

**BioProm – BioEnergy Promotion**



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Report on integrated financial factors

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# **1 – Introduction and objectives**

For the realisation of a bioenergy project investments must be executed. Therefore the operator normally has to raise a credit from a money institute. In some countries financial support is given to bioenergy plant operators by state-run institutions in form of low interest credits or allowances. To get the plant built and running the operator has to develop an investment plan about how he will get the money and from whom and how the pay back will be realised. In the questionnaire the financial factors comprise all the factors related to the situation of acquisition of money and the different concepts. Furthermore the financial factors describe the situation how the credit institutes deal with bioenergy investors and how state-run institutions design their financial support

The objective of this report is to describe, analyse and propose measures to overcome the financial barriers for bioenergy plants identified in this project.

## **2 - Description of financial barriers for bioenergy projects in condensed urban areas**

The objective of this section is to make a brief presentation and analysis of the financial barriers identified in the questionnaire done in Workpackage 2 of this project.

Next are presented the main conclusions of the mentioned questionnaire carried out by the project partners among bioenergy experts to identify barriers for bioenergy projects related with financial issues with special emphasis on urban areas. The conclusions regarding other factors rather than financial can be found in the corresponding project deliverables.

### **2.1 - Stuttgart region (Germany)**

- In order of highest importance, the economic factors lead the ranking list followed by information deficits and financial factors. The public money and the national and local/regional politics are considered to be very important for project realisation.
- For the Stuttgart-Region there is no clear tendency for the credit conditions to be favourable or not. The concept of finance and the existing guarantees are the most important influences on the credit conditions.

### **2.2 - Upper Austria (Austria)**

- Existing guarantees and a good concept of finance are important for credit conditions and financial negotiations.

- Concerning the financial aspects for bioenergy projects in urban areas, the first question was if the experts think that the credit conditions from financial institutions and banks are favourable. More than a half said that they are partly favourable.
- The question on the important frame conditions for credit conditions and financial negotiations was answered by more than a half with existing guarantees as most important factor, followed by a good financing concept, the project size and the public support. The effects on the environment, the climate and the employment, were not judged as important.

## **2.3 - Rhône-Alpes region (France)**

- Economic and financial matters are the main barrier according to questioned persons, even if they consider it to be a competitive energy.
- The public money and the local/regional politics have the strongest influence on biomass projects.
- There is no clear tendency if the credit conditions are favourable or not.
- For the credit conditions and financial negotiations the public support and the concept of finance is essential.

## **2.4 - Catalanian region (Spain)**

The general conclusions regarding financial aspects were:

- In the Catalanian region survey the financial factors rank in third position after economic and information deficits as barriers for bioenergy projects.
- On financial aspects there is a divided opinion on credit conditions for bioenergy projects.
- Existing guarantees and the project size are considered to have a great influence on credit conditions.

Other more specific issues included as commentaries by the experts asked to fulfil the questionnaire were:

- The lack of administrative support is a problem with respect to bioenergy project financing.
- Usually the project is not accepted as a guarantee to get a loan. There is a great lack of information on bioenergy projects among financing institutions so they are not confident in this type of technologies.

- The traditional utility service providers (electricity and gas) are not willing to share as much as possible of the market offer advantageous financing conditions for the equipment necessary for heating or climatisation in the case you became a user of their gas or electricity. For bioenergy there is nothing similar so it is very difficult to compete.

## 2.5 - Slovenia region (Slovenia)

- Information deficits followed by the financial factors are the most relevant non-technical barriers in urban areas.
- Public support and project size are important for credit conditions and financial negotiations.
- Local/national policies and public money is most relevant for the realisation of bioenergy projects
- The credit conditions for Slovenia are judged not favourable. Public support, project size and the concept of finance are the most important frame conditions for the credit conditions and financial negotiations.

## 3 - Financial incentives in each region

The objective of this section is to provide a summary of the financial incentives offered by each partner region for the implementation of bioenergy projects. The information presented was obtained from all the partners of the BIOPROM and also from previous EU and national projects.

### 3.1 – Stuttgart region (Germany)

The Federal Government has created a number of framework conditions and instruments which support the development of renewable energies and assist them in becoming mature and economically viable technologies.

The main promotion schemes for renewables in Germany are the following:

- Renewable Energy Law – feed-in tariff (REL amendment Aug 2004):
  - Biomass: up to 150 kW: 11,5 c€/kWh, up to 5 MW: 9 c€/kWh, up to 20 MW: 8,6 c€/kWh
  - Landfill gas, sewage gas: up to 500 kW: 7,7 c€/kWh, up to 5 MW: 6,6 c€/kWh
- Market incentive program: Investment subsidy for solar thermal, biomass heat and geothermal (200 Mio.€ in 2004).

- Full exemption from mineral oil tax and environmental tax for all pure liquid and solid biofuels in heat and transport.

In 2003 the “Richtlinie zur Förderung von Massnahmen zur Nutzung erneuerbarer Energien” (Ordinance for a market incentive programme for promoting the use of renewable energy sources) was established. It offers a wide range of financial support to encourage supply of bioenergy, in particular of heat from renewable energy systems (e.g. pellet and wood chip heating). The budget in 2004 was 200 million Euros for all renewable energies. The measures of this programme are government grants for small installations and loans with generous terms for bigger installations. That means, small automated/handfed boilers up to 100 kW are supported by grants. Loans are earmarked for automated boilers for solid biomass with more than 100 kW installed heat output capacity, for biogas plants up to 70 kW installed electrical capacity and for cogeneration plants for solid biomass. Additionally funds are available from German Bundesländer, regions or municipalities.

## **3.2 – Upper Austria (Austria)**

The financial stimulation regulations for bioenergy in Austria are mainly situated in the area of taxes or similar.

### **1 – Energy tax on gas and electricity (1996)**

This regulation amounts to 4.36 c€/Nm<sup>3</sup> + 20% VAT for natural gas and to 1.50 c€/kWh + 20% VAT for electricity in 2005. Approximate 12% of tax revenues are remitted to the Laender for the implementation of energy saving and environmental protection measures. This includes measures for the promotion of renewable energy sources.

### **2 – Eco-Power Act (2003)**

On the basis of the 2002 Eco-Power Act, drafted in line with the 2000 Electricity Act, this regulation introduced a federally uniform purchasing and payment obligation for eco-electricity plants. In accordance with the Eco-Power Act the Laender receive funds earmarked for the promotion of new technologies for the generation of eco-electricity. The amounts made available to the Laender amounted to 25 million euros in 2003, 25 million euros in 2004 and 7 million euros for 2005.

### **3 – The Austrian energy research and technology plan**

The plan is focusing on maintaining the technological leadership in bio-energy and in climate protection like increased shares of renewable energies.

## **3.3 – Rhône-Alpes (France)**

### **Bank loans**

As far as bank loans are concerned, unlike the situation in Alsace, in Rhône-Alpes no agreement with the banks is in place for granting bonus rate loans.

### **Third-party finance and leasing arrangements**

Schemes are available for public bodies to outsource investment to third-party financiers or leasing companies.

Third-party finance was used by Sinerg for the nine secondary schools in the region that were equipped with wood-fired boiler plants in the 1980's. Sinerg was set up in France to provide public and private economic bodies with the technical and financial means to reduce their energy expenditure. Since it was founded in 1985, Sinerg has invested in dozens of projects for secondary schools, primary schools, hospitals, swimming pools and other public buildings and also in housing and industry. Its role in a project is to secure third-party investment from local authorities and industry and in the form of leasing arrangements for hospitals and government-owned buildings.

This third-party investment as defined by the EEC and applied by Sinerg since 1986 takes the form of both a loan arrangement and an complete service including technical services and financial engineering. Sinerg takes on the investment for the equipment required and receives repayments from the savings generated. In this way the client avoids all of the risks involved in the investment and retains the right to oversee the conduct of the operations.

Sinerg's role is therefore divided between carrying out an energy audit, scheduling the building work, making investments and providing a means of managing and monitoring the plant. Repayments are funded only from the savings in charges resulting from the service it provides, thereby offering guaranteed results to the client. It remains the sole contact of the companies taking part in the setting up and operation of the facilities built. It is also the main contact for the client. Each project is individual and the set-up process is never the same. The results guarantee concerns the savings generated, from which Sinerg undertakes to deduct no more than 80% in repayments.

Sinerg only takes part in projects that are sufficiently profitable to guarantee a fairly rapid return on investment (6 years). More recently, Sinerg has been "privatised" and the way it operates has changed somewhat.

## **3.4 – Catalonia (Spain)**

### **ICO-IDAE financing agreement**

The IDAE (Spanish Energy Agency) and ICO (Instituto de Crédito Oficial, State's Financial Agency of Spain) have signed a collaboration agreement that will be renovated annually with the aim to create a funding line for projects on renewable energies and energy efficiency.

The financing line is addressed to everybody, a single person or a company of public or private nature.

The maximum amount financed will be 80% of the total investment, with a maximum of 6.310.500 € for person or company and year, either in one or several projects.

According to the qualification assigned by the IDAE to the project the interest rate for these credits will be the Euribor at 6 months minus one to three points.

Table 1 supplies information on renewable energy and energy efficiency projects including bioenergy projects that have benefited from this financing instrument in 2003. The total amount of credits in that year was of 24.36 million Euros.

Table 1 – Renewable energy projects awarded with especial credits from ICO-IDAE.

Project approved of Energy Efficiency and Substitution in Line ICO-IDAE 2003								
Area	Number of Projects	Associate Investment (Million €)	Total Support (Million €)	Final Energy Savings (toe/year)	Final Energy Substitution (toe/year)	Energy Diversification (toe/year)	Electrical Power (kW)	Electrical Production (MWh/year)
Energy Saving and Substitution in Industry	14	27,30	1,20	13.209,68	10.638,99	—	—	—
Energy Efficiency in Public Lighting System	1	0,10	0,01	0,68	—	—	—	—
Energy Rehabilitation of Buildings	1	0,14	0,01	—	149,93	—	—	—
Substitution Air conditioning by Heat Pumps	1	0,23	0,01	—	11,18	—	339	—
Substitution Thermal Generating Equipment for Air conditioning	4	0,50	0,03	152,54	458,01	—	3.296	—
Energy Valuation of Wastes	1	8,60	0,64	—	—	—	10.000	80.000
Electrical Biomass	2	5,80	0,40	—	—	8.163	1.815	11.900
Households Biomass	10	0,50	0,06	—	—	218	—	—
CHP Biomass	1	17,20	1,10	—	—	25,637	7.700	31.200
Smal Hydro	7	4,20	0,40	—	—	—	2.968	12.864
Wind Energy	33	3,40	0,20	—	—	—	3.605	22.553
Biogas	5	11,20	0,80	—	—	7.645	3.616	10.682
Photovoltaic	1.439	63,30	15,80	—	—	—	8.300	12.450
Solar Thermal	614	10,90	3,70	—	—	1.802	—	—
<b>Total</b>	<b>2.111</b>	<b>153,37</b>	<b>24,36</b>	<b>13.362,90</b>	<b>11.258,11</b>	<b>43.464,70</b>	<b>41.638,17</b>	<b>101.649</b>

## IDAE biomass loan

The objective of IDAE is to promote renewable and energy efficiency projects focused on technology innovation and with a clear component of replicability. In 2006 IDAE has started by their own a loan for stand-alone solar photovoltaic, cogeneration under 2 MWe and heating from biomass for domestic use and in buildings up to 3 MW of thermal capacity. The beneficiary may be a private person or a Small and Medium Enterprise (SME). The eligible cost for the biomass case comprises civil engineering costs and project management. The loan can cover a maximum of 1,5 Million Euro (excl. VAT). The loan is for 11 years at an interest rate equal to the Euribor plus 0,3%.

## **Other measures**

On the other hand, several legislation initiatives establish economic additional incentives for the development of the electricity produced using renewable energy sources:

Ley 51/2002, of December 27<sup>th</sup>, that allows municipalities to apply tax exemptions on economic activities and others to the companies using or producing energy from renewable sources or cogeneration.

Ley 36/2003, of November 11<sup>th</sup>, that promotes through tax reduction measures the application of environmental improvement measures.

The electricity market in Spain is regulated by the Law 54/1997, of November 27<sup>th</sup>, where among other regulations the electricity production facilities are differentiated into two groups. One of them is the so-called "Regimen especial" facilities that enjoy a special juridical and economic framework different from the big and centralised power station plants belonging to the electricity companies. The law that regulates the methodology for the application and update of the juridical and economic framework for the production of electricity in the "regimen especial" is the Real Decreto 436/2004. RD 436/2004 is previous to the EU Directive 2004/8/CE on the promotion of the highly efficient cogeneration but the main guideline of the law is to be fully confluent with the objectives of the EU directive. In this law it is stated the bonus for the electricity sold to the grid coming from biomass cogeneration plants. A more detailed description of this bonus is given in Deliverable 3.1 of this project.

## **Primary Energy Plan 2005 - 2010**

In 2005, August 26<sup>th</sup> it was approved by the Spanish government the so called "Plan de Energías Renovables (PER)" (Renewable energy plan) for the period 2005-2010. This new planning substitutes the previous "Plan de Fomento de las Energías Renovables 2000-2010" (PFER), the results of which have been insufficient, despite the fact that during the period 1999-2004 the global consumption of renewable energies in Spain has growth by 2700000 toe, only a 28,4% of the target.

The main target of the new normative (PER) is that 12,1% of the consumed primary energy in 2010 will come from renewable energy sources. The other main targets are to cover 29,4 % of the electricity consumption using renewable energy (in agreement with the EU Directive 2001/77/CE), and 5,75 % of the fuel consumption for transport using biofuels (in agreement with the EU Directive 2003/30/CE and transposed to the Spanish legislation as Real Decreto 1700/2003, December 15<sup>th</sup>). This Plan recognises that to reach this objective it is necessary to help the development of renewable energy technologies by means of economic, fiscal and normative type incentives. The required investment and public support required to fulfil the PER for the period 2005-2010 is shown in table 2.

Table 2 – Investment and public support for the Renewable Energy Plan 2005-2010  
(Source IDAE).

PERIOD 2005 - 2010	(Figures in thousands of Euros)			
TECHNOLOGY AREA (Type of energy)	INVESTMENT	PUBLIC AID	PREMIUM	TAX INCENTIVES
	TOTAL		TOTAL FOR PERIOD	EXEMPTION SPECIAL TAXES
HYDROELECTRIC	950.063	0	189.062	0
WIND	11.756.391	0	2.598.870	0
BIOMASS Industrial Thermal	54.577	0	0	0
BIOMASS Domestic Thermal	710.097	284.039	0	0
BIOMASS Electricity applications	1.964.596	0	1.059.922	0
BIOFUELS	1.156.830	0	0	2.855.095
BIOGAS Electricity applications	119.658	0	49.425	0
SOLAR THERMAL	2.684.611	348.078	0	0
SOLAR THERMOELECTRIC	2.162.500	6.200	559.514	0
SOLAR PHOTOVOLTAIC Standalone facilities	165.107	36.324		0
SOLAR PHOTOVOLTAIC Grid-connected facilities	1.874.211	6.299	499.415	0
	<b>23.598.641</b>	<b>680.939</b>	<b>4.956.208</b>	<b>2.855.095</b>

### 3.5 – Slovenia region (Slovenia)

The Energy Act adopted by the National Assembly (September 1999) gives a special emphasis to promotion of the use of renewable energy resources and giving priority to utilisation of renewable resources before supplying energy from non-renewable resources.

The very important document adopted by the National Assembly in May 2004, is the Resolution on the National Energy Programme (ReNEP). The Resolution on the National Energy Programme (ReNEP) defines the long-term development goals, orientation of energy supply, energy systems and mechanisms for stimulation of the use of RES.

The targets of Slovenian policy defined in the Resolution on the National Energy Programme (ReNEP) are increasing the share of RES in primary energy balance to 12% in 2010:

- increasing heat supply from RES from 22% in 2002 to 25% in 2010,
- increasing electricity from RES from 32% in 2002 to 33,6% in 2010,
- achieving 2% share of biofuels for transport at the end of 2005.

Proposed financial support in the ReNEP for utilisation of RES is 16,274 Euros per year, of them:

- 7,303 Euros per year for biomass and
- 2,086 Euros per year for biogas.

The Ministry of Environment, Spatial Planning and Energy prepared in 2001 a proposal for the government “Program of energy use of biomass wood in Slovenia and the operation programme”. In the proposal, they planned investing in district heating systems, individual small boilers for heating and large capacities boilers for heating. They took into consideration installing 50 district heating systems, 100 large boilers and 5000 individual small boilers.

The targets (goals) of the Resolution on the National Energy Program (ReNEP) are to increase the renewable energy sources in the primary energy balance to 4,0 PJ in comparison to the year 2002 of them 3,1 PJ wood biomass and 0,4 PJ biogas. To reach this target it is needed to install 1500 small boilers for households heating, 50 industrial boilers and 3-5 district heating

A major driving force for renewable development may come from the Kyoto process. In expectation of the difficulties that Slovenia will encounter in reducing CO<sub>2</sub> emissions to the Kyoto target, a CO<sub>2</sub> tax has been introduced. The tax is paid by all users of fossil fuels, except transport (where fuel is subject to high excise tax). A scheme of massive exemptions from the CO<sub>2</sub> tax is in place for electricity production, industry and public services.

Financing support of the investment in project for utilisation of RES in energy purposes is one of the main mechanisms, which impact the development of the use of RES. The financial supporting mechanisms in Slovenia are feed-in tariffs, soft loans, subsidies as public scheme and third party financing (TPF) as private scheme. Government supports through the Agency for Efficient use and Renewable Sources of Energy –AURE (within the Ministry of Environment and Spatial Planning) the development and the use of renewable energy sources through its public competition program with which it promotes energy efficiency and renewable energy investments and programs for increasing their use.

### **Soft loans – ECO Fund**

The ecological fund of the Republic of Slovenia (Eco fund) supports in soft loans form the investment in utilisation of RES (wood boilers, biogas plants, power plants, which produce electricity using RES). The soft loan is limited to cover up to 40% of eligible investment costs for large-scale companies and 50% of eligible investment costs for small and medium companies. In some cases the soft loan is higher, up to 70% (under special conditions):

- additional 10% for CHP in case RES are only used as primary fuels and it is the only electricity supply source in rounded off region
- additional 10% for investors who have production as their own job and under condition: the investment will keep in the region at least 5 years and contribute 25% of investment from own source.

## **GEF project**

The Ministry responsible for energy (The Ministry of Environment, Spatial Planning and Energy) and UNDP GEF (Global Environment Facility) programmes started with the implementation of the project "Removing barriers to increased use of biomass as an energy source". The target of the project is co-financing (non-returnable financing and soft loan) of installation of district heating systems on wood biomass.

The GEF support to the project "Removing barriers to increased use of biomass as an energy source" is 4,3 million dollars (USD) for stimulating the use of wood biomass. The total project cost is 11,8 million dollars (GEF, budget, municipalities and investors) for the whole period of the project (from October 2002 to February 2005). The goals of the project are the financial support of 3 to 5 district heating systems on wood biomass to 2005 and preparing all documentation for installation of 20 other district heating systems.

## **Third Party Financing**

Third Party Financing (TPF) covers a wide variety of contracting and financing techniques for energy efficiency and renewable energy projects. Its basis is represented by the following two approaches:

- energy performance contracting (EPC) aims at reducing energy requirements and the contractor's remuneration is based on the cost savings achieved,
- delivery contracting (DC) is meant for the investments in facilities used for energy conversion at the clients, where contractor's remuneration is based on the delivered heat, electricity and/or cool.

# **4 – Description of some financing mechanisms**

## **4.1 - Project Finance**

The term "Project Finance" refers to the financing of projects based upon a non-recourse or limited recourse financial structure where project debt and equity used to finance the project are paid back from the cashflow generated by the project. In other words, project financing is a loan structure that relies primarily on the project's cash flow for repayment, with the project's assets, rights, and interests held as secondary security or collateral. Project finance is especially attractive to the private sector because they can fund major projects off balance sheet. The biogas cogeneration plant using pig slurry in Catalonia (Spain) was mostly funded using this financing mechanism.

Unlike other financing instruments, Project finance is based mainly in the capacity of the project to generate resources enough to cover all the plant expenses including the payback

of the invested capital. The main innovation consists in that case that the financing mechanism substitutes the traditional guarantees partially or almost completely by several rigorous reports and viability studies (technical, normative and financing studies) and the contractual implication of all or the majority of entities involved in the design, building and management of the project.

## **4.2 - Third Party Financing mechanism**

The Third Party Financing (TPF) are realised by a public body, which invests in financially feasible renewable energy projects. It was designed to overcome the reluctance of banks to invest in RES projects. Some of the main particular characteristics are:

- A company (usually a public body) other than the user makes the investment totally or partially and under their own responsibility realise the technical and financial management of the project.
- The third party receives a percentage of the plant revenues for a certain period to recover the investment. Once the project is running and starts to generate profit the public body decides to handle their part of the business to other companies.

This type of mechanism has kicked off a highly successful wind power development in Spain but also a number of projects involving biomass for providing industrial process heat.

## **4.3 - Contracting**

An innovative approach for implementation of renewables in heat systems (in public and private sector) can be contracting. A precondition for this market segments are sufficient project sizes and profits to pay back investments. In heat delivery contracting, the focus is set on energy supply, energy performance contracting carried out by a so-called energy service company (ESCO) aims to reduce the overall energy demand. With energy performance contracting, a company, the so-called “contractor” or the TPF (Third party financing) identifies plans and implements energy-saving measures for buildings. Energy reductions can be realised by all kinds of methods to increase efficiency: the technical facilities in the respective buildings are modernised, operation costs are reduced and a contribution is made to environmental protection. In energy performance contracting, the contractor’s remuneration is based on the cost savings achieved. In heat delivery contracting, an ESCO invests in facilities used for energy conservation at the client’s and provides the necessary fuels. In addition the services provided by the company also comprise the operation and maintenance of the installed systems. The settlement of accounts is based on the delivered heat and/or electricity volumes, respectively.

## 5 - Suggestions to overcome financial barriers

So far it has been presented a summary of initiatives for financing projects in the different European regions participating in this project. These measures covers almost all the commonly known financial measures to promote bioenergy projects and can be categorise as follows:

- Subsidies to the investment
- Subsidies to the interest rate for credits
- Adequate incentive to the price for the production of electricity from biomass
- Tax incentives. Require less administrative work than other instruments. You get the money back just presenting the bill.
- Tax exemptions
- Subsidies to energy crops
- Direct subsidy to the biofuel price

The financial instruments that could be implemented for the correct development of bioenergy projects should include some of following:

- funding for execution of feasibility & market studies
- investment subsidy scheme
- soft loan schemes for bioenergy projects
- fiscal measures
- green tariffs for power and/or heat from bioenergy plants
- utilisation of internationally available funds for the reduction of greenhouse gases
- utilisation of EU-funds simultaneously to other more close funding sources

One of the lessons learnt is that low size projects can in some cases experience more difficulties to find the correct financing instruments than more ambitious projects for which some financing mechanisms can be available. Nevertheless in some of the regions studied this situation has started to change with loans especially focused in medium to small size biomass heating systems.

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