and education.

Rural settlements, villages and towns, are broadly similar in structure. Public buildings and apartment blocks (if any) are located in the town or village centre surrounded by private households. Each household usually has surrounding land / kitchen garden averaging in size around 0.21Ha. Most householders (85%) also have a land entitlement in the agricultural land surrounding a village (the former collective), on average 1.8Ha. Communal and reserve lands are held by the local authority as are public and non-privatised land, ponds and buildings.

Public buildings (kindergarten, school, town hall, health centre, library, house of culture) are mainly heated by coal or gas. Surrounding privately held houses mainly use biomass (wood as well as wastes such as maize husks accounting for up to 70% of fuel used) and coal for heating and calor gas for cooking. Households mainly use primitive and inefficient stoves.

Many villages in Moldova are connected to a natural gas main, where buildings in these areas can, at the owner's expense, be connected to a natural gas supply. Since the rapid increase in gas prices connections have slowed very significantly.

The forest and woodland coverage in Moldova is low, with less than 10% of total land area. The national arable sown area is approximately 1.5million hectares, accounting for 75% of land use. Agricultural lands surrounding villages average 1200Ha. Agricultural enterprises and individual families cultivate agricultural lands, for horticulture operations but predominantly for arable agriculture: cereals, grains and oilseeds are elements of annual arable rotations in every settlement, including winter wheat.

On average 200Ha of winter wheat per settlement is grown annually generating up to 450tons (nationally 700,000 tons) of a mainly unwanted wheat straw with an energy content of around 5,300GJ (nationally 8,200TJ, equating to about 8% of current national energy consumption). The unwanted straw is either chopped and incorporated during ploughing or, more frequently burnt in the field (contrary to regulation).

The availability of this straw biomass is the basis of the renewable energy source underlying the generation of thermal energy for public buildings. The average energy requirement for public buildings in rural villages is in the 150-500kWth range, requiring an average of 275tons of straw fuel, a quantity readily available from surrounding fields.

This is the main element of the roll-out of the Moldova energy and biomass project.

In addition there are important considerations regarding domestic and agri-industrial energy. Rural households use a considerable amount of firewood for heating. Households use wood and coal heating, mainly from radiant stoves that also provide for cooking, but do not provide hot water or central heating.

In overall terms wood use for domestic heating, nationally, is likely to be in the region of 2 million cubic metres per year (around 600,000 tonnes), a proportion of which may be illegally logged. Moldova's forest resources are limited and the problem of illegal logging is considered a priority of the forestry sector given negative environmental impacts of such logging. Efforts are currently underway to understand and address illegal logging in Moldova as part of the EC funded ENPI FLEG programme. The ENPI FLEG programme in Moldova is implemented by the World Bank and IUCN.

To address pressure on forests from the domestic use of heat, and the environmental impacts of coal use, two strategies may be followed: 1) improving the efficiency of household stoves that burn wood or coal, and 2) providing alternative fuels for household heating, such as briquettes made from straw.

While the residential sector comprises the majority of Moldovan energy demand (45% in 2005), industry makes up the second most important single sector (18%), as shown in Figure 1. Food processing is the largest domestic industry accounting for 39% of industrial output in 2008.

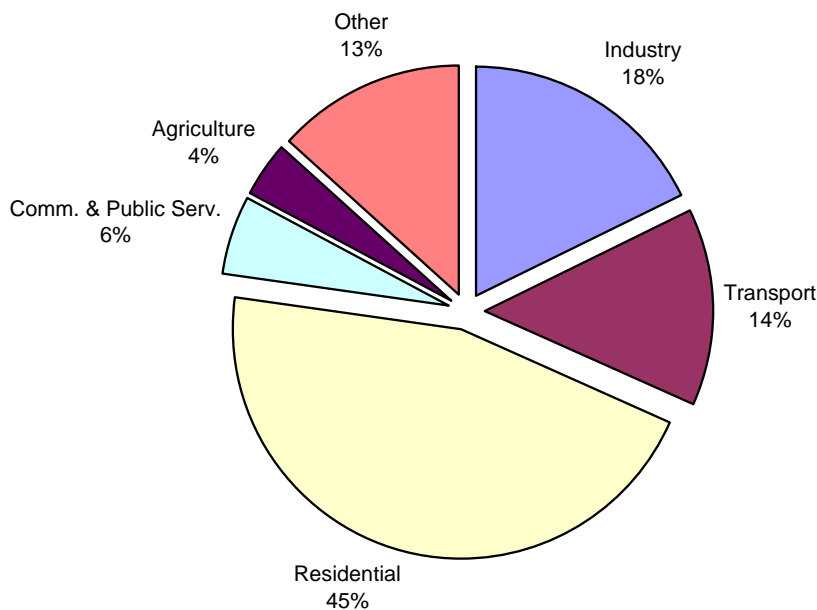


Figure 1: Breakdown of energy consumption per sector (Right Bank), 2005 (Source: Energy Strategy of the Republic of Moldova to the year 2020)

The agro-industrial sector is thus the core of the Moldovan economy and this industry holds significant potential for future added value and growth. The food industry of Moldova comprises about 280 enterprises providing employment for more than 26,000 people. Since there is a significant need for energy, and agri-processing is so important to the Moldovan economy, there should be significant potential for biomass based co-generation of heat and power based on solid fuel combustion or biogas using agri-processing wastes such as those from the wine industry, fruit processing, as well as husks, kernels, dust, shelling, bark and trimmings.

Other elements of the Moldova energy and biomass project reflect this pattern of energy use, focusing on the development and application of technologies to:

- Increase the energy efficiency of stoves in rural households, from a likely efficiency of 50% or less to 75% or more and to increase the functionality to provide for cooking, baking, hot water and central heating circuits, depending on cost and consumer preferences
- Develop briquette manufacture from biomass a substitute for wood and coal
- To develop biomass based CHP (co-generation) in agri-industrial applications using by-products of processing activities.

Rationale for UNDP involvement

UNDP is well placed to implement the Moldova energy and biomass project due to several factors that give assurance that the project will be successfully implemented: over the past years of work at local levels, UNDP has gained wide expertise, resources and knowledge related to the substantive and managerial aspects as well as regarding collaboration with Local Public Authorities:

- Since 1992, through numerous projects, UNDP Moldova has reached wide presence and has developed considerable knowledge on the situation and expertise in working at the local and regional level. Well-established partnerships are in place together with the capacity and mechanisms to efficiently deliver assistance at the local level.
- In the framework of its environment and energy programme, UNDP Moldova is supporting the country's transition to low carbon and climate resilient economies and ecosystems which involves the promotion of energy efficiency and renewable energy sources, both at the level of policies and the level of concrete interventions on the ground.

- From the project management perspective, UNDP Moldova has effective structures and procedures to ensure results-based management and delivery, including extensive experience with implementing local development, self-government and participatory projects.
- In terms of capacities, within UNDP and specifically within the Joint Integrated Local Development Programme (JILDP), the team includes well-experienced management and professional community mobilization experts and engineers. The team also brings along extensive knowledge and experience acquired through strong involvement in different stages of implementation of the first biomass pilot projects in Moldova.
- UNDP has very good working level relations with consultants and experts from throughout Moldova and experts within JILDP with experience in appraisal and implementation of biomass projects in Moldova. This also provides entry points for exchanges of experience, best practices and lessons learned from previous pilot projects.
- The UNDP country office, including its operations unit, is highly experienced with large scale procurement and recruitment at national and international level.
- Additionally, UNDP Moldova brings to this proposed project not only its own expertise and capacity, but also the expertise, knowledge and best practices from the region, made available through the Regional advisors and service centre and collaboration with other UNDP offices from Central and Eastern Europe and CIS countries.

II. STRATEGY

At a corporate level, UNDP's goal is to strengthen national capacities to manage the environment in a sustainable manner while ensuring adequate protection of the poor. Specific focus is given on building local capacity to better manage the environment and deliver services, especially water and energy. Over the past 15 years, UNDP assistance in environment and energy has evolved from supporting technology demonstration projects to promoting market development for environment-friendly technologies.

Expanding access to environmental and energy services for the poor is a key target, recognizing that those are essential for poverty reduction and economic growth. UNDP's activities include institutional capacity development to scale up energy service delivery to ensure nationwide coverage. This is especially important at the local level since service delivery is increasingly decentralized to local public authorities. UNDP assists local authorities in building the capacity of local agents including communities, non-governmental organizations, micro-, small and medium-sized enterprises, financial institutions and other private sector actors to manage and stimulate business and development benefits from environmental and energy service delivery.

The project is in line with UNDP Moldova country programme which sets "Regional and Local Development" and "Energy and Environment" as key areas of UNDP-Government cooperation. One of the three main Outcomes specified in the UN Development Assistance Framework for the Republic of Moldova (UNDAF) and the UNDP County Programme Action Plan (CPAP) states that by 2011 vulnerable groups in poor rural and urban areas take advantage of sustainable socio-economic development opportunities, including though better service provision and infrastructure development in urban and rural areas. The project is further fully in line with the Environment and Energy Programme's main objective of supporting Moldova's transition to low emission and climate resilient development.

In line with this, the ongoing UNDP Integrated Local Development Programme (ILDP, 2006-2011) promotes sustainable economic and environmental development and improved living conditions at the community level aiming at reduced income poverty by promoting income, employment creation and improving the local business environment and as well as at reduced negative ecological impact by promoting energy efficiency and improving environmental conditions.

Bioenergy requires special support mechanisms that go beyond those for other renewable energies because:

- While the combustion technology presents some challenges to market development, the creation of a sustainable biomass fuel supply infrastructure is highly complex and especially challenging
- Biomass fuel supply chains are essential to sustainable biomass energy use
- Fuel supply touches on multiple sectors – forestry, agriculture, industry, public sector/services (district heating), environment, and energy – and this adds to the complexity of arranging fuel supply
- There are competing uses for raw materials that are developing parallel to those of biomass fuels.
- Small fuel supply markets are highly volatile, and this increases initial risks for investors, until the markets have matured
- Market tools, such as places where one can find and compare offers from multiple suppliers, are lacking in biomass fuel supply
- Biomass heat is a significant opportunity, and can offer substantial benefits, but most renewable energy policies have focused exclusively on electricity (with heat as a by-product, occasionally).

II.1 Program 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. The project will also stimulate local markets for improved household heating, industrial cogeneration, and straw-based briquetting, as well as raise local capacity in the biomass sector, and promote the benefits of biomass energy and the project.

Program components: outputs and indicative activities

The Moldova Energy and Biomass Project consists of four inter-related outputs (work packages) as follows:

- Output 1: Municipal biomass heating and fuel supply markets established (work package 1)
- Output 2: Foundations laid for establishment of efficient household heating, industrial cogeneration and biomass briquetting markets (work package 2)
- Output 3: Capacity for local growth of biomass markets at regional and local levels is built (work package 3)
- Output 4: The opportunities and benefits of biomass energy for Moldova are well known locally, and visibility of project results promoted. (work package 4)

The outputs and indicative activities are described below.

Output 1: Municipal biomass heating and fuel supply markets established (work package 1)

Activities under output 1 aim to improve municipal heating of public buildings in rural areas and establish related fuel supply markets. Under this output 130 thermal heating systems primarily burning straw will be installed totalling about 35 MW_{th} (average installed capacity of approx. 300 kW_{th}) for the provision of heating for public buildings in rural communities in Moldova (indicative activity 1.1). Supporting this, market mechanisms will be used to support the involvement of local fuel suppliers to prepare, store and supply the fuel needed for the installed heating plants (activity 1.2). Very focused low-cost actions on policy, regulation, and contracting to support the market environment will make a third, minor output under output 1 (activity 1.3).

Indicative Activities

Activity 1.1: 130 heating systems in public buildings installed

The approach to procurement recommended for the installation of the 130 heating systems is Design-Build, rather than the Design-Bid-Build approach, under which the owner holds separate contracts with a designer and a construction contractor. While the public sector is most familiar with the use of Design-Bid-Build, the advantages of Design-Build for these small investments, in particular where the schedule is critical, costs are defined early, and there is a Single Point of Responsibility make the use of Design-Build compelling¹. Construction companies working in the heating sector in Moldova are experienced with the Design-Build approach. Given the unfamiliarity in Moldova in general with Design-Build procurement it is proposed that an experienced Design-Build Consultant, preferably with experience in the heating sector be hired to provide training,

¹ An alternative, interim approach that could potentially be used for the first few investments is that of Construction Management at Risk (CM@Risk), where the owner would maintain separate contracts with a design firm and a Construction Manager, could be considered. Otherwise the well established Design-Bid-Build approach will be adopted. A short summary of CM@Risk is given in Annex A.

review all documentation, and actively support the first tranche of projects and later on an advisory basis.

Detailed indicative sub-activities are given below outlining the participatory process and design-build work-flow. These sub-activities are illustrated as a PERT chart in Figure 2 on page 16 below.

- a. Design-Build procurement training and advisory: an experienced design-build consultant will be hired to give training to the UNDP PMT and CO in processes for Design-Build procurement, and to be on-call to advise on evaluation criteria, wording of RFPs etc., and support the first tranche of projects on an advisory basis.
- b. Determine the membership of the selection committees for various phases of implementation, and agree with the project board the draft evaluation and selection procedures for the pre-qualification request (PQR) and request for proposals (RFP).
- c. Request Letters of Interest (LOI): Publishing/issuing a global brief Request for LOI will facilitate the procurement process by:
 - Announcing and generating interest in a project among a wide spectrum of potential design-build team members;
 - Encouraging early formation of design-build teams; and
 - Initiating and providing for efficient future communication between the PMT and potential design-build team members.
 - The contents of the request for LOI will include a brief project description, statement of the goals and expectations of the project, name and address of the PMT contact, due date and other early schedule information, and an invitation to an informational meeting, at the PMT
- d. Prepare Pre-qualification Request (PQR), Issue PQR, Receive Statements of Qualifications (SOQ) and evaluation. Evaluation will include a number of pass/fail criteria (including provisions for a local service agent) and other quality factors. These factors should not need to be reevaluated later during the RFP. At least five design-build contractors should be short-listed following the evaluation and framework contracts (LTAs) signed.

Sub-activities a to d above would be carried out in parallel to community engagement and investment identification in sub-activity e to I below.

- e. Develop selection criteria for districts and communities and agree with Project Board.
- f. Choose initial districts based on selection criteria developed under (e). The assessment will be made by the PMT and agreed by the Project Board.
- g. First promotional meeting at district level: A general promotion meeting in each selected district will be necessary to ensure local buy-in. The District Chairman and Secretary of the District Council will be requested to arrange a district level meeting, with participants including:
 - Representatives of the District Council,
 - Representatives of district state departments (ecological, capital investment, sanitary, architect, financial, etc.)
 - Mayor and/or Secretary of Local Council from each village of the district,
 - Manager(s) of a public institution(s) (school, kindergarten, community center, etc.),
 - Agricultural entrepreneurs

- Representatives from local NGOs.

This half-day meeting will aim to promote the project and provide potential beneficiaries with information on objectives, procedures, funds, time frame and opportunities, and respond to questions. A call for expressions of interest from municipalities to implement community projects will be made during this meeting. A clear deadline for submission of EoI will be established.

- h. Expressions of interest received from communities will undergo preliminary appraisal based on criteria developed under (e) and be prioritized for awareness raising and capacity assessment (sub-activity (i)). At this stage the communities will be ranked; only communities which do not fulfill basic requirements (like availability of straw, existence of an eligible public building) will be rejected at this stage. Note that work will only start in districts or communities when resources are available, thus avoiding the case where a community successfully goes through all the evaluation stages only to be rejected because funds are no longer available.
- i. Awareness raising and capacity assessment will be carried out according to the prioritized list from h, above, during a ½ to 1 days field visit of project staff to the priority communities, and consist of i) an information and awareness campaign, and ii) evaluation of needs and capacity.
 - i) Information and awareness activities will consist of meetings with the local authority and other community members including representatives of the mayor's office, the local council, managers of community public institutions and social services, representatives of private sector, agricultural entrepreneurs, and other active community people. Community meeting will have to elect a Community Initiative Group / Project Committee which will consist of 5 -7 persons and a chairperson.
The Community Project Committee will be provided with an application form and will receive necessary technical assistance to formulate and fill in the application. An appropriate deadline for submission for applications will be established.
 - ii) A brief study of Community Needs and Capacities to implement a biomass project from an institutional, social, technical, ecological, economic, financial, legal, biomass fuel supply, and sustainability points of view. Particular attention will be given to existing local partnerships between the local authority and community stakeholders and the community's willingness and openness to collaborate with the project.
- j. Project applications from communities will be checked for compliance, clarifications requested, and then ranked for evaluation (per district).
- k. Each community project that passes the compliance check will pass through a single stage participatory appraisal procedure according to the order of the ranking and selection given under j above:
The appraisal of the project proposal will be carried out in a participatory manner, in close collaboration with the Mayor's Office and the community Project Committee. The appraisal will include assessments of:
 - o Community institutional capacity to mobilize local human and financial resources. Following established national practice, the communities will be required to contribute with 15% to the overall cost of the community project. The contribution can be in-kind and/or cash and will be assessed and agreed during the appraisal stage.²
 - o Technical feasibility of facilities proposed for switching to biomass heating

² This practice will be reviewed at least every 6 months and if deemed necessary, amendments to the approach will be suggested to the Project Board for consideration and approval.

- Energy audit of the buildings to be heated to identify demand and potential low cost energy efficiency investments that would be required before installation of a biomass heating system, and condition and suitability of heat distribution system (flushing and renewal of the heat distribution system would most effectively be included in the design-build RFP to ensure single point of responsibility for the entire heating cycle). Note that it is usually more cost effective, and certainly more environmentally and socially responsible to reduce energy demand first through low cost energy efficiency investments such as weatherization and insulation, and then to specify heating loads and boiler size. In addition there is absolutely no point in installing a new boiler system where the heat distribution system is not working – in essence the boiler system and distribution system are integral parts of an efficient heating system. The low cost energy efficiency investments ideally form part of the community cost-sharing, can however - given their cost effectiveness - be partially financed as part of the project grant (to be assessed on a case by case basis during the appraisal stage). Further, close collaboration with other national or donor funded building rehabilitation programmes will be sought to complement this project component with investments in the building infrastructure.
- Community's capacity to provide necessary biomass fuel (indicated by, for example, Expressions of Interest to a competitive tender for fuel supply covering at least the first heating season, etc.), provision for dry storage of fuel (one week reserve) in the area close to the project public facility including access for deliveries, and another (full season capacity) dry store facility near to the village, and mechanism for transferring fuel from store to boiler
- Environmental evaluation and fire security assessment by the relevant authorities;
- Project preliminary cost estimation and economical evaluation, including identification of costs of works that will be carried out by the community
- Community operational capacity and sustainability, and needs for training;

Any required community commitments to the project including agreement on necessary investments in weatherization of buildings, storage, foundations, permissions and certificates, etc., will need to be arranged by the community in the form of official documents, properly signed by appropriate authorities, before the project will enter the investment pipeline.

The project appraisal report with outlined observations, conclusions and recommendations will be prepared by the project staff. The community will have to contribute to the specification of requirements for the design of the new heating system.

- I. Based on the community's application, and the appraisal report the selection committee will prioritize the project for investment.

A performance based Request for Proposals (RFP) – as opposed to one which focuses on specifying all technical elements, a performance based approach focuses on the required technical performance of the system – containing, for the first round, a first tranche of community projects will be developed along with evaluation and selection procedures. Depending on practicalities however the RFP could constitute just 1 project (or a group of projects in one municipality). Following the first bidding round, depending on experiences and lessons learnt, RFPs for larger or smaller bundles of projects (and individual projects on an ongoing basis if deemed necessary) could be developed. Performance criteria will be determined during project execution, but is likely to include performance specifications which address incomplete combustion of biomass, fly-ash removal, fly-ash emissions from flues, batch loading of biomass, covered loading areas, systems for moving batched biomass from storage to loading platforms, and heat meters to monitor biomass energy generation per unit.

Comments on the draft RFP by short-listed design-build proposers will be sought during preparation of the RFP.

The draft RFP will also be reviewed by the international Design-Build advisor to check that it allows for the benefits of the Design-Build approach to be realized.

- m. The first RFP will be issued. During the bidding period technical concepts can be reviewed by the PMT for compliance only.
- n. Proposals will be evaluated according to the agreed evaluation procedures and criteria. The Best Value proposal (based on Life-Cycle cost³) is to be selected and contracted. It is proposed that the contract is signed by UNDP. Once commissioned ownership will be transferred to the beneficiary.
- o. The contract will define risks and responsibilities with the design-build contractor responsible for, amongst other things:
 - Execution of the contract in agreed time frame
 - Securing of design approvals as required by national legislation
 - Coordinating with local communities to ensure that the design meets their needs, and that necessary site preparation work is completed
 - Quality and quantity of works, materials and equipment in compliance with performance specifications of the RFP
 - Filling in and maintaining project site documentation (certificates, acts, site logbook, etc.)
 - Engineering setup, service testing and putting in operation of biomass fired boiler installation and heating system, according to project design and national norms and standards
 - Training of community operators in new biomass heating technologies
 - Participation in preliminary and final commissioning of completed project
 - Labour security during execution of works, compliance with fire protection, environmental protection standards

The local authority together with the Project Committee will do overall management of community project implementation and will be responsible for:

- Timely delivery of access to the project construction site to the contractor
- Monitoring and supervising Contract execution
- Commissioning of completed works, after they are accepted by hired local Engineer – Supervisor
- Authorize Contractor's Statements of Accomplished Works and sign requests for payment
- Select a sufficient number of local operators for training on new biomass heating technologies and organize their certification, according to local standards
- Provide sufficient quantity of biomass fuel both for testing and putting in operation of new biomass installation and for one heating season
- Organize proper storage and guarding of accumulated biomass fuel and take fire safety measures
- Organize and participate in the commissions on engineering set up, testing and putting in operation of new biomass heating systems
- Organize preliminary and final commissioning of completed community project in accordance with building legislation of the Republic of Moldova

Overall, the PMT engineering staff will monitor quality and supervision of the works according to their ToR.

³ This is the cost of construction of the system and the expected operating costs over the life of the system.

- p. During the design and construction period a 1-2 day training course will be delivered for municipal leaders in the community (or a group of communities), consisting of the project committee, plus any additional key public sector stakeholders, using the training material developed under activity 3.1 below.
- q. During the RFP period promotional meetings, applications, appraisal etc. (activities g to n above) will continue with the aim of identifying further investment projects.
- r. The PMT's design-criteria-professional (engineer) and technical experts of the district and community will supervise the technical design and construction work.

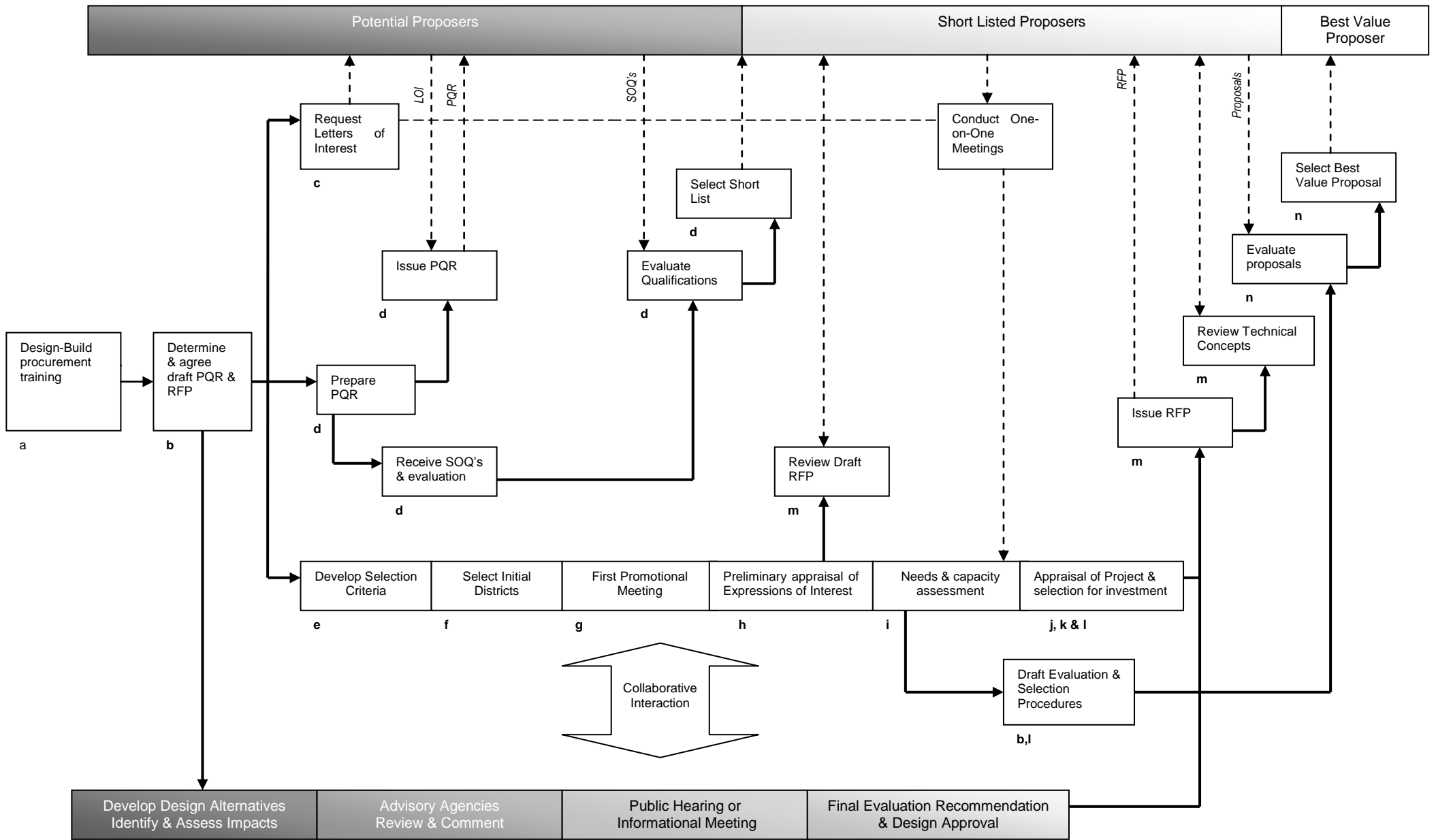


Figure 2: PERT chart of activity 1.1

Activity 1.2: Fuel cycle facilitated through leasing/hire-purchase mechanism for local fuel suppliers

Activity 1.2 will aim to support the development of a private sector market for contractors wishing to act as fuel suppliers to the heating plants installed under Activity 1.1. Straw handling equipment such as balers, trailers and bale handling tractors will be provided using lease-finance models that have been already developed and well-tested for example by the organisation 2KR. The EC-FSP (EC Food Security Programme, 2006) successfully used this mechanism in Moldova for the establishment of a revolving fund for the supply of irrigation equipment (€2 million revolving fund).

The services to be offered by an implementing partner/contractor with specific expertise and experience in agricultural leasing / hire-purchase will include assessment, advice and review of requirements; equipment supply; training; insurance; maintenance and repair. Such a model might include a revolving fund, to provide contractors with access to structured financing for the agricultural sector. This would finance the needed development of the fuel cycle without the need to provide grants to private sector fuel-supplying enterprises. During the project inception phase a detailed capacity assessment, incl. compliance with UNDP Financial Regulations and Rules and Programme Operations Policies and Procedures, of potential partners for this activity will be carried out and contractual arrangements agreed and concluded.

The following sub-activities are envisioned:

- a. Agree operation modalities, loan terms and responsibilities with the implementing partner/service provider. The terms could be a 4-year contract, 25% up-front and 25% in each subsequent year, collateralised by the equipment, and a 1.5% management charge and 1% insurance charge (total 2.5%). Supply terms are likely to include CASCO insurance, servicing and parts, consumables (bale twine supply), training and programme management. A contract will be established between UNDP and the the implementing partner/service provider for operation of the facility. A rough illustration of the mechanism is given in Annex C.
- b. Regular review of the draft RFPs under Activity 1.1 to identify the fuel cycle mechanisms needed and guide the partner in operation of the lease-finance scheme to match project needs, including location, bale sizes, etc.
- c. Monitoring of progress of the finance facility and actions to improve effectiveness to support the success of activity 1.1.
- d. Promotion, and technical support will be offered by the PMT in parallel to the project application, design and construction sub-activities under 1.1 above, to the participating municipal authorities and potential private sector suppliers in the project regions. This will
 - build their capacity to manage competitive tendering, and to manage the delivery of fuel.
 - include supply of standard tender documents, standard supply contracts (which define delivery terms on an energy basis, not fuel weight basis), and
 - provide training to municipal authorities on the approaches to supplier management and quality control (such as record keeping, sampling, weighing and measuring moisture content of supplied fuel).

Activity 1.3: Market environment enhanced to support quality, efficiency and effectiveness

Ongoing engagement by the PMT with national authorities will be pursued so as to address policy, legislation and bylaw development to facilitate the local biomass markets. This engagement will

include regular meetings with relevant government stakeholders to address key factors and adopt best EU practice, and small studies as required to identify best practice for other factors, including

- The use of straw and effects on soil fertility. While the amount of straw which will be used in this project is a small percentage of the total estimated available supply (31,850 tons out of an annual supply of 700,000 tons, or 4.5%), and roots plus 5 cm of straw remains in the soil even when straw is baled and removed, for potential future wider-scale roll-out, the impacts of using straw for heating should be assessed to determine the impacts on the carbon and nutrient cycles in Moldovan agriculture. The analysis should entail a literature review, and, where possible partnership with agricultural research into this topic. Best practice on the use of ash should also be reviewed and recommendations made. Further, in parallel to the identification of beneficiary communities the actual available solid biomass in localities will be assessed using a standardized questionnaire.
- Standards on emissions from solid and biomass fuels, looking at the national standards in Moldova in comparison to the EU. The standard might consider the whole heat generation cycle, including fuel cycle, building efficiency, boiler efficiency and emissions and means disposal of waste materials.
- Construction standards which specify issues like system sizing, backup / redundant heating provision, and the location of boilers with respect to buildings to be heated
- Chimney stacks, corrosion and ceramic linings
- Standard contracts for fuel tendering, fuel supply

The studies and recommendations / stakeholder dialogue will aim to target very specific issues related to this project's success, and will thus avoid overlap with the significant budget support provided by the EC and other donors in the Moldovan energy sector.

Output 2: Foundations laid for establishment of efficient household heating, industrial cogeneration and biomass briquetting markets (work-package 2)

Under Output 2, three emerging technology options for biomass energy in Moldova will be assessed, developed, and piloted. Activity 2.1 will focus on domestic heating in rural areas, addressing the need for improved efficiency of heating and possibly cooking. Activity 2.2 will support the deployment of industrial co-generation based on feedstocks from agri-industry, and activity 2.3 will pilot and demonstrate biomass briquetting.

Indicative Activities

Activity 2.1: Market solutions for high efficiency affordable rural biomass household heating identified and piloted

This project activity will aim to stimulate the market for high efficiency biomass heating systems suitable for rural areas with a target of at least 500 energy efficient domestic rural heating systems installed by the end of the project. It will follow a classic commercial market creation / market barrier model consisting of four key interrelated components: a) information, knowledge and outreach, b) strategic partnerships and alliances, c) infrastructure support, d) market stimulation as shown in the figure below.

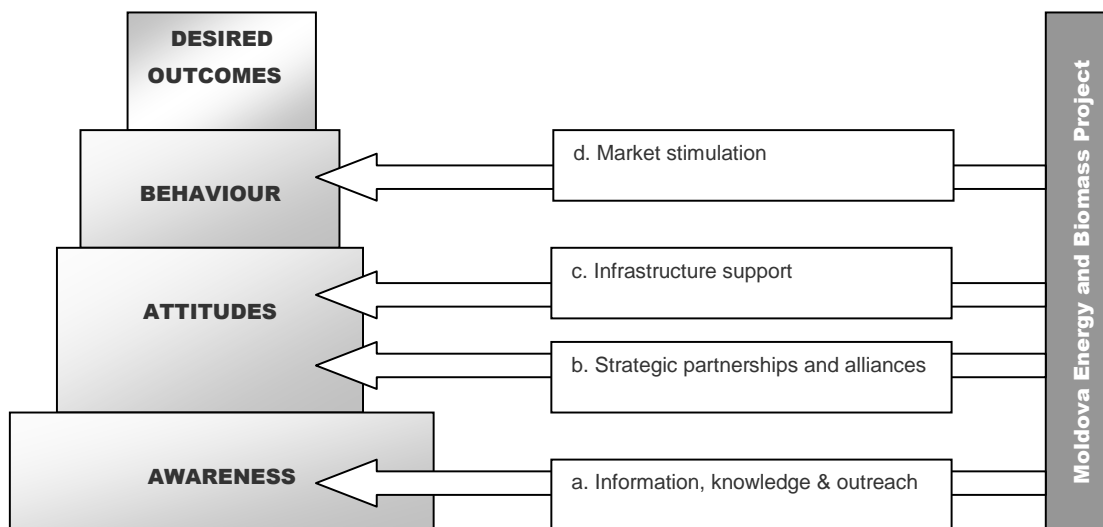


Figure 3: Market creation strategy for household heating from biomass

Market barrier perspectives focus on market processes, and decisions made by investors and consumers, including policy, technology, skills, and finance. In addition, it is desirable that our project facilitates the adoption of efficient household stoves, using approaches consistent with the objectives and constraints of a market system (i.e. that they are economically efficient).

There are a wide range of market barriers depending on the specifics of the market size and type. Some typical barriers evident in the rural household heating sector in Moldova are shown in Table 1 below:

Table 1: Overview of typical market barriers

Barrier	Key Characteristics	Typical tools which may be used to address market barriers
Uncompetitive market prices	Economies of scale and technology learning have not been realised, local production is not present, supply chains for products and services are not yet developed	<ul style="list-style-type: none"> • Learning investments • Additional technical development
Price distortion	Costs associated with existing technologies may not be included in their prices (e.g. oil or coal-fired boilers offered below cost, and costs recuperated in fuel prices, no accounting for environmental impacts in fuel prices) and they are subsidized (e.g. electricity, oil, gas and coal subsidies)	<ul style="list-style-type: none"> • Regulation to internalise 'externalities' • Special offsetting taxes or levies • Removal of subsidies
Information	Availability and nature of a product must be understood at the time of investment and ongoing use. The availability and benefits of more efficient domestic stoves are not well known.	<ul style="list-style-type: none"> • Labelling • Reliable independent information sources
Buyer's risk	Perception of risk may differ from actual risk (e.g. 'pay-back gap') Difficulty in forecasting over an appropriate time period, particularly relevant for fuel supply	<ul style="list-style-type: none"> • Demonstration • Routines to make life-cycle cost calculations easy
Finance	Initial cost may be high Imperfections in market access to funds	<ul style="list-style-type: none"> • Third party financing options • Special funding • Adjust financial structure
Excessive / inefficient regulation	Regulation based on industry tradition laid down in standards and codes not in pace with development	<ul style="list-style-type: none"> • Regulatory reform • Performance based regulation
Technology-specific	Related to existing infrastructures in regard to	<ul style="list-style-type: none"> • Focus on system aspects in use of technology

Barrier	Key Characteristics	Typical tools which may be used to address market barriers
barriers	hardware and the institutional skill to handle it	<ul style="list-style-type: none"> • Connect measure to other important business issues (productivity, environment, job creation)

The following sub-activities are envisioned:

- a. Information, knowledge and outreach: under this sub-activity market research will be carried out to determine:
 - Consumer needs, attitudes and motivations
 - Products already available on the local market and how these meet needs
 - Products available internationally and 'fit' for local markets
 - As necessary, analysis of local production potential (costs and licensing)
 - Stakeholder analysis (importers, producers, installers, buildings, shops, etc.), including capacity, attitudes and motivations
 - Determination of criteria for support of an entrepreneur or a householder (under sub-activity d)
 - Support to promotional activities of partners and allies to expand consumers' knowledge and understanding of efficient biomass domestic heating and opportunities.
 - Publications, Internet and other communications activities (in coordination with activities under Output 4 below).

- b. Strategic partnerships and alliances: under this sub-activity collaboration with industry, commercial stakeholders, civil society and government, and global networks will be fostered. The project will support organisations positioned to influence the domestic heating sector, encourage partners and allies to develop strategic plans to speed up growth in the efficient use of biomass for domestic heating, and establish formal co-operation with other programmes to enhance technology transfer.

- c. Infrastructure support: this sub-activity will aim to strengthen the capacity of efficient biomass domestic heating industries and infrastructure to supply, deliver and service quality efficient biomass heating stoves. The project will support training within the supply chain (needs as identified under sub-activity a) including for example technicians, installers, dealers, architects, designers, developers, insurers and lenders. The project will assist as necessary in the development of standards and certification protocols for high efficiency domestic heating systems, and develop and implement training.

- d. Market stimulation: this sub-activity will be implemented as follows:
 - i. Review of available technologies to provide efficient household heating within Moldova and the region. Potential technologies will be assessed and ranked based on technology performance (efficiency and emissions), fuel requirements (multi-fuel), features (cooking, baking, heating, central heating and hot water), and suitability for integration into Moldovan houses, costs, and supply / production needs. Based on the review a specification will be produced for stoves that could be manufactured in country, or imported, at an affordable price. A short-list of suitable stoves available on the local market or internationally will be drawn up.
 - ii. A limited number of stoves from within the shortlist will be installed in small municipal buildings to test their performance in use, and raise awareness in the market. This is likely to be complementary in nature with the activities of output 1, since very small municipal buildings could best be heated using a household-size stove (frequently these small buildings are former houses being used as municipal buildings, in any case). Alternatively the home of an 'energy champion' or other suitable influential community leader could be used if a mechanism can be found to do this transparently

and according to procurement rules. The selection of suitable locations could be based on simple application forms, with evaluation by the Project Management Team and decision-making by the project manager. Locations for stove demonstrations will be selected based on the likely impact / demonstration effect, similarity to household conditions, openness to act as a demonstration project and 'energy champion', and technology scale up potential. It is expected that installation will take place of up to 10 stoves of various types in this initial trial. If trials are unsuccessful, the technology review and trials will need to continue under suitable technology options are identified.

- iii. The initial trials will be evaluated and used to assess potential fuel impacts and market interest. The project will then try to facilitate market development by identifying needs for technology transfer, licensing needs, technical development (to tailor products to the local market needs), joint venture potential and/or access to markets by manufacturers. The desired outcome of the market facilitation work will be one or more local manufacturers or agents who are willing and able to enter into the stove market. Services to be provided by the project will include the development of business plans, and facilitation if necessary of commercial finance.
- iv. The producer(s) will be encouraged to produce and sell at least 500 stoves meeting the performance specifications. A subsidy will be given to households that purchase the stoves set at a suitable amount so as to bring the price of the device to a level that could be reached when market volumes are approaching the point on the long-run cost curve for a reasonable and sustainable market size (e.g. a production volume of 5,000 units per year). Either the appropriate project team member or an independent verification consultant will approve subsidies to households following verification. Verification will consist of a check that the equipment is in fact fully installed and functioning. An alternative approach practiced in other countries is granting the subsidy directly to the supplier after verification of satisfactory installation. The concrete approach and design of the subsidy scheme will be determined in the course of sub-activities a) to c).
- v. The Project Management Team will carefully monitor the progress of the market developed, and results and lessons learnt will be communicated nationally.

By providing for higher efficiency and functionality at affordable prices, the impact of such a programme will be substantial in:

- Making high efficiency multi-fuel stoves available at affordable prices
- Reducing the fuel cost to households through higher efficiency stoves
- Improving comfort and utility in rural households increasingly served with piped water and internal bathrooms by potentially providing for hot water and central heating as well as radiant heating
- Reducing the amount of both wood and coal and associated emissions, whilst generating more heat to greater effect.

Activity 2.2: Industrial cogeneration using biomass fuel demonstrated

This activity will support the development and implementation of at least one Combined Heat and Power (CHP) unit using biomass as a by-product of an agri-industrial process. There are reasonably rapid developments in the creation of clear pricing and an enabling environment for feed-in to the grid, although no independent power is currently fed into the grid. There are three major documents on renewable energy policy in the Republic of Moldova: the Law of Renewable Energy, approved through Parliament Resolution No. 160 from 12.07.2007; the ANRE Resolution No. 321 from 22.01.2009 on approving the Methodology for the Determination, Approval and Application of Tariffs for the Electricity Generated from Renewable Electricity Energy and Biofuel, as well as the ANRE Resolution No. 330 from 03.04.2009 on approving the Regulation on the Guarantees for Origin of Electricity Generated from Renewable Electric Energy and Biofuel. While practical and institutional barriers still remain to grid-feed-in, if possible, this project should make the most of opportunities to supply power to the grid that are available since this could increase the demonstration value substantially.

Key sub-activities include:

- a. Coordination: The EBRD Moldovan Sustainable Energy Financing Facility (MoSEFF) was launched in September 2009 in order to support energy efficiency investments in Moldovan enterprises. A credit line of 20 million Euro combined with a 5-20% grant component (from the European Commission) has been provided for on-lending to Moldovan companies through EBRD's partner banks, currently Moldova Agroindbank and Moldindconbank. Since biomass co-generation in industry is eligible for support from MoSEFF it is essential to coordinate the activities and ambitions of the project and those of the EBRD credit line to ensure that the market is not unnecessarily distorted and that the efficient use of the funding is maximized.

Coordination with the National Agency for Energy Regulation (ANRE) should also be ensured so as to maximize the chances that this project will contribute to progress with feed-in tariff and mechanism development.

The World Bank has initiated a GEF-co-financed project, currently under Project Preparation and planned to start from 2011 on commercial biogas. Component 1 of the World Bank GEF project will specifically address "cooperation with the country's energy regulator to allow smaller electricity producers to sell surplus electricity into the national grid". Thus coordination on this issue with the World Bank will be sought.

- b. Analysis and strategy refinement and updating: A small market study will be carried out to confirm market barriers and opportunities. Based on this study the investment strategy will be refined, building on best value considerations and maximum impact on awareness and market creation. The study will identify key residue streams that may be used for energy generation and market barriers to their use. The market study will cover the following key barriers:

- Policy and regulatory barriers, reassessing the status of the Renewables Feed-in Tariff and how it may apply to smaller scale biomass co-generation, grid access, and legislation related to organic waste and residue streams (use and disposal),
- Technology, covering the availability of technology to make use of the organic residues available from the agri-processing sector. This would, for example, address the state of technical solutions for using residues from the wine sector.
- Awareness and capacity, covering the current level of awareness of industry, service providers, technology suppliers and policy-makers.
- Finance, covering access to finance, collateral and possibilities for on- and off-balance sheet financing.

- c. Market development: The validated strategy will seek to address market barriers in a cost-effective and coordinated way, and will, subject to outcomes of the study, address the following

- **Policy and regulatory barriers:** it is expected that this will focus on legislation related to organic waste and residue streams. Relevant legislation in use in EU countries will be assessed for applicability, and the status and process related to transposition of EC directives assessed. Recommendations will be made to address the legislative barriers and effort will be made to support local stakeholders to adopt EU best practice.
- **Awareness raising:** the central component of the awareness raising activities will be one of technology demonstration. This will be implemented in the following way:
 - i. A call for proposals will be launched nationwide to identify a suitable agri-industrial demonstration project. The niche for this activity appears to be in communal farms / processing, state enterprises and municipal public-private partnerships.

The approach will be a standard two-stage process starting with Concept Notes / Expressions of Interest, and full proposals for shortlisted projects. The Project Management Team will evaluate concept notes and full proposals, with the final decision being made by the Project Board. Evaluation criteria will include the likely impact / demonstration effect, openness to act as a demonstration project,

public sector / community involvement, technology scale up potential, required level of subsidy, and exit strategy.

- ii. Grant funding will be used to cover costs of feasibility studies, engineering design, and partial support for investment costs.
- iii. Once commissioned, a media and awareness campaign will be developed including brochure, study tours, and web pages to disseminate the results to a wider audience.

Activity 2.3: Market solutions for briquetting piloted

Activity 2.3 will aim to support the creation of at least one commercial briquette business of approximately 1,000t per year using biomass derived from agricultural wastes or from by-product(s) of an agri-industrial process. The main issues relate to technology, biomass type and availability, to enable manufacture and supply at a competitive market price. While some small-scale briquetting operations in Moldova using such products as sunflower seed husks and walnut shells do exist and a demonstration-scale briquette line has been installed in the Agricultural University for trial and educational purposes (provided by the Czech Government), there is a need to demonstrate commercial briquette production.

The source of the biomass could be from an agri-industrial process, vineyard prunings, straw, paper and cardboard (from municipal waste), or residues from a managed forestry or lumber operation.

Indicative sub-activities are:

- a. Review of existing experience in Moldova (including the attempt that was made using Dutch funding to establish a briquetting plant some years ago, mushroom growing substrate briquette project, and small-scale sunflower / walnut shell production), and the region.
- b. Analysis of production potential: Suitable raw materials should be identified and assessed to determine availability for briquette production, and their expected local market prices. Where a local use of the raw material is not common, prices should be corrected based on market prices in neighbouring countries where available, since low-cost, free and waste material prices are highly volatile. The potential selling prices of produced briquettes for a number of potential raw materials should be determined based on estimated plant costs and depreciation, raw materials, operating cost, overheads such as advertising and promotion, and profit margin.
- c. Expressions of interest will be requested from municipalities where the analysis has shown that significant potential exists. The Project Management Team will evaluate these, and will make recommendations to the Project Board for their final decision. Suitable locations for briquetting plants will be selected based on availability of suitable raw materials, existence of a ready market for briquettes (based on current use of wood and / coal for household heating), the likely impact / demonstration effect, openness to act as a demonstration project and 'energy champion', public sector / community involvement, entrepreneurial track record, technology scale up potential, required level of subsidy, and UNDP exit strategy.
- d. Market research to identify potential users of briquettes, and test their willingness to use and pay for briquettes will be carried out initially at the top-rated location identified under c) above. If briquettes of the types and quality that could be produced at this location are not already available within the Moldovan market, a sufficient number will be imported and used in market acceptance tests. The quantity to be purchased by the project for market trials would allow, for example 50 households to use briquettes for household heating for one month. The following approach will be taken:

- i. Using standard randomized design for consumer research, market researchers will carry out door-to-door interviews. They will ask home owners survey questions about current heating strategies, preferences and costs. Briquettes will be shown to the home owners to ask their opinion, whether they would want to use an alternative fuel like this, and how much they would be prepared to pay. Attention should be given to the timing of the visits so that they, ideally, coincide with or precede the usual period when households purchase their fuel.
 - ii. Following the survey, the home owner being interviewed will be asked whether they would be willing to test the briquettes in their stove for a period of two weeks. If they agree, they will be given a first sample to cover heating for an initial short period, a registration card and vouchers that they will take to the municipal office or local shop for exchange for a limited number of additional briquettes. Note, however, that this approach will need to be adjusted to reflect likely local use patterns. To ensure that the vouchers are used by the participating household and not simply passed to another, they will only be redeemable on presentation of the registration card which also indicates name and address.
 - iii. Two weeks after the start of the test period, each household will be revisited and interviewed to gather information about their experiences with the fuel. They will then be offered vouchers to purchase additional briquettes at a discounted rate (so that the briquettes are, for example, 20% cheaper than equivalent wood fuel). This will allow the research to get an indication of the potential market demand and price sensitivity.
- e. Based on this fieldwork and analysis, the viability of a commercial market for briquettes in this location will be assessed. If results are not positive, the barriers will need to be reassessed and strategy developed. This may entail adjusting plans within the selected municipality, or selecting another location (step c).
 - f. Assuming that the market results are positive, a business plan will be developed in close co-operation with the municipality and local entrepreneur, and a public-private partnership (PPP) established. While the project funds will support the municipality, the entrepreneur in the PPP will need to risk some of their own capital in the venture, proportional to the risks, unknowns and potential profits in the market.
 - g. The progress of the PPP will be carefully monitored by the Project Management Team, and results and lessons learnt communicated nationally.

There are already indications of interest in briquette production from local administrations that have benefited from the GEF demonstration installations for domestic markets and possible use as a backup in the municipal straw-fired boilers. However the reality of a reliable supply, competent entrepreneurial involvement, reliable technology and commercial operation, along with demonstration value, would have to be ensured by the project.

Output 3: Capacity built for growth of biomass markets at regional and local levels (work package 3)

Output 3 aims to ensure that the benefits of biomass energy demonstrated and deployed under outputs 1 and 2 are delivered in a lasting and long-term way and that local capacities for further replication is ensured. For each stakeholder type to be reached under output 3, the first step will be the development of training materials, to be placed in the public domain. These materials, to be updated and improved each year, will provide an accessible repository of key information, and will be used either in the training to be delivered under outputs 1 & 2 or in sub-activities under output 3. The stakeholders to be targeted include: municipal management including mayors, civil servants, and teachers; straw-fired boiler operators; fuel suppliers; and school children as detailed below. Given the significant budget support and cooperation between the EC (and other donors), and the national authorities in the energy sector, including in policy and legislation for renewable energy, this project will not seek to address renewable energy policy and related capacities

directly, apart from the very specific and targeted activities that have been described under Activity 1.3 above.

Indicative Activities

Activity 3.1 Capacity of municipal leaders to manage biomass systems enhanced

Municipal leaders including mayors, local councilors, and civil servants such as teachers need information in how to manage the operation of straw-burning boilers in their local authorities. Topics to be included in the training will include general principles of operation, necessary maintenance routines, optimum building heating system operation (including such issues as overheating and underheating of various floors of the building), regular and sustained performance monitoring (including standard forms and reports), and sound management of fuel suppliers (including competitive tendering (standard tender formats), contracting (standard contracts), quality control (checking quality and condition of supplied fuel), and storage).

Indicative sub-activities include:

- a. Preparation of training materials: Generic training materials will be developed based on international best practice on the above topics. These will be enhanced by practical experience through interviews with successful projects under the former World Bank-GEF project so as to ensure that it is practical and builds on the experiences of and lessons learnt from those projects.
- b. The training materials will be used as part of the training and awareness raising activities under Activity 1.1:
 - i) Sub-activity (g) – Excerpts / Background material for the promotional meetings at the district level
 - ii) Sub-activity (i) – Excerpts for the community information and awareness raising activities.
 - iii) Sub-activity (p) – Delivery of 1-2 day training course for municipal leaders (the project committee) who will receive straw-fired boilers.

And under activity 1.2, sub-activity (d) – Delivery of ‘on the job’ training of municipal authorities on fuel supply.

- c. Impact measurement: the impact of the capacity development will be monitored through intake and exit surveys of participants, along with feedback forms. Lessons from regular impact measurement will be incorporated as required, and at least each year when the material is reviewed and revised (see (d) below)
- d. Following the first year, and each subsequent year of operation of the project, a lessons learned review of operating systems will be made to capture emerging best practice and incorporate it into the training materials.

Activity 3.2: Training materials developed for sound operation of straw-fired boilers

Under activity 3.2 training materials will be developed which will supplement the training to be given by design-build firms (as mentioned in Activity 1.1, (o) above), and provide a permanent, generic resource on the operation and maintenance of straw-fired boilers for use by municipal leaders when hiring new operators in future years.

Indicative sub-activities include:

- a. Training materials targeting operators of straw-fired boilers will be developed. These will take the form of low-cost, simple, practical information about how to operate and carry out routine maintenance of the straw-fired boilers.

- b. The training materials will be made available in low-cost formats to municipal leaders through the project, as part of activity 3.1, and as required.
- c. Support training facilitation and delivery and exchange of lessons learned and best practices among operators

Activity 3.3: Training materials developed for commercial fuel suppliers

Training material, and a business plan template will be developed, aiming at enhancing the knowledge and capacity of commercial fuel suppliers. The training materials will be made available on a self-study basis through the implementing partner in delivery of activity 1.2, and UNDP project staff in their interactions with potential private sector fuel suppliers. Indicative sub-activities include:

- a. Development of training materials on fuel supply, including information on the business opportunity, benefits, and risks. Creation of a generic business plan that could be used by entrepreneurs to understand the market and investments and processes needed to enter it.
- b. The training materials will be made available for self-study through the implementing partner when enquiries are received, and through UNDP project staff working under output 1.
- c. Impact measurement: the impact of the capacity development will be monitored through an impact log to be maintained at the implementing partner. This log will take the form of enquiries, requests for help, and stories of change, recorded in day-to-day activities of the implementing partner in delivery of Activity 1.2.

Activity 3.4 Community understanding and acceptance of biomass energy enhanced through school educational programme

Biomass energy is generally seen as ‘informal’, associated with poor village life, un-modern, and associated with dirty, polluting, and labour-intensive practices. In order to bring about a change in these attitudes, information on modern biomass energy is needed at the most fundamental levels of society. An effective approach, which has been shown by UNDP to have the potential for long-term sustainability is through educational programmes in schools. This can be achieved at a relatively low cost by building on existing international best practice.

Under this project sub-activity, co-operation will be sought with a local cooperation partner for example in the framework of the international “SPARE” programme⁴, an educational initiative on energy and environment for children of age 10-15. High-quality educational and methodical materials with practical tasks will be created / adapted to support the introduction of straw-fired boilers, and made available as a resource to teachers in Moldova. Teacher training and support could also be included and offered through the SPARE national network, and schools where straw-fired boilers will be introduced.

Indicative sub-activities include:

- a. Stakeholder dialogue and alliances: form an alliance with the existing local NGO, and seek collaboration for example with the International SPARE programme (Naturvern, Norway), to explore the potential to incorporate practical information on the use of biomass energy (and in particular straw), and the benefits to Moldova for the environment, energy security, local economy and job creation. Develop a co-operation agreement on common activities, covering development of specific modules on biomass energy and the use of straw for

⁴ See e.g. <http://www.spareworld.org/eng/node/140>.

heating (output 1), household heating, and briquettes (output 2), teacher training in schools where boilers are being installed, and local exhibitions, and round-tables.

- b. Translate and adapt school educational and methodology materials already available including incorporation of local information on the practical benefits and opportunities of biomass energy in schools in Moldova
- c. As required, support the local NGO to conduct teacher awareness raising and training in schools that are receiving straw-fired boilers under this project.
- d. In partnership with the local NGO, organize local exhibitions and roundtables. Explore and define collaboration with the annual school competition to present school activities to a wider audience (and possible incorporation into the project's annual award ceremony (output 4, below)).
- e. Impact is to be monitored through a participatory monitoring approach to be agreed with the local NGO. The Most Significant Change approach could be highly effective for this, and support from the project given to the NGO to help them initially in using this method if they are not already familiar with it.

Output 4: The opportunities and benefits of biomass energy for Moldova are well known, visibility of project results is promoted (work package 4)

The output will facilitate widespread dissemination on the general and specific advantages and impacts of using biomass energy in Moldova and promote the visibility of the partnership and impact of the action. Very specific awareness raising for beneficiaries of straw-burning boilers will be delivered under activity 1.1 (g) and (i). For this, use will be made of materials developed as part of activity 3.1 and activity 4.1.

Indicative Activities

Activity 4.1: Media campaign

A media campaign will be developed to provide information quickly and efficiently to national and local press, TV, radio and other relevant information sources, with a focus on raising awareness on benefits and best practices related to the use of renewable energy. Wherever possible this will be carried out through the existing UNDP and EC channels. Indicative sub-activities include:

- a. Media and awareness raising strategy development: In co-ordination with media specialists within the UNDP country office and the EU Delegation, a media strategy will be developed. This will include contact management, development of a professional media package on renewable energy promotion and best practices, and approaches for the regular development of press releases, media monitoring (for positive and negative media exposure), and management.
- b. Delivery of media strategy; including regular preparation and dissemination of press releases.
- c. Monitoring of media strategy: impacts will be assessed through a media log, including a log of enquiries in response to media events.

Activity 4.2: Annual national awards

To act as a focal point for awareness raising activities an annual award ceremony will be instigated. This award ceremony will operate for 4 years under the programme (end of year 1, 2 and 3, and 4) but should be created as an ongoing renewable energy and energy efficiency award event with external sponsors, and high-level patronage, with for example the Agency for Energy Efficiency as a potential future organizer and host of this event. Indicative sub-activities include:

- a. Strategic partnerships and alliances: As an initial review of the awards strategy, strategic partnerships and alliances will be identified nationally and internationally, and co-operation agreed where appropriate (including with the Energy Globe Award, and the SPARE 'Energy Saving' school competition). Alliances may help to broaden the award ceremony to address energy efficiency and other renewables.
- b. Award strategy developed: a detailed plan for the national awards will be developed. This strategy will address costs, timing, categories of award, selection criteria for awards, judging, sponsorship, prizes, and format. Categories of award may include:
 - Best municipality boiler project
 - Best fuel supplier
 - Leading community 'champions'
 - Best children's school projects
 - Best media coverage

If practicable a local media company / competent film enthusiast should be hired to make short 5-minute films of each shortlisted entry, to be used during the ceremony, and to be uploaded to YouTube and other relevant social media.

Prizes should be sponsored where appropriate, and may include:

- Computers
- Projectors
- Consulting services
- Equipment

Winning entries may also be supported to enter to compete in regional and/or international awards, such as the regional SPARE 'Energy Saving' competition.

- c. Delivery of annual awards.
- d. Monitoring of impacts will be carried out using event evaluation surveys and media logs tracking reporting in local and national media. Improvement will be made based on feedback to each annual award.

Activity 4.3: Communication and visibility of project results

Special emphasis will be put on continuously communicating and giving publicity to the outputs and impacts of the joint action, all communication and visibility activities will be carried out in close cooperation with the EU Delegation to Moldova. The EU funding will be highlighted in all materials according to the Joint Visibility Guidelines for EC-UN Actions in the field.

- a. During the inception phase of the project, a communication and visibility plan will be elaborated and agreed between the EUD and UNDP in promotion of the visibility of project results and positive impacts of the partnership.
- b. Delivery of concrete visibility promotion activities; including regular preparation and dissemination of visibility items, press releases on project impact and results and preparation of communication packages including project background, outputs and the impact of the action's results.
- c. Monitoring of the communication and visibility plan: impacts will be assessed through a media log and appropriate feedback mechanisms identified for the tools specified in the plan.

Stakeholder analysis

As well as the Ministries of Economy, Environment and Agriculture and Food Industry, several major donors are interested in the potential use of biomass for energy. There are also university departments, research institutes and NGOs that 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 resource and there is a general willingness to cooperate with the project. A detailed stakeholder analysis has been carried out in the preparation for this project. The current project strategy reflects this analysis and discussions with stakeholders.

The target beneficiaries under output 1 will be the rural municipalities that 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 significantly and there will be a need for capacity building and training for the project to be successful (output 3). Output 1 further addresses local entrepreneurs (in many cases farmers), for the creation of the fuel supply chain. Finally output 1 facilitates analysis and cooperation with national authorities to address and prioritise actions on policy, legislation and standards.

Output 2 targets entrepreneurs who plan to address needs for domestic heating and briquette production. In addition, an activity will address the agro-industrial sector with demonstration and awareness activities in biomass co-generation.

Output 4 targets national level awareness and visibility of the project. Clearly this addresses beneficiaries with direct involvement in the project activities such as municipal and community leaders, as well as the wider population.

Timeframe and project phases

Taking into consideration the complexity of the foreseen activities (multi-sectoral, production of alternative heating technologies, switching to alternative fuel from agricultural wastes, creation of alternative fuel supply chains, rehabilitation of existing facilities and heating systems, etc.) the project envisages an inception phase of between 2 and 4 months. During the inception phase, the project will:

1. Establish a Project Management Team within UNDP Moldova
2. Coordinate the list of project national stakeholders and establish a National Project Board and Advisory Group;
3. Develop general project operational formats, and templates for subcontractors;
4. Finalize selection criteria to be applied under activity 1.1 for approval by the Project Board
5. Provide training and review operating modalities for the Design-Build procurement process within UNDP: There are a number of reasons that support the decision to use a design-build delivery method for the bulk of the procurement in this project. Both complex and simple projects can benefit by using the design-build method and the approach could be used for bundles of investments or individual projects. Since this approach is relatively new in Moldova it is necessary to develop it in such a way as to be compatible with UNDP procurement processes, and Moldovan legislation.
6. Announce and select the project management team and international and national (short-term) consultants who will provide operational support to target municipalities in implementation of community biomass projects;
7. Developed strategies for communication, visibility and media engagement (activity 4.1 and 4.3) and the national awards (activity 4.2),
8. Develop survey methods, and impact logs which will be used to monitor the impacts of the various activities, and
9. Elaborate and approve the detailed Work Plan for the first year of implementation.
10. Conduct assessment, select and finalize contractual agreements with the implementation partner for activity 1.2.

The project time frame is 48 months.

III. RESULTS AND RESOURCES FRAMEWORK

Intended Outcome as stated in the Country Programme Results and Resource Framework:

UNDAF Outcome 3: By 2011, vulnerable groups in poor rural and urban areas take advantage of sustainable socioeconomic development opportunities through adequate regional and local policies implemented by Local Public Authorities (LPAs) and partners.

Outcome indicators as stated in the Country Programme Results and Resources Framework, including baseline and targets:

3.2 New businesses and jobs are created in targeted poor rural and urban areas

Indicator: Number of small business enterprises operating

Baseline: 22,928 (2004)

Target: Number of small enterprises increased by 20% as a means to reduce the poverty level

Indicator: Number of new jobs created with the help of UN agencies

Baseline: 0 (2007)

Target: At least 1,000 new jobs created

Applicable Key Result Area (from 2008-11 Strategic Plan): 4.4 Managing energy and the environment for sustainable development: Strengthened capacity of local institutions to manage the environment and expand environment and energy services, especially to the poor

Partnership Strategy

A participatory approach will be used in the implementation of this project. Experts from relevant line ministries (Ministry of Economy, Ministry of Environment, Ministry of Agriculture, Ministry of Construction and Regional Development) and departments, local communities, private companies, the academia, NGOs, and key actors from the donor community will be involved at both the inception and implementation phases. Such an approach will provide the basis for reaching consensus amongst all stakeholders and mobilizing all social efforts and available resources, to foster the proper implementation of actions envisaged and hence the mitigation of development gaps. Special attention will be given to community mobilization and ownership.

Close cooperation between the UNDP and EU Delegation and continuous coordination both in the framework of the Project Board and the Project Advisory Group and in the framework of the Energy Sector Coordination Council, led by the Government, will maximize synergies, ensure coordination, as well as reduce transaction costs and avoid duplication. UNDP will ensure that all necessary arrangements for coordination are made in a timely manner to ensure prompt and effective implementation. This will include a clear division of responsibilities among partners for the implementation of the activities.

To provide overall direction and take decisions on specific aspects of project implementation a Project Board will be created, led by the Government and involving senior representatives of all beneficiaries of the project. The Project Board will be complemented by an Advisory Group which will further include key ministries, academia, donors, civil society and other institutions and associations.

At the community level, the project's key partners are the representatives of local public authorities in the selected regions as well as the benefiting institutions and entrepreneurs. Other important stakeholders include the District Councils, the Regional Development Agencies and Regional Development Council. The stakeholders at the regional and local level represent the primary partners for output 1 of the project for the as of the selected region proposed initiative due to the heavy emphasis on community mobilization and participatory processes involved in all activities.

Project title and ID (ATLAS Award ID): Moldova Energy and Biomass Project

INTENDED OUTPUTS	OUTPUT TARGETS FOR (YEARS)	INDICATIVE ACTIVITIES	RESPONSIBLE PARTIES	INPUTS
<p>Output 1: Municipal biomass heating and fuel supply markets established</p> <p>Baseline: Isolated demonstration projects have been undertaken.</p> <p>Indicators: * Number of installed heating systems * MWth installed capacity * Number of leased fuel supply systems * Jobs created</p>	<p>Targets (year 1) Heating systems: 30 Leased fuel supply: 30 Heat provided: 70 TJ Jobs created: 60</p> <p>Targets (year 2) Heating systems: 64 Leased fuel supply: 64 Heat provided: 140 TJ Jobs created: 128</p> <p>Targets (year 3) Heating systems: 98 Leased fuel supply: 98 Heat provided: 210 TJ Jobs created: 196</p> <p>Targets (year 4) Heating systems: 130 Leased fuel supply: 130 Heat provided: 280 TJ Jobs created: 260</p>	<p>1 130 heating systems in public buildings installed (1.1)</p> <p>2 Fuel cycle facilitated through leasing/hire-purchase mechanism for local fuel suppliers (1.2)</p> <p>3 Market environment enhanced to support quality, efficiency and effectiveness (1.3)</p>	<p><i>UNDP</i></p> <p><i>Local Public Authorities</i></p> <p><i>Entrepreneurs (Fuel supply)</i></p> <p><i>Implementing partner for activity 1.2 (to be contracted during inception phase)</i></p> <p><i>Ministry of Economy</i></p>	<p><i>Heating Systems and equipment</i> €8.73 million</p> <p><i>Fuel supply systems</i> €1 million</p> <p><i>Technical assistance</i> €0.5 million</p>
<p>Output 2: Foundations laid for establishment of efficient household heating, industrial cogeneration and biomass briquetting markets</p> <p>Baseline: No improved heating systems locally produced, no biomass cogeneration, limited</p>	<p>Targets (year 1) Information requests: baseline Domestic systems: 0 Cogeneration plant: 0 Briquetting plant: 0 Jobs created: 0</p>	<p>1 Market solutions for high efficiency affordable rural biomass household heating identified and piloted (2.1)</p> <p>2 Industrial cogeneration using biomass fuel demonstrated (2.2)</p>	<p><i>UNDP</i></p> <p><i>Entrepreneurs</i></p> <p><i>Academia</i></p> <p><i>Ministry of Economy</i></p>	<p><i>Hardware/Equipment and Licences (incl. production incentive)</i> €1.1 million</p> <p><i>Technical assistance</i> €0.5 million</p>

<p>briquette production</p> <p>Indicators:</p> <ul style="list-style-type: none"> * Annual increase of 50% in requests for information * Deployment of at least 500 domestic systems on a semi-commercial basis * Installation of at least one co-generation plant * Successful operation of commercial briquette production enterprise * Jobs created 	<p>Targets (year 2)</p> <p>Information requests: +50%</p> <p>Domestic systems: 100</p> <p>Cogeneration plant: 0</p> <p>Briquetting plant: 0</p> <p>Jobs created: 10</p> <p>Targets (year 3)</p> <p>Information requests: +50%</p> <p>Domestic systems: 300</p> <p>Cogeneration plant: 1</p> <p>Briquetting plant: 1</p> <p>Jobs created: 15</p> <p>Targets (year 4)</p> <p>Information requests: +50%</p> <p>Domestic systems: 500+</p> <p>Cogeneration plant: 1</p> <p>Briquetting plant: 1</p> <p>Jobs created: 25</p>	<p>3 Market solutions for briquetting piloted (2.3)</p>	<p><i>Local Public Authorities</i></p>	
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<p>Output 3: Capacity built for growth of biomass markets at regional and local levels</p> <p>Baseline: zero (relative)</p> <p>Indicators: * Number of municipal leaders trained * Number of fuel suppliers trained * Number of children participating in awareness activities</p>	<p>Targets (year 1) Municipal leaders: 30 Fuel suppliers: 30 Children: 300</p> <p>Targets (year 2) Municipal leaders: 60 Fuel suppliers: 60 Children: 1000</p> <p>Targets (year 3) Municipal leaders: 100 Fuel suppliers: 100 Children: 3000</p> <p>Targets (year 4) Municipal leaders: 150 Fuel suppliers: 150 Children: 9000</p>	<ol style="list-style-type: none"> 1 Capacity of municipal leaders to manage biomass systems enhanced (3.1) 2 Training materials developed for sound operation of straw-fired boilers (3.2) 3 Training materials developed for commercial fuel suppliers (3.3) 4 Community understanding and acceptance of biomass energy enhanced through school educational program (3.4) 	<p><i>UNDP</i></p> <p><i>Local Public Authorities</i></p> <p><i>Academia</i></p> <p><i>Schools</i></p>	<p><i>Technical assistance</i> €0.24 million</p>
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<p>Output 4: Opportunities and benefits of biomass energy for Moldova are well known, visibility of project results is promoted</p> <p>Baseline: zero (relative)</p> <p>Indicators:</p> <ul style="list-style-type: none"> * Enquiries to the PMT increasing by 50% annually * Media references to project in positive light increase 50% annually * Evaluation surveys show that the awards are valued and indicate positive intention to take actions (score rating of high or very high based on surveys) * Media references to awards increase 50% annually 	<p>Targets (year 1) Enquiries to PMT: baseline Media references: baseline Surveys: 90% high & v. high Media reference: baseline</p> <p>Targets (year 2) Enquiries to PMT: +50% Media references: +50% Surveys: 90% high & v. high Media reference: +50%</p> <p>Targets (year 3) Enquiries to PMT: +50% Media references: +50% Surveys: 90% high & v. high Media reference: +50%</p> <p>Targets (year 4) Enquiries to PMT: +50% Media references: +50% Surveys: 90% high & v. high Media reference: +50%</p>	<ol style="list-style-type: none"> 1 Media campaign (4.1) 2 Annual national awards (4.2) 3 Communication and visibility (4.3) 	<p><i>UNDP</i></p>	<p><i>Technical assistance</i> <i>€0.37 million</i></p>
<p>Effective management and implementation of the project</p>	<p>Overall targets:</p> <ol style="list-style-type: none"> 1. Ensure 100% delivery rate; 2. Timely implementation of planned activities; 3. Timely development and submission of work plans and progress reports; 4. Compliance with UNDP rules and regulations. 	<ol style="list-style-type: none"> 1. Implementation of inception phase 2. Launch the project 3. Implement project activities 4. Involvement of local and regional stakeholders and beneficiary communities in the decision-making processes 5. Community mobilization and support 6. Assurance of quality of works, transparency and efficient use of funds 	<p><i>UNDP</i></p>	<p><i>Technical assistance</i> <i>€1.12</i></p> <p><i>Equipment and supplies</i> <i>€0.08</i></p>

		7. Annual monitoring and evaluation of project progress and external evaluation by the end of the Program period 8. Communication		
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IV. ANNUAL WORK PLAN

Year: 1

EXPECTED OUTPUTS <i>And baseline, indicators including annual targets</i>	PLANNED ACTIVITIES <i>List activity results and associated actions</i>	TIMEFRAME				RESPONSIBLE PARTY	PLANNED BUDGET		
		Q1	Q2	Q3	Q4		Funding Source	Budget Description	Amount
Output 1: Municipal biomass heating and fuel supply markets established Baseline: Isolated demo projects undertaken. Indicators: * Number of installed heating systems * MWth installed capacity * Heat energy provided from straw-fired boilers for municipal heating annually * Number of leased fuel supply systems * Fuel supply capacity * Jobs created Targets: Targets (year 1) Heating systems: 30 Leased fuel supply: 30 Heat provided: 70 TJ Jobs created: 120	1. 130 heating systems in public buildings installed (1.1)		X	X	X	UNDP	EC UNDP	Heating Systems Technical assistance	€0.41 million €0.07 million
	2. Fuel cycle facilitated through leasing/hire-purchase mechanism for local fuel suppliers (1.2)		X	X	X	Implementing partner, UNDP	EC UNDP	Fuel supply systems Technical assistance	€0.15 million €0.02 million
	3. Market environment enhanced to support quality, efficiency and effectiveness (1.3)		X	X	X	UNDP	EC UNDP	Technical assistance	€0.016 million

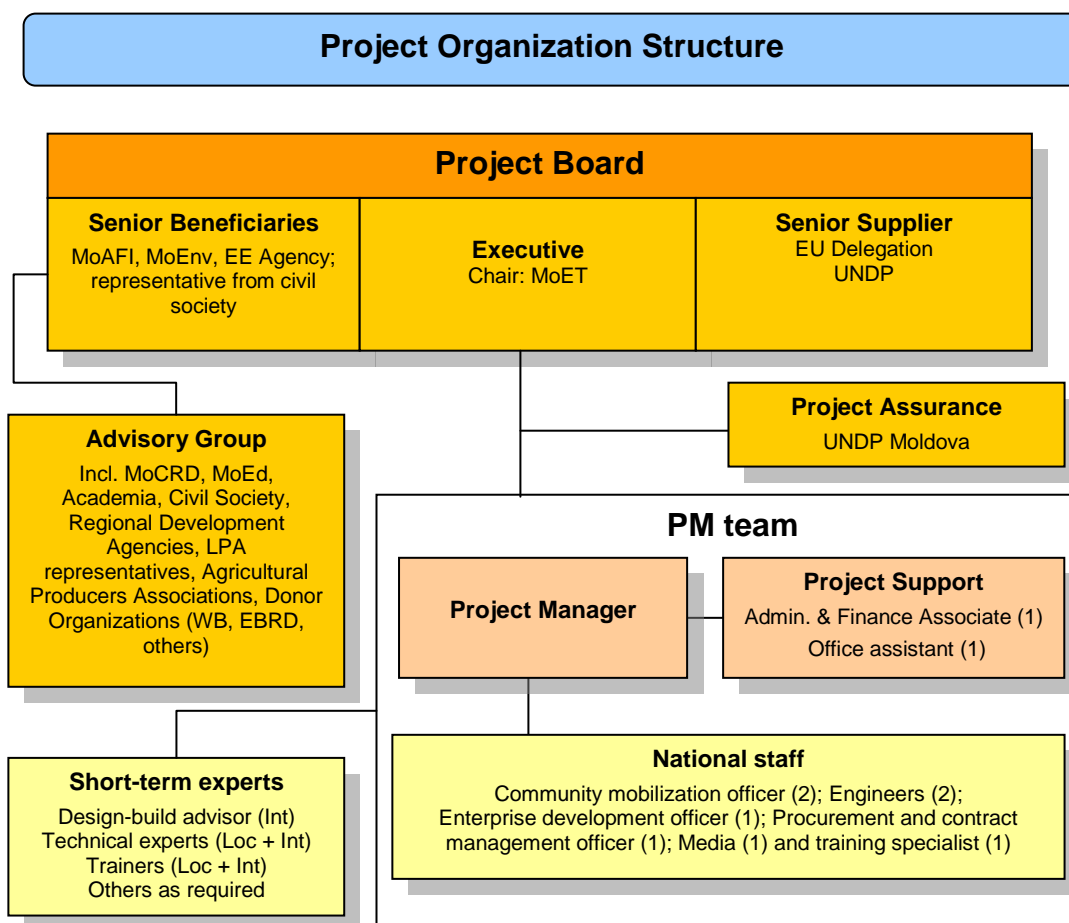
EXPECTED OUTPUTS <i>And baseline, indicators including annual targets</i>	PLANNED ACTIVITIES <i>List activity results and associated actions</i>	TIMEFRAME				RESPONSIBLE PARTY	PLANNED BUDGET		
		Q1	Q2	Q3	Q4		Funding Source	Budget Description	Amount
<p>Output 2: Foundations laid for establishment of efficient household heating, industrial cogeneration and biomass briquetting markets</p> <p>Baseline: No improved heating systems locally produced, no biomass cogeneration, limited briquette production</p> <p>Indicators: * Annual increase of 50% in requests for information * Deployment of at least 500 domestic systems on a semi-commercial basis * Installation of at least one co-generation plant * Successful operation of commercial briquette production enterprise * Jobs created</p> <p>Targets (year 1) Information requests: baseline Domestic systems: 0 Cogeneration plant: 0 Briquetting plant: 0 Jobs created: 10</p>	<p>1. Market solutions for high efficiency affordable rural biomass household heating identified and piloted (2.1)</p>		X	X	X	UNDP	EC UNDP	<p><i>Technical assistance</i></p> <p><i>Equipment</i></p>	<p>€30,000</p> <p>€120,000</p>
	<p>2. Industrial cogeneration using biomass fuel demonstrated (2.2)</p>		-	X	X	UNDP	EC UNDP	<i>Technical assistance</i>	€17,000
	<p>3. Market solutions for briquetting piloted (2.3)</p>		-	X	X	UNDP	EC UNDP	<i>Technical assistance</i>	€12,000

EXPECTED OUTPUTS <i>And baseline, indicators including annual targets</i>	PLANNED ACTIVITIES <i>List activity results and associated actions</i>	TIMEFRAME				RESPONSIBLE PARTY	PLANNED BUDGET		
		Q1	Q2	Q3	Q4		Funding Source	Budget Description	Amount
Output 3: Capacity built for growth of biomass markets at regional and local levels Baseline: zero (relative) Indicators: * Number of municipal leaders trained * Number of fuel suppliers trained * Number of children participating in awareness activities Targets: Municipal leaders: 30 Fuel suppliers: 30 Children: 300	1. Capacity of municipal leaders to manage biomass systems enhanced (3.1)		X			UNDP	EC UNDP	<i>Technical assistance</i>	€14,000
	2. Training materials developed for sound operation of straw-fired boilers (3.2)		X			UNDP	EC UNDP	<i>Technical assistance</i>	€12,000
	3. Training materials developed for commercial fuel suppliers (3.3)		X			UNDP	EC UNDP	<i>Technical assistance</i>	€12,000
	4. Community understanding and acceptance of biomass energy enhanced through school educational program (3.4)		X	X	X	UNDP	EC UNDP	<i>Technical assistance</i>	€30,000

EXPECTED OUTPUTS <i>And baseline, indicators including annual targets</i>	PLANNED ACTIVITIES <i>List activity results and associated actions</i>	TIMEFRAME				RESPONSIBLE PARTY	PLANNED BUDGET		
		Q1	Q2	Q3	Q4		Funding Source	Budget Description	Amount
Output 4: Opportunities and benefits of biomass energy for Moldova are well known, visibility of project results is promoted Baseline: zero (relative) Indicators: * Enquiries to the PMT increasing by 50% annually * Media references to project in positive light increase 50% annually * Evaluation surveys show that the awards are valued and indicate positive intention to take actions * Media references to awards increase 50% annually Targets: Enquiries to PMT: baseline Media references: baseline Surveys: 90% high / v. high Media reference: baseline	1. Media campaign (4.1)		X	X	X	UNDP	EC UNDP	<i>Technical assistance</i>	€36,000
	2. Annual national awards (4.2)			X	X	UNDP	EC UNDP	<i>Technical assistance</i>	€50,000
	3. Communication and visibility (4.3)	X	X	X	X	UNDP	EC UNDP	<i>Technical assistance</i>	€16,000
Project management		X	X	X	X	UNDP	EC UNDP	<i>Technical assistance</i> <i>Equipment/ supplies</i>	€270,000 €60,000
TOTAL									

V. MANAGEMENT ARRANGEMENTS

Project management arrangements are shown in the diagram below:



A *Project Board* (PB) will manage the Project at the highest level. The project Board will have 7 members, made up of one representative of each of the following ministries: Ministry of Economy (Senior Executive and chairing the PB), Ministry of Agriculture and Food Industry; Ministry of Environment; one representative from UNDP, one representative on behalf of the primary donor (the EU Delegation to Moldova), and one representatives of civil society (actively engaged in energy efficiency initiatives and/or environment protection in Moldova).⁵ The Project Board will meet regularly, on a quarterly basis, during the course of the Project.

The Project Board is the group responsible for making management decisions for a project when guidance is required by the Project Manager, including recommendation for UNDP/Implementing Partner approval of project plans and revisions. In order to ensure UNDP's ultimate accountability, Project Board decisions should be made in accordance to standards that shall ensure best value to money, fairness, integrity transparency and effective international competition. Project reviews by this group are made at designated decision points during the running of a project or as necessary when raised by the Project Manager. This group is consulted by the Project Manager for decisions when PM tolerances (normally in terms of time and budget) have been exceeded.

Based on the approved annual work plan (AWP), the Project Board may review and approve project quarterly plans when required and authorizes any major deviation from these agreed quarterly plans. It is the authority that signs off the completion of each quarterly plan as well as authorizes the start of the next quarterly plan. It ensures that required resources are committed

⁵ In order to avoid any conflict of interest, the civil society representatives on the Project Board will be ineligible to serve also as sub-contractors in any aspect of Project implementation.

and arbitrates on any conflicts within the project or negotiates a solution to any problems between the project and external bodies. In addition, it approves the appointment and responsibilities of the Project Manager and any delegation of its Project Assurance responsibilities. Formal minutes shall be prepared and adopted for each meeting of the Board, detailing any proposals made and decisions taken.

The Project will be implemented by the UNDP and recruitment and procurement will be according to UNDP rules and procedures. As such, UNDP will bear the overall accountability for delivering the project in accordance with its applicable regulations, rules, policies and procedures (<http://content.undp.org/go/userguide/results>).

A *Project Management Team* (PMT) will be established, and staffed with a project manager, a team of project officers in the fields of procurement and contract management, community mobilization, enterprise development, engineering, and media and training. The PMT will ensure results-based project management and successful implementation of the project within 48 months, close monitoring and evaluation of project progress, observance of procedures, transparency and efficient use of funds, quality of works, and involvement of local and regional stakeholders and beneficiary communities in the decision-making processes. The project manager should have an engineering background, and have a successful track record of implementing local community development projects, preferably with experience in biomass energy in Moldova. Consultants will be hired as needed for specialist short-term assignments from local and international sources including neighbouring countries such as Ukraine and Romania.

An *Advisory Group* will be established to facilitate effective and quality implementation and coordination of the project. It will be made up of the UNDP, the EC delegation, technical specialists representing the other project board members, representatives of the Ministry of Education and Ministry of Construction and Regional Development, Academia, civil society, agricultural producers associations, Regional Development Agencies and representatives of district councils and Local Public Authorities, representatives of donors active in the sector, and other relevant programs such as the Sustainable Energy Financing Facility of the EBRD. The advisory group composition can be amended and technical sub-groups can be established as required and will meet if required on a quarterly basis usually before the quarterly meeting of the Project Board.

Project Assurance is the responsibility of each Project Board member, however the role can be delegated. The Project Assurance role supports the Project Board by carrying out objective and independent project oversight and monitoring functions. This role ensures appropriate project management milestones are managed and completed. On behalf of UNDP, the function is delegated to a UNDP Portfolio Manager. Specific 'Assurance' tasks are to:

- ◆ Ensure that funds are made available to the project;
- ◆ Ensure that risks and issues are properly managed and monitored, and that the logs are regularly updated;
- ◆ Ensure that Project Progress/Financial Reports are prepared and submitted on time, and according to standards in terms of format and content quality and submitted to the Project Board;

MONITORING FRAMEWORK AND EVALUATION

In accordance with the programming policies and procedures outlined in the UNDP User Guide, the project will be monitored through the following:

Within the annual cycle

- On a quarterly basis, a quality assessment shall record progress towards the completion of key results, based on quality criteria and methods captured in the Quality Management table below.
- An Issue Log shall be activated in Atlas and updated by the Project Manager to facilitate tracking and resolution of potential problems or requests for change.
- Based on the initial risk analysis submitted (see annex E), a risk log shall be activated in Atlas and regularly updated by reviewing the external environment that may affect the project implementation.
- Based on the above information recorded in Atlas, a Project Progress Reports (PPR) shall be submitted by the Project Manager to the Project Board through Project Assurance, using the standard report format available in the Executive Snapshot.
- A project Lesson-learned log shall be activated and regularly updated to ensure on-going learning and adaptation within the organization, and to facilitate the preparation of the Lessons-learned Report at the end of the project
- A Monitoring Schedule Plan shall be activated in Atlas and updated to track key management actions/events

Annually

- **Annual Review Report.** An Annual Review Report shall be prepared by the Project Manager and shared with the Project Board. As minimum requirement, the Annual Review Report shall consist of the Atlas standard format for the QPR covering the whole year with updated information for each above element of the QPR as well as a summary of results achieved against pre-defined annual targets at the output level.
- **Annual Project Review.** Based on the above report, an annual project review shall be conducted during the fourth quarter of the year or soon after, to assess the performance of the project and appraise the Annual Work Plan (AWP) for the following year. In the last year, this review will be a final assessment. This review is driven by the Project Board and may involve other stakeholders as required. It shall focus on the extent to which progress is being made towards outputs, and that these remain aligned to appropriate outcomes.

Project Evaluation

- Prior to the completion of the project one final independent project evaluation will be carried out.

Quality Management for Project Activity Results

The quality criteria will be reviewed and further refined if necessary by the end of the project inception phase.

OUTPUT 1:

OUTPUT 1: Municipal biomass heating and fuel supply markets established
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Activity Result 1 (Atlas Activity ID)	130 heating systems in public buildings installed (1.1)	Start Date: Month 3 End Date: Month 48
Purpose	To improve municipal heating of public buildings in rural areas	
Description	130 thermal heating systems primarily burning straw will be installed totalling about 35 MW _{th} (average installed capacity of approx. 300 kW _{th}) for the provision of heating for public buildings in rural communities in Moldova	
Quality Criteria <i>how/with what indicators the quality of the activity result will be measured?</i>	Quality Method <i>Means of verification. what method will be used to determine if quality criteria has been met?</i>	Date of Assessment <i>When will the assessment of quality be performed?</i>
Number of installed heating systems	System commissioning records	Quarterly
MW _{th} installed capacity	System commissioning records	Quarterly
Heat energy provided from straw-fired boilers for municipal heating	Annual reports from installations of heat provided, checked using random sampling of installations	Annually
Jobs created	Annual reports from installations reporting on the number of people working on supporting the boiler houses.	Annually

OUTPUT 1: Municipal biomass heating and fuel supply markets established		
Activity Result 2 (Atlas Activity ID)	Fuel cycle facilitated through leasing/hire-purchase mechanism for local fuel suppliers (1.2)	Start Date: Month 3 End Date: Month 48
Purpose	To support the development of a private sector market for contractors wishing to act as fuel suppliers to the heating plants installed under Activity 1.1	
Description	Straw handling equipment such as balers, trailers and bale handling tractors will be provided using lease-finance models that have been already developed and well-tested in Moldova for example by the organisation 2KR	
Quality Criteria <i>how/with what indicators the quality of the activity result will be measured?</i>	Quality Method <i>Means of verification. what method will be used to determine if quality criteria has been met?</i>	Date of Assessment <i>When will the assessment of quality be performed?</i>
Number of leased fuel supply systems	Lease agreements, maintenance records	Quarterly
Fuel supply capacity	Lease agreements, maintenance records	Quarterly
Jobs created	Annual reporting according to lease agreements	Annually

OUTPUT 1: Municipal biomass heating and fuel supply markets established		
Activity Result 3 (Atlas Activity ID)	Market environment enhanced to support quality, efficiency and effectiveness (1.3)	Start Date: Month 3 End Date: Month 48
Purpose	To address policy, legislation and bylaw development to facilitate the local biomass markets	
Description	Regular meetings with relevant government stakeholders to address key factors and adopt best EU practice, and small studies as required to identify best practice for other factors	

Quality Criteria <i>how/with what indicators the quality of the activity result will be measured?</i>	Quality Method <i>Means of verification. what method will be used to determine if quality criteria has been met?</i>	Date of Assessment <i>When will the assessment of quality be performed?</i>
Progress in addressing barriers as evaluated by the project board	The project board will assess at their quarterly meetings the value and progress from the small studies and dialogue under this activity	Quarterly

OUTPUT 2:

OUTPUT 2: Foundations laid for establishment of efficient household heating, industrial cogeneration and biomass briquetting markets		
Activity Result 4 (Atlas Activity ID)	Market solutions for high efficiency affordable rural biomass household heating identified and piloted (2.1)	Start Date: Month 3 End Date: Month 48
Purpose	To stimulate the market for high efficiency biomass heating systems suitable for rural areas with a target of 500 energy efficient domestic rural heating systems installed by the end of the project.	
Description	Following a classic commercial market creation / market barrier model consisting of four key interrelated components, this project will seek to kick-start commercial markets: a) information, knowledge and outreach, b) strategic partnerships and alliances, c) infrastructure support, d) market stimulation	
Quality Criteria <i>how/with what indicators the quality of the activity result will be measured?</i>	Quality Method <i>Means of verification. what method will be used to determine if quality criteria has been met?</i>	Date of Assessment <i>When will the assessment of quality be performed?</i>
Annual increase of 50% in requests for information	Impact logs maintained at the PMT	Annually, with quarterly progress review
Deployment of at least 500 domestic systems on a semi-commercial basis	Data from market stimulation agreements and verification reports	Annually
Jobs created	Data from grant agreements	Annually

OUTPUT 2: Foundations laid for establishment of efficient household heating, industrial cogeneration and biomass briquetting markets		
Activity Result 5 (Atlas Activity ID)	Industrial cogeneration using biomass fuel demonstrated (2.2)	Start Date: Month 24 End Date: Month 48
Purpose	To support the development and implementation at least one CHP unit using biomass as a by-product of an agri-industrial process.	
Description	The activity comprises formation of strategic partnerships, analysis and strategy development, and strategy implementation.	
Quality Criteria <i>how/with what indicators the quality of the activity result will be measured?</i>	Quality Method <i>Means of verification. what method will be used to determine if quality criteria has been met?</i>	Date of Assessment <i>When will the assessment of quality be performed?</i>
Installation of at least one co-generation plant	Commissioning report, annual monitoring data	Annually
Jobs created	Data from grant agreements	Annually

OUTPUT 2: Foundations laid for establishment of efficient household heating, industrial cogeneration and biomass briquetting markets		
Activity Result 6 (Atlas Activity ID)	Market solutions for briquetting piloted (2.3)	Start Date: Month 12 End Date: Month 48
Purpose	To support the creation of at least one commercial briquette business of approximately 1000t per year using biomass derived from agricultural wastes or from by-product(s) of an agri-industrial process.	
Description	Activities will review existing experience in Moldova, analyse production potential, test market acceptance and willingness to pay, and development	

	and implementation of a deployment strategy	
Quality Criteria <i>how/with what indicators the quality of the activity result will be measured?</i>	Quality Method <i>Means of verification. what method will be used to determine if quality criteria has been met?</i>	Date of Assessment <i>When will the assessment of quality be performed?</i>
Successful operation of commercial briquette production enterprise	Annual sales figures provided by company under support agreement.	Annually
Jobs created	Data from grant agreements	Annually

OUTPUT 3:

OUTPUT 3: Capacity built for growth of biomass markets at regional and local levels		
Activity Result 7 (Atlas Activity ID)	Capacity of municipal leaders to manage biomass systems enhanced (3.1)	Start Date: Month 3 End Date: Month 48
Purpose	To build the capacity of municipal leaders including mayors, local councilors, and civil servants such as teachers need information in how to manage the operation of straw-burning boilers in their local authorities.	
Description	Training material will be developed for use within Outputs 1 and 2. At least annually the materials will be improved building on lessons learned.	
Quality Criteria <i>how/with what indicators the quality of the activity result will be measured?</i>	Quality Method <i>Means of verification. what method will be used to determine if quality criteria has been met?</i>	Date of Assessment <i>When will the assessment of quality be performed?</i>
Number of municipal leaders trained	Attendance forms	During each capacity building event

OUTPUT 3: Capacity built for growth of biomass markets at regional and local levels		
Activity Result 8 (Atlas Activity ID)	Training materials developed for sound operation of straw-fired boilers (3.2)	Start Date: Month 3 End Date: Month 48
Purpose	To supplement the training to be given by design-build firms, and provide a permanent, generic resource on the operation and maintenance of straw-fired boilers for use by municipal leaders when hiring new operators in future years..	
Description	Training material will be developed for dissemination through activities under Output 1.	
Quality Criteria <i>how/with what indicators the quality of the activity result will be measured?</i>	Quality Method <i>Means of verification. what method will be used to determine if quality criteria has been met?</i>	Date of Assessment <i>When will the assessment of quality be performed?</i>
Positive feedback from municipal leaders (who will use their materials to inform their dealings with operators) during training events	Feedback forms	During each capacity building event

OUTPUT 3: Capacity built for growth of biomass markets at regional and local levels
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Activity Result 9 (Atlas Activity ID)	Training materials developed for commercial fuel suppliers (3.3)	Start Date: Month 3 End Date: Month 48
Purpose	To enhance the knowledge and capacity of commercial fuel suppliers..	
Description	Training material and business plan templates will be developed and made available on a self-study basis through the implementing partner in delivery of activity 1.2, and UNDP project staff in their interactions with potential private sector fuel suppliers.	
Quality Criteria <i>how/with what indicators the quality of the activity result will be measured?</i>	Quality Method <i>Means of verification. what method will be used to determine if quality criteria has been met?</i>	Date of Assessment <i>When will the assessment of quality be performed?</i>
Number of fuel suppliers trained	Impact log / event records to be maintained by the implementing partner taking the form of enquiries, requests for help, and stories of change	To be recorded in day-to-day activities of the implementing partner in delivery of Activity 1.2.

OUTPUT 3: Capacity built for growth of biomass markets at regional and local levels		
Activity Result 10 (Atlas Activity ID)	Community understanding and acceptance of biomass energy enhanced through school educational program (3.4)	Start Date: Month 3 End Date: Month 48
Purpose	To bring about a change in attitudes to biomass energy in Moldova through an educational program in schools where straw-fired boilers are installed.	
Description	In co-operation with a local partner, potentially in cooperation with the international "SPARE" programme, an educational initiative on energy and environment for children of age 10-15, high-quality educational and methodical materials with practical tasks will be created / adapted to support the introduction of straw-fired boilers, and made available as a resource to teachers in Moldova. Teacher training and support will also be included and offered in schools where straw-fired boilers will be introduced.	
Quality Criteria <i>how/with what indicators the quality of the activity result will be measured?</i>	Quality Method <i>Means of verification. what method will be used to determine if quality criteria has been met?</i>	Date of Assessment <i>When will the assessment of quality be performed?</i>
Number of children participating in awareness activities	School attendance figures, participants in school projects	Ongoing within the framework of teacher and pupil interactions of the partner organization

OUTPUT 4:

OUTPUT 4: The opportunities and benefits of biomass energy for Moldova are well known, and visibility of project results promoted		
Activity Result 11 (Atlas Activity ID)	Media campaign (4.1)	Start Date: Month 3 End Date: Month 48
Purpose	To raise awareness on the potential and benefits of renewable energy in Moldova; provide information quickly and efficiently to national and local press, TV, radio and other relevant information sources	
Description	A media strategy, in coordination with UNDP / EC media offices will be	

	developed. Regular press releases and media briefings will be made throughout the course of the project	
Quality Criteria <i>how/with what indicators the quality of the activity result will be measured?</i>	Quality Method <i>Means of verification. what method will be used to determine if quality criteria has been met?</i>	Date of Assessment <i>When will the assessment of quality be performed?</i>
Enquiries to the PMT increasing by 50% annually	Enquiries log	Log maintained continually, impacts reported quarterly
Media references to project objective in positive light increase 50% annually	Media log	Log maintained continually, impacts reported quarterly

OUTPUT 4: The opportunities and benefits of biomass energy for Moldova are well known, and visibility of project results promoted		
Activity Result 11 (Atlas Activity ID)	Annual national awards (4.2)	Start Date: Month 6 End Date: Month 48
Purpose	To act as a focal point for awareness raising activities	
Description	An award ceremony will operate for 4 years under the program (end of year 1, 2 and 3, and 4) but should be created as an ongoing renewable energy and energy efficiency award event with external sponsors, and high-level patronage.	
Quality Criteria <i>how/with what indicators the quality of the activity result will be measured?</i>	Quality Method <i>Means of verification. what method will be used to determine if quality criteria has been met?</i>	Date of Assessment <i>When will the assessment of quality be performed?</i>
Evaluation surveys show that the awards are valued and indicate positive intention to take actions	Event evaluation surveys (exit surveys)	During each award event
Media references to awards increase 50% annually	Media log	Log maintained continually, impacts reported quarterly

OUTPUT 4: The opportunities and benefits of biomass energy for Moldova are well known, and visibility of project results promoted		
Activity Result 11 (Atlas Activity ID)	Communication and visibility of project results (4.3)	Start Date: Month 3 End Date: Month 48
Purpose	Continuous communication and promotion of visibility of project impacts and partnership results in line with the Joint Visibility Guidelines for EC-UN Actions in the Field; provide information on the project progress quickly and efficiently to national and local press, TV, radio and other relevant information sources	
Description	A communication and visibility plan will be elaborated and agreed between the EUD and UNDP in promotion of the visibility of project results and positive impacts of the partnership. Regular visibility actions will be implemented throughout the course of the project.	
Quality Criteria <i>how/with what indicators the quality of the activity result will be measured?</i>	Quality Method <i>Means of verification. what method will be used to determine if quality criteria has been met?</i>	Date of Assessment <i>When will the assessment of quality be performed?</i>

Media references to project impacts in positive light increase 50% annually	Media log	Log maintained continually, impacts reported quarterly
Perception of project achievements, recognition (tbd)	Telephone survey	annually

VI. LEGAL CONTEXT

This project document shall be the instrument referred to as such in Article 1 of the SBAA between the Government of the Republic of Moldova and UNDP, signed on by the parties on 2 October 1992. The host country executing agency shall, for the purpose of the Standard Basic Assistance Agreement, refer to the government cooperating agency described in that Agreement.

Consistent with the Article III of the Standard Basic Assistance Agreement, the responsibility for the safety and security of the executing agency and its personnel and property, and of UNDP's property in the executing agency's custody, rests with the executing agency.

The executing agency shall:

- a) put in place an appropriate security plan and maintain the security plan, taking into account the security situation in the country where the project is being carried;
- b) assume all risks and liabilities related to the executing agency's security, and the full implementation of the security plan.

UNDP reserves the right to verify whether such a plan is in place, and to suggest modifications to the plan when necessary. Failure to maintain and implement an appropriate security plan as required hereunder shall be deemed a breach of this agreement.

The executing agency agrees to undertake all reasonable efforts to ensure that none of the UNDP funds received pursuant to the Project Document are used to provide support to individuals or entities associated with terrorism and that the recipients of any amounts provided by UNDP hereunder do not appear on the list maintained by the Security Council Committee established pursuant to resolution 1267 (1999).

The list can be accessed via <http://www.un.org/Docs/sc/committees/1267/1267ListEng.htm>. This provision must be included in all sub-contracts or sub-agreements entered into under this Project Document.

VII. ANNEXES

Annex A – [CM@Risk](#) summary

Construction Management at Risk

Construction management at risk (CM@Risk) approaches involve a construction manager who takes on the risk of building a project. The architect is hired under a separate contract. The construction manager oversees project management and building technology issues, in which a construction manager typically has particular background and expertise. Such management services may include advice on the time and cost consequences of design and construction decisions, scheduling, cost control, coordination of construction contract negotiations and awards, timely purchasing of critical materials and long-lead-time items, and coordination of construction activities.

In CM@Risk the construction entity, after providing preconstruction services during the design phase, takes on the financial obligation for construction under a specified cost agreement. The construction manager frequently provides a guaranteed maximum price (GMP). CM@Risk is sometimes referred to as CM/GC because the construction entity becomes a general contractor (GC) through the at-risk agreement. The 'risk' is primarily based on the fact that the construction manager holds the trade contracts and takes the performance risk.

The following defining characteristics identify CM@Risk:

- Three prime players—owner, designer, CM@Risk
- Two separate contracts—owner to designer, owner to CM@Risk
- Final provider selection based on aspects other than total cost

Typical characteristics of the CM@Risk approach include the following:

- Overlapping phases—design and build (fast track)
- Hiring of the construction manager during the design phase
- Preconstruction services offered by the constructor (such as constructability review, bid climate development and bid management)
- Specific contractual arrangement determines the roles of players
- Clear quality standards produced by the contract's prescriptive specifications

Adapted from: *Primer on Project Delivery*, published by The American Institute of Architects and The Associated General Contractors of America, 2004.

Annex B - Draft Selection Criteria to be applied under Activity 1.1

Suggested categories for Pre-qualification Request (PQR) selection:

- **Insurance and statutory requirements:** the members of the consortium must show evidence of compliance with all statutory requirements for undertaking work in Moldova of the nature required and general liability and professional liability insurance to cover the work. (pass/fail criteria)
- **Experience of consortium working together:** frequently the designer and contractor have worked together in design-build or traditional projects, and this part history can be useful to show that members have a confidence in each other that has led to teaming up again. This may be considered a positive aspect in the short-listing process, compared to a designer and contractor that have not worked together in the past.
- **Design-Build experience:** this criterion considers whether the members have prior experience of working on design-build experience. (Based on discussions in Moldova, it is apparent that there are local contractor companies have design-build experience. The same is likely the case for EU-based contractors).
- **Similar type of work experience:** experience should clearly demonstrate that the consortium has performed construction of the same type, scope and complexity as the advertised project.
- **Current workload:** indications of the current workload of the consortium members should give an idea of whether the members will be able to deliver on the project requirements.
- **Time delays on past projects:** timely completion of past projects should receive a high emphasis. Consortia and members who have demonstrated the ability to finish jobs on time when they have encountered conditions differing from those represented in the plans should be given greater consideration.
- **Experience of key personnel assigned to the project:** the experience of key personnel proposed by the consortium to be in charge of the day to day work on the project. This includes the key people in charge of construction, design, inspection, and testing.
- **Safety and environmental record:** the consortium's performance in safety, fire safety, labour security during construction is to be considered, as well as their environmental record.
- **Consortium's organisation, resources and location:** members of the consortium should be evaluated for ability to do the job; the location of the members should be considered for their ability to work together cohesively as a team, and their experience with working with local government, permit and regulatory agencies, and community groups.
- **Local support and local development impact:** the design-build team's strategy to ensure local impacts on sustainable development, entrepreneurial development and job creation (extent of local manufacturing) and availability of ongoing local technical support following the installation.

- **Project understanding:** the design-build team's knowledge and understanding of specific project issues and concerns.

The Selection Committee may take many approaches to reach a short list. The short list should be a list with the preferred ranking. A scoring matrix will be developed by the Selection Committee to identify the categories and the associated weighted averages for the scoring system. The list should also have a narrative comment summary of strengths and/or weaknesses as identified by the Committee of each DB Entity. The evaluation categories and scoring weighted averages (scoring matrix) will be developed and identified prior to distribution of the RFQ/P.

Suggested categories for Request for Proposals (RFP) selection:

The "pass/fail factors" in the RFP are generally the same as in the PQR, although the information requested will differ in certain respects, including legal, financial, and the details of the proposal.

The quality factors in the RFP might include:

- Management (includes proposed schedule, quality plan, safety plan, organization, key personnel qualifications, design and construction management, etc.);
- Technical (technical solution, structures, fuel requirements and tolerance, emissions, etc.). The detail required on technical specifications should be consistent with the risk assessment for each part of the offer. Prescriptive specifications included in the RFP, are usually only appropriate where project components must interface with existing systems, and the technical evaluation should assess how the offer matches with these necessary specifications; and
- Project support (may include public information/community relations, service offering, guarantees etc.).

Based on the evaluation of the quality factors a technical score will be applied to each proposal. The selection committee will open the sealed price proposals of those technically qualified.

The primary difference between the evaluation of the PQR and the RFP is that the evaluation criteria for the RFP also includes price. The relative importance of price and quality should be carefully defined, with the expectation that they are of equal importance.

It is not expected that the RFP evaluation will reassess factors already evaluated in the PQR.

Suggested categories for selection of districts for community mobilization

Target districts will be selected based on criteria such as:

- Institutional capacity to mobilize local human and financial resources
- Potential for fuel availability
- Heat demand
- Need and opportunity: communities/districts affected by the floods will be prioritised where practicable, i.e. specifically where re-construction works are ongoing and the project can support the rehabilitation of communities etc.

During the first year it should be noted that it is primarily important to demonstrate success. During subsequent years more complex projects, in poorer communities, will be selected.

Suggested categories for selection of communities

Community projects will be evaluated according to criteria such as:

- Community institutional capacity to mobilize local human and financial resources
- Technical feasibility of facilities proposed for switching to biomass heating
- Energy audit of the buildings to be heated to identify demand and potential low cost energy efficiency investments that would be required before installation of a biomass heating system, and condition and suitability of heat distribution system
- Community's capacity to provide necessary biomass fuel, provision for dry storage of fuel (one week reserve) in the area close to the project public facility including access for deliveries, and another (full season capacity) dry store facility near to the village, and mechanism for transferring fuel from store to boiler
- Environmental evaluation and fire security assessment by the relevant authorities;
- Project cost estimation and economical evaluation, including identification of costs works that will be carried out by the community
- Community operational capacity and sustainability, and needs for training;

During the first year it should be noted that it is primarily important to demonstrate success. During subsequent years more complex projects, in poorer communities, will be selected.

The suggested categories for selection of districts and communities will be reviewed, refined and agreed by the Project Board during the inception phase.

Confidentiality and Conflict of Interest

Critical to the validity of the selection process for both the PQR and RFP, is the absolute necessity for confidentiality and avoidance of conflict of interest. Each participant in the evaluation process for either the PQR or RFP will be required to sign a "Confidentiality and Non-Disclosure Agreement" and a "No Conflict of Interest Statement".

Overview of evaluation processes

Selection type	Purpose / participants	Participants	Frequency	Delivering	Responsible for evaluation
Pre-qualification request (PQR)	Develop a shortlist design-build consortia	Companies	Annually, or less frequently	A short list of pre-qualifying consortia	Selection committee 1
Request for proposals (RFP)	Select a design-build consortium	Short listed consortia	As required	A contract with a winning consortium	Selection committee 1
Ranking of districts	Select locations where community mobilization / training takes place	PMT	Annually, or less frequently	A ranked list of districts	Project board
Expressions of Interest (EOI)	Identify possible locations for investment proposals	Communities in mobilized districts	As required	Screened applications; and ranking of passing EOIs	Selection committee 2
Project appraisal	Rank and select investments for RFP	Communities and mobilized districts	As required	Data for RFP	Communities with decision made by selection committee 2

Annex C: Overview of possible operation of lease-hire financing for fuel supply equipment

A lease-hire financing system for fuel supply could potentially work as follows:

Bailing and handling equipment may cost €25,000.

Lease-hire company bulk-buys, for example, 20 units = €500,000

They lease it to a farmer / entrepreneur over a 4-year contract, with 25% upfront payment, and 25% in each subsequent year, collateralised by the equipment, and a 1.5% management charge and 1% insurance charge (total 2.5%).

Item	Amount
Amount of credit	€25,000.00
Duration of the agreement	4 years
Total amount payable	€26,581.79
First payment (upfront)	€6,645.45
Second, third and final annual payments	€6,645.45
Interest paid	€1581.79
Of which,	
... on insurance	€638
... on management fees	€944

Repayment of capital for all 20 units (assuming they were all leased at the same time) would be €100,000 per year, meaning, in simple terms, that an additional approx. 4 units could be leased each year.

The supply terms are likely to include CASCO insurance (1% of loan), servicing and parts, consumables (bale twine supply), training and programme management (1.5%).

Annex D: Order of magnitude calculation of heating system costs for an average boiler of 300kWth

Estimated average budget for thermal energy generation for a biomass heating system in rural locations with an average capacity of 300kWth with 3 scenarios for the magnitude of community contributions			
Number of Units	130	130	130
Local contribution	15%	10%	7%
	Budget (EUR)	Budget (EUR)	Budget (EUR)
Heating System (300kWth)			
Land & building preparations	5,000	5,000	5,000
Foundations	8,000	8,000	8,000
Boiler	35,000	35,000	35,000
Installation	16,000	16,000	16,000
Design	6,000	6,000	6,000
Management	6,000	6,000	6,000
Total	€ 71,000	€ 71,000	€ 71,000
Local contribution (% of total)	10,650	7,100	4,970
Grant requirement per unit	€ 60,350	€ 63,900	€ 66,030
Grant requirement for project	€ 7,845,500	€ 8,307,000	€ 8,583,900

Annex E - Risk Analysis

Description of risk	Type and Category	Risk management actions
Ongoing support from the national government for renewable energy	Political / Low	Given the obvious economic and social advantages of the energetic use of waste wheat straw, and the budget support from the EC in renewable energy this risk is small. Activity 1.3 and the awareness-raising activities under output 4 will both contribute to ongoing national support.
Local municipalities show limited enthusiasm to adopt straw-fired heating	Political / Low	Given the increasing cost of natural gas, and coal and current experiences in the use of straw for heating, meaning cost savings of between 50 and 70%, this risk is low. The participatory approach used for activity 1.1, coupled with capacity building and awareness raising under outputs 3 and 4 serve to reduce this risk.
Natural gas and coal prices fall, equipment costs rise, or fuel supply costs	Economic / Low	The price differential is large at present so, as far as operating costs are concerned, wheat straw is likely to maintain its cost advantage even with a medium level of straw price inflation. Project efforts to create competitive markets for fuel supply under activity 1.2 mitigate this risk. The existence of Moldovan and several foreign producers of equipment 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.
Weather risks affect the availability of straw	Economic / Low	Since the straw requirements represent only around 4 to 6% of the normal national availability, this is a low risk. Use of furnaces under activity 1.1 that can also burn other agricultural residues further mitigates this risk.
Political instability may affect the efficiency of the project implementation with respect to cooperation with municipalities, and a supportive policy environment for renewables	Political/Medium	The programme is designed as a flexible framework to be able to cope with possible challenges being able to quickly adjust and provide the best support for relevant counterparts. Moreover the programme is designed and envisaged to be implemented in a highly participatory manner engaging all stakeholders from the beginning.
High level of corruption could undermine sustainability of outputs.	Political/Medium	The project will support local governments to ensure full transparency and accountability during the design and implementation of procurement processes.
Lack of culture of participation	Operational / Medium	The project will use best practices and lessons learned to show tangible benefits for communities from other similar contexts, and will be working on changing the attitudes and behavior of

		local councillors and staff towards citizens as well as will empower communities, CSOs and citizens to fully participate in all local development processes.
Local capacities for delivery and financial operations.	Operational / Medium	The UNDP will address these risks by providing on-going training, coaching and mentoring to beneficiaries.
Negative impacts from the use of straw for heating	Environmental / Low	Only a small proportion of the available straw will be used by the project boilers. Analysis will be carried out under Activity 1.3 to assess possible impacts with further growth of the use of straw, and develop limits / best practices, as required.

Annex F - Draft Terms of Reference for Key Project Staff

Core project team

Project Manager
Procurement and Contract Management Officer
Administration and Finance Associate

Community Mobilization/Support Officer (1 in the beginning, 2 as of year 2)
Engineer/Biomass Expert (1-2)
Enterprise Development Officer (as of year 2)
Media specialist (1)
Training and Education Expert (1)

Office Assistant
Driver/Clerk (1 in the beginning, 2 as of year 2)

Short term experts

Design-build advisor (1)
Press/media specialist
Technical experts on biomass technologies
Trainers

The roles of the Key Project Staff in the various project activities are shown in the table below. This is followed by draft ToR for the various positions. Detailed Terms of Reference for project staff and consultants will be finalized and published during the inception phase of the project.

Activity	Position								
	Community mobilisation specialist (x2)	Engineer (x2)	Enterprise development specialist (x1)	Procurement specialist (x1)	Media specialist (x1)	Training and education specialist (x1)	Design-build advisor (international; x1)	Press/media specialist (local; x1)	Technical experts (local and international)
Activity 1.1: 130 heating systems in public buildings installed	sub-activities e., f., g., h., i., j., k., q.	sub-activities b., c., d., k., l., m., n., o., q., r.		sub-activities a., b., c., d., l., m., n., o., q.		sub-activities p., q.	sub-activities a., b., c., d., l., m., n., o., q.		sub-activity k., q.
Activity 1.2: Fuel cycle facilitated through leasing/hire-purchase mechanism for local fuel suppliers		sub-activities b., d.	sub-activities a., b., c., d.	sub-activities a., b., d.					
Activity 1.3: Market environment enhanced to support quality, efficiency and effectiveness [NB – there are no sub-activities under this activity]		all							all
Activity 2.1: Market solutions for high efficiency affordable rural biomass household heating identified and piloted			sub-activity c.	sub-activities d.		sub-activity c.			sub-activity a. sub-activity b. sub-activity d.
Activity 2.2: Industrial cogeneration using biomass fuel demonstrated		sub-activity a., c.	sub-activity a., b.	sub-activities c.					sub-activity a., b.
Activity 2.3: Market solutions for briquetting piloted		sub-activity a., b., c., d.	sub-activity a., c., d.	sub-activities d., f.					sub-activity a. sub-activity b. sub-activity c.
Activity 3.1 Capacity of municipal leaders to manage biomass systems enhanced		sub-activity a.		sub-activity a.		sub-activities a., b., c., d.			
Activity 3.2: Training materials developed for sound operation of straw-fired boilers		sub-activity a.				sub-activities a., b.			
Activity 3.3: Training materials developed for commercial fuel suppliers		sub-activity a.	sub-activity a.			sub-activities a., b., c.			
Activity 3.4 Community understanding and acceptance of biomass energy enhanced through school educational program						all sub-activities			
Activity 4.1: Media campaign		sub-activity a.			sub-activities a., b., c.			sub-activities a., b., c.	
Activity 4.2: Annual national awards	sub-activity b.	sub-activity b.	sub-activity b.		sub-activities a., b., c., d.	sub-activity b.		sub-activities a., b., c., d.	sub-activity a., d.
Activity 4.3: Communication and visibility					sub-activities a., b., c.			sub-activities a., b., c.	

COMMUNITY MOBILISATION SPECIALISTS

Education and experience

- Educated to degree level, preferably in social sciences, public administration or related disciplines
- At least ten years of experience working in community-based development projects, or energy / environmental projects involving a significant element of community engagement and capacity building in the public sector.
- Experience of working in or with international organisations
- Knowledge of energy / environment issues is an advantage
- Fluency in Romanian and preferably also Russian. Good command of English would be an advantage.
- Computer literacy
- Proven ability to work as part of a multi-disciplinary team

Duties and responsibilities

The Community Mobilisation Specialists will be part of the Project Management Team (PMT), under the overall supervision of the Project Manager. The main role of the Community Mobilisation Specialist is to ensure that appropriate communities are identified in which investments in municipal biomass energy systems can be made, and that key stakeholders from these communities are committed to participating in the project.

The Community Mobilisation Specialists will be responsible for carrying out the following specific tasks:

- Develop selection criteria, in agreement with the rest of the PMT, for districts and communities wishing to participate in the project and, based on these criteria, make an initial selection of districts with which to work.
- Liaise with the District Chairman and Secretary of the District Council in each of the selected districts to organise a promotional meeting with the aim of ensuring local buy-in. These meetings should include representatives from the District Council, representatives from each of the relevant District Departments, the Mayor or Local Council Secretary from each village in the district, managers of public institutions (schools, kindergartens, community centres etc.), local agricultural / rural entrepreneurs and representatives from local NGOs. The meetings should incorporate a call for expressions of interest from municipalities to implement community-based projects.
- Undertake a preliminary appraisal of the expressions of interest received from communities, and prioritise interested communities for awareness-raising and capacity assessment. In the first round of applications, the aim is to develop approximately 5

municipal biomass heating projects, so the number of communities prioritised should reflect this aim.

- Conduct field visits to the priority communities (½ to 1 day each) to raise awareness among key stakeholders of the opportunities and risks presented by biomass energy technologies, and to assess the capacities and needs of the priority communities with regard to biomass energy project implementation. The field visits should result in each priority community forming a 5-7 person Project Committee, who should receive the necessary paperwork to allow them to make a formal application for support for their investment project.
- Work with the PMT Engineers to provide technical assistance to the targeted communities in completing the application forms, and to rank the received applications for detailed evaluation.
- Liaise with the PMT Training and Education Specialist to develop appropriately targeted training materials to match the capacities and needs identified during the community field visits.
- Work with the PMT Engineers to undertake a participatory appraisal of the applications received. This appraisal should closely involve the Mayor's Office and the community Project Committee, and should take account of: (i) the institutional capacity of the community to mobilise the necessary resources to successfully implement the project; (ii) the technical feasibility of the project, including the current condition of the heat distribution system and the opportunities for low-cost energy efficiency improvements; (iii) the availability of a regular and reliable supply of fuel, including a suitable fuel storage capacity and the necessary fuel transport and handling arrangements; (iv) the financial feasibility of the project, demonstrated in a detailed financial appraisal; (v) the existence of satisfactory environmental, health and safety assessments.
- Based on the capacities of communities to mobilise the necessary resources to successfully implement their respective project, provide input to the PMT's prioritisation of projects for investment.
- During the period that the initial round of projects are at the RFP stage, solicit further applications by continuing with the above activities on an on-going basis.
- Work in collaboration with the other members of the PMT to develop a strategy for the Annual National Awards component of the project, and to select winning projects.

PROJECT MANAGER

Education and experience

- University/Master Degree in Engineering or other closely related areas
- At least 10 years of progressively responsible experience is required at the national or international level in the areas of community-based development and project management in the energy and environment field involving a significant element of community engagement and capacity building in the public sector
- Previous experience in development assistance or related work for a donor organization, governmental institutions, NGO or private sector / consulting firm is a very strong advantage.
- Strong analytical, drafting and communication skills.
- Experience in the usage of computers and office software packages (MS Word, Excel, etc) and advance knowledge of spreadsheet and database packages, experience in handling of web based management systems.
- Strong leadership skills and proven experience in managing interdisciplinary teams

Duties and responsibilities

The Project Manager will have the responsibility to plan, oversee and ensure that the Project is producing the expected outputs at the right time, to the right standards of quality and within the allotted budget.

- Plan the activities of the project and monitor progress against the initial quality criteria;
- Mobilize goods and services to initiative activities, including drafting TORs and work specifications;
- Build, motivate and lead a high performing team consisting of project personnel, expert consultants, translators, etc. Undertake personnel performance appraisals and career development coaching at project level;
- Monitor events as determined in the Project Monitoring Schedule Plan, and update the plan as required;
- Manage requests for the provision of financial resources by UNDP, using advance of funds, direct payments;
- Monitor financial resources and accounting to ensure accuracy and reliability of financial reports;
- Responsible for preparing and submitting financial reports to UNDP on a quarterly basis;

- Manage and monitor the project risks initially identified, submit new risks to the Project Board for consideration and decision on possible actions if required; update the status of these risks by maintaining the Project Risks Log;
- Be responsible for managing issues and requests for change by maintaining an Issues Log;
- Prepare the Project Progress Report (progress against planned activities, update on Risks and Issues, expenditures) and submit the report to the Project Board and Project Assurance;
- Prepare the Annual review Report, and submit the report to the Project Board;
- Prepare the AWP for the following year, as well as Quarterly Plans if required;
- Ensure wide dissemination and visibility of project achievements. Establish and manage mechanisms for exchange of information, experience and lessons learned at the local and national levels
- Maintain close coordination with project partners, ensure synergies, avoid overlaps in project implementation, collaborate with other donors working in the same area, provide information relevant to the project.

ADMINISTRATION AND FINANCE ASSOCIATE

Education and experience

- University Degree in economics, finance, accounting, law, public administration or other related field.
- At least five years of experience in administrative work, accounting/finance, economics, or other substantive area is required.
- At least three years of previous experience in development assistance or related work for a donor organization, consulting company, or NGO is compulsory. Previous experience with EC/UNDP is a very strong advantage.
- Experience in the usage of computers and office software packages (MS Word, Excel, etc) and advance knowledge of spreadsheet and database packages, experience in handling web-based management systems.

Duties and responsibilities

Administrative management

- Pro-actively contribute to day-to-day project implementation and ensure conformity to expected results and project work-plans;
- Provide support to international/national consultants in the implementation of their tasks for the achievement of project results (communication, contracts, agenda, visas, hotel reservations, etc);
- Maintain records on all project personnel/national consultants and their respective status (contracts, ToRs, time and attendance – if appropriate, etc.) in accordance with accepted policies and procedures;
- Prepare and issue contracts;
- Make pertinent logistical arrangements for the prompt and effective implementation of the programme activities;
- Draft minutes of relevant project related meetings;
- Assume overall responsibility for administrative matters of a more general nature, such as registry and maintenance of project files and records;
- Arrange external and internal meetings

Financial management

- Prepare requests for advance of funds and/or direct payments;
- Monitor budget expenditures and maintain a proper record of approved project budgets and their revisions;
- Prepare proposals for budget revisions;
- Prepare and submit expenditure and programme budget status reports;
- Respond to queries from UNDP with respect to financial aspects of the programme, liaise with UNDP appointed and external auditors wherever required;
- Prepare recurring reports as scheduled and special reports as required for budget preparations and audit;
- Advise and assist international advisors and national consultants on all aspects of allowances, travel claims and other financial matters and calculate payments due for claims and services;

- Draft minutes/evidences on evaluations related with public acquisitions at community level, financed by UNDP/EC and ensure full compliance with UNDP financial terms and conditions.
- If necessary, travel for control and auditing purposes to field projects and report on expended funds or incurred irregularities
- Undertake other financial and administrative tasks on an ad hoc basis.

OFFICE ASSISTANT

Education and experience

- Degree in economics, finance, accounting, law, public administration or other related field.
- At least three years of experience in administrative work, accounting/finance, economics, or other substantive area is required.
- At least two years of previous experience in development assistance or related work for a donor organization, consulting company, or NGO is a very strong advantage.
- Experience in the usage of computers and office software packages (MS Word, Excel, etc) and advance knowledge of spreadsheet and database packages, experience in handling web-based management systems.

Duties and responsibilities

- Provide all types of support to the PMT and national/international consultants in the implementation of their tasks for the achievement of project results (communication, contracts, agenda, visas, hotel reservations, etc);
- Make pertinent logistical arrangements for the prompt and effective implementation of the programme activities;
- Assume overall responsibility for administrative matters of a more general nature, such as registry and maintenance of project files and records;
- Arrange external and internal meetings (including the meetings of the Project Board, Technical level, as well as other relevant meetings etc.).
- Collect project related information data
- Update plans
- Administer the quality review process
- Administer project revision control
- Establish document control procedures
- Compile, copy and distribute all project reports

ENGINEERS

Education and experience

- Educated to degree level in an engineering or applied science discipline
- At least five years experience in designing / specifying / installing heating systems for public and / or commercial buildings. Experience of working with biomass energy systems would be a definite advantage.
- Experience of conducting energy audits of buildings
- Experience of working in / with international organisations would be an advantage
- Proven ability to work as part of a multi-disciplinary team
- Fluency in Romanian / Moldovan and preferably also Russian. A good working knowledge of English would be an advantage.
- Detailed knowledge of the Moldovan energy sector
- Computer literacy

Duties and responsibilities

The Engineers will be part of the Project Management Team (PMT), under the overall supervision of the Project Manager. They will also be expected to work closely with the short-term experts

The main roles of the Engineers are to provide technical input and support to all activities of the PMT, and to work alongside the District and Community technical experts in supervising the design and construction of the municipal biomass heating projects that are implemented under this project.

The Engineers are responsible for carrying out the following specific tasks:

Municipal biomass heating and fuel-supply projects

- Provide assistance to the PMT Procurement Specialist on the technical / engineering content of the Request for Letters of Interest (LOI) and the Prequalification Requests (PQRs), issued to solicit responses from prospective Design-Build contractors. Assist the PMT Procurement Specialist in evaluating the technical / engineering aspects of the Statements of Qualification (SOQs) received.
- Work alongside the PMT Community Mobilisation Specialists in conducting participatory appraisals of project applications received from participating communities. These appraisals should closely involve the Mayor's Office and the community Project Committee, and should take account of: (i) the institutional capacity of the community to mobilise the necessary resources to successfully implement the project; (ii) the technical feasibility of the project, including the current condition of the heat distribution system and the opportunities for low-cost energy efficiency improvements; (iii) the availability of a regular and reliable supply of fuel, including a suitable fuel storage capacity and the necessary fuel transport and handling arrangements; (iv) the financial feasibility of the project,

demonstrated in a detailed financial appraisal; (v) the existence of satisfactory environmental, health and safety assessments.

- Work with the other members of the PMT to select which project applications should be prioritised for investment.
- Provide assistance to the PMT Procurement Specialist and the International Design-Build Advisor on the technical / engineering aspects of: (i) developing and issuing requests for proposals (RFPs) to implement the projects that have been selected for investment; (ii) evaluating the proposals received; (iii) drawing up the Design-Build contracts with the successful contractors.
- Co-operate with the District and Community technical experts in supervising the technical design and construction work of the projects that have been selected.
- Based on regular reviews of the RFPs received, draw up a set of technical specifications that prospective biomass fuel supply contractors will need to meet. It is expected that a specialist technology provider will be used to provide prospective biomass fuel suppliers with a complete package consisting of the necessary equipment, finance, training, maintenance and repair services. The technical specifications drawn up by the PMT Engineers will be agreed upon by the technology provider to ensure that the equipment and associated financing package that they provide is optimally matched to the needs of individual projects.
- Work alongside the PMT Enterprise Development Specialist and Procurement Specialist in providing the necessary technical support to municipal authorities and potential fuel suppliers, with respect to quality control of fuel supplies and the formulation of fuel supply contracts.
- Work with other members of the PMT to engage with relevant national authorities on addressing the policy, legislation and regulation issues surrounding the development of biomass energy markets. The contribution of the PMT Engineers to this component of the project should include identification of best-practice with regard to the emissions standards of biomass boilers, performance and construction standards for biomass heating systems, technical standards for system components, waste management.

Market development for biomass industrial co-generation and biomass briquetting

- Work with other members of the PMT to facilitate the implementation of at least one agri-industrial cogeneration plant using own-produced biomass waste. This will involve: (i) conducting a detailed survey of available technologies and their technical characteristics; (ii) identifying potential users of biomass industrial cogeneration who generate a suitable biomass waste stream; (iii) prioritising the most promising sites for a demonstration project, based on technical criteria; (iv) providing the PMT with the necessary technical data on potential demonstration projects to allow a detailed financial appraisals to be carried out.
- Work with other members of the PMT to develop and implement a deployment strategy for pilot biomass briquetting plant. This will involve: (i) reviewing existing and past biomass briquetting initiatives in Moldova; (ii) surveying available briquetting technologies; (iii) identifying suitable sources of raw materials; (iv) providing the PMT with the necessary technical data to assess the viability of commercial biomass briquetting and to develop a business plan.

Training, education, media and outreach

- Review the technical content of training materials on biomass energy systems targeted at municipal leaders, at design-build firms and at commercial biomass fuel suppliers. Advise the PMT Training and Education Specialist as necessary.
- Review the technical rigour and accuracy of media packages, press releases, pieces for radio and TV and all other public communications relating to the project. Advise the PMT Media Specialist as necessary.
- Work in collaboration with the other members of the PMT to develop a strategy for the Annual National Awards component of the project, and to select winning projects.

ENTERPRISE DEVELOPMENT SPECIALIST

Education and experience

- Educated to degree level in business administration, management, business enterprise development or related disciplines
- At least ten years of relevant experience, which should include a significant element of building the capabilities of entrepreneurs and / or providing technical assistance to support the development of new enterprises. Experience of working with the public sector would be advantageous.
- Knowledge of energy / environment issues would be an advantage, particularly where this is relevant to Moldova
- Experience of working in / with international organisations would be an advantage
- Proven ability to work as part of a multi-disciplinary team
- Fluency in Romanian and preferably also Russian. A good working knowledge of English is an advantage
- Computer literacy

Duties and responsibilities

The Enterprise Development Specialist will be part of the Project Management Team (PMT), under the overall supervision of the Project Manager. The main roles of the PMT Enterprise Development Specialist are to provide such technical support as necessary to the municipalities and contractors participating in the project, to strengthen the capacity of municipalities and private contractors to implement biomass heating projects and to undertake market studies relating to biomass energy supplies.

The Enterprise Development Specialist will be responsible for carrying out the following specific tasks:

Municipal biomass heating and fuel-supply projects

1. Work alongside the PMT Procurement Specialist and Engineers in outlining a design for a financing facility (most likely leasing / hire-purchase) under which a technology provider will provide biomass fuel suppliers will necessary equipment and associated services. Detailed design of the financing facility will be developed in agreement with the technology provider(s) and prospective biomass fuel suppliers.
2. Monitor the success of the technology provider's financing facility, and recommend actions to improve its effectiveness
3. Work with the PMT Engineers and Procurement Specialist to provide technical support to municipal authorities and potential fuel suppliers in the areas of supplier management and quality control of fuel supplies.

4. Co-operate with the PMT Training and Education Specialist in strengthening the capacity of the biomass domestic heating industry to supply, deliver and service efficient biomass heating equipment, including assisting with the development and delivery of training.

Market development for biomass industrial co-generation and biomass briquetting

5. Work alongside the other members of the PMT to ensure that the activities of this project relating to the development of biomass industrial cogeneration are co-ordinated with the activities of other significant players such as the EBRD, the World Bank, GEF and the National Agency for Energy Regulation.
6. Undertake a study of the market barriers to, and opportunities for, the development of industrial cogeneration based on biomass. The study should conclude with an investment strategy which will be implemented
7. Undertake a market study on the viability of commercial production of biomass briquettes, leading to the development of a business plan and a deployment strategy. Work with other members of the PMT to implement the deployment strategy.

Training, education, media and outreach

8. Work with the PMT Training and Education Specialist to develop training materials targeting commercial fuel suppliers. This material should highlight the business opportunities and risks, and should include a generic business plan that could be used by entrepreneurs seeking to understand the market and the steps needed to enter it.
9. Work in collaboration with the other members of the PMT to develop a strategy for the Annual National Awards component of the project, and to select winning projects.

PROCUREMENT AND CONTRACT MANAGEMENT SPECIALIST

Education and experience

- Educated to degree level in a discipline that involves a significant element of procurement, supply chain management or purchasing
- At least ten years experience in procurement, a significant proportion of which should be in the public sector
- Experience of working in / with international organisations would be an advantage
- Experience of working with energy supply project or familiarity with energy technologies would be an advantage
- Fluency in Romanian and preferably also Russian. A good command of English is an advantage
- Computer literacy
- Proven ability to work as part of a multi-disciplinary team

Duties and responsibilities

The Procurement Specialist will be part of the Project Management Team (PMT), under the overall supervision of the Project Manager. The main role of the PMT Procurement Specialist is to take a lead in all matters relating procurement, including the selection of contractors and the drawing up of contracts. In particular, the Procurement Specialist will be expected to work closely with the International Design-Build Advisor during the early part of the project, developing the experience and expertise necessary to manage the Design-Build procurement process independently.

The Procurement Specialist will be responsible for carrying out the following specific tasks:

1. With input from other members of the PMT and assistance from the International Design-Build Advisor, draw up and issue the Request for Letters of Interest (LOI) and the Prequalification Requests (PQRs) aimed at soliciting responses from suitably qualified contractors for the implementation of municipal biomass heating projects.
2. Using criteria and procedures agreed with the other members of the PMT, evaluate and prioritise the Statements of Qualification (SOQs) received.
3. With guidance and training from the International Design-Build Advisor: (i) take the lead role in developing and issuing Requests for Proposals (RFPs) to the contractors that have submitted satisfactory SOQs; (ii) evaluate the proposals received, according to criteria agreed with the other members of the PMT; (iii) draw up contracts with the successful design-build contractors. These steps should be repeated as necessary for each municipal biomass heating project (or bundle of projects) for which support is requested. It is expected that the International Design-Build Advisor will be retained only for the first tranche of projects (expected to be approximately five projects). It is therefore important that the PMT Procurement Specialist uses this contact time to acquire sufficient knowledge and expertise on Design-Build Procurement to be able to manage the process independently once the contracts for the first tranche of projects have been finalised.

4. Work with the PMT Enterprise Development Specialist and Engineers to: (i) develop an outline design for a financing facility (most likely leasing or hire-purchase) under which one or more technology providers will supply a package of equipment and services to prospective biomass fuel supply contractors; (ii) identify a suitably qualified technology provider and formulate a co-operation agreement with them; (iii) work with the technology provider and other members of the PMT to finalise the detailed design of the financing facility.
5. Work with the PMT Training and Education Specialist to provide on-the-job training and technical support to municipal authorities and potential fuel suppliers in parallel to the implementation of biomass heating projects, in the areas of competitive tendering, management of fuel supply, and quality control.
6. Review the procurement-related content of training material on biomass energy systems developed under the project, and advise the PMT Training and Education Specialist as necessary.

MEDIA SPECIALIST

Education and experience

- Educated to degree level
- At least ten years of experience in working with the media, a significant proportion of which should involve taking a leading role in conducting high-level media campaigns successfully targeting national press, television and radio
- A good working knowledge of energy / environmental issues
- Experience of working in / with international organisations would be an advantage
- Fluency in Romanian and preferably also Russian. A good command of English is an advantage
- Computer literacy
- Proven ability to work as part of a multi-disciplinary team

Duties and responsibilities

The Media Specialist will be part of the Project Management Team (PMT), under the overall supervision of the Project Manager, but will also be expected to work closely with media specialists within the UNDP Country Office and the EU Delegation. The main role of the PMT Media Specialist is to manage all aspects of communicating the project's aims, successes and impacts to the public via the print and broadcast media and via high-profile events.

The Media Specialist will be responsible for carrying out the following specific tasks:

- Work in co-ordination with media specialists in the UNDP Country Office and the EU Delegation to develop a media strategy. This should include identifying and cultivating key contacts in both the print and the broadcast media, development of a professional media package to provide background information about the project, and establishing processes for: (i) regular communication with media contacts; (ii) regular production of press releases; (iii) advising and assisting municipalities in managing local media interest at the community level; (iv) monitoring of media exposure.
- Take the lead in implementing the media strategy, in close partnership with UNDP and EU Delegation media specialists.
- Undertake continuous monitoring of the impacts of the media strategy through both a media log and a log of enquiries arising from media exposure.
- Lead the instigation of a National Annual Awards Ceremony, initially for participants in the programme but with the aim of expanding into a more general renewable energy / energy efficiency awards ceremony after the programme finishes. This will involve identifying and developing strategic partnerships and alliances both nationally and internationally with a view to both sponsorship and raising the profile of the ceremony; working with other members of the PMT to develop a detailed plan for the awards ceremony (e.g. timing,

award categories, judging criteria, prizes); ensuring high-profile coverage of the event in the print and / or broadcast media; monitoring the impacts of the event.

TRAINING AND EDUCATION SPECIALIST

Education and experience

- Educated to degree level
- At least five years of experience in developing and delivering training to senior managers in the public and / or commercial sectors.
- Familiarity with the Moldovan educational system and curricula, and experience with developing educational material for younger audiences
- A good working knowledge of energy / environmental issues
- Experience of working in / with international organisations would be an advantage
- Fluency in Romanian and preferably also Russian. A good command of English is an advantage
- Computer literacy
- Proven ability to work as part of a multi-disciplinary team

Duties and responsibilities

The Training and Education Specialist will be part of the Project Management Team (PMT), under the overall supervision of the Project Manager. The main roles of the PMT Training and Education Specialist are to take the lead in developing and delivering all training materials required under the project, and to liaise with external educational initiatives to enhance community understanding and acceptance of biomass energy.

The Training and Education Specialist will be responsible for carrying out the following specific tasks:

1. Develop a comprehensive training package on biomass energy systems and their management, aimed at municipal leaders, local council staff and building managers. The training material should cover: general principles of operation; maintenance routines; optimising building heating system operation; regular and sustained performance monitoring; sound management of fuel supplies and suppliers. The material should include examples of international best-practice, which should be regularly reviewed to ensure the material remains current.
2. Deliver training to municipal authorities using appropriate sections of the material developed under Task 1. above. Training should be delivered at an appropriate level at a number of key stages within the project, including: (i) at District-level promotional meetings aimed at raising awareness of the project among District officials; (ii) during information and awareness-raising field visits to priority communities; (iii) at 1-2 day training sessions directed at the Project Committees of communities where biomass heating system projects are being implemented; (iv) during 'on-the-job' training on competitive tendering and the management of fuel supplies and suppliers, directed at municipal authorities operating biomass heating systems.

3. Monitor the impacts of all training sessions using intake and exit surveys of participants along with feedback forms. Training material should be reviewed and revised as necessary according to the results of this monitoring.
4. Work with the PMT Enterprise Development Specialist to develop training materials aimed at commercial biomass fuel suppliers. This material should highlight the business opportunities and risks presented by the biomass fuel market, and should include a generic business plan that could be used by entrepreneurs seeking to understand the market and the steps needed to enter it. The material should be produced in a form that enables prospective fuel suppliers to engage in self-study, and be made available through the technology provider that operates the financing facility for biomass fuel supply systems, and directly through UNDP.
5. Monitor the impacts of the self-study material developed under Task 4. through a log of enquiries and requests for help, maintained by the technology provider, and follow-up contacts with recipients of the material.
6. Liaise with an appropriate local and / or international educational initiative to develop educational material for use in schools, targeting the 10-15 age group. This will involve: entering into dialogue with an appropriate partner organisation (for example, SPARE); formulating a co-operation agreement with the partner organisation for common activities relating to the development of teaching modules on biomass energy and the use of straw for heating; co-operate with the partner organisation in conducting teacher awareness-raising and training in schools where biomass heating systems have been installed; work with the partner organisation in conducting other educational events such as exhibitions and roundtables; monitor the impact of educational activities using a participatory approach agreed with the partner organisation (for example, the Most Significant Change approach).
7. Work in collaboration with the other members of the PMT to develop a strategy for the Annual National Awards component of the project, and to select winning projects.

DESIGN-BUILD ADVISOR (SHORT-TERM, INTERNATIONAL)

Education and experience

- Educated to degree level in a discipline that involves a significant element of procurement, supply chain management or purchasing
- At least ten years of experience in public sector procurement, a significant proportion of which should involve design-build contracting
- A proven ability to provide on-the-job training, or otherwise develop the capabilities of colleagues
- An excellent command of written and spoken English, as well as either Romanian or Russian
- Some experience of energy supply projects, or familiarity with energy technologies is a strong advantage

Duties and responsibilities

The Design-Build Advisor will operate under the direction of the Project Management Team (PMT), and is expected to work particularly closely with PMT Procurement Specialist. The specific tasks for which the Design-Build Advisor is responsible are as follows:

- Provide initial training and advice to all members of the Project Management Team (PMT) and UNDP CO procurement unit on the process of Design-Build procurement.
- Provide on-going support and assistance to the PMT, in particular the Procurement Specialist, in conducting all aspects of Design-Build procurement relating to the first tranche of municipal biomass heating projects (most probably approximately five projects). This support should cover the drafting and issuing of Requests for Letters of Interest, Prequalification Requests and Request for Proposals as well as the evaluation of the Statements of Qualification and proposals received. It is essential that, as a result of this on-going support, the PMT Procurement Specialist should have developed sufficient experience and expertise after the first tranche of municipal biomass heating projects has been implemented to be capable of independently managing the process of Design-Build procurement thereafter.

HOUSEHOLD ENERGY SPECIALIST (SHORT-TERM)

Education and experience

- Educated to degree level in an engineering or applied science discipline
- At least ten years of relevant experience, including a significant element of working on energy issues in the residential sector.
- Detailed knowledge of the Moldovan energy sector, in particular policies, initiative and institutions relating to residential energy.
- Experience of working in / with international organisations would be an advantage
- Proven ability to work as part of a multi-disciplinary team
- Fluency in Romanian and preferably also Russian. A good working knowledge of English would be an advantage.
- Computer literacy

Duties and responsibilities

The Household Energy Specialist will operate under the direction of the Project Management Team (PMT). The role of the Household Energy Specialist is to develop a strategy for stimulating the market for household biomass heating systems in rural areas of Moldova.

The specific tasks for which the Household Energy Specialist is responsible are as follows:

- Conduct a comprehensive study of the current status of the rural household energy market and the barriers to, and opportunities for, uptake of household biomass heating systems. This study should include: an analysis of consumer needs, motivations and attitudes to biomass heating; a survey of biomass heating products already available and how these meet consumer needs; a survey of products available internationally with the potential for being imported or manufactured locally under licence; an analysis of local manufacturers' capacity for expanding the range of available products; an analysis of the supply chains for both biomass stoves and fuel supplies.
- Work with the PMT Training and Education Specialist and Enterprise Development Specialist to assess the capabilities and needs of household biomass heating suppliers, providing support and training as necessary to strengthen their capacity to supply, install and service high-quality biomass heating systems.
- Foster strategic partnerships with stakeholders in the industrial and commercial sectors, local and national government, and civil society.
- Work with these partners to design one or more schemes to accelerate the adoption of household biomass heating technologies (for example, through targeted grants or other incentives). It is important that the scheme(s) designed do not: (i) lead to the provision of household biomass heating systems in homes that lack adequate insulation / weatherisation; (ii) exclusively target low-income households, with the result that the technology become stigmatised by its association with poverty.

