

# BioProm – BioEnergy Promotion



EIE/04/100/S07.38585

supported by



## Final Technical Implementation Report

**January 2005 – June 2007**

Coordinator

Stuttgart Region Economic Development Corporation (WRS)



***Wirtschaftsförderung  
Region Stuttgart***

# 1. Final Report Summary

## 1.1 Objectives of the action

The project aims to overcome non-technical constraints of the realisation of bio-energy projects in densely populated urban areas. It tends to bring bioenergy projects on their way by establishing a network of actors and stakeholders of the bioenergy sector in five European regions. The main objectives are:

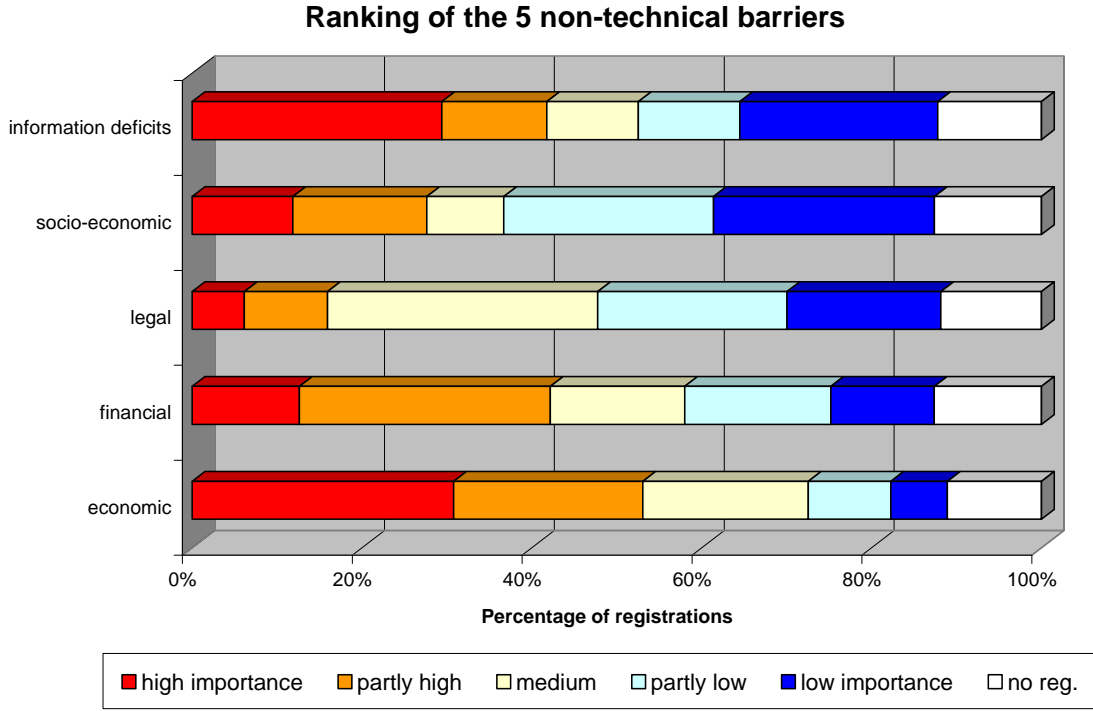
- to establish regional and functional networks, involving all relevant regional actors and stakeholders in the field, which effectively support the realisation of bio-energy projects
- to solve existing non-technical barriers hindering the dissemination and implementation of bio-energy projects with particular focus on the problems in densely populated urban areas
- to enable problem-solving by providing a broad range of “best practice” examples and concepts and disseminate these in an interregional exchange platform
- to stimulate the market introduction of bioenergy projects by increasing awareness and information on bioenergy and on project initiation
- to organise external workshops in order to train farmers and public bodies in realizing bioenergy projects

## 1.2 Achieved results and lessons learnt during the action

The work started with a comprehensive analysis. Therefore the consortium developed a questionnaire in order to get a consistent and complete set of information from all regions. The questionnaire was distributed to at least 50 actors and stakeholders of the Bioenergy sector in each region. Until October 2005, 147 questionnaires have been analysed by the five European partners. The respondents were asked to dedicate each questionnaire for one of the four proposed categories “pellets”, “biogas”, biomass/wood-chips” and “bio-fuels”.

In order to compare the five regions with each other, all regions have been asked to describe their geographical, infrastructural and energy-political characteristics.

The overall results of the survey is shown in figure 1:



The results show a high diversification of the importance of the different kinds of biomass in the five regions. Biomass/Wood-chips have a high importance in all regions. Biogas is also relevant at a medium or low level in all regions. For the pellets and the bio-fuels there is a rather high diversification noticeable.

The main barrier for bioenergy projects is the economic one. The cost competitiveness with respect to conventional technologies and fuels is nowadays still difficult if other factors other than economics are not considerate very important.

Companies interested in bioenergy projects are not aware of the sources of funding that can be obtained from demonstration projects.

The link between potential bioenergy users and bioenergy technologies providers is very weak. The realisation of viability studies should be encouraged to be done by third parties other than engineering companies that in many cases are focused on the introduction of their own products.

Some more points are the following:

- emissions and space requirements are considered as one of the most important barriers
- existing guarantees and a good strategy for project finance are important for credit conditions and financial negotiations
- the location of the plant has the strongest influence on the acceptance of bioenergy projects in urban areas.
- specialised organisations and institutions are main sources of information for bioenergy projects.

#### Lessons learnt

- The location of biomass facilities is a much more important barrier than expected.
- The specific capital costs per unit of capacity increase with decreasing plant capacity ("economy of scale"). Subsidies should differentiate between the different biomass plant sizes that face different types of problems.
- urban development leads to more constraints (transports, implantation...)
- environmental protection regulations are seen as a constraint (level of emissions...)
- legal barriers can be strong enough to completely stop a project or delay it for a very long time
- the socio-economic impacts on local level are diverse according to such factors: technologies, local economic structures, social profiles and production processes
- the information deficits are higher than expected, and there is a need for more objective information, especially in Austria, where the survey showed, that information deficits are considered the strongest barrier.

Another important information and awareness raising tool were events, e.g. workshops, meetings etc. Bringing together stakeholders to specific topics turned out to be a very successful approach. The events organised in the course of the project met with very high interest in all regions. Solutions to overcome these constraints mentioned below have been spreadened and distributed among market participants and interested stakeholders, particularly by demonstrating regional 'best practice' concepts and examples.

Besides that, all regions published brochures and informed their partners, stakeholders and public bodies about the project, for example with a new designed homepage.

It turned out that the awareness and knowledge level concerning the energy situation in condensed urban environments was very low. It was therefore necessary to analyse the potential for biomass installations, before tackling the deficits. A good example ist the analysis "Biomass market potential in condensed urban areas", done by the partner **ESV**.

Besides, a survey to municipalities was carried out in **Upper Austria**, to assess their opinion on renewable energy sources and to get an insight into their opinion about bioenergy utilisation. More than 400 administrative officers were asked about the energy sources used. The results were quite interesting, for example it turned out that there is a difference depending on the municipality size: public buildings in smaller municipalities were mainly heated with oil (40%), larger municipalities mainly use natural gas (76%) or district heating (27%). Biomass is more frequently used in smaller municipalities. Luckily, the future prospects for biomass utilisation are good: more than 50 % of all municipalities plan to convert to wood chips or pellets in the next 5-10 years. However, this trend is only visible in smaller municipalities, larger ones tend to use natural gas and district heating.

The brochure "Biomasse im städtischen Raum" (Biomass in urban areas) was developed. 500 copies of the 4 page and full colour brochure were printed and disseminated.

As the awareness of biomass utilisation in urban areas is quite low, the main aim is to demonstrate best practice examples. Ten projects are presented with a short description and an attractive picture.



In addition the brochure includes information on different possibilities to use biomass in urban areas (e.g. pellets & wood chip heating systems, biogas plants, CHP plants, biomass district heating plants) and on financial support schemes.

In the **Stuttgart Region** the main trade fair in this sector, the "Clean energy power" will transfer its location from Böblingen to Stuttgart (in 2008) and will double the exhibition space up to 10.000 square metre. More than 300 exhibitors, 14.000 visitors and 1.200 participants for a biomass congress from all over the world are to be expected.

Some mayors from communities in Göppingen County developed a position paper, which is added as annex 3 to the “publishable result-oriented report”. This paper recorded some political and strategy issues that are crucial. The project homepage developed in 2005 is well-known and got up to 150 visitors per day (July 2007). The deliverables and the reports of the project will be available soon for everybody via a extra button on the first side of the homepage.

In the **Catalonian Region** (Spain) the realisation of techno-economic viability studies for the initiation of bioenergy projects, like the Hospital and Sewage treatment plant and gasification plant in Cerdanyola del Vallès, has been started. The elaboration of a document on the bioenergy situation in Catalonia and Spain covering the situation on biomass and biogas consumption and a comprehensive description of bioenergy plants has been finished. For interregional exchange of knowledge URV presented a poster of the BIOPROM project with the title “Implementation of Bioenergy Projects in Condensed Urban Environments” at the International Symposium “Sustainable Energy Supply for Buildings” May 2006, Steyr (Austria).

In the **Rhône-Alpes Region** some working groups have been set up, e.g. the “Social housing and wood energy network” and the “Town planning and renewable energies network”.

The brochure about social housing and wood energy was finalised in May 2006. Another brochure is the one “Sustainable development and urban policies: how to effectively manage energy and renewable energy”. This booklet is intended for elected officials responsible for town-planning. Its aim is to inform them of the possibilities of considering sustainable development and the energy issue through town-planning documents and also planning and development operations. It offers examples of best practice and a tool kit and was produced in 3000 copies. It was distributed to a section of the Rhône-Alpes authorities and members of the review committee. Both brochures have been added to the “publishable result-oriented report” (with the numbers D-118 A and D-118 B).

In **Slovenia** the project partner JSI helped to overcome the economic barriers for the co-firing biomass project in Thermal power and heat plant in Ljubljana (Termoelektrarna Toplarna Ljubljana - TE-TOL). TE-TOL is the main supplier of heat for the Ljubljana district heating system and process steam to industrial consumers. The project is under decision and the activity is focused on the economic assessment of the project to encourage the management of TE-TOL in decision for the implementation of the project. The problem is the economy of the project under the current legalisation.

### 1.3 Identified problems and corrective actions taken during the action

As expected the involvement of the biomass stakeholders in biomass survey has not been as high as desirable (e.g. in Spain and Slovenia), but in general the response has been quite satisfactory and the people attending the workshops have considered it very worthy.

In differing from the list of deliverables we decided at our project meeting in Ljubljana in April 2006 not to spread or make flyers on selected "Best practice" examples but to collect these examples all over the regions, to translate all information in english and to spread them via Internet (see Interim Report of July 2006) for download. The reason therefore was, that all partners agree to the limited interest of regional stakeholders for best-practise examples coming from other regions being involved in this project.

With a look on the different sizes, infrastructures, energy-markets and inhabitants of the involved regions the comparison of the results is not as easy as being thought.

This project demonstrated that it is not possible to mix partners who work around different types of biomass or at different levels.

### 1.4 Activities and impact after end of the action

#### **Stuttgart Region:**

To the activities planned after the end of the action belong the maintenance of the project website (<http://www.bioprom.net/>), the lectures at the university stuttgart, the enlarged trade fair "Clean energy power" (see <http://www.cep-expo.de/>) at the new "Landesmesse Stuttgart" and the ongoing meeting round tables for biomass and bioenergy (named "Treffpunkt Biomasse").

#### **Catalonian Region:**

Maintain the Bioprom web site in Spanish adding public documents on bioenergy (papers and presentations) and links to current events on national and international events related with bioenergy. The web will help also to maintain the contact with the regional network providing a phone and email contact that can be of help for the initiation of bioenergy projects. So the door is open to continue the initiation of bioenergy projects in the future.

Two of the initiated projects will be followed because they have high possibilities of practical implementation. These projects are:

- The gasification plant in the cork industry in Girona. In October – November 2007 the raw material for gasification will be analysed as the start for the viability study that can take around four months.
- Biogas cogeneration plant in the sewage treatment plant in Reus. The viability study is made and submitted to consideration by the plant owners. If the project is considered interesting to continue providers of micro gas turbines using biogas will be directly involved in the project.

The gasification plant under construction using agriculture residues by Movialsa is expected that with the collaboration of URV can be included in a European project as a demonstration site preferably in a proposal prepared before the end of 2007 or beginning of 2008.

The Universitat Rovira i Virgili has initiated this year the First European Conference in Poligeneration – Applications and Technologies, that will be held in Tarragona in October, 16-17th, 2007. In this conference speakers experts in renewable energy sources, highly efficient cogeneration and cooling from different countries are invited to participate including experts in the field of bioenergy. This conference will be a good source of contact for future initiatives in the area. Also the bases will be settled to celebrate a second edition of this conference in another European country.

### **Rhône-Alpes Region:**

The BIOPROM project has created or supported several developments. These shall endure, because of local support or as part of other future European projects. With regard to grain energy, the Feyzin project is the first in Rhône-Alpes. It should encourage the development of other sites. The work carried out with the town of Lyon on pure plant oils should encourage other authorities to invest in this sector. The work carried out with the public housing office serves as a reference for other contracting authorities.

The sustainable development and town-planning task force continues, two meetings are planned for autumn 2007 on the issues of density and urban shapes from an energy perspective. The task force with ARRA HLM should be relaunched this autumn. A section of the wood energy plants in the study should eventually increase in number.

Work remains to be done on financing projects, air quality linked to biomass and the most effective integration of wood energy plants into their environment.

## **2. Consortium management during the action**

The coordinator was responsible for the organisation of the meetings (kickoff- and project meeting), for the summary of the respective results, for the communication between the partners during the whole action and for the communication with the project officer and the EACI, the European Commission and also for all the reports. Coming to that this included the spreading of the payments, the collection of the time sheets, the invoices and all the other details concerning the project. Presentations and lectures about the ongoing of the project belong also to the tasks of the coordinating agency (Stuttgart Region Economic Development Agency). One lecture was on the Contractor meeting on the 5th of December, in Bruxelles, the other on a conference co-organized from the partner RAEE on the 16<sup>th</sup> February 2007 in Lyon. Additional duties were the development of templates and the guarantee, that all templates will be used in correct order and manner (quality control). The coordinator has to look for possible co-operation with other projects and programs and has to answer all questions arising from the partners, media, political parties, partners of the network and other stakeholders. It was necessary to collect detailed descriptions of some pilot projects from all the partners involved in this action. He was also responsible for maintenance of the project website, not only during the action but he will also be involved for this purpose until two years after the end of the action.

### 3. Achievements of the action

#### 3.1 Achieved results per work package against initial objectives

There have been no deviations against the initial objectives. The list of deliverables has been fulfilled and is attached at the end of the publishable result-oriented report. The achieved results have been mentioned earlier in this report by region. Every region was the leader of at least one work package (WP):

<u>No. WP</u>	<u>Partner</u>	<u>Region</u>	<u>Description</u>
WP 1	WRS	Stuttgart Region	Dissemination/Implementation activities
WP 2	IER	University Stuttgart	Situation inventory/ Survey, Exposé)
WP 3	URV/CREVER	Catalonian Region	Economic factors
WP 4	URV/CREVER	Catalonian Region	Financial factors
WP 5	RAEE	Rhône-Alpes	Legal factors
WP 6	JSI	Slovenia	Socio-economic factors
WP 7	ESV	Upper Austria	Information deficits
WP 8	WRS	Stuttgart Region	Coordination, management activities

#### 3.2 Review of deliverables, including not achieved results

All deliverables listed in Annex I of the Grant Agreement are listed below and have been completed in time. The one change is described in chapter 1.3 of this report. At the end of this report there is a updated list of submitted deliverables of the action (Table 1).

##### Work Package 1

Project internet portal with general project information and links to the regional websites

Websites of the regional partners in national languages linked to the general project website

Flyers on selected "Best practice" examples, for project developers & stakeholders

Online information and communication platform (extranet)

Interim report "Overcoming of non-technical barriers"

Five external workshops "How to realize bioenergy projects" one per region

initiation of ten bioenergy projects – two per region

Brochure of RAEE for the target group: Social housing organisations (using wood energy)

Project presentations including, presentations, written abstracts, posters, dissemination material

## Work Package 2

Questionnaire template for the situation inventory

Regional specific analysis of the questionnaires

Exposé on the situation inventory of non-technical barriers in and across all partner regions

## Work Package 3 to 7

Report on economic factors in all observed regions\*\*

Report on integrated financial factors in all observed regions\*\*

Report on integrated legal factors in all observed regions\*\*

Report on integrated socio-economic factors in all observed regions\*\*

Report on integrated information deficits in all observed regions\*\*

\*\* including Best Practice solutions with regional impact

## Work Package 8

Reporting and organisation of Kickoff-Meeting and two other project meetings

### 3.3 Review of impact of the action

The performance indicators listed in Annex I of the Grant Agreement correspond with the impacts of the action. It is expected that as the policy environment around the Kyoto protocol develops, the trade in "carbon credits" will impact positively on the economics of bioenergy projects. By pricing the greenhouse gas emissions, especially CO<sub>2</sub>, environmental benefits become part of business planning on the revenue side. EU Directives with clear targets like those for renewable electricity and biofuels, provide a useful framework and incentive for governmental action, as they keep coming up as a reference to the public in the appraisal of progress in most member states.

### 3.4 Success stories

#### **Upper Austria**

In the course of the project, for a number of potential biomass projects in urban areas, information meetings were held and advice especially on the financial support scheme was given. The projects were supported in the planning and implementation phase. One of them,

the biomass district heating plant in Puchenau - a neighbour municipality of Linz, the capital of Upper Austria - was probably the most "difficult" case and without support, the plant would not have been realised. The planning phase was characterised by conflicts. The biomass plant was planned to substitute the (former) natural gas heating plant. The main argument against the biomass heating plant was firstly an economic one as the gas heating plant worked rather profitably (losses were covered by the municipality). Another argument was more emotional as the operator (a community of interest) built up the gas heating plant 25 years ago and this would be finished by now.

However, with the support of ESV – several meetings were held and input in the development of a promotion folder was given – the final decision to implement the plant was taken. With an installed capacity of 5,000 kW the heating plant will provide 500 homes with heat.

### **Stuttgart Region**

The "Albhof" farm near Lauterstein is a prime example of an agricultural business that is able to operate profitably under market conditions. Instead of delivering its products to a local cooperative, the owner built up his own distribution network at his expense to market the farm's milk and cheese products. The Albhof farm later supplemented their operations with two additional future-oriented lines of business: biogas plants and drying sewage sludge.

The Schömbucher farm (Albhof) has been operating a biogas plant since 2004 and has been using the heat made there to process its own milk and cheese products and to dry fodder for its livestock. This plant, located rurally, is scheduled to be significantly expanded soon and will then have a capacity of up to 650 KW. Since this new capacity supplies more energy than the farm needs for its own operations and the surplus energy will be used to dry other materials and to make electricity, the land had to be officially rezoned as a site designated for special usage. Once in operation, this plant will process the renewable plant material that accumulates on some 350 hectares of agriculturally used land.

### **Contribution and support through the WRS**

Prior to an expansion of this magnitude, a feasibility study had to be conducted. Through another EU-supported structural fund project, the Stuttgart Region EDC was able to secure a 50% co-funding grant to pay for a feasibility study that demonstrated the project's cost-effectiveness. Without this support it would not have been possible to expand the facility to this extent. This is a good example of how good networking and good cooperation with Göppingen

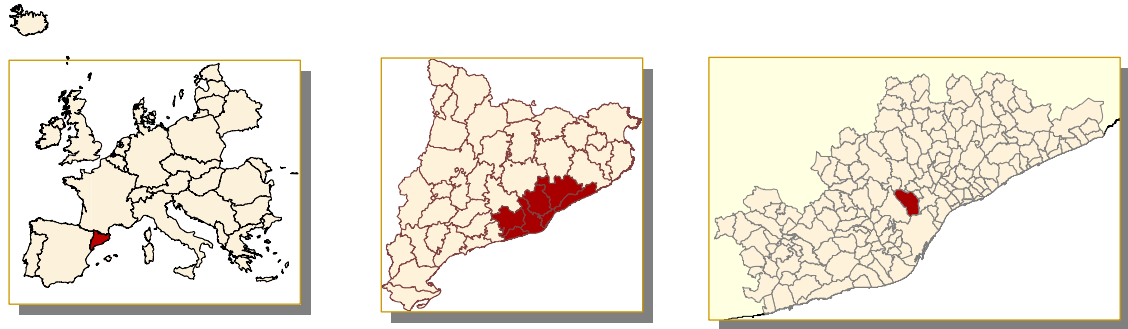
County's biogas information centre can help overcome non-technical obstacles – in this case, an economic problem.

But the profitability issue was not the only obstacle. Once solved, other problems turned up, particularly in the area of land-use planning. Because of the dimensions of the expansion, the public authorities in charge of regulations considered an operation of this size to be commercial, and since the site designated for this plant was not zoned for commercial use, the Stuttgart Region EDC appealed to the appropriate regional planning authority, the Stuttgart Region Association, to help the farm owner get his project approved. Using the argument that this project was potentially very important for an area as sparsely populated as this one is, they were able to convince the regulatory body to approve it. This project is now under construction. The Stuttgart Region EDC was also instrumental in convincing the local utility company to allow some of the surplus energy to be fed into the local energy grid.

**Catalonian Region**

Assistance in the development of a biomass gasification project for a district heating and cooling network in Cerdanyola (Spain)

Crever-URV is providing assistance to the Consorci Urbanistic del Centre Direccional de Cerdanyola del Vallès (Barcelona) in the evaluation of the viability of including a biomass gasification plant in their new cogeneration facilities. These facilities will provide energy to a District heating and cooling network in a new building area constructed around a Synchrotron laboratory. The project is situated in the Metropolitan Area of Barcelona in the second crown of urban development.



Project location (surroundings of Barcelona inside their metropolitan area).

The innovative character of the project consists in the integration of different systems for advanced production of electricity, heat and cold in a network, where flexibility and an innovative management system will allow the optimisation of the primary energy consumption depending of the demand of the consumption centres.

The consumption centres will be the industries and public equipment buildings, but not the residential buildings, which will be supplied by a private company. The system of heat, cold and electricity production will include innovative systems, so far not applied in Catalonia, as well as conventional ones all connected by the distribution heating and cooling network. Figure 6 shows a simplified block diagram for the complete energy supply of the Cerdanyola site.

The feasibility of biomass supply has been studied for the specific ambit of Cerdanyola by Department of the Environment and Housing of the regional Government. The analysis is focused on wood biomass: on one hand harvested forest biomass and on the other hand on wooden bulky wastes. There are three aspects for organising well the feasibility analysis of the Biomass supply structure (BSS): the resource availability, the estimated costs and the energetic and environmental analysis. The project is by now at the basic design stage by the consortium made by the companies Lonjas Tecnología and Tecnocontrol. The whole project including the biomass gasification plant will receive funding from the European project POLYCITY ([www.polycity.net](http://www.polycity.net)) under the Concerto Program until 2010.

## **4. Lessons learnt**

### 4.1 Management

We made good experiences with the chosen management structure. As mentioned above (chapter 3.1) every region was responsible for one factor (URV for two) and has to collect all data within this factor from the other regions too. The alternative has been that one region is only for his own region in charge and not for the others. Another advantage of our structure was that the contacts between the partners grew better and better, and every one was interested in the problems of the other regions. So you learned about the others quite more.

### 4.2 Communication and Dissemination

This project demonstrated that it is not possible to mix partners who work around different types of biomass or at different levels.

### 4.3 Common Dissemination Activities - upon request by the IEEA.

#### 4.4 Conclusions

This project made us realise that whilst the sector, in particular energy wood, is technically mature, a lot of work remains to be done to “democratise” the sector and ensure its acceptance, but above all to properly identify its virtues and also its faults or limitations.

For better acceptance of these new technologies it will be necessary to use communication skills to simplify the technical language which can be deterrently for users.

This project has really contributed to furthering the question of using biomass as an energy source.

#### 5. Other issues

- none -