

**UNITED NATIONS DEVELOPMENT PROGRAMME  
GLOBAL ENVIRONMENT FACILITY**

**Final Evaluation**

**Slovenia: Removing Barriers to the Increased Use of Biomass as an  
Energy Source (SVN/99/G31)**

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## LIST OF ABBREVIATIONS

AURE	Agency for Efficient Use of Energy of Slovenia
BDH	Biomass District Heating
Fund	Biomass Energy Fund
CHP	Combined Heat and Power (plant)
DH	District Heating
EC	European Commission
Eco Fund	Environmental Development Fund of Slovenia
EIA	Environmental Impact Assessment
EPA	Environmental Protection Act
EU	European Union
GDP	Gross Domestic Product
GEF	Global Environment Facility
GHG	Green House Gases
GIS	Slovenian Forestry Institute
IRR	Internal Rate of Return
MAFF	Ministry of Agriculture, Forestry and Food
MEA	Ministry of Economic Affairs
MoESPE	Ministry of Environment, Spatial Planning and Energy
NEP	National Energy Plan
PDF	Project Development Facility
Phare	European Union Phare Program
PIU	Project Implementation Unit
SIT	Slovenian Tollars

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## **1.0 EXECUTIVE SUMMARY**

### **1.1 Brief Description of the Project**

In years 2002-2007 UNDP implemented the GEF full-sized project titled Removing Barriers to the Increase Use of Biomass as an Energy Source in Slovenia

The objective of the project was to reduce the CO<sub>2</sub> emissions of Slovenia by removing barriers to the increased use of biomass as an energy source. The project was intended to promote the increased use of biomass as an energy source in Slovenia by: a) removing barriers to, and reducing the implementation costs of biomass based district heating projects in local communities; b) improving the energy efficiency of the existing boilers and individual fireplaces using biomass; and c) increasing the use of biomass for co-generation and in small individual boilers, when economically and environmentally feasible.

The project was designed to complement 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. The project was intended 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 was on wood biomass based district heating (BDH), which in many communities had already been identified as an attractive alternative to fossil fuel based heating systems. The target of the project was to facilitate the financing for at least 3 to 5 BDH projects over its duration of 3 years (extended to 5 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 was also intended to 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.

After consideration of a number of financial options, it was determined that the deployment of GEF resources as equity investments in individual BDH projects was the preferred approach. A financial mechanism was then developed that provided equity investments up to 25% of total project costs with a mechanism for repayment that would be used to capitalize a revolving Biomass Equity Fund.

A biomass project financing program was then developed that incorporated the equity investment approach and consisted of the following:

- 25% equity using GEF funds
- 25% owner equity

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- 25% grant (from government of Slovenia co-financing)
  - 25% Eco Fund loan for 15 years

The initial capital of the Biomass Energy Fund was transferred from the GEF to the Government of Slovenia as a grant without the obligation to return the funds to the GEF, should the funds be disbursed and managed according to the criteria set up in the Project Document. The GEF contributions were then placed in their own designated account managed by the EcoFund as the “Fund Manager”.

The designed total project budget was 11.8 M USD, including 4.3 M USD GEF funding. At the end of the project the expected total budget disbursed was expected to be over 13 M USD due to increased amount of governmental and private sector investments.

## **1.2 Context and Purpose of the Evaluation**

This Final Evaluation assesses the relevance, performance and success of the project. It reviews potential impact and sustainability of results, including the contribution to capacity development and the achievement of global and national environmental goals. This evaluation also provides lessons learned and makes recommendations that project partners and stakeholders might use to improve the design and implementation of other related projects and programs in Slovenia and elsewhere.

## **1.3 Main Conclusion, Recommendations and Lessons Learned**

### **1.3.1 Equity Investments**

The deployment of GEF funds as equity investments in BDH projects was both innovative and challenging. Equity serves as the foundation of any project financing structure and is generally designed to leverage substantial debt. The value of equity is determined by its liquidity, transparency in pricing, and available exit strategies. These factors were not fully understood in the Project Document making implementation difficult.

Because each biomass project was relatively small, and because investors in these projects were not major companies, the equity in biomass projects was not sufficiently large to trade on a securities exchange. This substantially diminished the liquidity and transparency in pricing of the equity investments in the biomass projects.

The exit strategy for GEF equity investments in each project contained inherent conflict of interests. Under the financial plan, the GEF equity investment must be tendered for sale to the general public within 3-5 years of initial financing. If no responses are generated by the tender, the project sponsor was required to purchase the GEF shares for 50% of initial value. Under this arrangement, the private sector investor and majority shareholder in each biomass project had an incentive to under perform in the first 3-5 years of operation to reduce the value of the GEF equity and purchase it at 50% of original value.

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The future use of GEF resources as equity investments in carbon reduction projects should be considered as equity can potentially serve as a powerful catalyst for other investments and debt financing. However, if this financial mechanism is utilized in the future, innovative exit strategies should be considered. One option would be to require the project sponsor to purchase the GEF equity at face value at the end of 3-5 years. Under most circumstances, the project sponsor's best option would be to borrow funds to acquire the GEF equity. This arrangement would create a strong incentive for a project sponsor to reach optimal financial performance in order to qualify for debt financing. This approach also effectively converts GEF equity to debt within 3-5 years, creates a more balanced debt/equity ration, and results in more robust revolving financial program.

### **1.3.2 Composition and Operation of the Project Implementation Unit (PIU)**

The successful financing of BDH projects in Slovenia was due in large measure to the professional quality and entrepreneurial spirit of the PIU. On several occasions, the PIU encounter impediments to project implementation within the original GEF program structure and devise new approaches to address these challenges. Due to lack of initial interest in BDH projects, for example, the PIU had to play the role of project developer identifying BDH opportunities, performing initial due diligence and project appraisal, brokering strategic partnerships and helping close financial transactions. This approach required revisions in PIU composition and allocation of resources. The Slovenia Biomass Project Document, much like many other GEF Project Documents, had over designed team composition and budget allocations. While this is often done to insure proper expenditure of resources it restricts creative responses to unforeseen challenges. Fortunately the UNDP regional office was actively engaged in project implementation and approved revisions to the implementation plan in a timely manner.

Future GEF Project Documents should avoid the temptation to over design human and financial resources and leave greater flexibility to the PIU. The success of this approach depends on selection of highly qualified and motivated PIU members but can result in a more dynamic and successful implementation process

### **1.3.3 Marketing strategies**

The Project Document allowed for \$1,800,000 USD in training and marketing of wood biomass energy technologies. Notwithstanding considerable efforts to expand the awareness of the benefits and advantages of wood biomass in Slovenia, the response to the tender for equity investments only produced two successful projects in the first two years after the tender was issued. This was a disappointing result given the fact that the tender document offered both equity investments and direct grants with total support possibly up to 70% of total project costs.

This suggests that general marketing strategies may be of lesser value than strategic marketing initiatives. Future GEF projects should pay special attention to the relationship between general marketing strategies and the objective of project implementation. It would require greater focus in the marketing process to key decision makers in the public and private sectors.

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### **1.3.4 Monitoring and Evaluation**

The Project's goal and objectives were clearly stated in the Project Document and provided sufficient guidance for periodic evaluation of the Project's progress. Composition of the Project Steering Committee included representation of all relevant national government agencies involved in implementation which allowed for coordination of the government's response to implementation challenges. Annual progress implementation reports (PIR) were filed in a timely manner and provided sufficient information for assessment of the project's status. Annual Tripartite review meetings involving the project's implementing and executing agency, UNDP's Regional Center Office and the PIU were effectively utilized to consider and approve modifications in the project's implementation strategy.

## **2.0 INTRODUCTION**

### **2.1 Purpose of the evaluation**

The objective of this evaluation is to assess the achievement of project objectives, the affecting factors, the broader project impact and the contribution to the general goal/strategy, and the project partnership strategy.

### **2.2 Key Issues Addressed**

Special attention is paid to the structure and implementation of the equity investments in selected biomass projects. This analysis focuses on the usefulness, leverage, sustainability, and effectiveness of deploying GEF resources through an equity investment scheme. Another area of focus is the verification methodology utilized and the carbon savings achieved by these investments.

### **2.3 Methodology and Structure of the Evaluation**

The evaluation took place in Slovenia from April 7-12. It also involved review of all major project documents including annual reports, the Mid-term evaluation, summaries of the Tripartite meetings, project budget revisions, progress reports, financial legal agreements and successful biomass project profiles.

During the mission consultations took place with government counterparts, the members of the project team, the National Project Director from the Ministry of Environment and Spatial Planning, the partners and sub-contractors, and direct beneficiaries. Site visits of projects supported by the GEF Project were also conducted. These consultations and site visits were intended to determine the relevance, performance and success of the project.

In addition, following the mission, an expert in carbon savings calculations had follow-up discussions with the PIU to more fully assess the carbon savings methodology utilized by the project team, and to verify carbon savings from biomass projects.

## **3.0 THE PROJECT AND ITS DEVELOPMENT CONTEXT**

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### **3.1 Project start and its duration**

On December 13, 2001, the project document was signed by senior officials on behalf of the government. Due to a restructuring of government agencies and responsibilities, a revised project document was developed and signed by senior officials on October 7, 2002. Consequently, the effective start date of the project was delayed from March 2002 to October 2002 because the Agency for Efficient Use of Energy (AURE) was transferred from the Ministry of Economy to the Ministry of Environment, Spatial Planning and Energy (MoESPE), and a decision was made within MoESPE to assign AURE as the executing and implementing agency for the project. The EcoFund, which was originally supposed to implement the entire project, maintained its implementing role for the financial component of the project

In compliance with the project document requirements, the PIU was established in October 2002, with the necessary technical and administrative support acquired on contractual basis. The Unit was active until June 30, 2007 when the activities foreseen in the Project Document were concluded. The duration of the project was extended beyond the 3-year period planned in the Project Document so that it lasted for 4 years and 8 months.

The GEF grant to the government of Slovenia was transferred to the Biomass Energy Fund and was considered, under Slovenian law, as a state asset under the Fund's control. This subjected the GEF grant to Slovenian procurement regulations. As such, the Fund's investments in BDH projects were considered a sale of state assets that must be open to the public and could not be treated as a delayed equity investment by the project owners. As a result, the project encountered further delays in developing guidelines, funding criteria and pro-forma agreements for operation of the Fund. In addition, in order to meet the project document requirement for a 50% maximum unsecured investment by the Fund, the project owners were required to purchase the Fund equity shares at 50% of initial value if no buyer was found during the public offering. These complexities delayed approval of the Fund documents until June 2003, and created several problems and delays in the negotiations with the initial BDH project proponents.

Project activities to develop BDH projects were further delayed because of the complexities in developing the legal mechanisms to implement the Biomass Energy Fund as a revolving equity fund. Compounding this delay were new rules imposed by the upcoming EU accession of Slovenia, especially those relating to limits on state investment aid (Community guidelines on State aid for environmental protection 2001/C 37/03). These issues were resolved and the Fund became operational in June 2003.

### **3.2 Problems that the project sought to address**

Although wood biomass is the most abundant renewable energy resource in Slovenia, and the construction of BDH systems is a potential means of achieving greenhouse gas (GHG) emission reductions, greater utilization of wood biomass was not realized at the time of the project document. This GEF project was therefore designed to remove barriers to the increased use of biomass as an energy source,

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thereby reducing the fossil fuel consumption and associated greenhouse gas emissions. The project was designed to support the development of an initial set of BDH projects by reducing investor risks and demonstrating the technical and financial feasibility of projects to local communities and residents.

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

Previous efforts to support wood biomass development in Slovenia, support with PHARE funds, had produced projects with considerable economic and environmental shortcomings generating mistrust of biomass as a viable energy source. These PHARE projects also had attenuating environmental problems giving wood biomass an image of a “black biomass” alternative. The project therefore sought to improve the image of wood biomass through the successful and environmentally sound implementation of new wood biomass projects.

In the absence of GEF support to overcome the defined barriers, the progress in increasing the use of biomass as an energy source would 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 was not likely to be achieved.

### **3.3 Immediate and development objectives of the project**

The Project Document states that the project will promote the increased use of biomass as an energy source in Slovenia by: a) removing barriers to, and reducing the implementation costs of biomass based district heating projects in local communities; b) improving the energy efficiency of the existing boilers and individual fireplaces using biomass, and c) increasing the use of biomass for co-generation and in small individual boilers, when economically and environmentally feasible.

The project objectives as set out in the Project Document include the following:

- Finalizing the project implementation arrangements and building the capacity of the local project personnel to conduct and supervise the project activities.
- Finalizing 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.
- Facilitating the implementation of the BDH and other wood biomass related energy projects.
- Promoting the sustainable growth of using biomass as an energy source in Slovenia

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### 3.4 Main Stakeholders

A Project Steering Committee, consisting of representatives from different ministries and other key stakeholders (among them the representatives of UNDP, research institutions, local communities, environmental NGO's) and chaired by the National Project Director was created to provide stakeholder input to project implementation.

Membership of the committee included:

- Ministry of Economy, Jadranko Medak, State Undersecretary
- Ministry of Finance, Irena Momič, Adviser to the Minister
- Ministry of Economy, Peter Šmitek, Adviser to the Minister
- Ministry of Agriculture, Forestry and Food, Robert Režonja, Adviser to the Minister
- ECO Fund RS, public fund, Darko Koporčič, Assistant to the Director
- Slovene Society for Solar Energy – SLOSE, Matjaž Valenčič,
- Association of Slovene Biomass Societies, Martina Šumenjak, MSc, Chairperson

Other stakeholders in the project were municipal governments, regional organizations, farmers, local consultants, and manufacturers of biomass equipment.

### 3.5 Results Expected

- Financial support for the construction of three to five biomass boiler plants which would in turn provide relevant experiences for further wood biomass energy use projects as well as for the commercialization of the use of renewable energy sources
- Creation of the VEM tool – Methodology of assessing RES project impacts
- Finalizing 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)).
- Compiling a guidebook and training material on project financing, including the preparation of feasibility studies, business plans and tender documents in a transparent, standardized format based on a common methodology and parameters.
- Creation of a Biomass Energy Fund supported by the government of Slovenia
- Total emission reduction of 9800 tons of CO<sub>2</sub>

## **4.0 FINDINGS AND CONCLUSIONS**

### 4.1 Project Formulation

#### 4.1.1 Implementation Plan -- Satisfactory/ Marginally Satisfactory

The implementation plan contained in the Project Document provided a multi-dimensional approach to removing barriers to the increased use of biomass as an energy source in Slovenia. It combined financial incentives with educational, training and policy initiatives. The sequencing of activities was appropriately coordinated and effectively integrated in the plan.

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The implementation approach, however, did not reflect a detailed understanding of the issue associated with the deployment of GEF resources as equity investments in eligible projects. The plan basically did not fully anticipate the legal complexities for implementation in Slovenia. This failure led to delays in the implementation of equity investments particularly with projects “owned” by the public sector. This shortcoming was amplified by the unexpected complications associated with EU regulatory requirements regarding “state aid” and Slovenian law governing “state assets.”

The implementation plan did not fully appreciate that the preparatory periods for new biomass district heating systems are very long for projects where municipalities are the main project generator. This is due to scarce financial and human resources provided by local communities and the requirements imposed on the project in terms of local infrastructure and public service costs.

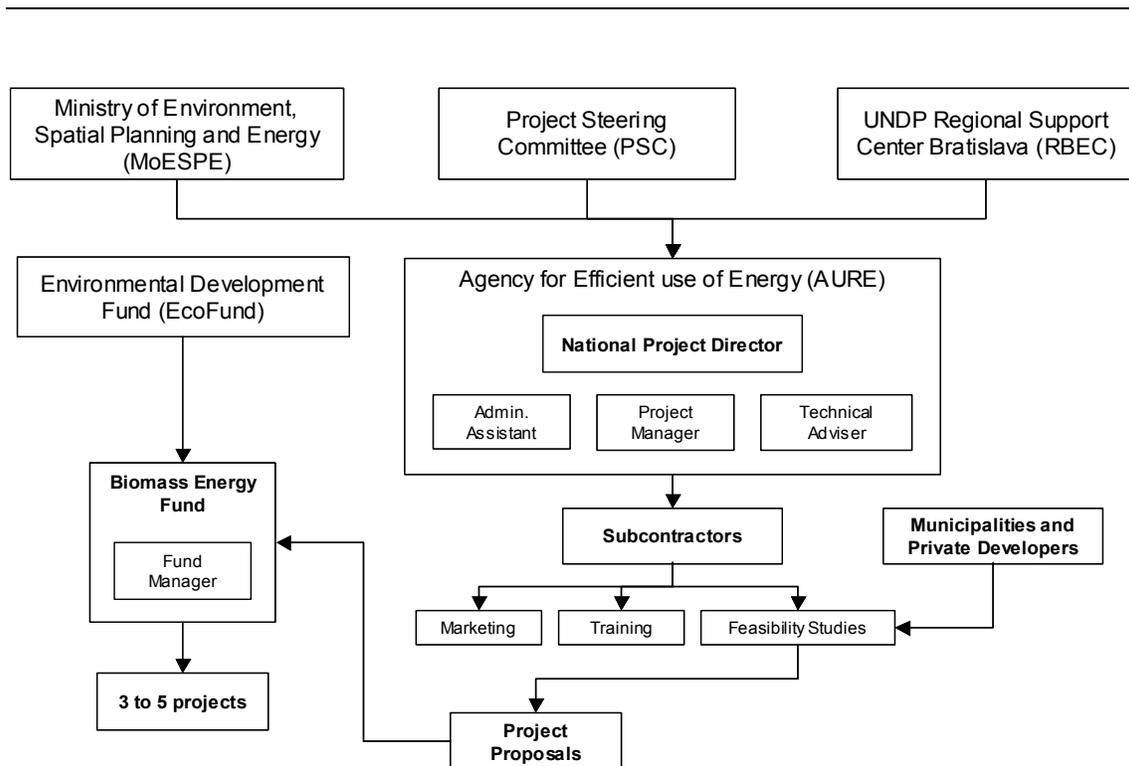
The plan did not appreciate the quality of feasibility studies performed prior to the start of the Project. Many of the studies did not meet investment standards and were of marginal value to Project implementation. In many cases where feasibility studies are performed without investor input and review the results tend to be more generic and of limited value. Funding for feasibility studies should be tied to investor input and evaluation to ensure the quality and relevance of work performed.

#### **4.1.2 The Management Arrangement**

The “Agreement on Management” executed by the Government of Slovenia (represented by MoESPE); the AUER; and the EcoFund was well crafted. Areas of responsibility were clearly established and properly allocated among the parties best able undertake them.

A diagram of the project organizational arrangements is shown in Figure 1 below. The AURE was assigned as the executing and implementing agency for the project. The EcoFund was assigned to implement the project’s financial component through a Biomass Energy Fund (Fund) to be created under the project. A PIU was established within AURE to manage the project activities, including capacity building, developing a pipeline of projects for the Fund, and promoting the sustainable use of biomass in Slovenia.

**Figure 1: Project Organizational Arrangement**



While the management arrangement was well conceived, the composition of the PIU and budget were over designed in the Project Document. For a Project with a primary goal of identifying, developing, financing and implementing biomass projects, the allocation of equal sums of funding for a “technical advisor” and a “marketing advisor” as members of the PIU was a misallocation of scarce resources. The fact that there was no line item of funding for a financial/legal advisor on the PIU team also reflects a failure in the project formulation process to fully understand the task being asked of the PIU. While marketing strategies are important to the success of the Project and funding for marketing activities are important, the value of a marketing advisor should not be equal to the value of a technical advisor for the purpose of achieving the Project’s objectives. Fortunately, this was recognized early in the implementation phase and revision in the budget and allocation of resources were made.

Although all major components of the Project Document were implemented under the program, substantial revisions in the composition of the PIU and revisions to the project implementation strategy were required due to (1) over design of composition of the implementation team and budget in the Project Document ; (2) complexities in the equity investments in biomass projects; (3) unforeseen developments due to the expiration of time between the finalization of the PDF B document and Project’s conclusion.

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#### **4.1.3 Analysis of LFA (Project logic /strategy; Indicators)**

The log frame set out a coordinated implementation plan with the proposed timing of expenditures to match project coordination objectives. It contained a clear set of objectives with a matrix for measurement of progress and success.

Here again, however, the log frame did not anticipate the realities of implementing an innovative financial product. It reflected greater emphases on mechanics over practicalities. While the log frame called for the development of a model heat supply agreement, for example, it did not articulate the need or timing for the legal agreements necessary for equity investments in municipal projects.

#### **4.1.4 Lessons from other relevant projects (e.g., same focal area) incorporated into project implementation**

The Austrian experience in implementing over 300 biomass district heating projects during the 1990s was closely reviewed and lesson learned from that experience helped shape the Project's design and implementation strategy. Some of the key conclusions of a study of the Austrian experience were:

“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 (v) extend the scope of renewable energy policies to individual domestic heating with wood.”

These factors were fully considered in the project design and were carried forward in the project implementation.

During project implementation, the PIU continued to draw from biomass experts and programs in neighboring countries to provide educational assistance and technical guidelines for the Slovenian Project. The PIU retained the Swiss Association Holzenergie SCHWEIZ to provide training and manuals for biomass project implementation. The group included a team of experts – authorized quality officers from Switzerland (Ruedi Bühler, Andres Jenni and Jürgen Good), co-authors of QM - Wood Boiler Standards and as such the best qualified interpreters of standards and for training new users.

In addition, during project implementation, excursions for local government officials and consultants to Austria and Italy were organized to provide more in depth understanding of the individual phases in the production as well as the operation of wood biomass plants.

Insufficient attention was paid to how biomass projects were financed in neighboring countries however. Greater attention to these lessons would have been helpful in the project planning, design and implementation process.

#### **4.1.5 Country ownership/Driveness**

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At the national level, Slovenia ratified the Kyoto Protocol in 2003, and biomass can make a significant contribution to Slovenia meeting its Kyoto targets. The National Energy Plan (NEP) has important goals for biomass energy systems, which are consistent with the potential of the resource to contribute to achieving the country's Kyoto targets.

The PIU worked closely with MoESPE officials developing the NEP to draft the biomass component of the plan. Analysis performed by Josef Stephan Institute in support of the Operational Program for Reduction of Greenhouse Gases adopted by the government in July 2003 shows that biomass is the most important of the renewable energy technologies for Slovenia, and that biomass systems are among the most cost-effective technologies for CO<sub>2</sub> emission reductions in the heating area. Through the year 2012, biomass for heating could account for as much as 20% of all GHG emission reductions depending on the development of the market.

Also at the national level, the GEF project is very complimentary to AURE's other support programs for household biomass systems and industrial biomass systems. The project is also relevant to the activities of the Slovenian Forestry Institute to promote a stable wood energy market.

At the local level, biomass supply can be an important means of improving income and living conditions among farmers and other potential suppliers in the local community. Biomass has also been included in the regional development plan for several regions where BDH project have been proposed. As an example, a biomass demonstration and training facility will be funded by the regional development agency as an adjunct to the Vransko BDH project.

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 CO<sub>2</sub>-tax has been considered and proposed as one possibility to collect these funds.

The design of the Biomass Energy Fund appears to be a reasonable and logical extension of Slovenian government activities in this area based on the results of past efforts.

#### **4.1.6 Stakeholder Participation – Highly Satisfactory**

Based on the extensive documentation and history of past efforts to promote biomass investments in Slovenia contained in the Project Document, one can assume that adequate stakeholder consultations took place during Project formulation. However, in view of the fact that these consultations took place in 1999-2000, more than 8 years ago, time and resources did not allow for independent verification of these consultations.

To reach any valuable conclusion on this matter would involve considerable time and effort reaching out to participants from 8 years ago. The rating provided for this

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section of the final evaluation is therefore based on information contained in the Project Document. Although stakeholder consultation appears to have been adequate during project design, additional and more extensive consultations with legal and financial experts during this stage of development may have identified some of the legal and technical difficulties that took place at the launch of the Project and delayed Project implementation

During implementation the PIU used a number of partnerships and strategic associations to effectively advance the Project's objectives, This associations include the following:

- The PIU collaborated with the Association of Biomass Organisations of Slovenia – SLOBIOM, to organize training on small biomass boilers for installers, chimney sweeps and designers in 2004-2005.
- The LesEnSvet network was established and functioned within the following three institutions: the Slovenian Forest Service (in the continuation SFS); Chamber of Agriculture and Forestry (in the continuation CAFS); and, the ZRMK Construction Institute as the coordinator of the EnSvet project. The consultations in the LesEnSvet network covered the dissemination of information about the wood biomass potential (forest, scrap wood, other wood biomass), modern technologies of wood biomass production (logging, harvesting, transport), modern technologies of wood biomass processing (cutters, logwood processors, drying, stocking), and modern technologies of wood biomass use (boilers for central heating, sanitary water heating).
- A biomass district heating investments brokerage event, was organized to promote investments in new wood biomass district heating projects for which the feasibility studies had already been made. The brokerage event brought together municipalities with already performed BDH feasibility studies and potential investors willing to co-invest into the projects.
- Cooperation was undertaken with the Slovenian Chamber of Commerce on disseminating project information through the Chamber's monthly magazine.
- The PIU actively and effectively collaborating with the Slovenian Forestry Institute and within the FAO project to increase the effectiveness of both efforts
- Other partnership activities discussed more fully in the results section of the report

#### **4.1.7 Design of the financial mechanism**

Unfortunately, the Project Document did not understand or contemplate the issue associated with the deployment of GEF resources as equity investments in eligible biomass projects. Under the terms of the project Document, GEF resources were transferred to the Government of Slovenia and considered state assets. Under

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Slovenian law, the sale of all state assets must be open to the public, and the original concept that the GEF investment would actually be a delayed equity investment by the project owners could not be fully achieved. However, in order to meet the project document requirement for a 50% maximum unsecured investment by the Fund, the project owner must guarantee to purchase the Fund equity shares at 50% of initial value if no buyer is found during the public offering. Because of complications related to these two requirements, final approval of the guidelines, funding criteria and pro-forma agreements for operation of the Fund were not approved until June 2003. The result was about a nine-month delay in the implementation of project activities to develop BDH project.

The current Fund design has added significant complexity and delay to the initial project development activities and has discouraged some potential project owners. As an example, negotiations with Kočevje (a municipal project owner) took from June 2003 to Feb 2004 to resolve and required that they transfer ownership of the site property from the municipality to the municipal utility company in order to maintain majority ownership after the Fund investment. The legal arrangements for this added cost, required additional municipal government approvals and delay to the project.

The project designed also underestimated the extensive transaction costs associated with this process. It did not fully assess the appropriate exit strategy for equity investments. Methodologies for the transparency in pricing equity investments were also underdeveloped.

#### **4.1.8 Cost-effectiveness**

The Project design sought to leverage GEF funds by a factor of 3-1 in the first round of projects financed. This is a reasonable leveraging ratio for such projects and is consistent with traditional financing modalities. Modifications in the project design, however, are needed to achieve greater leverage and cost effectiveness.

The GEF equity investment was designed to address the lack of available financing from traditional financial institutions due to perceived biomass project start-up and technology risks. The Project achieved these objectives during Project implementation without additional costs even though Project completion was extended well beyond the original closing date.

The extensive transaction costs associated with equity investments makes the utilization of the equity model inappropriate for smaller-scale projects. As such, the Project Document's design to move this financial model forward in the future for smaller-scale biomass projects will be problematic.

#### **4.1.9 Replication Approach**

The replication value of the Project in other geographic area depends in large measure on the financial conditions in those areas. Equity can be a powerful catalyst to leverage debt financing for projects. Equity for energy projects is generally provided by project sponsors and has its own measurement of return. While return

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on debt financing can be measured in terms of interest rates, equity investments are measured in terms of net internal rate of return (IRR).

As a general proposition, equity demands higher rates of return than debt as it is a more risky form of investment. For this reason, efforts to keep the costs of financing renewable energy projects in an affordable range, would seek a greater percentage of debt in the financial structure

A program to provide equity investments for renewable energy projects will be most successful in areas where project sponsors have adequate technical and management skills but lack sufficient equity to support their projects because they are thinly capitalized start-up enterprises. This is a common characteristic of many renewable energy project developers around the world. In these circumstances, an equity fund with the capacity to properly evaluate project risks can fill an important gap in the project development process. This role can only be effective, however, if there is affordable debt financing in the market.

In Slovenia, project developers were able to provide equity investments in projects up to 25% of total project costs. Under these circumstances an equity fund may not be the most appropriate financial intervention strategy. However, due to the reluctance of local banks to lend to BDH projects, other sources of financing were necessary. In this case GEF resources could have been deployed as debt through a loan program. During the project implementation phase issues were raised about the value of a debt program given the statutory debt limitations of local government who were the primary target market for BDH projects. The possibility of using the GEF investment to provide loan guarantees was evaluated in the development of the Project Document, and it was not considered to be an effective mechanism because most municipalities have statutory borrowing limits and found it hard to take on more debt. The equity fund concept emerged from these circumstances.

The equity investments in BDH projects had no IRR, and as such effectively served as a zero interest loan of 3-5 years. In Slovenia, a zero interest loan program may have been more appropriate as most of the projects were financed by private sector developers rather than municipal enterprises. This program would have been easier to implement. And, the repayment of loan principal on an annual basis would have more quickly capitalized the Biomass Energy Fund.

As local banks in Slovenia become more familiar and comfortable with biomass and BDH projects, the need for an equity fund will diminish.

#### **4.1.10 UNDP comparative advantage**

Implementation of an innovative financial program necessarily involves unexpected issues and challenges. These challenges often require modifications to project design and implementation strategies. Such was the case in Slovenia. The project benefited from an active and constructive engagement of the UNDP Regional Center. The office brought a wealth of knowledge about biomass financing initiatives

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in the region and an understanding of the need for flexibility in project implementation.

#### **4.1.11 Linkages between project and other interventions within the sector**

The key linkage of the project with other interventions involved the financing arrangement with the EcoFund. The EcoFund is actively engaged in financing environmental projects in several sectors including energy. Under the biomass financing program, the EcoFund provided the 25% debt financing of projects supported with GEF equity investments. Given the state of the banking sector in Slovenia and a reluctance to finance biomass projects, the EcoFund played a critical role in the financing program.

While the EcoFund will remain a source of debt financing for future biomass projects, it will be imperative to bring commercial bank financing into the program to make it fully sustainable.

### **4.2 Project Implementation -- Highly Satisfactory**

#### **4.2.1 Implementation approach**

Following formation of the PIU, the project implementation proceeded expeditiously. AURE appears to be a supportive environment for the project, and while the PIU has encountered certain difficulties and delays, it appears that project activities were managed effectively and expedited as much as possible. In particular, regular supervision of the project developments by MoESPE, AURE, Eco Fund, and close involvement of some Project Steering Committee members in crucial moments were decisive factors to overcome some institutional barriers.

The Project Steering Committee served as a useful and effective oversight and coordination mechanism for the project. It helped facilitate formation of a working group to solve the complexities surrounding the operational principles and contractual arrangements of the Fund.

The PIU encountered some restrictions and delays dealing with the bureaucratic procedures in place because they operate as part of AURE within the MoESPE. While annoying, these have not been the most significant delays encountered by the project.

The AURE was a supportive environment for the project, and while the PIU has encountered certain difficulties and delays, it appears that project activities are being managed effectively and expedited as much as possible. In particular, regular supervision of the project developments by MoESPE, AURE, Eco Fund, and close involvement of some Project Steering Committee members in crucial moments was decisive factors to overcome some institutional barriers.

Stakeholders interviewed during the evaluation mission felt that membership in the Steering Committee provided ample opportunity to express their interests and concerns regarding implementation of the Project. The requirement that all biomass projects had to obtain Steering Committee approval before disbursement of funds

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required regular consultation between the PIU and stakeholders. This also provided PIU leverage in negotiations with potential investors. On a number of occasions, the PIU used the necessary Steering Committee approval as a buffer against aggressive negotiations by individual project investors over the terms and conditions of project financing. Several modifications in the Project implementation were approved in a timely fashion through consultation with the Steering Committee and Tripartite meetings.

#### **4.2.2 The logical framework used during implementation as a management and M&E tool**

The Annual Project Reports (APR), UNDP/GEF Project Implementation Reports (PIR) and Mid-term evaluation effectively used the logical framework as an evaluation benchmark of performance to date.

#### **4.2.3 Feedback from M&E activities used for adaptive management**

As stated previously, necessary modifications in the implementation plan were implemented in a timely fashion due to the effective oversight of the Steering Committee working in concert with the Tripartite Review Committee.

#### **4.2.4 Financial Planning**

Due to the delays in implementation mentioned earlier, expenditures of Project funds were delayed considerably. While the Project Document anticipated expenditures of \$3.5 million in years 2002-2003, actual expenditures for those years totaled \$410,000. Expenditure for year 2006-2007, two years after the anticipated termination of the Project, totaled \$1.7 million. Large expenditures in the final years were due to the equity contributions in BDH projects which represented the largest portion of the total Project budget.

These delays in project expenditures did not adversely affect the sequencing of Project implementation. Expenditures for training, marketing and capacity building appeared to take place in a timely manner relative to the timing of equity investments in BDH projects. The delays in expenditure did not require reallocation of Project funds among activities.

Sources of co-financing for BDH projects were made available in a timely manner to allow for financial closure of BDH projects. Funding for the Slovenia government's grant portion of BDH projects was appropriated well in advance of BDH project financing. The EcoFund was sufficiently capitalized throughout the Project to allow for timely execution of loan agreements.

#### **4.2.5 Monitoring and Evaluation -- Highly Satisfactory**

GEF project team set the standards for data collection to investment project proponents, and the project proponents collected required data as part of pre-feasibility and feasibility study. Most of the required data serves the double purpose of assessing global impacts and assessing financial sustainability of investment

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projects. Hence, this is a double assurance for quality and accuracy of data collection.

The scope and level of details of data collected to assess global impacts is satisfactory and meet GEF standards. The global impacts assessment methodology and results of implemented BDH projects are meeting GEF and UNDP quality standards

The quality of data collected has not been assessed as it would have required unduly heavy work for the project team on one hand and the project evaluation team on the other. However, the order of magnitude reported is consistent with available knowledge.

The project team has carefully estimated CO2 emission reduction and has included bottom up CO2 avoidance calculations within application procedures elaborated to select projects to support and carried out by projects investors.

The project has dedicated GEF funding to carrying out a methodological study and one of the outputs of the project is made up of tools to calculate CO2 emissions reductions, easily available to the public, free of charge. These tools serve as solid ground for carbon finance investment appraisal.

The institutional set up guaranties relevance and consistency between project outputs and national regulations for support provided by the ECO fund since the Jozef Stefan Institute, entrusted with elaboration of the CO2 calculation tool, is also in charge of national emission abatement plan and national goal setting.

#### **4.2.6 Management by the UNDP regional office**

The Bratislava regional office provided consistent and helpful guidance to the PIU as requested and participated in the tripartite reviews. Members of the PIU found the UNDP regional office support both constructive and timely. Delays in the release of GEF funds for projects, however, created some difficulties in specific biomass project execution as UNDP funding was needed to be in place before financial closure. The UNDP should consider establishing a more streamlined fund disbursement process to respond to request for funds to accomplish project financial closure in a timely manner.

### **5.0 Results/ Attainment of objectives**

#### **5.1 Biomass projects implemented**

The number of wood biomass projects financed by the program exceeded project targets. Eight BDH projects were financed under the program as reflected in the table below.

**Table 1: Summary of BDH Project Financing**

PROJECT BDH	PROJECT COSTS (FINAL) VAT 0%	GRANT	EQUITY	EQUITY / COMPANY CAPITAL	DEBT ECO FUND
	€	€	€	%	€
<b>KOČEVJE</b>	2,429,305	524,260	524,260	45.97	625,939
<b>VRANSKO</b>	2,284,740	463,875	483,360	49.10	667,668
<b>MOZIRJE + LUČE*</b>	1,464,172	383,996	383,996	49.10	312,969
<b>LOČE</b>	806,725	214,342	214,342	49.17	166,917
<b>ČRNOMELJ</b>	2,009,634	316,584	319,921	49.30	(1.052.623)**
<b>SOLČAVA*</b>	181,498	58,153	58,153		
<b>TOTAL</b>	<b>9,176,074</b>	<b>1,961,211</b>	<b>1,984,033</b>		<b>1,773,494</b>

\* - one company

\*\* - not ECO FUND provided debt

\*\*\* - maturity 15 years, rate to be provided by the ECO FUND

The total power installed at project end equals to 12.84 MW. Based on planned production and on information provided by project team, the average plants use can be estimated at 1770 hours full power equivalent, for normal climatic years, which is consistent with normal DH operations.

A brief description of each project is provided below.

### **BDH Vransko**

The investor in the new boiler house and BDH Vransko is Energetika Projekt d.o.o., Vransko.. Before the construction of the BDH system, heat production depended on the burning of log wood and fuel oil in mostly old individual boilers, whereby renewal was long due for some of the bigger ones. This hastened the transition to a new heat supply source. The construction project for a new wood biomass boiler plant and district heating consists of two wood biomass boilers (2+1.2 MW) and one spare boiler ELKO (1.5 MW), which covers the peak points and district network in the total length of 4,700 m. Altogether, 124 customers are connected to the system, 20 of them large or public users, among them a school, kindergarten, health centre and the municipality. BDH Vransko operates throughout the year, including summer.

### **BDH Kočevje**

Before the implementation of the BDH Kočevje project, heat for the already existing district heating system was produced in extra light fuel oil boilers or residual fuel oil boilers. In order to keep some of the old boilers operating, the investor would have had to carry out expensive renovation works. This fact contributed to a speedy decision to invest into BDH system which mitigates air pollution in the town and reduces energy costs.

The construction of the new wood biomass boiler plant and the extension of BDH Kočevje consist of a wood biomass boiler of 4.5 MW and a new part of the district heating network in the length of 3,605 m. In total, 1,330 households are connected to the network, plus 18 public consumers, among them a school, high school, kindergarten, health centre, residence for the elderly, student dormitories, sports hall, the municipality and 11 industrial and small

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trade users. The new wood biomass boiler plant is located in the Kočevje industrial zone – Trata. The construction took place between July 2004 and

March 2005, when a test start up of the wood biomass boiler was carried out. The new boiler operates belt wise; the remaining ones operate on fuel oil in existing plants and supply heat in peak times. The boiler enables automated burning process with a relatively high, 50 percent humidity, and utilization rate over 88 %.

### **Micro BDH systems Mozirje / Luče**

The wood biomass district heating project in the municipalities of Mozirje and Luče includes three smaller systems, which are the micro BDH system in the Mozirje Primary school, the micro system BDH Podrožnik in Mozirje and the micro system BDH Luče, which all have wood biomass boilers with 0.5 MW or 0.5 + 0.11 MW rated capacity. In all three of them there is a heat storage tank with the volume of 10 m<sup>3</sup>.

### **Micro BDH system Mozirje / school**

The boiler plant in the Mozirje Primary School provides heat for two existing public facilities, the primary school and the kindergarten, whereby the connection to the new sports hall has also been envisaged. The boiler plant includes a boiler with a combustor on wood chips, with a rated capacity of 500 kW and a heat storage tank of 10 m<sup>3</sup>. The length of the hot water connection is 175 m. Summer operation has not been foreseen. The BDH system will only be operating during the heating season.

### **Micro BDH system Podrožnik / Mozirje**

The boiler plant in the business district Podrožnik is connected to the existing facilities: Tuš chain store, a catering establishment and a housing plus business facility. The boiler plant has two boilers on wood chips of 500 kW and 110 kW rated capacity and a heat storage tank of 10 m<sup>3</sup>. The length of the heat supply pipeline is 587 m. The connection to two further business and trade facilities, which are now under construction, is also planned. The construction of the boiler is adapted to the existing building, which is true also for the access drive for the fuel/wood chips, which are blown into the storage space directly from the transporting vehicle.

### **Micro BDH system Luče**

There are 12 users connected to the boiler plant in Luče, 4 of them being public buildings, two business and housing facilities and six residential houses. The boiler plant includes two wood chip boilers of 500kW and 110 kW rated capacity, with a heat storage tank of 10 m<sup>3</sup>, which enables good adaptation of heat production to the variable consumption during the heating season. The BDH system will be in operation only during the heating season. The length of the heat supply pipeline is 787 m.

BDH system Luče started operation in January 2007.

### **BDH Loče (Municipality of Slovenske Konjice)**

In accordance with the Decree on Heat Supply from the District Heating Network in the Municipality of Slovenske Konjice and the Decree on Economic Public Enterprises in the Municipality of Slovenske Konjice, the grantor, Municipality of Slovenske Konjice and the

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recipient, TOPLOTNA OSKRBA d.o.o. signed a concession contract for the distribution and production of heat for the BDH Loče system for an indefinite period of time.

The founders of the company, given the concession for wood biomass district heating in Loče, included private entrepreneur and the Housing Fund of the Municipality of Slovenske Konjice.

The facilities connected to the BDH system are: the primary school, kindergarten, health center, residence for the elderly, cultural institution, 2 industrial or small trade consumers and 24 housing units. For heat production, a boiler with a wood chip combustor of 1000 kW rated capacity will be installed in the boiler plant, which is located at the location of the Cugmajster sawmill in Loče. The length of the heat supply pipeline is 1,338 m. The BDH system will be in operation during the heating season only. The investor is considering an expansion of the system.

### **BDH Čardak / Municipality of Črnomelj**

Prior to the implementation of the BDH Čardak project, heat for the existing, but already decrepit district heating system in the agglomerated settlement of Čardak, was produced in the liquid oil boilers, and before that in coal-fired boilers.

The size of the existing boiler plant, which the investor purchased from the previous owner, allowed for the reconstruction of the heating system with a different fuel – wood biomass. More than 500 housing units, a kindergarten and the health centre are connected to the new BDH system. In the future, the residence for the elderly will also be connected to the system.

The boiler house includes a boiler with a wood chip combustor of 2,200 kW rated capacity and a heat storage tank of 40 m<sup>3</sup>. To satisfy the energy needs at peak consumption times as well as for reserves, an EL fuel oil fired boiler with 2000 kW rated capacity has also been installed. The length of the heat supply pipeline is 1,840 m. The system will be in operation during the heating season only.

### **BDH Solčava**

The concession for the sale of heat in the Municipality of Solčava was awarded to EKOEN d.o.o., owned by the entrepreneur Rok Suhodolnik.

The newly constructed primary school and kindergarten, a multi-purpose facility, cooperative and housing units are all connected to the boiler plant, which is located in the cellar of the multi-purpose facility. It includes a boiler with a wood chip combustor and has 220 kW rated capacity. The length of the heat supply pipeline is 430 m. The wood biomass district heating system in Solčava was the last of the BDH projects that received financial support from GEF project.

Based on a review of project materials, all projects financed with GEF assistance were fully commissioned, are currently operational, are delivering heat supplies under their contractual obligations, and are current in their debt service payments to the ECO Fund. In addition, each boiler is inspected on an annual basis and all boilers have been found to be operating within Slovenian environmental regulations.

## **5.2 Verification of GHG emission tools**

The project team drafted simple, easy to use tools to assess individual projects in the following technological options:

1. Biomass District Heating
2. Individual biomass boilers

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3. Solar thermal collectors
  4. Solar PV systems.

For each option, a download executable Excel file is available on the website of The Jozef Stefan Institute. The executable Excel files provide options for economic, financial and CO2 calculations. Source data used are official Slovenian emission factors as recorded and communicated to the UNFCCC. Locally significant emissions such as Sox and Nox are taken into account.

From review, the level of details seems adequate. Furthermore, from interviews with the project team, it appears that the methodology proposed based on a bottom-up approach and fully consistent with project figures. This methodology is a mix of the Prototype Carbon Fund methodology and the ERUPT methodology.

### **5.3 Verification of GHG emission reductions**

Total emission reductions from implemented BDH projects is indicated to be 7880 tons of CO2 per year compared to the initial 9800 tons of CO2 estimated in the revised brief. This figure is calculated based on a bottom up analysis of used fuel for heating by DH customers prior to BDH installation. The fuel mix is hence specific to each project. As an initial hypothesis, projects with dual fuel (all projects over 1MW) would use the fossil fuel boiler to meet peak demand. Primary fossil fuel consumption would represent 20% of total fuel consumption.

Climate impacts have also been correlated to actual consumption for 3 years and climate adjustment has been carried out so that figures relating to CO2 emission reductions are relevant under “normal” climate conditions.

The GEF project team has been thorough in estimating CO2 emissions reductions and the source figure are based on actual data collected at each investment project site.

### **5.4 Global Environmental impacts of the project**

When the project brief was prepared in 1999, GEF required a global impact estimation figure but the notion of direct, direct post project and indirect emissions were not in use. The final report, as presented by project team, does not report on all these figures and indicates only a theoretical yearly CO2 emission reduction amount achieved by 8 investment projects supported by GEF through this initiative, calculated at project investment stage.

#### **5.4.1 Direct project emission reductions**

For GEF projects, emission reductions were calculated over a 20 year period for investment projects commissioned during project life. In this particular case the total amount, based on project team calculation would be 157,600 tons of CO2 avoided. As previously mentioned, this is calculated from a bottom up approach, based on an analysis of energy consumption for heat of DH customers prior to BDH installation. An alternative solution where BDH systems would have been installed anyway does not correspond to sound baseline since such systems would most probably not have been installed without government and GEF intervention.

The project team aware of local conditions concluded that without GEF and GOS intervention, consumers would continue to use LPG and other forms of decentralized

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energy sources. The relevance for the present evaluation is linked to easiness of verification. If the baseline had been an alternative decentralized system, it would have been easy to check figures. On the other hand if the baseline had been a fuel based DH system, conclusion of the present would have been that baseline option was incorrect.

If one considers the operation of the 3 major BDH plants with total 9.9 MW, which utilized 100% biomass instead of initially planned 80% and considering the alternative fuel is LFO, the increased CO<sub>2</sub> emission reduction can be estimated at 2,776 tons of CO<sub>2</sub> over a 20 year period. This can be considered with a 100% confidence factor.

If all dual DH systems were to run exclusively on biomass, additional emission reductions over the project life time would be in the range of 960 tons of CO<sub>2</sub> per year or 19,200 tons over a 20 year period.

In total, direct emissions would be reduced by 176,800 t of CO<sub>2</sub> as direct impact of GEF project.

#### **5.4.2 Direct post project emission reductions**

These reductions relate to investments carried out after project end but with support of monies originated from the GEF. In this particular case, \$2.5 M USD from the GEF was provided as contribution to investments under the form of capital shares which will be sold within a period of 3-5 years. In other words in 2011, all the shares acquired are property of the GOS today will have been sold. Contracts were drafted in such a way that if the market offer was less than 50% of the nominal value of the shares, the initial investor is obliged to buy back at 50% value. In short, the minimal return is 50% of the initial GEF stake or \$1.25 M USD. Returns are planned to be placed into a special account of the ECO fund, dedicated to the promotion of BDH with 50% top up from the GOS.

Hence, subsequent projects supported by the ECO Fund can be considered for post project impact estimations. Given the conservative estimation of return on GEF monies on one hand and the will of the GOS to provide 50% additional funding on the other, a reasonable estimation would be to envisage that over the next 5 years, direct post project impacts would equal that of the GEF project itself.

#### **5.4.3 Indirect emission reduction**

In the particular case of Slovenia, which will benefit from European support and which will commit to UNFCCC reduction targets, the impact of the GEF project on renewable energy development in general and on the development of BDH in particular can be considered negligible. This does not hamper the value of the project in itself or the lessons that have been learned from the project but illustrates impacts of wider political options on a single individual GEF projects and highlights the limits of single project evaluation.

The GOS has targeted a total of 36 GWh and 2,77 PJ for biomass use only at a 2023 horizon corresponding to emission reductions 225 kt of CO<sub>2</sub> per year. This is very ambitious for Slovenia and the GEF project has supported the establishment of such targets. Nevertheless, only a small portion of this amount could be accounted for as indirect impacts of the GEF project.

Should the evaluation conclude that equity is the most effective mode of support and should the Biomass Equity Fund envisaged be established and operational, then indirect emission would be sustained over time.

Hence the project global impact assessment would be as follows:

Table 2: tons of CO2 avoided over a 20 year period	
Direct project impacts	176, 800
Direct post project impacts	176, 800
Indirect project impact	Negligible unless equity investment is actually taking place on a permanent basis The use of biomass would probably have taken place without GEF intervention, based on Slovenia entering the EU

#### 5.4.4 Methane benefits of Biomass District Heating projects

Projects using wood fuel are generally considered to have a neutral impact in terms of CO2. Their global benefits originate from avoided fossil fuel consumption. Conversely, depending on national circumstances, avoided methane release from unused wood residues could benefit biomass projects by providing sizeable income through carbon finance. This particular aspect is not mentioned in project reports.

From the sustainability perspective, while project reports mention having supported sustainable forest resource management practices, very little is mentioned on the actual situation in Slovenia or project activities. The impact of land degradation and land use changes has not been presented in project report.

All of this is justified by the specific Slovenian situation with regards to forest management. Information which has been obtained through interviews indicates that limited information provided is justified by national circumstances which are as follows:

- Slovenian territory is constituted of forest areas at 60%. Free logging is limited and current regulations secure that only 40% of forest growth is logged each year. This corresponds to 4.5 million cubic meters while current actual logging is in the range of 3 million cubic meters.
- Slovenia is currently taking advantage of the European context and exports biomass fuel to neighboring countries mainly Italy and Austria, where regulations provide that green electricity is highly retributed. Because residues from the wood industry are less expensive, they are used in priority. Hence given the national context, no unused wood residues methane release can be claimed as benefits of biomass based projects using wood chips.

As a result, neither forest depletion aspects nor methane avoidance from wood residues were relevant to the present project final calculation and clearly present

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gaps between initially planned global impacts and achievable ones at project end.

While in this particular case, specific biomass use related complex issues did not have much relevance, in the future it is recommended that project reporting should present implications of projects on sustainable forest/land management and to require that methane related situation be studied and presented for replication purposes because of its potential sizeable impact in carbon finance.

## 5.5 Contribution to capacity building and training

- *Information dissemination.* The PIU compiled materials on state-of-the-art biomass energy technologies, their technical and economic characteristics, etc. in Slovenian. The PIU also developed an effective web site that contains brochures and leaflets downloadable in electronic format and provides technical information on all aspects of the biomass industry in Slovenia. In addition three internet portals were established: (i) the project home page <http://www.aure.si/index.php?MenuID=114&MenuType=E&lang=SLO&navigacija=on>; (2) the biomass exchange <http://res.borzen.si/DesktopDefault.aspx>; and (3) biomass potential <http://www.gov.si/zgs/biomasa1/index.php>).
- *Public Awareness.* The PIU conducted multiple meetings with local communities and industry representatives to raise public awareness, provide information and support project developments. In 2005-2006, the PIU organized 9 local presentations of modern technologies for the production, processing and use of wood biomass. Over 5,500 participants in 2006 had the opportunity to see wood processing machinery, machines and procedures for preparing fuel as well as chip and pellet boilers. All the companies supplying equipment for wood energy use were invited to participate
- *Capacity for preparing feasibility studies and “bankable” project proposals.* Because the biomass consultancy market in Slovenia lacked competition, PIU has provided training to consultants..
- *Training.* The PIU organized two Seminars on “Biomass Energy Supply Contracting in European Practice” and on “Quality Management in Planning and Construction of Biomass Energy Systems.” Seminar participants received a Slovene translation of a set of rules and manuals from the QM – Wood Boilers program, which include the best achievements of European know-how in this area. The translation of the collection was prepared in 2005 by GEF project and contained:
  - Volume 1: Q - Instructions for Quality (with Q – Quality Plan) /52 pages. Instructions describe the process of the QM - Wood Boiler Plant and shows in detail the quality requirements that need to be fulfilled when installing such a plant.
  - Volume 2: Standard Boiler Connections – 1st part /145 pages. The manual presents practical solutions for monovalent or bivalent installations for heat production with one or two wood boilers, with or without a heat storage tank. There are also numerous solutions provided for the consumer dealing with heating the premises and with the preparation of hot sanitary water.

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Volume 3: Model Tender for Wood Boilers /64 pages. The publication includes instructions for planners preparing a tender for boiler producers. On the basis of an electronic template, the planner can adapt the tender sample to his own needs.

Volume 4: Planning Manual /245 pages. The manual explains the course of action and describes in detail how to plan and implement the project to achieve the quality goals which have to be taken into account when installing a wood boiler plant.

- The PIU also collaborated with the Association of Biomass Organisations of Slovenia – SLOBIOM, to organize training on small biomass boilers for installers, chimney sweeps and designers in 2004-2005.
- *Capacity of local communities to assess the sustainability of the wood fuel supply and to mobilize/organize the local fuel wood market.* The small size of the forest holdings in Slovenia (the average is 3 hectare) creates a special challenge to developing a biomass supply market. To tackle this issue, the PIU worked in collaboration with the Forestry Service to promote training and cooperation between the regional representatives of the Forestry Service, the Agricultural Advisory Service and the Energy Advisory Service to identify synergies that will support a biomass supply market.
- *Capacity of government agencies.* One of the main contribution of the project to capacity development is represented by the continuous technical assistance and inputs provided by the project team to Ministries and other public institutions for developing sound national programs and plans for introducing biomass as a sustainable energy source. This included contributions the National Energy Plan (2004), National Development Programme (2007-2013) and Sustainable Energy Programme (2007-2013).

## 5.6 Sustainability

Targets for biomass energy have been specified in the National Energy Plan relative to achieving the Kyoto targets for Slovenia. Energy companies, municipalities, equipment suppliers, consultants, public relations companies, mass-media and NGOs are focusing attention of biomass energy because of this project. Agencies such as the Forestry Institute, Agricultural Advisory Service and the Energy Advisory Service are cooperating to better promote biomass energy supply, and a pipeline of BDH projects feasibility studies has been generated by the project.

The program should address policies and programs that impact the viability of BDH and other biomass systems, including current rules and regulations constraining heat prices, methods to ensure a viable biomass supply market, and supports for the environmental and other benefits of biomass systems.

Development of a stable and reliable biomass supply market is also critical to achieving sustainable results from this project. The PIU has undertaken several activities to promote and support a stable biomass supply market for its projects.

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However, this market is also dependent on the activities of the wood processing industry in Slovenia and on the wood energy markets in Italy and Austria.

The small size of the forest holdings in Slovenia (the average is 3 hectare) creates a special challenge to developing a biomass supply market. To achieve sustainable results, additional collaboration with the Forestry Service to promote training and cooperation between the regional representatives of the Forestry Service, the Agricultural Advisory Service and the Energy Advisory Service will be required.

The Biomass Equity Fund as currently structured is sustainable but at very low levels of leverage. Following the evaluation mission, a new Environmental Law, enabling establishment of the Equity Fund, was submitted by the Government to the Parliament. The initial Equity Fund capital request was 1.67 millions euro. This government proposal, if adopted by the Parliament, will increase the leveraging capacity of the Equity Fund

The sustainability of the Biomass Energy Fund and suggested revision to the Fund's operation to enhance sustainability and leverage are discussed in greater detail in the recommendations section of this report.

## **6.0 Recommendations**

### **6.1 Improvements in the Biomass Energy Fund's equity ownership structure**

To enhance the sustainability and viability of the Biomass Energy Funds, several recommendations in the equity investment instruments are provided below.

First, the contract for the purchase of equity by the Government of Slovenia requires that the company amend their Articles of Association to contain the following provisions:

“As long as the Government of Slovenia remains a shareholder of the Company a previous consent of the Government of Slovenia is required for the valid adoption of the following resolutions at the shareholders' meeting:

- Changes in the Articles of Association,
- Increase in share capital,
- Reduction in share capital,
- Changes in status,
- Dissolution of the Company,
- Acquisition or disposal of Company's own shares,
- Use of Company's profits for distribution among the shareholders and for other purposes (payments to employees, members of the Board of Directors and Supervisory Board, if it exists),
- Nomination of the Company's auditor,
- Any disposal or encumbrance of Company's immovable and movable property related to the implementation of the project entitled Wood Biomass-based district heating of .....

If the Company has a supervisory board the Government of Slovenia shall have the right to elect at least one member of the Supervisory Board on its proposal. The

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supervisory board member proposed by the Government of Slovenia must be elected to the supervisory board at least within 6 (six) months of the date of the execution of the agreement on paying up a new contribution and acquisition of a new stake in the Company.”

In addition, the company’s managing director is obligated to obtain previous approval of the Company’s shareholders’ meeting to enter into the following transactions:

- Acquisition or disposal of shares or stakes,
- Acquisition or disposal of company’s own shares,
- Setting up or dissolution of other companies, branches, plants,
- Introduction of additional activities of the company or phasing out existing activities of the company,
- Purchase, sale or other disposal or encumbrance of immovable property,
- Entering into any types of transactions (including investments) the value of which exceeds 10% of the company’s share capital or SIT 10,000,000.00

The purpose of these provisions is to prevent management and majority shareholders from taking actions that may be harmful to minority shareholders’ economic interests. As a result, they enhance the value of minority shareholders’ ownership. These same provisions should be included in the tender document such that the purchaser of GEF project equity would bring with it minority shareholder protections. This should increase the market value of shares during the tendering process. If the equity in the BDH projects is sold back to the project sponsor, these provisions will have no impact as the position of minority shareholder in the projects will be terminated.

A second recommendation deals with the exit strategy for the equity acquired by the Biomass Energy Fund in eligible projects. Under current arrangements, the Biomass Energy Fund would tender the equity for public sale through government asset management regulations. It is widely expected that the response from the market will be weak and that in the absence of offers to purchase the shares the government will make a put call on the project sponsor to purchase the equity at 50% of acquisition costs.

The approach creates an inherent conflict of interest for the project sponsor. Under this arrangement, the opportunity for project sponsors to acquire the shares at half price is enhanced by underperformance of the project. This would diminish investor’s interest in acquiring equity shares during the tendering process and create a better chance that the project sponsor can purchase the shares at have the acquisition price.

An alternative approach would be to require the project sponsor to purchase all of the government equity at face value in 3-5 years. For most project sponsors, the most economically sound response to this mandate would be to take out a loan equal in the value to 100% of the GEF equity investment to meet repayment obligations to the government. This approach creates a positive incentive for project sponsors to reach maximum project return as soon as possible to qualify for local commercial debt financing.

Local banks that are reluctant to investment in the startup and implementation of biomass projects would have a greater interest in lending to successful ongoing

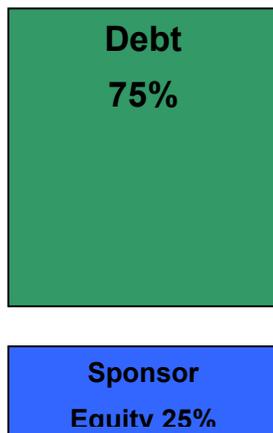
projects. First, once the biomass project is commissioned and successfully operational for three years, the technology risk diminishes considerably. Second, after three years of operation, banks can look at actual performance and financial data from the project itself rather than estimates contained in a feasibility study. The risk profile of a BDH plant after three years of operation is substantially reduced from the risk profile of a planned project.

This approach would also establish a more proportionate balance between debt and equity in biomass projects. Traditional project financing utilizes a 70/30 debt equity ratio as a starting point in financial structuring. These ratios can vary greatly project by project but the 70/30 ratio is considered a financial industry benchmark.

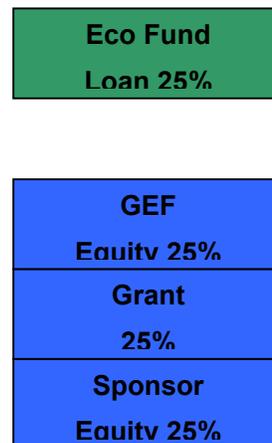
In contrast the biomass projects in Slovenia have a 25/75 debt/equity ratio. The difference between the traditional finance model and the biomass projects in Slovenia is shown in the chart below.

**Comparative**  
**Financial Structures**

**Traditional**  
**Financial Structures**



**Biomass**  
**Financial Structures**



Conversion of the Biomass Energy Fund equity investment in a project to debt from commercial banks restores a greater balance between debt and equity in the financial structure. This would also allow the project sponsor to, in essence, finance the purchase of the government's equity over time rather than in a one-time payment.

This approach would generate additional revenues above those projected for the Biomass Energy Fund. The leveraging and gearing ratio of the fund based on a 50% purchase of government equity after 3-5 years by the project sponsor would be much lower than the leverage of a fund with 100% payback.

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This approach also establishes greater transparency and predictability in pricing as establish financial evaluation polices and due diligence practices of commercial banks would be applied to each project.

Finally, the mid-term evaluation suggested an extension of the timing of the sale of GEF equity from the proposed 3-5 years to a period of 10 years. This would effectively render the Biomass Energy Fund inoperative. Reflows from the purchase of equity would not occur until 10 years after operation, severely diluting any “revolving” aspect of the Fund. Moreover there is no evidence that public tender of equity in 10 years will be any stronger than in 3 years.

Rather than delaying the tendering of GEF equity to the market, the Slovenian government should accelerate this process. As previously stated, three years of operating and financial data should be sufficient for the market to assess the value of each project. The government should also revisit the 50% payback requirement of project sponsors and consider a 100% repayment of equity in three years.

If a project is performing as expected by the end of year three, the technology risk of the projects had been virtually exhausted. At this stage lenders/investors are more concerned about operating risk, continued and timely feed stock supply, plant accidents and related matters for which the market can supply well established risk mitigation instruments.

To mitigate the risk that a project sponsor may not be able to make the 50% payment in years 3-5, the Biomass Energy Fund requires each project sponsor to obtain a bank guarantee of payment. If the project sponsor is unable to purchase the GEF equity at 50% of established value, the bank is required to make payment.

Before providing this guarantee, banks conduct a financial analysis of the project and project sponsor and only provide this guarantee if they believe the project sponsor can make the one-time sizable (relative to total project costs) payment. If a bank concludes that a project sponsor is able make this one-time payment, the project sponsor should certainly be able to finance the equity repayment obligation over time. By financing the one-time equity payment obligation the project sponsor can spread this costs over several years. This places a lesser financial burden on the projects’ financials than the one-time payment obligation.

The economic advantage of converting the GEF equity to debt for the project sponsor and the Biomass Energy Fund can be illustrated by the following example. If a biomass project with total costs of \$1 million is financed through the existing program, the project sponsor would be required to provide \$250,000 at financial closing as equity and the GEF equity investment in the project would be \$250,000. In three years, the sponsor would have to make a minimum one-time payment of \$125,000 to the government. If the project sponsor financed the repayment obligation over 10 years at 10% interest, the payment required in year three would be \$16,510. Given the fact that the project sponsor has a bank guarantee to cover the \$125,000 obligation, meeting a payment of \$16,510 should not be difficult. If the project sponsor is required to make full repayment on the \$250,000 in year three and finances the repayment obligation over 10 years at 10% interest, the payment due in year three would be \$33,037.

If local banks, after a financial analysis, believe a project sponsor can make a one-time \$125,000 payment in year three, those same banks should conclude that the

project sponsor can make a \$16,510 annual payment over ten years or a \$33,037 annual payment over 10 years if full repayment of equity is required.

Under this arrangement, the Biomass Energy Fund would recapitalize much faster and achieve greater leverage, without undue burden on the project sponsors.

<b>Table 3: Repayment Obligations for \$250,000 Equity Investment</b>			
	Year 3	Year 4	Year 5
Existing program	\$ 125,000	0	0
Existing program with bank financing 50% repayment obligation over 10 years	\$ 16,510	\$ 16,510	\$ 16,510
Full payment of equity with bank financing repayment obligation over 10 years	\$ 33,037	\$ 33,037	\$ 33,037

Bank financing over 10 years at 10% interest

For purposes of comparative analysis, a three year repayment is assumed. Banks are conservative institutions and would estimate the risk of equity repayment under the most conservative terms, i.e. the Fund would make a demand for equity repayment in year three out of a possible 3-5 year period.

Under the financing of equity repayment obligations approach, the project sponsor would pay more over the life of the project as total principal and interest would exceed \$125,000. However, for bank lending purposes, the lender looks to the capacity of the project sponsor to make the largest one-time payment under the financial structure. For a bank to provide an equity repayment guarantee, it must assume that the project is producing sufficient revenues in year three to cover the \$125,000 repayment obligation or that the project sponsor has sufficient funds to do so. In either case, there is no reason to delay repayment to 5 or 10 years.

The impact on the cash flow of the Biomass Energy Fund would be greatly enhanced under a 3 year full repayment structure. A comparative analysis of the impact of various Biomass Equity Fund repayment options is provided below. This table reveals that full repayment of equity in three years nearly doubles the total carbon savings from the 50% repayment over five years.

<b>Table 4: Biomass Energy Fund Cash Flow \$2.5 million portfolio</b>										
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
<b>Equity 5 year repayment @50%</b>	2.5	0	0	0	1.25	0	0	0	0	0
Total Financing	2.5	2.5	2.5	2.5	3.75	3.75	3.75	3.75	3.75	3.75
Total carbon savings tons	100	200	300	400	550	700	850	1000	1150	1300
<b>Equity 10 year repayment @50%</b>	2.5	0	0	0	0	0	0	0	0	1.25
Total Financing	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	3.75
Total carbon savings tons	100	200	300	400	500	600	700	800	900	1050
<b>Equity 3 year repayment @100%</b>	2.5	0	0	2.5	0	0	2.5	0	0	2.5
Total Financing	2.5	2.5	2.5	5	5	5	7.5	7.5	7.5	10

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## **6.2 Monitoring and verification**

In order to increase cost effectiveness of GEF support, it is proposed that the GEF provide standard methodological tools and guidelines for carrying out GEF projects global impact assessments. It would be beneficial to the GEF overall impact assessment on one hand and to project teams on the other, to have a clear framework for such assessments. This would also establish standards for comparative benefits from various UNDP/GEF projects.

## **7.0 Lessons learned**

- Deployment of GEF resources as equity investments in renewable energy projects can serve as a powerful catalyst for project financing but requires extensive legal documentation relative to loan programs.
- Equity investments require liquidity, transparency in pricing, and effective exit strategies to be fully effective.
- Replication of equity investment schemes will depend on local market conditions and availability of affordable local debt financing.
- Equity investment schemes should focus on larger projects as transaction cost relative to project size is a deterrent to project sponsors
- Marketing strategies should have a greater focus on decision makers.
- The success of a financial program will depend in large measure on the professional and entrepreneurial approach of the PIU.
- Sustainable financial models require timely repayment of investments to achieve appropriate leveraging capacity.
- Project Documents should resist the temptation to over design project budgets and human resources.
- Lessons learned from other relevant programs should pay close attention to financial models.
- Special attention should be paid during the project development process to the legal treatment of the transfer of GEF resources to host governments.

## **8.0 Conclusions**

- The project has been highly successful and Slovenia is now on the road to developing RES at a national scale. National target together with corresponding financing are acted at national level.
- Capacity has been built and investment has taken place using innovative approach.
- Financing was made available by the GOS, project stakeholders and other partners and subsequent financing is ready to support the development of RES.
- The GOS is taking the necessary steps to provide the legal and regulatory framework as well as the financing opportunities for the development of RES in general and Biomass use in particular.

Co financing (Type/ Source)	IA own		Government		Other Sources*		Total		Total	
	Financing (mill US\$)		(mill US\$)		(mill US\$)		Financing (mill US\$)		Disbursement (mill US\$)	
	Proposed	Actual	Proposed	Actual	Proposed	Actual	Proposed	Actual	Proposed	Actual
Grant			2.5 m	3.03 m					2.5 m	3.03 m
Credits										
Loans			2.5 m	2.68 m					2.5 m	2.68 m
Equity	2.5 m	2.5m			2.5m	3.06 m			5.0 m	5.56 m
In-kind			.400 m	.400 m					.400 m	.400 m
Non-grant Instruments										
Other Types										
<b>TOTAL</b>										

## 9.0 ANNEXES

The following Annexes are include with this Evaluation report:

- 9.1 Consultant Terms of Reference
- 9.2 List of persons interviewed,
- 9.3 List of documents reviewed
- 9.4 Detailed assessment of Objectives, outputs and activities

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## 9.1 Consultant Terms of Reference

### EVALUATION OBJECTIVES AND SCOPE

The objective of the Evaluation is to assess the achievement of project objective, the affecting factors, the broader project impact and the contribution to the general goal/strategy, and the project partnership strategy.

The Evaluation will focus on the following aspects:

- Project design and its relevance in relation to:
  - a) *Development priorities* at the national level;
  - b) *Stakeholders* – assess if the specific needs were met;
  - c) *Country ownership / driveness* – participation and commitments of government, local authorities, public services, utilities, residents;
  - d) *UNDP mission to promote SHD* by assisting the country to build its capacities in the focal area of environmental protection and management;
- Performance - look at the progress that has been made by the project relative to the achievement of its objective and outcomes;
  - a) *Effectiveness* - extent to which the project has achieved its objectives and the desired outcomes, and the overall contribution of the project to national strategic objectives;
  - b) *Efficiency* - assess efficiency against overall impact of the project for better projection of achievements and benefits resulting from project resources, including an assessment of the different implementation modalities and the cost effectiveness of the utilisation of GEF resources and actual co-financing for the achievement of project results;
  - c) *Timeliness* of results,
- Management arrangements focused on project implementation:
  - a) *General implementation and management* - evaluate the adequacy of the project, implementation structure, including the effectiveness of the Project Steering Committee, partnership strategy and stakeholder involvement from the aspect of compliance to UNDP/GEF requirements and also from the perspective of “good practice model” that could be used for replication
  - b) *Financial accountability* – extent to which the sound financial management has been an integral part of achieving project results, with particular reference to adequate reporting, identification of problems and adjustment of activities, budgets and inputs
  - c) *Monitoring and evaluation on project level* – assess the adoption of the monitoring and evaluation system during the project implementation, and its internalization by competent authorities and service providers after the completion of the project; focusing to relevance of the performance indicators, that are:
    - **Specific:** The system captures the essence of the desired result by clearly and directly relating to achieving an objective and only that objective.
    - **Measurable:** The monitoring system and indicators are unambiguously specified so that all parties agree on what it covers and there are practical ways to measure it.
    - **Achievable and Attributable:** The system identifies what changes are anticipated as a result of the intervention and whether the result(s) are realistic. Attribution requires that changes in the targeted developmental issue can be linked to the intervention.
    - **Relevant and Realistic:** The system establishes levels of performance that are likely to be achieved in a practical manner, and that reflect the expectations of stakeholders.
    - **Time-bound, Timely, Trackable and Targeted:** The system allows progress to be tracked in a cost-effective manner at desired frequency for a set period, with clear identification of particular stakeholders group to be impacted by the project.

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- Overall success of the project with regard to the following criteria:
    - a) *Impact* - assessment of the results with reference to the development objectives of the project and the achievement of global environmental goals, positive or negative, intended or unintended changes brought about by the project intervention, (number of households benefiting, number of areas with the new technology in place, level of sensitization and awareness about the technology; any change at the policy level that contributes to sustainability of the tested model, impact in private/ public and/ or at individual levels);
    - e) *Global environmental benefits* - reductions in carbon dioxide emissions and other green house emissions.
    - b) *Sustainability* - assessment of the prospects for benefits/activities continuing after the end of the project, *static sustainability* which refers to the continuous flow of the same benefits to the same target groups; *dynamic sustainability* use and/or adaptation of the projects' results by original target groups and/or other target groups;
    - c) *Contribution to capacity development* - extent to which the project has empowered target groups and have made possible for the government and local institutions (municipalities) to use the positive experiences; ownership of projects' results;
    - d) *Replication* – analysis of replication potential of the project positive results in country and in the region, outlining of possible funding sources; replication to date without direct intervention of the project;
    - e) *Synergies* with other similar projects, funded by the government or other donors.

In addition to a descriptive assessment, all **criteria should be rated** using the following divisions: Highly Satisfactory, Satisfactory, Marginally Satisfactory, Unsatisfactory with an explanation of the rating.

Expected technical assessment and measurement:

**The Evaluation Report will present the reduction of CO<sub>2</sub> emissions. Consultant should evaluate/ validate the financial viability and the savings of the investments made by this project. The evaluation should be fully supported by financial and measurement data..**

**Special attention shall be paid to the impact of the project to Slovenian biomass market in relation to sustainable use of biomass for heating and hot water preparation.**

**For future development support in the region, UNDP is especially interested in the assessment of the support model applied in the project, its implications for the long-term impact and sustainability of the project results.**

**The Evaluation Report will present recommendations and lessons of broader applicability for follow-up and future support of UNDP and/or the Government, highlighting the best and worst practices in addressing issues relating to the evaluation scope.**

#### EVALUATION METHODOLOGY

**The evaluation will take place mainly in the field. The evaluator is expected to follow a participatory and consultative approach ensuring close engagement with the government counterparts, the members of the project team, the National Project Director from the Ministry of Environment and Spatial Planning, the partners and sub-contractors, and direct beneficiaries.**

The evaluator is expected to consult all relevant sources of information, such as the project document, project reports – incl. Annual Reports and Mid-term evaluation Report, project budget revision, progress reports, project files, national strategic and legal documents, and any other material that s/he may consider useful for evidence based assessment.

The evaluator is expected to use interviews as a means of collecting data on the relevance, performance and success of the project. S/He is also expected to visit the project sites and some new sites, where the technology has been replicated.

Although the mission should feel free to discuss with the authorities concerned, all matters relevant to its assignment, it is not authorized to make any commitment or statement on behalf of UNDP or GEF or the project management.

The Consultant should reflect sound accounting procedures and be prudent in using the resources of the evaluation.

#### DELIVERABLES

The output of the mission will be the Final Evaluation Report.

Initial draft of the Evaluation Report will be submitted to UNDP and national counterparts for review. After incorporation of comments, the Evaluation Report will be finalised.

### 9.2 List of Interviewees

1	UNDP/ GEF Liaison Officer and Regional Coordinator	Geordie Colville
2	Ministry of Environment, Spatial Planning and Energy	Jani Turk Lojze Subic
3	Environmental Development Fund of the Republic of Slovenia (ECOFUND)	Franc Beravs, Director
4	National Project Director	Jani Turk
5	National Project Manager	Damir Staničič
6	Project Implementation Unit	
7	Ministry of Agriculture	Robert Rezonja, Adviser to the Gov., PSC Member
8	Biomass Energy Fund	Milojka Jerse, Fund Manager Darko Koporčič, Director of the Project Implement. Dept. Alenka Krzan, Senior Financial Advisor
9	NGO - Slovenian E-Forum	Andrej Klemenc
10	Kočevje	Leon Behin, Director of the Communal Utility,
11	Forestry Service of Slovenia	Loize Budkovic
12	Istrabenz Energy Systems	Andreja Urbancic, Director for Sustainable Energy Borut Del Fabbro, Project Manager
13	Institute Jozef Stefan	Stane Merse, Project Manager Andreja Urbancic
14	Training consultant	Forest Institute - Nike Kranjc, Project Manager

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### **9.3 Documents Reviewed**

Web Site: <http://www.aure.si/index.php?MenuID=114&MenuType=E&lang=SLO&navigacija=on>

Documents reviewed:

1. Revised Project Document
2. Annual Implementation Reports - in English
3. Mid-term Evaluation Report
4. Tripartite Meeting Reports of 06/21/04; 10/08/05; 11/23/06
5. Detailed Work Plan
6. Project Execution Report
7. Training materials on public participation, project development and financing
8. Agreement on Management
9. Option Agreement on Sale of Equity
10. Agreement on paying up a new contribution and acquisition of a new stake in the company
11. Resolution on (reduction and) increase in share capital of the company
12. Elements of the articles of association
13. Public notice for competition for allocation of funds to promote investments in district heating systems using wood biomass
14. National Environmental Action Program

## 9.4 Detailed Assessment of Objectives, Outputs and Activities

Outputs / Activities:	1. Results	2. Comments	3. Rating
<b>1.1 Finalized project implementation arrangements</b>			
1.1.1 Appointing the National Project Director (NPD) and establishing the Project Steering Committee (PSC)	Completed in April 2002	The approach of using a working group consisting of members on several ministries helped resolve the disagreement over the form of the Biomass Fund Agreements.	<i>Highly satisfactory</i>
1.1.2 Establishing the Project Implementation Unit (PIU)	Staff hired in September and October 2002. Provision of IT and other office equipment was delayed to Feb 2003.	Highly qualified candidates were selected through a formal candidate selection process.	<i>Highly satisfactory</i>
1.1.3 Organizing the project initiation workshop	Decision was made to redefine this activity to a future workshop on training or promotion activities.	This decision did not adversely affect the launch of the project	<i>NA</i>
1.1.4 Establishing the Biomass Energy Fund	The Biomass Energy Fund was formally established within the Eco Fund by the nomination of the Fund Manager in October 2002. Developing the complete set of draft procedures and agreements for operation of the Fund was completed in June 2003. Legislation to formally establish the Biomass Energy Fund and provide capitalization of 1.67 million euros has been submitted to the Parliament	The nature of the Biomass Energy Fund as a revolving fund using state assets caused significant complications in the development of its operating procedures and pro-forma agreements. Substantial revisions to the Biomass Energy Fund are needed to obtain sustainability and appropriate leverage	<i>Marginally satisfactory</i>
1.1.5 Finalizing the detailed work plans and implementation arrangements for the other components of the project	Work plan finalized in December 2002 and presented to PSC in January 2003	PIU needed to be in place.	<i>Highly satisfactory.</i>
<b>1.2 Enhanced capacity of the local experts to implement the project</b>			

Outputs / Activities:	1. Results	2. Comments	3. Rating
1.2.1 Increasing the knowledge of the key project personnel on the various aspects of the developing and financing biomass energy projects	PIU has made study tours to BDH units in Sweden and Austria; visited wood boiler manufacturers in Slovenia, Germany; attended workshops on BDH in Austria and Germany; and attended conferences on biomass and renewables in Germany and Austria.	The PIU focused on venues of most significant to the accomplishment of the project objectives.	<i>Highly satisfactory</i>
1.2.2 Compiling a guidebook and training material on project financing, including the preparation of feasibility studies, business plans and tender documents	Formats for feasibility studies and business plans were developed in June 2003 as part of the public tendering documents for preparing such studies of BDH project investments.	Numerous feasibility studies prepared before the project began were not of investment grade quality. The PIU worked with local and international experts to improve the quality and value of studies prepared under the Project	<i>Highly satisfactory</i>

Outputs / Activities:	1. Results	2. Comments	3. Rating
<b>2.1 Potential municipalities, industries, farmers and others are fully informed about wood biomass as an energy source</b>			
2.1.4 Disseminating information and conducting meetings with the local community and industry representatives	<p>Website and three internet portal established</p> <p>Meetings and discussions took place with representative of municipalities, and other interested parties, private investors, farmers, owners of wood resource regional development groups and others.</p> <p>30 municipalities signed by Letters of Interest, and 25 municipalities applied for the preparation of BDH feasibility studies.</p> <p>The average number of hits per month on the project website is approximately 600, and more than double when a public call is announced</p>	Greater focus is needed on key decision makers	Highly satisfactory
2.1.5 Conducting market and pre-feasibility analysis in the interested communities to increase their use of wood biomass as an energy source	Existing feasibility studies for three municipalities were reviewed and revised in line with the GEF project format and project financing negotiations were initiated.	Quality of initial feasibility studies failed to meet investment grade standards	<i>Satisfactory</i>
2.1.6 Disseminating and discussing the results of the pre-feasibility studies	In two municipalities (Kočevje and Vransko), public hearings were organized.		Satisfactory
<b>2.2 Detailed feasibility studies, business and financing plans.</b>			

Outputs / Activities:	1. Results	2. Comments	3. Rating
2.2.1 Reviewing and improving/updating, as applicable, the existing feasibility studies and business plans	The existing feasibility studies were reviewed, resulting three biomass district heating projects selected for further improvement in the first phase. In the second phase two projects out of three applied for GEF financing and additional assistance was provided in order to improve projects quality.	Initial financial model used by the consultants was not consistent the Slovenian accounting system. Because of limited capabilities of the municipality's staff, additional PIU support was provided to examine some design improvements in a timely manner. In terms of effectiveness and efficiency, activities of the PIU to improve the existing feasibility studies was considered appropriate.	<i>Satisfactory</i>
2.2.2 Evaluating the possible financing schemes to finance the projects	A risk sharing financing scheme was proposed with 25% GEF equity, 25% state grant, 25% EcoFund loan and 25% owner equity. Contracts were developed that require recovery of 50% of the Biomass Energy Fund (GEF) equity.	Not a fully sustainable model with low leveraging capabilities. Future efforts should focus on local bank financing for equity take out	<i>Marginally satisfactory.</i>
2.2.3 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, finalize the detailed feasibility studies and business plans for increasing the use of biomass as an energy source in the selected communities	Detailed feasibility studies were prepared for 40 projects	The commitment and financial resources of the municipality and other interested parties are critical to sustaining such projects throughout their implementation.	<i>Highly successful</i>

<b>Outputs / Activities:</b>	<b>1. Results</b>	<b>2. Comments</b>	<b>3. rating</b>
3.1 A national biomass energy program adopted			
3.1.1 Finalizing 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.	Within the GEF project framework, the Ministry of the Environment and Spatial Planning has prepared the Operational Programme of Wood Biomass Energy Use (OPENLES) for the period 2007–2013.	The PIU worked effectively to implement the biomass component of the National Energy Plan, by defining targets for biomass energy programs that support achieving the national Kyoto goals. Similar effectiveness will be needed to develop the supporting National Biomass Energy Program.	<i>Satisfactory.</i>
3.2 Model Heat Supply Agreement			
3.2.1 Preparing a model for fuel supply and heat purchase agreements	Model biomass supply and heat purchase agreements were prepared to support development of the BDH investment proposals.	Future Project Documents should consider a more detailed assessment of all model contracts for successful financing schemes	<i>Satisfactory</i>
3.3 Commissioning of 3-5 demonstration projects	8 BDH plants financed with total costs of 9.1 million euros, and total power installed equal to 12.84 MW. Annual Co2 reductions of 7880 tons	The PIU expended considerable time and effort beyond what was anticipated in the Project Document to achieve this result	Highly satisfactory
3.3.1 Organizing a public call for tenders to facilitate the construction of the first 3-5 demonstration projects	Initial response to the tender was limited which required greater direct marketing by the PIU.	Greater coordination of marketing activities with the tendering process would have been helpful	<i>Satisfactory</i>
3.3.2 Supporting the finalization of all the required documentation to launch the selected demonstration projects	All necessary transaction documents were completed to successfully finance several BHD projects	The Project Document failed to appreciate the complexity of legal documentation for equity investments and failed to account for this in the budget and scheduling of activities	<i>Highly satisfactory.</i>
3.3.3 Provision of training to the local professionals to install, maintain and operate the biomass energy installations	Training seminars for approximately 80 consultants, design engineers and civil servants dealing with the biomass district heating projects were organized.	.	<i>Highly satisfactory</i>

Outputs / Activities:	1. Results	2. Comments	4. Rating
4.1 Recommendations for the long term strategy, institutional and financial framework to support biomass energy activities adopted	<p>Legislation to establish and capitalize the Biomass Energy Fund has been put forth by the Government.</p> <p>Operational Programme of Wood Biomass Energy Use (OPENLES) for the period 2007–2013 put forward by PIU</p>	The lack of a clear biomass supply market, uncertainty over biomass prices and the existence of conventional fuels for DH systems at a relatively low price pose serious challenges to enhancing the level of understanding in BDH as an attractive option.	
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.	Completed	The mid-term evaluation contained recommendations that failed to appreciate the financial possibilities of alternative actions	Satisfactory.
4.1.2 As applicable, establishing an independent national agency/focal point to support biomass energy activities	Not completed.	Currently, the Law on Environmental Protection supports substantial changes to the institutional framework, and the final act will go through the parliamentary procedure.	NA
4.1.3 Constituting the legal and regulatory framework and long term financing mechanisms to support biomass energy activities	See above	The Biomass Energy Fund was undercapitalized to meet its proposed long-term objectives. An additional 1.6 million euros has been proposed to the Parliament. This will help but structural adjustments to the equity investment scheme are required to achieve full sustainability and appropriate leveraging. This factor contributes mostly to the rating	Marginally satisfactory.