

**UNITED NATIONS DEVELOPMENT PROGRAMME
GLOBAL ENVIRONMENT FACILITY**

Project of the Government of Slovenia

Project number: SVN/99/G31/A/1G/99
Project title: Slovenia - Removing Barriers
to the Increased Use of
Biomass as an Energy Source
Estimated start date: March 2002
Estimated end date: February 2005
Executing agent: Ministry of Environment and
Spatial Planning
Implementing agent: AURE
Environmental Development Fund
Project site: Slovenia
LPAC meeting: 12 July 2000

ACC/UNDP sector: 0500 Energy
ACC/UNDP subsector: 0504 New and Renewable Sources of Energy

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LIST OF ABBREVIATIONS

ApE	Energy Restructuring Agency
AURE	Agency for Efficient Use of Energy of Slovenia
BDH	Biomass District Heating
CHP	Combined Heat and Power (plant)
CPI	Consumer Price Index
CTA	Chief Technical Adviser
DH	District Heating
d.o.o.	(Any, not just private) Private limited liability company
EC	European Commission
EBRD	European Bank for Reconstruction and Development
EDFS	Environmental Development Fund of Slovenia
EIA	Environmental Impact Assessment
EPA	Environmental Protection Act
ESCO	Energy Service Company
ETSU	UK company providing consulting services in energy-related field
EU	European Union
GDP	Gross Domestic Product
GEF	Global Environment Facility
GHG	Green House Gases
GIS	Slovenian Forestry Institute
ISPA	Instrument for Structural Policies for Pre-Accession
MAFF	Ministry of Agriculture, Forestry and Food
MEA	Ministry of Economic Affairs
MoESP	Ministry of Environment and Spatial Planning
NEP	National Energy Plan
PBDHP	Programme of Biomass District Heating Projects
PDF	Project Development Facility
PET	Project Evaluation Team(s)
Phare	European Union Phare Programme
PMT	Project Mobilisation / Management Team
ReSROE	Resolution on the Strategy of Energy Use and Supply of Slovenia (Official Gazette of Slovenia No.9; 16 February, 1996)
TPES	Total Primary Energy Supply

A. CONTEXT

1. Description of subsector

Slovenia is situated between the southeastern Alps and the Adriatic Sea. It is bordered by Italy in the West, Austria in the North, Hungary in the East and Croatia in the East and South. The total land area of the country is 20,256 km².

Slovenia is a heterogeneous country in its relief, climate and vegetation. The climate varies from continental in the Panonian lowlands to alpine in the mountain regions and sub-Mediterranean in the coastal region. There is a strong interaction between these three climates over the interior of Slovenia.

The population of Slovenia is about 2 million according to the 1994 estimate. It is ethnically homogeneous, with Slovenes making up 90% of the population. Small Italian and Hungarian communities constitute officially recognized minorities. The population density is 98 people per km². The capital of the country, Ljubljana accounts for 270,000 people.

Economy

The Slovenian economy was the most highly industrialized and advanced of those of the six republics of the former Yugoslavia. While accounting for less than 8% of the population, Slovenia was, in 1990, responsible for 20% of the gross “social” product, 29% of export and 20% of import. Even before independence, most agricultural and small-scale trade and service activities were run by the private sector, and the larger state owned enterprises often acted in a similar way to western companies.

After declaring independence on 25 June, 1991, Slovenia managed to overcome relatively quickly the recession that hit the country. GDP has grown since 1993 and the GDP growth hit a peak of more than 5% in 1994. In 1998, the GDP per capita was US\$9,300, which is high compared to many other countries with the economies in transition. The foreign debt is relatively low and the inflation was brought down to 6.5% by the end of 1998. The country is also well integrated into the EU market and is on the way, among the first new EU accession countries, to become a full member of the EU.

Energy sector

In 1994, the heat and hot water supply for the industry, residential and public buildings accounted for approximately 30% of Slovenia’s total final energy consumption, and about 28% of total greenhouse gas emissions of 14.34 million tons of CO₂.

Space heating is the largest energy user in the residential sector with 70.5% of the total residential energy demand, followed by the preparation of hot water (10.7%) in 1994. About 63% of the apartments have central heating systems, which provide approximately 50% of the space heating requirements. Liquid fuels are the predominant energy source, accounting for 47% of the total energy consumption of the residential sector in 1998. Solid fuels (coal and wood)

accounted for 7.3% of the total energy demand. The real share of solid fuels, however, is probably higher, as the fuel wood, which is not traded commercially, escapes the official statistics.

The average efficiency of existing heating systems based on coal and wood is estimated to be around 50%. Installation of new, correctly sized and more efficient equipment could raise this efficiency to 80%. In buildings, in which the heating is based on old, oversized oil- or gas-fired boilers, the installation of new correctly sized gas fired boilers could increase the efficiency from current 75% to around 90%.

Currently, district heating (DH) is provided primarily to large multi-family dwellings, either by heat-only boilers or by communal and industrial co-generation plants. Ljubljana and Velenje are the only cities using heat from thermal power plants. Surplus heat from industrial co-generation plants is used in the towns of Jesenice, Zelezniki, Nazarje, Ptuj, and Kocevje. About 15% of all apartments are currently connected to district heating.

The concentration of consumer demand (heat load), climatic conditions and the price of biomass versus the price of fossil fuels are key factors in determining, whether the construction of new biomass based district heating systems or extending the existing ones is economically feasible or not. The results of selected feasibility studies conducted in different Slovenian communities show that the economic feasibility of the projects can vary considerably depending on the specific local conditions and assumptions made in the study. A summary and a sensitivity analysis of these feasibility studies are presented later in this proposal. In general, however, it can be concluded that at least in the beginning the biomass based district heating projects will require some public support to cover the learning costs, to reduce the risk of the investors and to demonstrate the technical and financial feasibility of the projects to the local communities and residents. Also, the still unaccounted domestic and global benefits of biomass energy activities can justify this support later on.

2. Host country strategy

Renewable energy sources, in general, are considered as an important future primary energy source in Slovenia. Considering the fact that about 70% of Slovenia's total primary energy need is imported, the renewable energies - beside their obvious environmental and social benefits - are considered as an important national strategic reserve. The priorities are, as laid down in the Resolution of the Government of Slovenia on the Strategy of Energy Use and Supply (ResROE), to increase the share of renewable energy sources in energy production and to enhance the combined heat and power production.

In conformance with ResROE, the Slovenian National Energy Plan (NEP), which is currently under preparation, envisages to increase the share of wood biomass within the primary energy balance by 50%. Besides increasing the efficiency of the existing boilers and small individual fireplaces using biomass, this goal is envisioned to be reached by increasing the use of biomass for district heating either in heat-only or co-generation plants. The analysis conducted by the Slovenian Forestry Institute under the UNDP/GEF project preparatory phase supports this goal by estimating the total unused potential of industrial wood waste, brushwood, and unrealized

planned annual cut to over 600,000 tons of wood biomass annually. The current share of biomass in primary energy supply is 4.4% (11.2 PJ).

Slovenia is also one of the signatories of the Kyoto protocol, in which it has committed to reduce country's greenhouse gas emissions with 8% by 2008-2012, relative to the 1986 level. The national greenhouse gas mitigation strategy is presented in the Framework Strategy of Fulfilling the Kyoto Protocol Commitments prepared by MoEPP, giving among other priority to biomass energy use.

3. Prior and on-going assistance

The Government of Slovenia has systematically supported renewable energy programs and investment projects since 1991 through its public competition program. The support was spent through a number of instruments, through soft loans, interest rate subsidies and grants. The Government budget for renewable energy sources for the period 1991-1998 accounted for about US \$13 million. For the implementation of the NEP, the establishment of a long-term financing mechanism to support energy efficiency and renewable energy projects has been proposed. In that context, also a CO₂-tax has been considered and proposed as one possibility to collect these funds.

The study "Qualitative, Structural & Regional Assessment and Evaluation of Wood Biomass Potential for Energy Purposes in Slovenia", prepared by the Forestry Institute of Slovenia in 1995, concluded that prospects for more extensive biomass utilization exist, but further research is needed to get reliable, site specific data on sources, quantities, energetic value and social/economic significance of wood biomass. Under the PDF B phase of this project, the studies were refined and the results were published in the report "Analysis of Wood Biomass Potential in Slovenia" (1998). Otherwise the results of the PDF B phase of the project were published in the final report "Removing Barriers to Biomass District Heating Projects in Slovenia" (ApE, January 1999).

In 1999, the Ministry of Economic Affairs provided support for the biomass district heating projects through the following calls for tenders:

- Ministry of Economic Affairs, Agency for Efficient Use of Energy, the tender for subsidising energy assessments of companies, energy concepts of local communities and feasibility studies for projects of efficient use of energy and heat and power production (the Slovenian Official Gazette no 11/99, dated February 19, 1999).
- Ministry of Economic Affairs, a tender for a) financing system programs of renewable energy sources, b) co-financing feasibility studies and investment documentation, c) non-returnable subsidies for renewable energy sources investment project, d) program of non-returnable subsidies for households (the Slovenian Official Gazette no.11/99, dated February 19, 1999).

The available state support (covering 50% of the total costs of the studies) has enabled a number of municipalities to prepare local energy plans and feasibility studies for biomass district heating projects. In the majority of cases, these projects are based on existing industrial boilers.

According to the most recent data (RACI d.o.o., 1998), there are 78 wood waste boilers in operation in the Slovenian wood processing industry, with a nominal power of over 1 MW. The total installed capacity of these boilers is 340 MW. Most of the existing old boilers do not meet the new emission requirements, and therefore they need to be replaced with new, modern boilers equipped with automatic fuel dosing. Before the replacement, the possibilities to extend the use of boilers for providing heat for the nearby communities and/or for co-generation should be analyzed.

Since 1996, the Ministry of Economic Affairs (MEA) has also offered to subsidize up to 25% of the investment costs of the biomass based district heating projects.

Slovenian Ecofund has offered soft loans since 1994 under different calls for tenders. The current selection criteria for the projects are that they deal with: (i) abatement of air pollution, (ii) development of local infrastructure, or (iii) reduction of the emissions in industry. The interest rate of the credits has been the Foreign currency clause + the World Bank interest rate (approx. LIBOR) + 1,5 % (currently 5,14%) for (i) and the base (inflation) rate + 2% for (ii) and (iii). The biomass energy projects are considered eligible for financing. The Ministry of Environment, who is in control of the Ecofund, has agreed that at least US\$ 2.5 million from the Ecofund over the next three years can be made available to support the biomass energy activities. For the time being, the only biomass district heating project supported by the Ecofund has been the Gornji Grad pilot project.

The PHARE programme of the European Union has supported the pilot biomass district heating project in Gornji Grad and a programme for the installation of solar collectors. In addition, a High Level Policy Adviser on Energy Efficiency was appointed to work in AURE – the Agency for Efficient Use of Energy to improve its capacity and to provide advice and assistance. In 1995, ETSU produced under the PHARE programme the “Draft Final Report to the Ministry of Economic Affairs- Study on Energy Conservation Strategy in Slovenia”, providing advice on the areas, in which opportunities for energy conservation can be found, including guidance in the renewable energy field.

The 1999 budget for the PHARE cross-border co-operation included 1,5 million EURO for supporting biomass district heating projects in the EU-border areas of Slovenia. This will be in addition to the 0.360 million EURO already committed for the Gornji Grad pilot project.

Other bilateral co-operation programmes have been supported, e.g. by the Austrian government, which has provided assistance in performing the Slovenia-Styria energy initiative, supporting energy efficiency and renewable energy projects.

4. Institutional framework

The Environmental Protection Act was adopted in 1993 and it represents the main legislative framework of environmental protection. It is based on the principles of the UN Declaration of Environment and Development, considering at the same time the requirements of the European Union directives.

The role of the different institutions with respect to climate change and energy related issues is as follows:

Ministry of Environment and Spatial Planning deals with all the environment related matters. It is the GEF operational focal point in Slovenia and is also responsible for the UNFCCC in Slovenia, mostly through the Hydrometeorological Institute, which is a part of the Ministry.

The Environmental Development Fund of the Government of Slovenia (EcoFund) was established to issue loans (credits) for projects promoting environmental protection. The Fund's initial capital was formed by the claims transferred by the Ministry of the Environment and Spatial Planning on the basis of the "Law on Ownership Transformation of Socially Owned Companies". In June 1996, the Fund also received a DEM 30 million credit from the World Bank to carry out the Air Pollution Abatement Program, under which also the biomass energy projects can apply for funding.

Until the reorganization of the Government of Slovenia in May, 2001, Ministry of Economic Affairs dealt with energy related issues. A part of this Ministry was the Agency for Efficient Energy Use (AURE), which deals with demand-side energy efficiency and has been working on a National Program for Energy Efficiency in co-operation with the EU/PHARE. Since May, 2001, the energy sector and the Agency for Efficient Energy Use are part of the Ministry of the Environment and Spatial Planning

Ministry of Finance plays an important role in financing different projects.

Ministry of Education and Sports incorporates in its educational programs climate change issues and helps to raise public awareness.

Ministry of Foreign Affairs supports inter national co-operation related to climate change.

In addition, there are several NGOs dealing with environmental issues, such as Umanotera (The Foundation for Sustainable Development), Climate Change Institute, and Slovenian E Forum.

District heating in Slovenia is a municipal responsibility. It is generally undertaken by utilities that only supply heat to households and industry. Within towns, separate distribution areas may exist for gas and district heating, thereby avoiding competition. Local government responsibilities include the planning of the development of district heating and gas distribution networks.

B. PROJECT JUSTIFICATION

1. Problems to be addressed

Despite the obvious environmental and other local benefits of biomass projects and the available state and other support to promote them, the progress in increasing the biomass as an energy source has been very slow. Until now, only one biomass district heating project (Gornji Grad) has been started under the grant support from the Ministry of Economic Affairs, EU/PHARE and the Austrian Ecofund.

Based on the consultations and analysis conducted under the PDF B phase, the following key barriers were identified as reasons for the slow progress with biomass energy activities in Slovenia:

a) Institutional barriers:

- (i) lack of communication and co-operation between the different sectoral ministries dealing with biomass related activities (energy, environment, agriculture and forestry);
- (ii) lack of a cross-sectoral strategy and policy/legal framework to promote biomass energy projects;
- (iii) lack of a strong national focal point to support and promote biomass energy activities in Slovenia; and
- (iv) strong competition with big, well organised oil and gas companies.

b) Awareness, information and capacity barriers:

- (i) lack of information and awareness of the local communities, industry and consultants on the state of the art technologies and approaches for increasing the use of biomass as an energy source;
- (ii) lack of capacity and guidelines for preparing feasibility studies and “bankable” project proposals;
- (iii) lack of capacity and experience of the local experts to finalise all the other documentation needed to present projects for financing;
- (iv) lack of awareness of the end users on the costs, benefits and possible constraints of changing the individual heating systems to district heating;
- (v) lack of information and awareness of the local communities on the social and environmental benefits of increasing the use of biomass as an energy source;

- (vi) lack of capacity and information of the local communities to assess the sustainability of the wood fuel supply and to organise the local fuel wood market;
- (vii) lack of information to determine accurately the specific investment and operational costs of biomass based district heating plants in Slovenia;
- (viii) lack of experience and “success stories” of biomass district heating projects in Slovenia;
- (ix) lack of trained professionals to promote and support biomass energy activities, and to ensure reliable operation of the new installations; and
- (x) perception of biomass boilers as an environmentally not friendly technology (due to the inefficient and polluting old biomass boilers)

c) Financial barriers

- (i) lack of information about the possible sources of financing;
- (ii) high project preparation costs without the assurance of obtaining financing for the actual implementation of them;
- (iii) uncertainties on the long term market price of fuel wood and on the final number of the clients that decide to connect themselves into district heating;
- (iv) absence of stable, long-term financing mechanisms to support renewable energy projects (the current Government support is dependent on the annual budget preparations, which for long term planning purposes does not provide enough financial assurance);
- (v) weak financial status of the communities and local wood processing companies to apply for commercial credits, although the projects themselves would be financially strong;

In the absence of the GEF support to overcome the defined barriers, the progress in increasing the use of biomass as an energy source will remain slow or stop entirely, and the Government target to increase the share of biomass by 50% in the primary energy consumption by the year 2010 is not likely to be achieved.

2. Expected end of project situation

The project is expected to remove the key barriers to the improved and increased utilisation of biomass as an energy source in Slovenia, thereby facilitating its increasing share in country's energy balance. During the lifetime of the project, at least 3-5 new biomass district heating projects are expected to be started. Otherwise, the specific objectives and outputs of the project are presented in section D of the project document.

3. Target beneficiaries

The project will assist the Government of Slovenia in reaching the target to increase substantially the share of biomass in country's energy balance by the year 2010. Beside the national macroeconomic benefits and the global environmental benefits, the main beneficiaries at the local level are envisioned to be as follows:

- (a) Slovenian communities through the creation of new jobs and provision of modern heat and hot water supply services to their population;
- (b) Local wood processing companies through opening a market for industrial wood waste;
- (c) Local farmers and forest owners through increasing the possible market for wood fuel collected from forest thinning and cleaning, and from increased use of brush woods from the abandoned agricultural land;
- (d) Local consultant companies and NGOs providing expertise and services to promote and implement biomass energy activities; and
- (e) Local firms producing wood biomass boilers and related equipment (secondary beneficiary)

4. Project strategy and implementation arrangements

The project will complement the Government activities to promote the use of biomass as an energy source in Slovenia, by combining a technical assistance package addressing the barriers described above with a financial support scheme to leverage other sources of financing, and to reduce the risk and to support the learning costs of the first "demonstration" projects. As such, the project seeks to gain more information and experience on the (i) different possible technical set-ups, their performance and cost-reduction potential; (ii) performance and feasibility of the different institutional and financial arrangements; and (iii) eventual constraints and barriers faced during the implementation of the BDH projects.

The focus of the project is on wood biomass based district heating (BDH), which in many communities has already been identified as an attractive alternative to fossil fuel based heating systems. The projects to be supported will be selected through a "public call for tenders", based on the agreed technical, economic and financial criteria encouraging the economic optimisation and long term cost reduction objective of biomass energy technologies. The objective of the project is to facilitate the financing for at least 3 to 5 BDH projects over its duration of 3 years, and based on the experiences from these projects to encourage and leverage financing for similar projects in other communities.

Beside promoting the BDH projects, the project will also promote the increased and more efficient use of biomass in other biomass energy applications, such as in individual biomass boilers and in the combined heat and electricity production by the local wood processing industry. In undertaking and evaluating the feasibility studies for BDH projects, the different

options for using biomass will be fully taken into account, with the goal to optimize the BDH system size, minimise the costs and maximise the use of biomass as an energy source at the national level.

The project will be executed by the Ministry of Environment and Spatial Planning, through its Agency for Efficient Use of Energy (AURE), under the support of the UNDP Regional Support Centre in Bratislava. The Agency for Efficient Use of Energy, which is responsible for implementation of government programmes for promotion of efficient use of energy and renewables, will act as both, executing agency and implementing agency. As a standard UNDP requirement for nationally executed projects, the executing agency will appoint a National Project Director, who should be a Government official not paid by the project. He/she will assume the overall responsibility for the project, i.e. accountability of the use of funds and meeting the overall objectives of the project.

The Environmental Development Fund of the Republic of Slovenia (Ecofund) will implement the financial component of the project. The Ecofund is an independent legal entity, registered as a joint stock public company. Its core activity being the provision of loans for environmental protection projects. The Ecofund will establish a Biomass Energy Fund (hereafter referred to as the Fund) as a separate account within the Ecofund. As an in-kind contribution of the Government of Slovenia, the Ecofund will assign a person to act as the Fund Manager with the responsibility for the Fund's daily operations and for supporting the implementation of the financial component of the project otherwise. The Fund Manager will report every month for the first two years, followed by yearly reporting, to the Executing Agency and to the UNDP RBEC Regional Support Centre Bratislava on the status of the Fund including, as necessary, independently audited financial statements. The detailed Terms of Reference of the Fund are presented as an annex to this project document.

In addition, the executing agency will establish a Project Implementation Unit, consisting of a full time project manager and technical adviser and, as needed, a part/full time administrative assistant (eventually to be shared with the EcoFund).

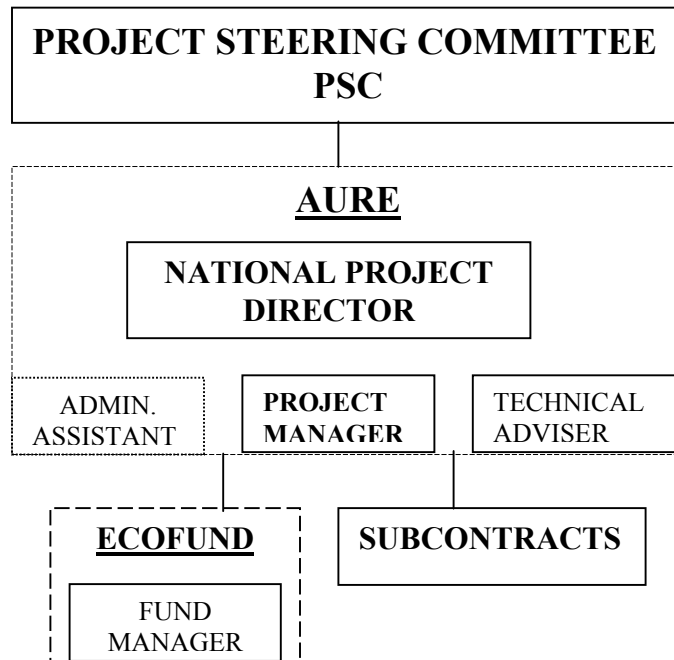
A cross-sectoral Project Steering Committee (PSC), chaired by the National Project Director and consisting of the representatives of the relevant ministries and other relevant key stakeholders of the project (e.g., local municipalities, private sector entities, research institutes, UNDP, environmental NGOs etc.) will be established to provide advise for and to oversee the implementation of the project. The Project Steering Committee will also play an important role in further resource mobilisation for the project. It will also be directly the co-ordinating body for the formulation of the cross-sectoral National Biomass Energy Program. Based on the decision of the PSC, smaller working groups can be established to implement or to oversee specific project activities.

PIUThe UNDP RBEC Regional Support Centre Bratislava will provide support to the executing and implementing agency as needed during the project implementation. Specifically, support will be provided in the following areas: assistance in the project launching, potential participation in the steering committee meetings, monitoring the implementation of the work plan and timetable, field visits and preparing and circulating reports after the visit, project documentation revision,

reviewing, editing and responding to the project reports, technical backstopping, support to the policy negotiations, financial management and accountability, advising and consulting during the audit process, preparation of budget revisions, financial completion activities, direct payments, advance payments, other support services as networking and exchange of best practices, preparation of the APRs, TPRs, PIR, and arranging the independent evaluations. The selection of the key local personnel such as the project manager and the technical adviser as well as the selection of all the international experts will be done in consultation with UNDP.

The UNDP/GEF funds are released by the UNDP Regional Support Centre for the implementation of project activities as “Project Advances” based on the request of the Government Implementing Agency and authorised by the Executing Agency – subject to the satisfactory financial reports and overall progress of the project.

The schematic layout of the project implementation arrangements is presented below:



A detailed work plan and implementation strategy for each component of the project (together with a proposal for the first budget revision) will be prepared at the outset of project operations by the project manager, in co-operation with the project’s technical and financial advisers. Prior to starting the actual implementation of the work plan, the work plan will be reviewed and must be approved, together with the associated revised budget, by the executing agency and the UNDP Regional Support Centre in Bratislava.

The best experts available in Slovenia should be involved to implement the different activities of the project taking stock and fully utilising the resources and results of relevant prior or ongoing national or international activities. The necessary external support will be provided by

strengthening and encouraging the information exchange between the national and relevant regional and international expert institutions, and hiring short-term international consultants to assist in the implementation of the project through the critical stages. In working with international consultants, specific emphasis will be on promoting the information exchange between the national, regional and international expert institutions and on building the problem-solving capacities of the local experts, through on-the-job training and otherwise, to undertake similar activities independently after the project has ended.

Specific emphasis throughout the project is also laid on facilitating the full public participation in the implementation of the project activities through public hearings, information dissemination events, training seminars, etc. In proposing the individual biomass DH projects for financing, the commitment of the majority of the foreseen clients to join the new system needs to be demonstrated (e.g. by a specific letter) as a pre-requisite to any investment decisions.

5. Reasons for assistance from UNDP

Slovenia ratified the UN Framework Convention on Climate Change on 19 October, 1995. As Party to the Convention, Slovenia has accepted the commitment to formulate, implement, publish and regularly update national and, where appropriate, regional programmes containing measures to mitigate climate change by addressing anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol.

In the Framework Strategy of Fulfilling the Kyoto Protocol Commitments prepared by MoESP, the proposed project has been identified as one of the priority measures to reduce Slovenia's greenhouse gas emissions. The cumulative impact of the project by facilitating the implementation of 50 BDH projects has been estimated to about 1.8 million tons of CO₂ over the next 20 years. In addition, the possibilities to increase the use of wood biomass for co-generation and improving the energy efficiency of the existing boilers and individual fire places are expected to have a substantial contribution in the total GHG reduction achieved. By reaching its ultimate objective to increase the share of biomass in primary energy supply by 50% by 2010, the cumulative reduction of greenhouse gas emissions by the year 2010 would be about 2.77 million tons.

The project is consistent with the objectives and eligibility criteria listed in the GEF Operational Strategy and GEF Operational Programme # 6 "Promoting the Adoption of Renewable Energy by Removing Barriers and Reducing Implementation Costs".

6. Special considerations

The project will have a specific emphasis on the sustainable use of the available biomass resources (primarily industrial wood waste and residues), so as to ensure that the project will not have a negative impact on biodiversity or environment in general. As a part of this effort, a detailed environmental impact assessment will be undertaken for all the biomass district heating projects supported by the project.

While preparing the pre-feasibility and feasibility studies for biomass district heating projects, the economic potential for improving the energy efficiency of heating and hot water supply (e.g. through better insulation and regulation) within the buildings should be fully taken into account, following the least cost planning principles.

The Austrian experiences in implementing over 300 biomass district heating projects during the past 15 years have been closely reviewed in a recent study (Rakos, 1997). Some of the key conclusions of the study were:

(a) “The case of biomass district heating in Austria shows the profound complexity of establishing a (new) renewable energy system. It is of fundamental importance for successful renewable energy policies to address this complexity and to refrain from looking easy answers on difficult questions (as suggested by strictly economic or technical perspectives). The most direct consequence of this finding is, that it is essential, that sufficient resources are made available for “system management” during the introduction of renewable energy technologies”;

(b) “The assessment of obstacles and critical issues for the successful dissemination of this (biomass district heating) technology shows that various factors have been important: technological performance, economic factors, socio-economic boundary conditions and the socio-cultural context of plan establishment. Supportive policies have played a critical role and included a multitude of measures. Particularly in the early phase of technology diffusion, dedicated institution managing the day-to-day introduction problems and speeding up learning processes by arranging communication and feedback, have been very important for success. Successful introduction happened only in provinces, that established a dedicated institution or focal point that managed the day to day problems of early introduction”;

(c) “Major technical obstacles for renewable energy diffusion were created by a lack of qualification of relevant professionals as plumbers, planners and plant operators. It is dangerous to focus all attention to the core part of renewable energy technology without regarding the periphery both in technical terms as in terms of professionals responsible for setting up and maintaining the renewable energy system. Feedback is fundamental for technological learning. It must be regarded as a central task for renewable energy management to install appropriate feedback mechanisms”;

(d) “A major barrier present particularly in early innovating villages was distrust in the new technology. Will it work? What will be its impact on village life? Who is going to profit from the project? These are some of the questions usually discussed for months at the village inns. In most cases studied, conflicts have been settled somehow. However, in many villages, that originally had considered a BDH plant, such conflicts actually stopped the development of the project”;

(e) “It is of central importance for a BDH project that conflicts are properly addressed on time and managed in the best possible way. Even if a project succeeds despite severe conflicts, economic disadvantages are often considerable. We found that the average investment costs for plants meeting strong or very strong resistance were 30% higher than for plants with no resistance. Cost increases are caused e.g. by the necessity to change the siting or by extra requirements for licensing. Lower heat sales due to the unwillingness of opponents to connect to

the grid may also have a serious economic impact.”;

(f) “This (technical development + costs of small individual biomass boilers) points to another lesson to be learned: enthusiasm for a successfully developing renewable energy technology should not block the view on the whole picture. This is particularly true for domestic heating with wood, which is almost completely out of the scope of renewable energy policies”;

(g) “Policy recommendations on a national level regarding the particular case of biomass district heating are: (i) implement measures to enhance technical performance of plants, particularly older plants; (ii) develop subsidy regimes that favour cost reductions and maximise the specific amount of renewable energy produced; (iii) implement further educational measures for related professionals; (iv) increase the resources for high quality project development. Pay particular attention to decision making processes at the local level; and (iv) extend the scope of renewable energy policies to individual domestic heating with wood.”;

(h) “Policy recommendations on the intergovernmental level are: (i) co-operation on an intergovernmental level should not be restricted to technical aspects of renewable energy, but also to the exchange of experiences on non-technical questions, effective financial incentives, measures to enhance public acceptance of renewable energy and management issues; and (ii) enhancing the efficiency of traditional uses of renewable energy sources may both mitigate negative effects of renewable energy use (e.g. overexploitation of resources) and ensure their continued use. Due to the global nature of this challenge an international effort is recommendable, that takes both technical and cultural aspects of traditional use of renewable energy into account.”

Close co-operation and exchange of information and experiences with Austria as well as with other countries and experts that have collected significant experience of promoting the industrial and/or residential energy use of biomass should be encouraged and continued throughout the project implementation. As such, the project also provides an excellent opportunity to verify how the lessons learned, e.g., in Austria, can be implemented in the Slovenian context, and what kind of difference their incorporation will make in the diffusion speed and the financial resources needed to support biomass energy activities. In addition, the project can serve as a demonstration project for the introduction of BDH programs in other CEE countries

7. Co-ordination arrangements

The executing agency, working in collaboration with the PSC and UNDP, will have the responsibility for the overall co-ordination of the activities and of ensuring that the expected outputs will be achieved on a timely manner. The project manager will be charged with “day to day” management and co-ordination of these activities, and he will report regularly to the executing agency and UNDP on the progress of the project.

By promoting information exchange between the participating institutions both through the PSC and otherwise, the project seeks to identify, to create links to, and to use the results of all the other prior or ongoing activities relevant to the project.

From the financial point of view, the project activities will be co-ordinated closely with the activities supported by other sources of financing such as the EU/PHARE and the different bilateral organisations.

Regarding the other international collaboration, working links with relevant regional and international expert institutions should be created, e.g. in Austria as well as in the Nordic Countries that have gained experience in promoting the increasing use of biomass as an energy source so as to draw from their experiences and lessons learnt.

8. Counterpart support capacity

Before the reorganisation of the Government's energy sector activities, the Slovenian Ministry for Economic Affairs assumed the main responsibility for the promotion of the use of biomass in Slovenia. Among other measures, organisation of two promotional events, a symposium in Jarenina, December 1994, and a workshop "Biomass - Potential Energy Source for Slovenia", ApE, Santa Vita d.o.o., and Energieverwertungsagentur - Vienna, Brdo/Kranj, April 1996, raised substantially the interest of potential investors. The Ministry also financed the study "Qualitative, Structural, & Regional Assessment and Evaluation of Wood Biomass Potential for Energy Purposes in Slovenia", which indicated a considerable potential for biomass utilisation.

Following a public tender organised by the Ministry of Economic Affairs in 1996, some communities formally applied for Government support to increase the use of biomass as an energy source. Based on this interest, the Ministry co-financed up to 50% of the feasibility studies for biomass-based district heating in the following towns/villages: Gornji Grad, Preddvor, Trzic, Kocevje, Zelezniki. At the time of the project preparation, the Ministry also committed to support the initial investment costs of the BDH projects up to 25% up to the amount of at least US \$ 2.5 million over the duration of three years. After the transfer of the energy related issues under the Ministry of Environment, the management of these funds has been transferred to AURE.

Slovenian Ecofund has offered soft loans since 1994 under different calls for tenders. The current criteria for the projects financed by the Ecofund are that they deal with: abatement of air pollution, development of local infrastructure, or reduction of the emissions in industry. The interest rates of the credits in the recent year have been the Foreign currency clause + 5,14% for the first group of projects and the base (inflation) rate + 2% for the other two groups of projects. The biomass energy projects are considered eligible for these credits. The Ministry of Environment, who is in control of the Ecofund, has agreed that at least US \$ 2.5 million from the Ecofund will be made available over the next three years to support the biomass energy activities.

C. DEVELOPMENT OBJECTIVE

The long term development objective of the project is to remove barriers to the increased use of biomass as an energy source, thereby reducing the fossil fuel consumption and the associated greenhouse gas emissions. The project is also envisioned to support the sustainable development of the local economies by creating new income and employment opportunities.

D. IMMEDIATE OBJECTIVES, OUTPUTS AND ACTIVITIES

Immediate objective 1

Finalising the project implementation arrangements and building the capacity of the local project personnel to conduct and supervise the project activities.

Output 1.1

Finalised project implementation arrangements.

Activity 1.1.1

Appointing the National Project Director (NPD) and establishing the Project Steering Committee (PSC).

Activity 1.1.2

Establishing the Project Implementation Unit (PIU) PIU, as specified under chapter “Project Strategy and Implementation Arrangements” and the attached Terms of Reference.

Activity 1.1.3

Organising the project initiation workshop.

Activity 1.1.4

By building on the draft Terms of Reference of the Biomass Energy Fund attached to this project document, finalising the operational guidelines for and funding criteria of the Fund and establishing the Fund otherwise. These Terms of Reference must be reviewed and approved by the UNDP RBEC Regional Support Centre Bratislava before they are to be considered finalized.

Activity 1.1.5

Finalising the detailed work plans, terms of reference and implementation arrangements for the different components of the project.

Output 1.2

Increased capacity of the local experts to conduct and supervise the project activities, including the preparation of a guidebook and other training material on project preparation and financing (addressing barriers b(i)- b(iii)).

Activity 1.2.1

By reviewing the international experiences in promoting the use of biomass as an energy source (through literature surveys, study tours etc.), increasing the knowledge of the local key project personnel on (i) the state-of-the-art biomass energy, district heating and wood biomass collection technologies, (ii) their technical and economic characteristics, (iii) cost reduction possibilities in the different stages of the fuel chain, (iv) available public awareness and training materials and other international sources of information, (v) existing policies in different countries to promote the use of biomass; and (vi) possible sources and mechanisms for financing biomass energy activities.

Activity 1.2.2

Compiling a guidebook and training material on project financing, including the preparation of feasibility studies, business plans and tender documents in a transparent, standardised format based on a common methodology and parameters.

Immediate objective 2

Finalising the feasibility studies for and development of a pipeline of at least 20 biomass district heating and other wood biomass related energy projects to be presented for financing (addressing barriers b(i)-b(vi) and c(i)-c(ii)).

Output 2.1

Increased awareness of the local communities and wood processing industry on the technical and economic possibilities to increase the use of wood biomass as an energy source and undertaking a more detailed analysis of the market potential of biomass based district heating and other biomass based energy production in selected communities.

Activity 2.1.1

Based on the results of the PDF B phase of the project as well as of the activities 1.2.1 and 1.2.2 above, preparing and compiling public awareness raising and training materials on the state-of-the-art biomass energy technologies, their technical and economic characteristics, possible implementation and financing schemes as well as their potential local economic and environmental impacts. A recently developed UNDP document “Biomass Primer” can also be used as one useful resource in that regard.

Activity 2.1.2

Reviewing and updating the results of the studies “Qualitative, Structural & Regional Assessment and Evaluation of Wood Biomass Potential for Energy Purposes in Slovenia” and the “Analysis of Wood Biomass Potential in Slovenia” prepared by the Forestry Institute in 1995 and 1998, to identify the communities and the local wood processing industries posing the biggest potential for increasing the use of wood biomass as an energy source.

Activity 2.1.3

Analysing the existing technologies and their costs for collecting wood biomass from different sources and making recommendations for their use.

Activity 2.1.4

Disseminating information to and organising meetings with the local community and industry representatives to raise their awareness on the state-of-the-art biomass energy technologies and their technical and economic characteristics as well as to evaluate their preliminary interest to increase the use of biomass as an energy source, if proven technically and economically feasible.

Activity 2.1.5

Conducting market and pre-feasibility analysis in the interested communities to increase their use of wood biomass as an energy source.

Activity 2.1.6

Organising public hearings, and disseminating and discussing the results of the market and pre-feasibility studies with the local community and industry representatives, evaluating their interest to proceed towards full fledged feasibility studies and actual investment projects.

Output 2.2

Detailed feasibility studies, business and financing plans for at least 20 biomass district heating and other wood biomass related energy projects, presented according to the requirements of the relevant local and international financing organisations, and also taking into account the economic potential for improving the energy efficiency of heating and hot water supply within the buildings (e.g. through better insulation and regulation).

Activity 2.2.1

Reviewing and improving/updating, as applicable, of the existing feasibility studies and energy plans prepared for different communities to increase the use of wood biomass as an energy source.

Activity 2.2.2

Evaluating the possible financing schemes to finance the projects and preparing a summary report on the results and conclusions of this evaluation.

Activity 2.2.3

Analysing the possible demand side energy efficiency measures to be implemented within the buildings, parallel to the introduction of the biomass district heating systems.

Activity 2.2.4

In co-operation (also in financial terms) with the interested local communities and wood processing industry and by building on the conclusions under activity 2.1.6, finalising the detailed feasibility studies and business plans for increasing the use of biomass as an energy source in the selected communities, taking into account the possibilities for biomass based district heating as well as the possibilities for increasing and improving the efficiency of individual boilers and fire places.

Immediate objective 3

Facilitating the implementation of the biomass district heating and other wood biomass related energy projects.

Output 3.1

A national Biomass Energy Program (addressing barriers a(i) and a(ii))

Activity 3.1.1

By building on results of the work conducted so far, finalising a national Biomass Energy Program to support (from the legal, regulatory and financial points of view) the increased use of biomass as an energy source in Slovenia. The Government has the primary responsibility for this task, and will therefore follow internal procedures. The PSC will participate in supervising the preparation of this programme as outlined in section B.4.

Output 3.2.

Model fuel supply and heat purchase agreements (addressing barriers b(vi) and c(iii)).

Activity 3.2.1

Based on close consultations with the potential fuel suppliers, the foreseen owners of the biomass district heating plants as well as the consumers of the heat, preparing model fuel supply and heat purchasing agreements.

Output 3.3

The first 3-5 demonstration projects successfully under implementation (addressing barriers b(vii) – b(x)).

Activity 3.3.1

In co-operation with the Slovenian Ecofund and the other key institutions participating in the project, organising a public call for tenders to facilitate the construction of the first 3-5 demonstration projects. The guidelines and criteria for presenting and selecting the projects for financing will be presented as a part of the final operational guidelines and funding criteria of the Biomass Energy Fund (see activity 1.1.4) and reviewed by the Project Steering Committee/Executive Board of the Fund and UNDP before their approval.

Activity 3.3.2

Supporting the finalisation of all the required documentation to launch the selected demonstration projects. The method of determining funding amounts and terms for each project, involvement of the various stakeholders, and the monitoring and evaluation approach are all clarified in the terms of reference of the Fund (see annex VII).

Activity 3.3.3

Provision of training to the local professionals to install, maintain and operate the biomass energy installations.

Immediate objective 4

Promoting the sustainable growth of using biomass as an energy source in Slovenia.

Output 4.1

A long term strategy and an institutional and financial framework to support the increased use of biomass as an energy source (addressing barriers a(i)–a(iv) and c(i)-c(v)).

Activity 4.1.1

Monitoring the implementation of the project and undertaking independent mid-term and final evaluations of it, presenting the experiences and the lessons learnt as well as the recommendations for further action. For financial audits, monitoring and evaluation will be carried out as outlined under section H “Project Review, Reporting and Evaluation”. For the other “overall” evaluation missions, the consultants for these missions will be selected and recruited by the Bratislava UNDP office.

Activity 4.1.2

As applicable, establishing an independent national agency/focal point to support the biomass energy activities in Slovenia, dealing with aspects such as information dissemination and public awareness raising, review and recommendations for the legal and regulatory framework, standards and technical quality control etc.

Activity 4.1.3

Constituting the legal and regulatory framework and long term financing mechanisms to support biomass energy activities in Slovenia, encouraging the long term cost reduction objectives of the biomass energy technologies and gradually declining financial support needed for their implementation.