IMPROVING THE PUBLIC PERCEPTION OF BIOENERGY IN THE EU

Final Report

Harald Rohracher, Thomas Bogner, Philipp Späth, Florian Faber

INTRODUCTION

It is widely acknowledged that the diffusion of technologies in general, and the use of bioenergy in particular, does not depend on technological advances and favourable economic conditions alone. A good understanding and strong backing of bioenergy by the wider European public (or at least specific target groups and opinion leaders) is an essential background for policies supporting the introduction and wider use of bioenergy but also helps to bring costs further down as a result of increased adoption rates and economies of scale. Quite similar, a lack of awareness and (maybe unfounded) fears may result in resistance to bioenergy projects, even if they are economically viable and technologically robust. A better understanding of the acceptance and public perception of bioenergy and resulting strategies to gain higher public support thus have to be an integral part of any large scale market introduction of bioenergy as intended by the European Union.

However, although most organisations and actors involved in the promotion of bioenergy would agree with the importance of a favourable public opinion on bioenergy there is also wide agreement that this issue has to be dealt with more effectively – although at the same time there often is uncertainty about the strategies to do so. Thus there are good reasons to analyse the public perception of bioenergy, and the factors shaping it more systematically and through this provide a better basis for strategies to improve public perception.

The aim of this project-part on the public perception of bioenergy therefore is – as stated in the call for tender: “To identify new approaches for promoting a positive public perception of bioenergy. Such approaches should primarily address the European citizen, because the building of a more positive perception amongst individual citizens will lead directly to a more positive perception within the technical, industrial and commercial communities.” The hypothesis included in this aim will be critically discussed later.

Guiding questions of this task therefore are: What are the reasons for differences in the public perception of bioenergy? In which elements does the perception of bioenergy differ between groups of citizens and regions (regarding the benefits of bioenergy use, or the perceived consequences of an increase in bioenergy usage; regarding past experiences, or the trust in organisations and actors who promote bioenergy; regarding the arguments used to support bioenergy)? Which of the approaches to promote bioenergy are transferable across Europe? What is the potential role of the European Union – what would national / regional organisations and promoters expect and hope for? Which new approaches could be taken to promote bioenergy and have there been experiments with new approaches elsewhere?

As interviews and literature search turned out, the issue of public perception of bioenergy and its promotion is indeed difficult to deal with at a general level. Most of the interviewees felt that improving the public perception of bioenergy is of high importance for the promotion of bioenergy, but often could not tell very much about the situation in their country or broader strategies to gain more support from European citizens. As the following discussion will point out, improving the public perception of bioenergy certainly is a cross-sectoral issue that highly depends on national or even local contexts and is closely linked to the way bioenergy is introduced to the market.

METHODOLOGY, SHORT DESCRIPTION OF THE PROJECT

The study „Improving the public perception of bioenergy“ aims at integrating existing knowledge and studies about the public perception of bioenergy in Europe and at drawing conclusions from this knowledge by proposing a range of activities for the European Commission. The research strategy of this task thus is not to conduct a survey on the attitudes and perception of European citizens or to design a PR campaign but to re-analyse and re-organise existing data and knowledge. The two main strategies that so far have been employed on this behalf are:

- a search for and comparison of existing surveys and studies at an international/national and regional level conducted in different contexts;
- conducting semi-structured interviews with key stakeholders and representatives of organisations and programmes promoting the use of bioenergy.

More specifically the study is empirically based on the following sources:

- Exploratory interviews with persons either working at an international level (e.g. IEA) or having knowledge about the issue of public perception of bioenergy. The explanatory interviews facilitated setting up guidelines for further interviews, identifying relevant topics within the field of public perception and identifying key institutions in the bioenergy area.
- Search for publications, surveys and studies on the public perception of bioenergy through the Internet, library databases and by questioning interview partners about relevant material. As it turned out there is surprisingly little material on public perception as such. The search thus has been widened to market introduction strategies of bioenergy and barriers to the dissemination of bioenergy-related technologies.
- A database of organisations and stakeholders, who are focusing on the promotion of bioenergy or at least to some extent cover renewable energies (such as energy agencies, which are often mainly focusing on energy efficiency, but often also include renewable energy). In a first step a database of 235 organisations has been set up, including contact addresses, the organisations’ main targets and information on work related to public perception of bioenergy (or often renewables in general). The

database is mainly based on Internet research (starting with the manage-energy database) and has been extended by following up links or keyword-searches. The database is organised by member (or accession) country with hyperlinks to the specific organisations.

- Telephone interviews with relevant persons in bioenergy-related institutions. A selection of about 50 institutions has been made from the database (based on the relevance to the subject and advice from project partners and other experts). An interview guideline has been drawn up and revised with project partners from a PR-agency, who are also participating in the project. The interviews mainly focus on available material on public perception, an assessment of factors influencing public acceptance of bioenergy, noteworthy or innovative initiatives to promote bioenergy and suggestions for actions to be taken at an European Union level. Interviews have been transcribed to provide a basis for content analysis and conclusions.

As a result the project provides an overview of existing work on the public perception of bioenergy and of the way a significant number of bioenergy organisations perceives this topic. However, it turned out that the bioenergy community still is very heterogeneous and only loosely organised, which sometimes made it difficult to get good country overviews on public perception by only involving one or two organisations. Though the picture produced by interviewing bioenergy organisations is somewhat patchworky, the information turned out to be a good basis to suggest strategies on a European level.

RESULTS

1) Public awareness of bioenergy

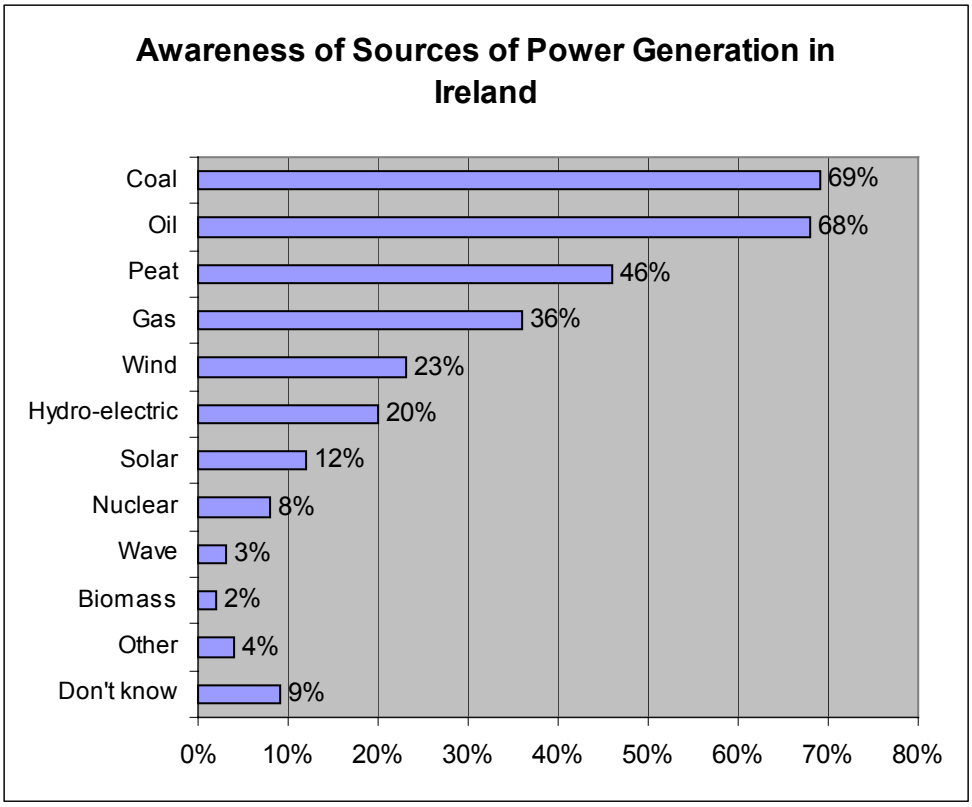
Recently a European public opinion survey on “Energy: Issues, Options and Technologies” has been carried out. The poll is based on Eurobarometer for which about 16.000 citizens have been interviewed in 2002. Unfortunately the survey covers renewable energies only at a general level, without specifically asking for bioenergy. As it turns out, citizens of the European Union have a rather vague idea of the overall structure of energy consumption and underestimate in particular the amount of energy used for transport. Nearly nine out of ten respondents, however, consider global warming and climate change to be serious problems requiring immediate action.

Renewable sources of energy get strong public support: They are perceived by a majority of those polled as being the least expensive, the best for the environment, and to a lesser extent, the most efficient. Cultural factors tend to influence the percentages in favour of renewable energy sources – e.g. higher education correlates well with a higher appreciation of renewable energy sources. Interestingly, Europeans tend to overestimate the actual use of renewable energy sources, in particular in the Netherlands (where 23% give the answer “much used to produce energy”). Looking at this Europe-wide survey, everything appears to be fine for renewables – and bioenergy as part of it.

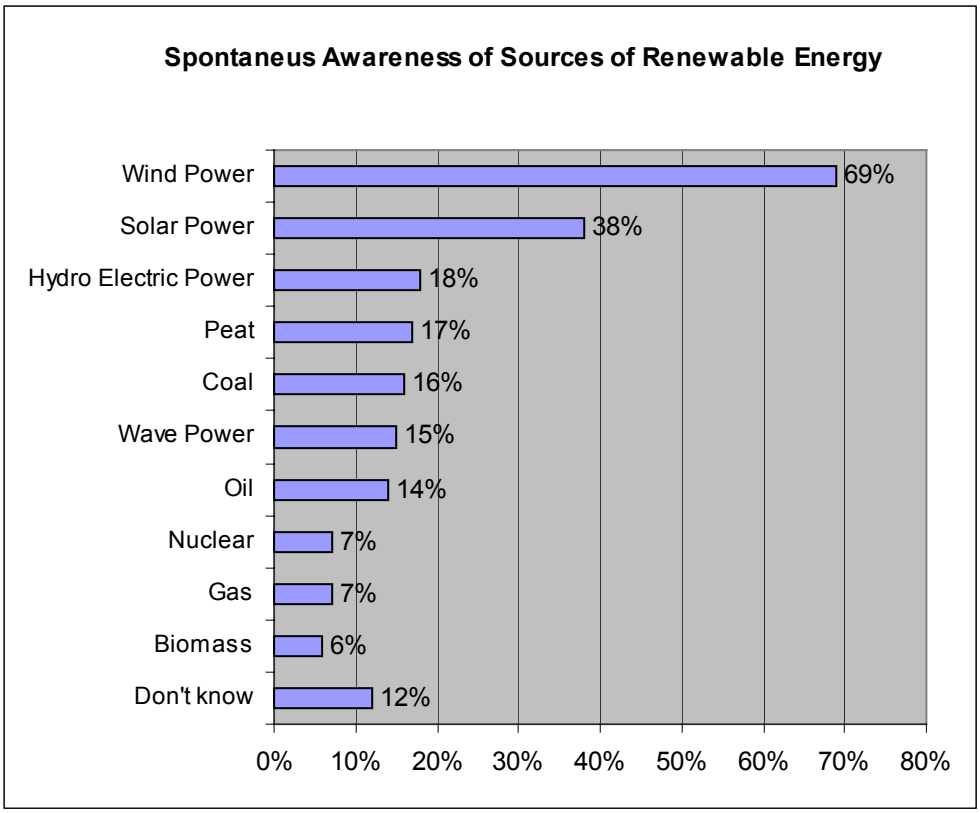
However, surveys differentiating between the different kinds of renewable energy and asking different types of questions often draw a contrasting picture. Especially the differences within the segment of renewable energy carriers are striking, i.e. the perception of wind energy vs. solar vs. bioenergy. As we will see later a similar differentiation even happens within the bioenergy segment. Unfortunately only a very limited number of surveys could be found, which go into depth about different kinds of renewable energies and different kinds of bioenergy. The diagram below is based on a survey on “Attitudes towards wind farms and wind energy in Ireland” carried out for “Sustainable Energy Ireland” in March 2003. An introductory part of the survey covered the awareness of different power sources in Ireland. Astonishingly, biomass as a source of power generation comes out last with an awareness of only 2% (compared to e.g. wind with 23% and solar energy with 12%). If only those aware of the term “renewable energy” (53%) are asked to name sources of renewable energy, biomass still only gets 6% and is even behind nuclear, coal or gas, which

apparently are mixed up with renewable energy sources by some people. Wind energy (69%) and solar power (38%) apparently are the main sources identified with renewable energy.

Even if this survey is restricted to Ireland it indicates the difficulties of treating the awareness of “renewables” at a too general level and of applying figures derived from surveys on renewable energies to bioenergy.



Source: Attitudes Towards Wind Farms And Wind Energy in Ireland, Presentation to Sustainable Energy Ireland by Lansdowne Market Research, March 2003



Source: Attitudes Towards Wind Farms And Wind Energy in Ireland, Presentation to Sustainable Energy Ireland by Lansdowne Market Research, March 2003

A small survey in the Netherlands, where a sample of about 100 people was interviewed by PDE (Projectbureau Duurzame Energie)[1], led to rather similar results, even if the background for renewable energy is different in the Netherlands. Asked about what they would associate with the consumption of green electricity (as the dominant end-use of renewable energy in the Netherlands), answers were distributed as follows:

- Wind 60%
- Solar 22%
- Hydro 15%
- Bioenergy 8%

Again we find a very low awareness of bioenergy. And as expected the same survey also shows that less people feel well informed about bioenergy than about green energy (electricity) as such.

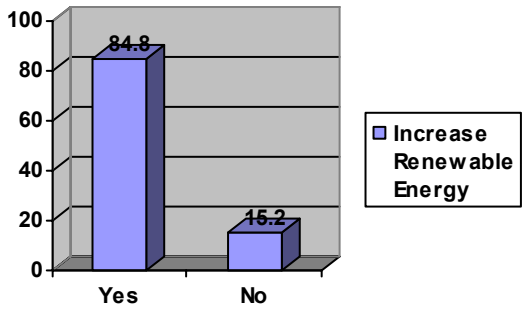
[1] Ria Kalf, Projectbureau Duurzame Energie, Presentation for Euroforum, 6 November 2002

How people feel informed about bioenergy

	green energy	bio energy
good	38%	13%
not really good	43%	35%
bad	12%	28%
not at all	7%	24%

Source: Ria Kalf, Projectbureau Duurzame Energie, Presentation for Euroforum, 6 November 2002

Let us turn to one more survey, which was conducted in the area of Reading, UK, where about 600 citizens answered to a questionnaire.[2] Again, the basic result is similar: General support for renewable energy is high, support for biomass is much lower.



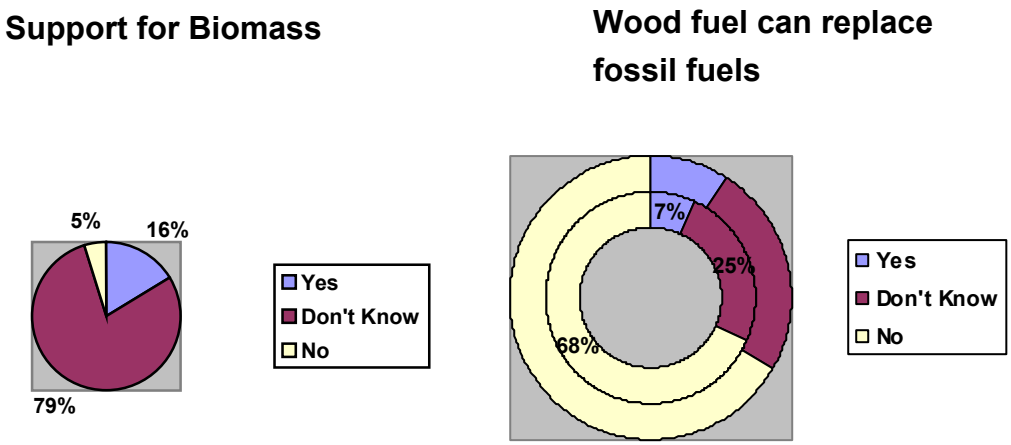
Source: Deborah Støer, Keming Yang, 2003

Respondents were asked whether they felt that renewable energy should be increased. Survey results showed an overwhelmingly positive response rate of 85% in agreement to increased renewable energy, 15% of the sample opposed to the increase. Moreover, a large percentage of the sample perceived this to be the responsibility of national government.

---

[2] Deborah Støer, Keming Yang: Who's For Renewable Energy and Why? Answers from a Sample Survey in Reading. TV Energy and University of Reading, 2003

Questions about level of support for particular technologies were also included in the model. Support for wind energy was at 72% with only 2.4% opposing, this was a similar statistic for solar energy at 74.7 with 1% in opposition and to an extent for hydro at 63% in support and 2.6% opposing the technology. However, biomass received less support at only 16% with 4.8% oppsoed. For this variable the majority replied as don't know, which could be seen as result of misunderstanding of what biomass meant.



Source: Deborah Støer, Keming Yang, 2003

Respondents were also asked whether they thought wood fuel could replace fossil fuels and here 68% rejected this view.

Unfortunately we could not find comparable surveys for countries with a high proportion of bioenergy, such as Sweden or Austria. However, the ranking order of renewable energy might be quite similar in these countries, too: In his article Upreti (2004, p. 787) mentions a public opinion poll conducted in Sweden (which could not be followed up in our study), which compared different renewable energy sources and shows "that hydropower was the most preferred option followed by wind power and solar power and biomass was the least preferred option."

2) Heterogeneity of the notion and use of bioenergy

While our diagnosis in the previous chapter was: Awareness of bioenergy or biomass is generally rather low and wind energy or solar power are the main types of energy identified as renewable energies by a wider public, the main

statement in this section will be: Bioenergy is a very heterogeneous aggregation of different feeding materials, conversion technologies and end-uses, which is difficult to communicate at such a general level.

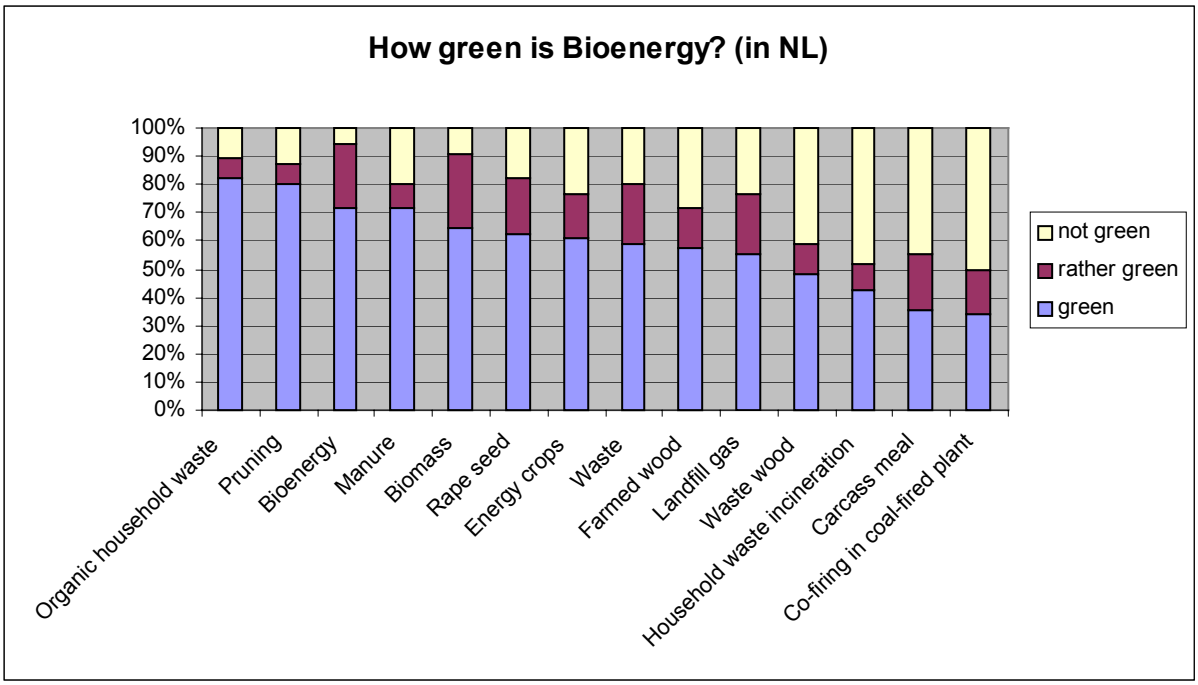
Indeed, when we talk about “the public perception of bioenergy” we may mean many different things. It makes a big difference for everyday perception, whether one deals with pellets heating in single-family houses, district heating systems (and here, whether one deals with fuel-switching in existing systems as in many Scandinavian countries or with new district heating networks), biogas, bio-diesel for transportation or energy from waste plants. And it makes a difference whether we talk about these technologies and uses in Finland, England or in Spain – where different kinds of bioenergy usage may be dominant, different historic connotations and practices may exist (Is there still a tradition of using fire wood?, Is it regarded as an old-fashioned energy carrier?; Is there a tradition of district heating? etc.). In addition, most of these products and bioenergy uses are only relevant for a specific segment of ‘the’ public and most people are not much aware of other uses.

To be more systematic, there are several sources of heterogeneity in the bioenergy sector:

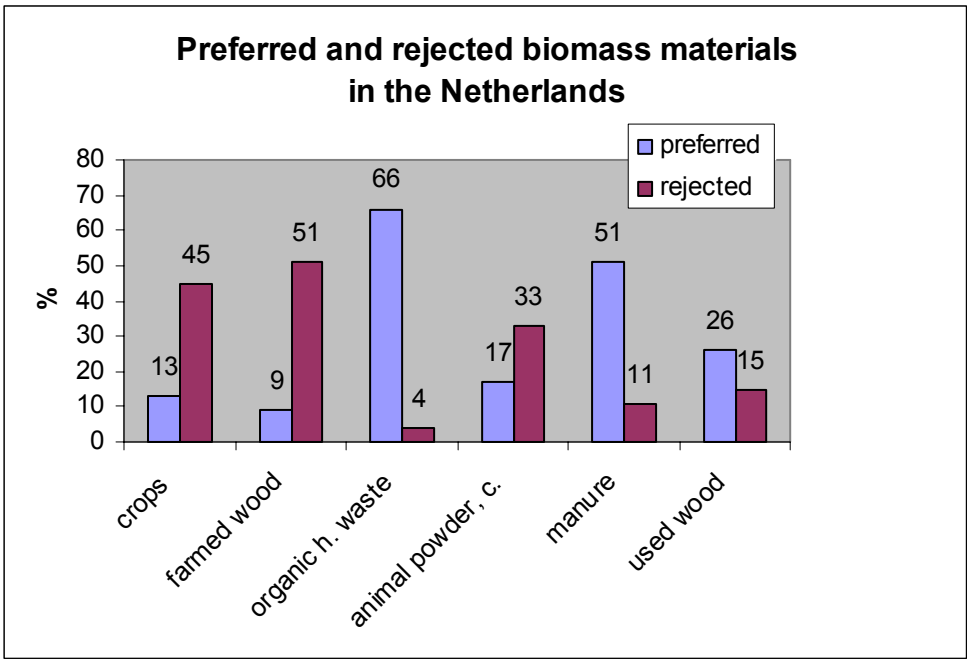
- Different feeding materials: farmed wood / energy crops, forest residues, used wood, organic household waste, manure, to name but a few. The feeding material used is an important factor for the public perception of bioenergy.
- Different conversion technologies: thermal use: combustion in stoves or central heating boilers; communal district heating systems; anaerobic digestion – biogas; electricity production in large scale power plant (again based on different technologies, such as co-firing in coal-fired power plants, gasification, pyrolysis etc.) Some of these technologies may be perceived as e.g. modern, some as old-fashioned.
- Different end-uses: green electricity, district heating, heating with pellet stoves, transport etc.
- Different sizes of production facilities: as will be pointed out later, it makes a big difference for public perception (and even more for communication strategies) whether we are dealing with bioenergy-technologies at household level (e.g. pellet stoves) or at an ‘industrial’ level (e.g. waste to

energy plants). In the perception of citizens these are two completely different things.

- Compared to homogenous energy sources such as wind or solar energy, the range of available fuels and feeding material which we encounter in the bioenergy sector may also be perceived in remarkably different ways. While some fuels may be seen as clean (pellets, forest residues) others may be perceived as dirty fuels (e.g. waste). However, this separation is not always as expected. In the Netherlands the use of waste for bioenergy is more accepted than the idea of cutting trees (see Bioenergy forum 2002 and other figures given below).
- Finally there are strong differences in the regional situation – regarding the dominant use and perception of bioenergy (in some areas it may be wood chips from forest residues, in others green electricity from big bioenergy power plants, again in others the use of residues from the food processing industry) or regarding the tradition and connotations.
- An additional ambiguity about biomass as renewable energy may be created by discussions and controversies about the sustainability of different types of bioenergy along the supply chain. In the Netherlands, to take just one example, environmental NGOs in some cases oppose the labelling of specific bioenergy chains as green – e.g. the use of chicken litter from intensive farming. Similarly ‘energy from waste’ sometimes is not seen to be green (and often is opposed by environmental groups) as well as the import of forest residues from far-away places (discussions which Austrian district heating systems sometimes get involved). The perception of bioenergy may, moreover, be associated with environmental pollution (through combustion processes), which also compromises the image of a clean and green energy carrier.



Source: Ria Kalf, Duurzame Energie, Euroforum, 6 november 2002



Presentation

Preliminary results of the study 'Implementation barriers of energy from biomass: psychological factors', Cees Midden, Anneloes Meijnders, Gundula Hübner, Wouter van den Hoogen, Technische Universiteit Eindhoven (TU/e), 2003

The two diagrams above, the first of which is from an already mentioned survey from PDE (Projectbureau Duurzame Energie)[3] and the second one from an ongoing study on the public perception of bioenergy at Eindhoven Technical University in the Netherlands, may serve as a good illustration of the points made above. Interviewees at PDE were asked which sources of green electricity they would regard as being green. The terms asked have not been intended to be a systematic list of bioenergy sources, but a range of notions related to bioenergy was tested - sometimes general notions such as biomass are used, sometimes feeding materials, sometimes technologies. As the picture shows, the different types of bioenergy cover the whole range from green to not at all green. Especially waste appears to be an interesting issue with sometimes unexpected answers in the Netherlands. Organic household waste is the most positively valued source of bioenergy, also in the Eindhoven study below, though the PDE survey also shows that waste incineration is not as all regarded to be green. Manure is also valued high in both studies, although several interview partners from European bioenergy organisations mentioned, that waste or manure would be seen as 'dirty' sources of bioenergy and rejected by the public. Energy crops, farmed wood, i.e. 'clean' sources of bioenergy are not seen as green in the Netherlands. Interviewed bioenergy organisations (not only in the Netherlands) also report that using farmed wood as a source of biomass often is resisted by a wider public or by environmental organisations – as cutting trees is regarded to be harmful to the environment. Bioenergy as a general term is valued high, significantly better than the general term biomass. Finally, co-firing in coal fired power plants, the most important source of Dutch bioenergy, comes out last in the ranking of green energies. There is certainly a need to closer investigate the attitudes connected with different uses of bioenergy in different European countries to appropriately design communication strategies.

Again, just as the term 'renewable energy', which is valued high in Europe, quickly splits up in differently perceived energy carriers as soon as one gets closer, the perception of the generally positively seen term 'bioenergy' splits up as soon as one asks for specific sources of bioenergy. Compared to other sources of renewable energy such as wind or solar energy, this heterogeneity certainly is a barrier to the public understanding and awareness of bioenergy

[3] Ria Kalf, Projectbureau Duurzame Energie, Presentation for Euroforum, 6 November 2002

and certainly makes it much more difficult to communicate the need for this energy and its advantages to a wider public. These specific characteristics of the perception of bioenergy are an important key to the design of appropriate communication strategies.

As interviewees in different European bioenergy organisations point out, the terms bioenergy or biomass are hardly used in everyday language. People talk about wood stoves, pellets heating systems or biogas plants. As a consequence the term ‘bioenergy’ or ‘biomass’ is very difficult to communicate, especially for end-users but also for more specific target groups. Specific problems arise from the fact that the term bioenergy

- is not connected to specific images of consumers
- is not at all concrete and tangible
- is too abstract as a notion.

These difficulties are strongly perceived even in Austria with a high proportion of bioenergy and a generally good image of wood energy. At a European level the heterogeneity of this term and the differences in images and conceptions attached are supposedly even worse and more difficult to communicate.

Communication strategies to improve public perception will have little chances for success if they target this general and abstract level. It is highly advisable to address concrete themes and topics which are closer to the experiences and imaginations of end-consumers. Topics like “wood pellets”, “tiled stoves” (in certain areas), or wood heating most likely have a much higher awareness and carry significantly more positive connotations and will therefore be much easier to communicate, than rather ‘unwieldy’ topics like bioenergy and biomass.

As a basic rule communication has to be easily understandable for end-users or the specific target group addressed. The content and the relevant communication targets have to be easily understood by the receivers and should not reflect the thinking and the reality of the senders. This means to

- get away from the vague and incomprehensible notion of ‘bioenergy’
- and instead to differentiate and focus on specific, concrete and well-known uses of bioenergy, such as wood, pellets or biogas plants.

This means:

- ► no image campaign for bioenergy at a general level, but only for specific segments and uses
- ► emphasis on uses and applications which are regarded as most relevant for end-users and which are pointing the way ahead
- ► focus on solutions which fit best to the demands and needs of end users
- ► show / present models of best-practice.

As the position paper of the Dutch Bioenergy Forum (2002) emphasises, it is important to come to a shared vision of acceptable forms of bioenergy and to communicate this. Examples for such uses and solutions could be:

- pellet heating systems, pellet stoves
- open fire / tiled stoves / wood heating
- biogas (with a mainly local need of information, in regions where biogas plants are planned)
- reuse of residuals (not as a disposal of waste but framed in a positive and forward looking way – a strategy which is e.g. followed in Greece)
    - the topic would be highly relevant and attractive, especially when regarding present regulatory changes, such as EU directives on waste disposal
    - turning away from waste incineration to more sensible uses of renewable raw material
    - specific solutions depending on national or regional situation (such as olive processing residues in Greece or Spain, used wood in Germany, manure in the Netherlands)
- wood chip boilers for blocks of flats, if possible combined with professional energy services (company supplies heat to the building and is responsible for maintenance etc.)
- district heating
- bio-diesel for transport

As we will discuss in the next chapter, the situation for larger-scale plants e.g. for electricity production is different, as there is mainly a local need for information and interaction. General image campaigns for such energy production sites are very expensive and will presumably have little effect, especially if they are not followed up by activities consumers (or the wider public) can engage in. Focussed activities such as lobbying & networking, influencing of local opinion makers and the establishment of a successful public participation in this regard play a much stronger role. A more detailed discussion of targeted marketing and communication strategies will be given in the final chapter.

3) Public perception / acceptance of large-scale bioenergy plants

An important result from interviewing bioenergy associations and analysing the issue of public perception of bioenergy is the observation that the dynamics of public acceptance and associated strategies for improving public perception strongly depend on the type of bioenergy application. Technologies at household level (which will be discussed in the next chapter) strongly depend on a high awareness in target groups, information and understanding of the technologies, image (e.g. of modernity), investment costs, comfort etc. and require marketing-type strategies for their promotion. Large-scale plants for power production on the contrary are strongly affected by a local dynamics of perception – Are there opposition groups and how well are they organised?, Who is the developer of the plant? How is the planning process organised (communication with public authorities and neighbours of the plant)? etc. Medium sized technologies such as central heating systems for larger buildings and blocks of flats, small and medium sized district heating systems, small and medium biogas plants etc. again depend on other conditions and in a different way on public perception. Therefore there are two chapters dealing with dynamics of public perception: the present one on larger scale plants, the next one on household technologies. Medium sized technologies will be included in both chapters where appropriate.

Large-scale bioenergy plants are potentially confronted with problems similar to other industry projects. Projects may be stopped or may not get permits because of local opposition.

Upreti (2004)[4] concisely sums up the major sources of conflicts observed in case studies on biomass power plant development. They were:

Related to the issue of ***siting***:

a) Location of the power plant,

b) Disposal of by-products and their chemical effects,

c) Growing of biomass crops and

d) Close proximity to local residents.

Related to the issue of ***emissions and health hazards***:

a) Emission of greenhouse gases and water vapour,

b) Unpleasant odour,

c) Emission of light at night,

d) Nuisance from traffic,

e) Vibration and noise from power plant and

f) Fear of public health hazards.

Related to the issue of ***traffic***:

a) Increases in traffic movement and flow of high goods vehicles (HGV),

b) Use of town trunk roads,

---

[4] B.R. Upreti, 'Conflict over biomass energy development in the United Kingdom: some observations and lessons from England and Wales', Energy Policy 32 (2004), 785-800, p. 792:

c) Accident and noise.

Related to the issue of ***environmental/ecological effects***:

a) Fear of negative impacts to rare species, wildlife and ecosystems, aquatic environment and buffer zone and SSSI,

b) Negative effects on local weather system,

c) Negative effects of dust residue to surrounding flora and fauna.

Related to the issue of ***landscape and agriculture***:

a) Landscape and agricultural change,

b) Undermining openness,

c) Visual effects of relative height of buildings, chimney and other associated structures,

d) Negative effects on cultural heritage and archaeological significance.

Related to ***economic concerns***:

a) Low benefits to local community compared to associated social and environmental costs,

b) Doubt about continuity of SRC grant and its market assurance,

c) Negative effects to tourism and livestock,

d) Compensation dispute,

e) Negative effect on property prices and

f) No significant employment opportunity to local people."

These reasons are also confirmed by observations in Germany (Köpke & Schmidtferick 2002), where power plants fired with used wood often face local

opposition. The main reasons are fear from additional air pollution and increased traffic, or fear that the plant will later be converted into a waste incinerator. Resistance is in many cases also supported by environmental organisations, which e.g. argue “The plant is too big, at the wrong place and does not follow a holistic energy policy” (Adamczewski, BUND, cited in Köpke & Schmidtferick 2002). The situation is aggravated, as most of the recently planned wood-based power stations in Germany do not combine power with heat generation, which would also bring benefit to the local population and would make the plant more efficient. As proponents of an increased biomass use point out such a development (and the regulations that support it) may generally harm the image of bioenergy. As will be emphasised below, it appears to be an important task at national and European level to develop strategies and promote regulation which improve the sustainability of various bioenergy applications as a basis for an improved public image of this type of energy.

Local resistance to renewable energy facilities is typically organised by ad hoc interest groups, consisting of neighbours in the community, who feel that their local environment is threatened, as Khan (2002) points out. Environmental organisations often have a more positive attitude to these issues, as they are generally supportive of renewable energy. However, their local units or environmental organisations working at a local level may face a dilemma, as they are confronted with the worries and opposition of local communities, effects to the local environment (see above: emissions, traffic...) and at the same time want to support renewable energies. However, the Dutch example shows that opposition of environmental organisations can also be faced at national level, where NGOs oppose certain technologies and uses of bioenergy.

Generally, as Upreti (2004, 787, referring to other authors such as Rakos 1998 and others) points out, conflicts between the public and the developers escalate when the general public perceives that

a) the development is involuntarily imposed to their locality,

b) the technology is not familiar,

c) they have no decision making power, or

d) the development is for corporate profit rather than local benefit.

Acceptance of large-scale bioenergy facilities thus strongly depends on the communication strategies used in the biomass energy development and the organisation of the planning process (is it participatory or top down?, etc.). Upreti`s (p. 790-91) case study of the Elean Power Station (EPS) in Ely, UK, is quite instructive in this respect. Presently this 36 MW straw burning power plant is the world's largest straw-fuelled power station in operation, annually requiring 200,000 tons of straw from a 50-mile radius from the power station. Initially the top down planning approach faced fierce local opposition regarding traffic, pollution, noise and visual impact. Instead of going to an appeal the planners decided to follow a more participative approach and revised the proposal to address concerns raised by the public. Moreover, they sponsered a fact finding mission to Danish straw-fired power plants, inviting district councillors, journalists and other community representatives. These efforts finally led to a planning permission in the second application, operation of the plant without any conflict and still good relations between local people and the company.

However, one has to have in mind that public participation is no panacea to avoid conflicts and get planning permission, as several failed projects with public participation show (Khan 2002). Nevertheless, it is important to organise communication processes which avoid opposition between the poles NIMBY (not in my backyard) and TINA (there is no alternative – a strategy often employed by planners and developers). Analysis of case studies show that blaming all local conflicts and opposition to the 'NIMBY syndrome' is too much of a simplification for the processes and conditions leading to opposition and certainly is not a good basis to find a way out of such conflicts. For the case of wind energy where the Not-in-my-backyard syndrome was also commonly referred to as the reason for local resistance to the construction of wind mills, Wolsink (2000) carried out a detailed quantitative survey in the motivations and attitudes of neighbours to plants. His analysis reveals that the set of preferences referred to as NIMBY (positive overall attitude to wind energy but resistance to local site in neighbourhood) can only be found in a limited number of cases. Generally NIMBY preferences only explained 4% of the variance of behaviour. By labelling all protests as NIMBY one misses the multitude of underlying motivations and the different roots of opposition. Most importantly, Wolsink's survey showed that attitudes are dynamic and influenced by the features of the project, along with the content of the public discussion which also depends on these features and not on a general NIMBY attitude. Wolsink

concludes, “Particularly the fact that attitudes can be dynamic and consequently may change during the planning phase of a project is easily overlooked. (...) Although attitudes and behaviour may be personal, they are apparently influenced by the decision-making process. These processes develop patterns that depend highly on the way physical planning is organised. These institutional factors can also be recognised in place making processes for wind power. Hence the success of wind power appears to be strongly dependent on institutional arrangements within the policy domains of physical planning and energy.” (p. 58) Although no such detailed survey has been carried out for bioenergy siting problems yet, the examples below give evidence that the mechanisms at work are the same: NIMBY-opposition is only part of the problem. Much more important are general fears of negative effects of bioenergy facilities or opposition which develops in the course of the planning process and often depends on institutional arrangements.

One of the impeding factors for the construction of bioenergy facilities, interviewees often pointed to is the importance of trust in the developer – Is the development purely commercially driven or is it a community project? Who profits from the development? Is there a danger that the bioenergy plant will be turned in a waste incinerator later? An EU FP 5 project (AEA Technology 2002) with case studies on bioenergy plants in 5 EU countries came to the interesting conclusion that British experiences with biomass to energy schemes (with commercial developers taking the initiative) were quite different and much more negative than Danish experiences, where many plant have been developed in association with local municipalities and with the support of Government grants. Similarly interviews carried out in a different project (Gray et al. 2001) with stakeholders of biomass power plant projects also pointed to the “lack of trust in the developer caused by suspicion and misunderstanding of the intent of the developer” as a key issue for the success or failure of planning applications. The interviews showed that both planners and developers felt there was a common perception by local residents that approval of a specific facility might lead to its use for other means. For example, local residents feel that developers may ‘sell out’ to processing other products if the biomass process is not found to be viable. It was also felt that the reactions from local politicians were influenced by their perception of what there constituents might fear regarding this technology.

Lack of trust to developers, lack of understanding of bioenergy facilities and badly organised planning processes and communications processes with the public may ultimately result in an image of bioenergy plants which rather reflects the shortcomings of planning and communication than 'real' negative effects of the plant. Upreti & van der Horst (2004) describe such a dilemma in a case study of a planning process: "Most notably, the plant was viewed as a factory with smoking chimneys rather than a small, state of the art, environmentally friendly facility to produce green electricity to benefit all. With the exception of the visual impacts, the negative social and environmental impacts perceived by the local people did not hold sway in the official planning decision." (p. 68)

There are also common features in schemes that were successful in gaining planning consent: If schemes, e.g. for energy from waste facilities, are placed on the site of previous schemes or at least at industrial sites, there usually is little opposition. The same holds true for situations where existing infrastructure can be used – e.g. switching Swedish district heating systems from oil fired heat generation to pellets fired boilers. Although co-firing of pellets to existing coal-fired power plants in the Netherlands is not seen to be green energy by a good proportion of the Dutch public, co-firing in existing plants will hardly meet local opposition – problems that are reported rather concern difficulties in getting required permits, if e.g. co-firing of used wood is treated as waste incineration with emission regulations that are more difficult to fulfil than regulations of energy generation sites.

It should not be overseen that positive perception of bioenergy facilities and support not only has to be built up during the planning process, but also within companies which may construct and operate bioenergy plants. An example are the municipal utilities of Vienna, which were for a long time against a municipal bioenergy plant (although there was some political support for such a project). Only when the Austrian Energy Agency (EVA) organised a study tour to Scandinavia and managers of the utilities could see successful projects the attitude to such a plant made a U-turn and the process went ahead. Meanwhile the company is in the final planning stage for a 60 MW CHP-plant in Vienna.[5]

---

[5] See the interview in energy 3/2003, pp. 13-15

An AFBnet project focusing on success indicators for 100% renewable energy communities, where biomass plays a significant roles, lists a number of factors which helped the success of a scheme (Final report 2001):

Success was often associated with:

- Support from key local organisations
- Sound finances
- Reliable technology
- A key person/organisation within the community driving the scheme forward
- Good communication and recognition of the different aims of different sectors of the community
- Good local partnership and the use of local labour. Income streams flow back into the community
- Local utility is one of the partners

Failure was often associated with:

- Poor economics; poor finance
- Unreliable technology
- Over-ambitious schemes
- Indifference or hostility locally
- A feeling of imposition of a scheme by outside developers
- Little or poor track record
- Unbalanced motivation e.g. strong environmental drivers, with few economic drivers or strong economic drivers but few society or environmental drivers."

In addition the study carried out by AEA Technology (2001)[6] on energy-from-waste facilities (EfW) mentions the following factors which influence public perception:

- Familiarity with the technology is important in acceptance of EfW of biomass. Countries or regions with a long history and culture of EfW or use of energy from biomass residues experience fewer acceptability problems. However, familiarity is not always a precondition for acceptance. In areas where previous plant had a bad emissions record (e.g. in Alkmaar, the NL) the local population can have many concerns that must be addressed.
- A high level of industrialisation in an area may mean that the population is more open to development of EfW or energy from biomass schemes.
- Infrastructure. The availability of good transport infrastructure will not make the public accept development of a plant, but it does overcome one of the major concerns about new plant.
- Local energy needs. Swedish and Danish municipalities have been allowed to develop localised energy planning, particularly for heat. EfW and biomass residues have become important local alternative sources of energy.
- A population well-educated in energy and waste disposal issues is more likely to understand the need for EfW and energy from biomass residues. In Sweden and Denmark a lot of time and effort has been spent ensuring that their population understand the place these technologies have within waste and energy management.
- Trust in the developer is vitally important. However, experience in the Netherlands and the UK shows for new plant proposed by out of town developers there is no substitute for local presence and accessibility.
- Involvement or backing of the local council
- Confidence in the regulators ability to control emissions

---

[6] European Commission – Directorate General for Energy and Transport (ed.), Comparison of Public acceptability of energy from waste and energy from biomass residues in 5 EU states (Brussels, 2001) p. 67-69

- Local vision. The local population's vision of its own environment is very important in determining its reaction to proposed development.
- If the plant provides an obvious benefit to the community, the community is likely to be less hostile towards the development. This is particularly true in rural areas where large quantities of agricultural waste can cause odour problems and the only alternative is land spreading.

Based on such results Upreti (2004) suggests the following process to achieve a consensual approach.

a) "Involve every stakeholder in the process. Involving them in the process increases accountability. If local communities are not involved they suspect proposal and opposition starts.

b) Hear voice of all people. But manage the expectations from the start by explaining clearly and consistently. Clarify the purpose of the project.

c) Promote horizontal communication with the community that builds societal strength and leads to achieve constructive results.

d) Get support of local leaders, opinion leaders, and senior citizens.

e) Be prepared to change or adjust. Interaction with community builds trust and rapport and develops improved options, which can be more effective operationally.

f) Involving an independent facilitator, process manager or mediator could do a lot to build trust in the process."

Stakeholder categories that can be identified in controversies around the siting of bioenergy plant are (compare also Gray et al. (2001):

- Central government
- Regulatory authorities
- Developers
- Planners

- NGO's
- Local community and resident groups

Based on the examples of research done on the issue of siting and public acceptance of bioenergy plants and on the interview responses of bioenergy organisations it does not seem advisable to run broad image campaigns on e.g. co-firing of pellets, biomass gasification or pyrolysis for electricity production. Effective image campaigns are very expensive and should be accompanied or immediately followed by marketing strategies. If image campaigns on bioenergy power plants are run at a time they won't have any effect after a few years when maybe a developer wants to set up a bioenergy facility somewhere.

Moreover, public image or information campaigns should be based on a thorough understanding of the factors important for people's attitudes and understandings of the specific problem. Looking at public campaigns on global warming, Löfstedt (1995) found campaigns that were hugely ineffective and expensive because they did not take global warming perception research suffiently into account. Thus Löfstedt concludes (p. 85) that "governments should first launch research into what exactly the blocking mechanisms are to people's understanding of global warming; and secondly conduct well thought out educational campaigns."

Based on the examples and analyses above a cost-effective way to promote the perception of large scale bioenergy facilities would be to

- ► Target specific groups with information campaigns, e.g. those (as has often been pointed out in interviews) responsible for giving permits for the plants in public authorities;
- ► Get in contact with potential opposition groups to new plants, e.g. environmental groups, at an early stage and try to develop joint guidelines and framework conditions for new plants: How can such plants be made more sustainable? How can local negative effects be minimised? Efforts are currently undertaken e.g. in the Netherlands to bring together environmental NGOs and industrial developers to achieve agreement over the sustainability of feeding material and plants.

- Use established information channels e.g. popular magazines with a technical or environmental focus to disseminate information about new bioenergy conversion technologies;
- Design information campaigns or guidelines for developers on how to set up communication strategies accompanying the planning process and how to involve neighbours and stakeholders in the planning process;
- Run targeted campaigns and information programmes in the run-up to the planning of a facility. The actual information campaign during the planning process as well as the integration of stakeholders in the planning process should, however, be task of the developer.
- Develop and communicate examples of best-practice (in all relevant aspects: technology, decision-making processes, participation processes, etc.).

4) Public perception / acceptance of consumer technologies

Obviously, for small-scale bioenergy applications, especially at household level, public perception of bioenergy place a different role than for large-scale bioenergy plants. The key role of citizens in this case is not the 'concerned neighbour' as it is the case with large-scale plant, but the role of the consumer. Public perception in this case is not so much relevant from its negative side – possible local opposition to new facilities – but as a motivator for purchasing decisions. If bioenergy technologies (e.g. heating systems) have a good image they are more widely adopted. Due to this different context it is not the planning process that is at the centre of strategies, but rather marketing type strategies to promote the adoption of small-scale bioenergy technologies.

The bioenergy applications most relevant to end-consumers are mainly found in the three spheres of

- heating
- mobility
- and only to some extent electricity generation.

Moreover, primarily well established fields / markets of bioenergy applications should be targeted. Promotion activities at the small-scale level therefore should focus on

- wood heating (pellets, chips, logs)
- bio-fuels (public/ private transport)
- biogas (electricity generation, waste disposal)

The small-scale segment is very important to create a positive image of bioenergy use, which could also have a positive impact on the medium and large scale applications, where economic considerations are of greater importance.

Furthermore, the small-scale applications are of special importance, because of their potential for the increase of bioenergy use and the impact they will have on the structures of the industry (e.g. create qualified service jobs in SMEs) and the momentum such a growth of industry will create. Swedish interviewees have reported for example, how the growing popularity of wood chip and pellet boilers

at household level (mainly due to the economic advantages of bioenergy heatings because of higher taxes on fossil fuels) resulted in a critical mass of bioenergy-related companies (mainly SMEs), which then would develop sufficient lobbying and marketing power to further increase the market.

One of the small-scale technologies most interviewees put their stakes on and currently strongly gaining market shares is pellets heating at household level. As Vinterbäck and Roos (2001) point out, pellets for heating are attractive because they are convenient (compared with conventional wood heating), efficient (uniform fuel), easy to transport and store (high energy density, flowable), clean and CO_2-neutral. In countries like Sweden and Austria, the adoption of pellets systems is already sharply rising, while most other European countries are potential new markets. However, even with this new technology we can already observe a high national diversity, as the survey from Vinterbäck and Roos (2001) points out: while pellets heating systems are mainly used in newly built houses in Austria and the prime motivation is an environmental one, Swedish systems are mainly retrofittings of old furnaces with pellet burners for primarily economic reasons. In both cases, however, the survey reveals high levels of content.

Marketing campaigns for pellets heating are already organised at regional and national levels in many countries, however, coordinated European efforts could be targeted towards better coordinating and supporting these campaigns and putting emphasis on emerging pellets heating markets.

The situation for biofuels for transport is rather different. Most of the interviewed organisations do not experience a high awareness for this application in their country. Especially if biofuels are blended with ordinary Diesel fuel, the dissemination of this biomass use is seen to rather depend on regulatory changes or tax incentives and not so much on public awareness (as, moreover, the user of biofuels would not experience much difference). Part of the interviewed organisations rather are afraid that public perception could enter the picture from the negative side – in case (even a limited number) of motor problems because of the use of biofuel and if car manufacturers do not give guarantees for the use of such fuels (as is presently the case), public opinion may quickly turn against the use of biofuel. The occurrence of such negative experiences should therefore be strictly avoided in any programme promoting biofuel.

Since public awareness often is very low, as we have seen earlier, and the applications of bioenergy in the three fields are rather different, the potentials and advantages of each application needs to be communicated separately.

The target groups for bioenergy-applications differ between the three spheres and are diverse even within each of the spheres. Therefore, for each of the three spheres, a distinct communication strategy needs to be formulated: The more specific, the more successful such a strategy probably will be.

Good marketing of bioenergy thus consequently should avoid the term ‘bioenergy’! A similar process can be observed in the solar energy sector, where e.g. lobbying organisations switched the terms used in their campaigns from ‘solar thermal energy use’ to e.g. ‘solar collectors’ which turned out to be a more understandable and positively connotated term.

Each of the communication strategies needs to comprise the following elements

- clear definition and segmentation of target group(s)
- clear communication goals for each target group (information? change of opinion? sale of new technology?)
- elaboration of key messages (specified for the different target groups)
- recognition of possible change processes for the relevant target groups
- linking up to well known images.

In addition, in order to allow for a successful communication (and in consequence a successful market strategy), solid and well focussed market research is crucial. As the experience during the preparation of this report shows, there is a significant lack of surveys and market research on the issue of bioenergy. This gap needs to be filled – in order to gain information about the target groups as well as about their motives and needs.

To promote the use of bioenergy (e.g. wood-pellets) for small scale heating (e.g. homes), a lot of positive connotations can be observed and used for communication strategies:

- the social function of a fire place
- its special comfort and warmness
- the special connotation (“myth”) of fire

- the high availability of wood (in regions where this is the case)
- the regional sources for wood, thus the autonomy from imports (in regions where this is the case).

At the same time, negative aspects may be connotated with wood as a source of heating:

- the fuel of the poor people
- no easy handling, dirty, smoking chimneys
- logging wood as being harmful to nature

From a marketing perspective, many of these negative aspects could be avoided by promoting wood pellets, since – as organisations involved in promoting pellets have observed – they are perceived as:

- modern and innovative, even High-Tech
- clean, environmentally friendly and “appetising”
- trendy and something to be proud of.

Requirements for successful marketing strategies – examples from the solar industry

It is widely recognised, that good communication strategies and marketing are as important for the diffusion of a new product (or technology) as are quality and price. Nevertheless, in the field of bioenergy, as well as in solar energy, actors have only limited resources for marketing activities:

- very limited budgets (often SMEs)
- little strategic thinking relating to marketing & PR
- little know-how and training for marketing & PR
- little resources such as market research or elaborate client data-bases allowing for specific marketing programmes.

Studies on the German and Austrian renewable energy industries are proving this unisonously. Even at industry branch level (renewable industry organisations), very limited resources (both funds and know-how) are available for active marketing and image campaigns (though there are some exeptions, e.g. in Austria, like Pelletsverband or ProHolz). This is especially true, if export markets are to be developed.

Capacity building within these organisations seems to be very important, since such driving forces have proven to be an essential part of any successful campaign. To support these agencies with conducting joint marketing and image campaigns, is therefore a recommended activity at the European level (see last section).

Successful communication strategies in similar fields (promoting new energy applications) have constantly featured the following success factors:

- competent and trustworthy PR
- quality of products and services (incl. a solid knowledge of market & costumers)
- supporting framework conditions (regulation, subsidies etc.)
- an organised driving force/ facilitator (making sure that 1-3 are given)

The interplay of each of these factors appears to be inevitable for successful communication.

Concerning the design of campaigns, three main components are to be distinguished:

- creating a positive image / triggering a desire and/or a wish for change (general advertising)
- providing concrete options for a reaction by the targeted audiences (response mechanisms, call centres, information – on paper as well as online / Web)

- preparing the infrastructure for installation and service (craftsmen, professionals, e.g. installers)

Especially the third element is of crucial importance, but still often neglected. Marketing campaigns or communication strategies can hardly be successful if installers and other professionals, who are in direct contact with the end-users and also traditionally have a very important function of opinion leaders and trustworthy persons when heating systems are chosen, are not fully integrated into the campaign or lack sufficient competence in the field of bioenergy (which is often the case). Improving the qualification and the competence of professionals therefore is a highly important though all too often neglected prerequisite for successful marketing campaigns for bioenergy technologies.

Examples for successful marketing activities in Austria and Germany are:

The two campaigns for wood pellet heating by the Austrian biomass association and by the regional association for renewable energy in south-west Germany (fesa).

- both are joint actions with commercial partners (boiler producers etc.)
- focusing on issues and solutions, not on fuels, products or trademarks
- using the positive connotations of pellets (comfort and cleanliness)

The campaign for solar hot water in Germany: “Solar - na klar!”

- successful image campaign, yet concrete information on options came late
- involvement and identification with installers was high.

The general campaign for the replacement of boilers in Germany

- as an evaluation turned out, every second person receiving information was subsequently motivated to invest!

The importance to reach out to and co-operate with well established branch organisations was shown by the German wind turbine industry, which in recent years was able to establish a fruitful co-operation with the rather conservative German association of machine fabricating industries (VDMA) and German electric industries.

Useful tools and guidelines for campaigns have been developed by the European project soltherm (www.soltherm.org) and by the German campaign solar - na klar! (e.g. the guidelines for its regionalisation: 'Solar - na klar! Regional').

Public perception of small-scale bioenergy applications in context: building socio-technical systems

An important point for the improvement of the public perception of bioenergy – especially at the level of consumer technologies such as pellet heating systems – is to embed information or image campaigns and marketing efforts in a broader set of measures which improve and strengthen the whole system of bioenergy production, distribution and use. This includes regulatory measures (such as quality or emission standards), improving the fuel availability and the build-up of a supply and distribution infrastructure, improving the knowledge and competence of involved professionals (such as installers or architects), supporting the introduction of new services (e.g. heat services for blocks of flats) and so on. Public acceptance not only depends on marketing and information, but maybe even more on the working and the quality of the overall system of bioenergy supply and on other economic parameters such as investment costs or fuel costs of bioenergy installations.

Below we are referring to two cases to point out the importance of seeing public perception as part of a broader picture and of indirectly influencing it through strategies for strengthening the socio-technical system of bioenergy use and adapting it to regional and local traditions, preconditions and requirements.

Governing immature markets: the lesson from pellets heating in Sweden

The first case has been documented in the Swedish Biomark-project (Helby et al. 2003). The background of the crisis in the Swedish pellet market in 2001/02

it refers to, shows on the one hand how changing market conditions (in this case prices of oil and gas and increasing comparative advantages of biofuels) may boost public acceptance and adoption of biomass heating systems, but at the same time how a lack of governance of immature fuel markets may severely damage the image of such heating systems. Awareness and acceptance in this case strongly is influenced by the working of the market and the requirement of better governance structures for such developing markets.

The authors analyse the disturbances of the pellets market as follows (p.16, Helby et al. 2003):

"The most shocking observation in pellets case was the fact that nobody was in a position to foresee or prevent the crisis. Briefly, the prelude to the 2001/02 heating season was this:

- Household installations of pellet burners sky-rocketed, due to rising oil and electricity prices, thus preparing the ground for an increased household demand for pellets in the 2001/02 heating season.
- Meanwhile pellet producers were diverting pellets away from the household market, through an extraordinary amount of contracts for exports and deliveries to district heating companies.
- Neither individual pellets producers, nor their national organisation, had any monitoring system that could catch these developments and inform market actors of impending imbalances.
- Distributors to the household market had little awareness of the rising demand, and were used to abundant supplies, so they made no efforts to assure the availability of pellets for their customers.
- These impending problems were not observed or reacted upon by public authorities, who did their best to promote the installation of pellet burners, but trusted the fuel market to function by itself and find its own balance.

The consequences appear to have been severe in terms of reputation among consumers. The promised savings on the heating bill disappeared as pellet prices went up. In the midst of winter, consumers had serious worries about how to get heating next week or month, sometimes even begging around for deliveries. Sophisticated equipment, that were supposed to make pellets easy and convenient, broke down when faced with inferior qualities of pellets, which

were often the qualities available in the market and were often dumped on customers without any information about potential problems."

Public perception and public acceptance in such a case only to a limited extent depends on information or marketing but is much more influenced by the frictions and disturbances of the fuel market which in the first place should be addressed (or at least has to be simultaneously addressed) along with measures directly aiming at image and acceptance of bioenergy.

Biomass heating in large buildings: the example of the BIOHEAT project

The second case which is very instructive for the importance of embedding image and marketing campaigns into broader strategies is a project within the ALTENER programme aiming at the heating of large buildings with biomass. In this case we also see, how developing a new market segment requires aiming at a whole set of interdependent requirements of fuel supply, training, new services, demonstration projects, etc. – and only as part of this set of measures, efforts aiming at information, image and acceptance are included.

BIOHEAT is dedicated to stimulate the use of modern automatic wood boilers for heating large buildings such as schools, town halls, hospitals, retirement homes or residential blocks. An analysis of the situation is conducted in 10 participating countries (Austria – Coordinator, Denmark, France, Greece, Italy, Netherlands, Norway, Portugal, Spain, Sweden) within BIOHEAT I. For BIOHEAT II the focus is widened up to 14 countries.

BIOHEAT makes a major effort to disseminate knowledge about the option of using wood fuels to relevant target groups as municipalities, provincial governments, housing associations, consultants, architects etc. Brochures are produced in 14 different languages (within BIOHEAT II) and a website offering practical information has been established.

The project also includes support of projects in the start-up phase. Developers or communities that want to engage in pilot projects receive direct support. This includes both national and international field trips to interesting projects, training seminars for professionals and a telephone hot line for further information offering also economic assessments of pilot projects.

Besides disseminating basic information BIOHEAT II will aim at involving regional energy agencies and train them to develop wood heated projects. It will implement measures to ensure that projects are of high quality as mistakes are frequent when new technologies are used by inexperienced professionals. This will include an international training course for planners and detailed technical manuals explaining the do's and don'ts of heating large buildings with wood fuels. The national participants will also have the flexibility to address particular national barriers for wood heating that have been identified during the analysis phase at the beginning of the project.

Results

… concerning the present (market) situation of biomass use for heating large buildings

Four typical market situations were distinguished in the participating countries:

Dormant markets (e.g. Greece, Spain)

Markets with a significant potential that have hardly seen any development in the field of modern wood heating so far. Only very few examples exist where wood is used to heat large buildings, usually with semi-modern equipment. In these countries policymakers have given low priority to the issue of using biomass for heating purposes. The potential for using wood or agricultural residues is rather large.

Markets in an early stage of development (e.g. France, Italy, Norway, Portugal)

In these markets there is a significant number of projects relying on wood heating and applying modern technologies. Using wood fuels is still very unusual and hardly known in these countries, however. Significant market development cannot be taken for granted yet as many barriers exist that make wood heating in large buildings a marginal phenomenon. Pellet production exists or has recently been started in one or several plants. Interest in using wood fuel is growing and policy makers have taken some initiatives to develop the wood heating market.

Markets on a self-sustained growth-path (e.g. Austria, Denmark, Sweden)

In these markets the use of wood fuels has exceeded the threshold at which market forces pick up a development and carry it from regional, isolated examples towards diffusion into the general market. This threshold is usually achieved when a “technology support system” is in place. Elements of this “support system” are skilled professionals, a developed fuel supply system, sound technology and established systems of quality assurance along the whole chain of services and products necessary to make the technology work.

Markets with limited perspectives for growth (e.g. Netherlands, but also Denmark)

The characteristics of these markets can be defined as having no significant biomass resources and a fully developed natural gas system that serves almost the entire heating market. Consequently there is no space for biomass boilers and fuel storage in existing buildings. In addition, emission limits are so strict that biomass boilers would need very expensive and presently not even available flue gas cleaning systems.

… concerning the identified barriers for wood heating

… in countries with no or limited diffusion:

- Fundamental lack of knowledge
- Lack of an established system of fuel supply
- Poor image of wood as a fuel
- Lack of information on and access to state-of-the art technology
- Lack of skilled professionals

… in countries with dynamic market development:

- Lack of information and personal experience
- Higher investment costs, leading to financing problems or problems regarding the investor/user dilemma
- Competition from natural gas and from fuel oil

Strong competitive activities from energy companies marketing oil or gas has been noticed, even at a very early stage of market development. It can be

expected, that the competition from natural gas and fuel oil supplier will become even more fierce, as pellets appear as a relevant competitor.

The large energy companies STATOIL and Shell became market-actors in Sweden and Denmark, which promote and offer energy services on a wood pellet basis. The entry of Shell and STATOIL as players in this market is an encouraging sign from the project's perspective, but still a singular event in the European context.

… concerning the analyses of the economics of wood heating

Two results of this economic comparison are remarkable

- Heating large buildings with biomass can be competitive throughout Europe (apart from Greece and Ireland in the pellet-sector)
- Market penetration is not necessarily determined by economic competitiveness. Other factors such as the availability of technologies, fuel supply, image and supportive policies, can lead to a dynamic market take-off even if the economic benefit is limited.

Conclusions

Modern pellet and woodchip boilers provide heat at a level of comfort, efficiency and economics that make it a viable alternative to fossil fuels throughout Europe. Wood chips and pellets are significantly cheaper than conventional fuels in all investigated countries and total heating costs calculated on the basis of a model plant heating 20 flats in a residential block would be competitive in all participating countries with the exception of Greece.

Despite appropriate preconditions in the entire area covered by the focus of BIOHEAT, dynamic market deployment takes place only in several countries. The lack of information on state of the art automatic wood heating has been identified as a major barrier for market deployment. Besides this fact, a complex set of barriers need to be addressed to realise the full potential of biomass heating. After processing the project's analyses it can be stated that research is no more the constraining factor for market deployment, but the availability of resources to remove these different barriers.

Further topics, which have to be addressed to accomplish full scale market deployment:

Fuel supply is a key barrier in many countries at present. The establishment of an EU pellet market, able to deliver high quality pellets competitively to any user without geographic restrictions is an issue of top priority.

In several participating countries there is still a serious lack of successful demonstration projects. The implementation of state of art demonstration projects is desperately needed, because they provide good images and influence decision makers towards innovative biomass projects effectively.

Even if wood heating is competitive nominally, it needs financial incentives to compensate for risk and higher transaction costs during the first years of market development.

Training of professionals like architects, consultants or installers - is another fundamental precondition for market development. The BIOHEAT-project proposes as a means for overcoming the existing barriers for wood heating the implementation of energy service companies, which build, own and operate the respective wood heating system. An example for a such a strategy is the agency ‘Regional Energy Styria’ in Austria, which promotes energy services based on biomass boilers by giving advice to developers, providing cost calculations, supporting the set-up of small companies which sell heat to blocks of flats and operate, maintain and (sometimes) pre-finance biomass boilers.

TOWARDS AN EU ACTION PLAN

1) General remarks and strategic approach

Decision making processes and buying decisions for bioenergy products usually are taking place at a regional or local area. Trust, credibility and proven integrity play an important role in this context. As e.g. German surveys demonstrate, the most important factors for buying decisions on a new heating system are word-of-mouth recommendations (i.e. friends and relatives) and installers (i.e. relevant, competent persons from the region).

Improvements in public perception of bioenergy thus will have to put a strong ***emphasis on the regional or municipal level***. Even if big national or European initiatives (image or PR campaigns) could be effective to raise awareness or knowledge about bioenergy technologies or successful demonstration projects; such initiatives will not have a sustainable impact without successfully transferring (and transforming) their efforts to the regional / local level of actual investment decisions.

Moreover, the topic of *bioenergy* as such can hardly be communicated or positioned as an understandable and effective solution because of its heterogeneity and the lack of awareness for applications and technologies which are not yet widespread. It appears thus to be advisable for the European Union to set clear ***priorities*** in their communication strategy. Some suggestions for such priorities can be found at the end of this action plan. Many of the interviewed bioenergy organisations call for a stronger emphasis on thermal bioenergy uses and on technologies which are already beyond the demonstration phase.

As pointed out earlier, the **main strategic elements** taken into account should be:

- communication and promotion strategies should be based on detailed market research and knowledge about perceptions, attitudes and motives in different relevant target groups
- focus on concrete and if possible already known uses of bioenergy (heating with wood, pellets etc.) and its advantages – in a modern, visual and user-oriented communication which substitutes the somewhat outdated image of

wood fuel with new values and meanings (such as design, technology, modernity, trend-setting, positive environmental aspects etc.)

- ► focus on successful solutions and services (not abstract technologies or fuels) at an individual and communal level
- ► focus on innovation, technology, design, cost-effectiveness
- ► if possible also the use of credible testimonials who e.g. have switched “from traditional wood fuel (or other ‘old’ combustion technologies) to innovative and modern pellet technology”.

Crucial: A shift in financial allocations

To operationalise the aim of improving the public perception of bioenergy a re-orientation of approaches and strategies at the level of the European Commission would be advisable. During the past years and even decades substantial amounts of money have been spent on research, technology development and demonstration in the area of bioenergy.

Meanwhile many biomass technologies are economically competitive and technologically well-developed. This situation calls for a new orientation in strategies of financing and promotion to allow producers (often SMEs operating on national markets) to successfully position their products on international markets.

At least to some extent funds should be transferred from technology development and investment subsidies to market and consumer information (similar to areas such as food or public health, where PR activities are funded by the EU) – gradually resulting in increased awareness and improved public perception of bioenergy.

Important tasks which ought to be adopted by the EU are measures to ensure and communicate quality of products and services, market research, market and consumer information, support of SMEs, and facilitating the internationalisation of market presence.

2) Aims of communication

The aims of the communication strategies for bioenergy are manifold, as we encounter a high diversity of target groups and intermediary actors (catalysts) in the bioenergy area and a high variety of different uses of renewable energies, of different regions with sometimes diverging strategic orientations and approaches of individual actors.

Besides the great variation in natural resources of the differing regions, differing national / regional levels of awareness and knowledge as well as national socio-cultural differences on the issue of heating and the use of renewable energies, add to the complexity of the current European situation. Such a situation calls for diversified implementation and well-targeted, regionally (sometimes even locally) adapted communication strategies to deal with the requirements at different levels and in different regions.

Important target groups are (though this list presumably is not complete):

- End-users
    - people planning to build a house
    - people refurbishing their home
    - people planning to replace and modernise their heating system
    - ecologically interested people (as potential multipliers or because of their support for new, ecologically sound technologies)
    - technologically interested people
    - young people (both as future consumers and influencers of adults, esp. on technology, trends and environment issues)
- Multipliers and intermediary actors influencing buying decisions
    - installers
    - chimney sweepers
    - home builders
    - architects, planners
    - public authorities / advice centres

- Information-disseminating institutions and their communication channels
    - energy advisers
    - environmental organisations
    - consumer associations
    - trade fairs
    - relevant media
- Politics & authorities
    - communal politics, municipalities
    - regional politics
    - national politics
    - European politics
    - building authorities
- Producers, distributors and their associations
    - nationally
    - at European level
- Potential suppliers and beneficiaries of a growing bioenergy sector (boiler producers, machine building, agriculture, waste processing companies etc.) as well as their associations
    - nationally
    - at European level
- Media
    - service-oriented media (including consumer information on home and building)
    - professional and specialist journals and magazines (heating systems, home building etc.)
    - media with emphasis on environment and sustainability

- specialist journals on science and innovation

It should be kept in mind that these target groups may also differ at a national and sometimes even at a regional level – regarding their composition as well as their importance for buying decisions and change in public perception.

Targets of communication should be

- ► To convincingly communicate advantages and USPs of specific, concrete solutions and uses of bioenergy (pellets, wood, etc.)
- ► To include strongly emotional values (theme: fire; theme: regional availability; theme: security of fuel supply)
- ► To create a positive and favourable world of images and ideas of bioenergy
- ► To emphasise innovation and high-tech aspects
- ► To use the interplay of modern and old (e.g. traditional fuel and top modern design)
- ► To emphasise ecological aspects
- ► To communicate positive examples and models (as a means of information transfer, but also to point out aspects such as feasibility, 'shining examples', innovation, design etc.)
- ► To elaborate and emphasise potential cost advantages (or general cost aspects).
- ► To strengthen the regions (as suppliers of wood / burning material; as providers of a safe and guaranteed fuel supply)

3) Implementing the communication strategy

Given the complexity of the task as well as the fact that many of the factors important for awareness building or decision making processes are located at a regional or local level, the European Union and its institutions only to a lesser extent will be in the role of an implementing body.

However, an important task lies in ***empowering key players*** in EU member states, regions and municipalities by targeted and coordinated activities to professionalize their appearance and communication and make it more user-oriented and successful.

Important elements of such an empowerment strategy could be:

- Strengthening the position of relevant, regional target groups
- Well structured and understandable transfer of information (on technology, market research and development, regulatory framework, best practices and successful strategies)
- Coordination and communication of existing efforts and initiatives in Europe (meetings, symposia, studies, networking via the Internet)
- Support for high quality training and education
- Specific offers and accompanying campaigns for image improvement

It should be pointed out that national or Europe-wide image or promotion campaigns will hardly be successful without stable regional partners who can react to the awareness and interest created by the campaign and follow up with advice and product or service offers.

4) Strategies of empowerment

4.1) Training and education

Know-how and information transfer at different levels and to different target groups may have a decisive impact on improving the public perception of bioenergy and consequently on the dissemination of bioenergy technologies.

Know-how and information transfer should take place at different levels:

a) within the 'bioenergy-community' (i.e. associations, organisations, lobbying and networking institutions)

b) within the group of producers, suppliers and distributors

c) aiming at target groups relevant for buying decisions

    - installers

- chimney sweepers
- architects, planners, home builders
- energy advisers
- municipalities, public authorities

d) know-how transfer between selected key players (institutions, associations,..) of different countries

e) know-how transfer towards authorities and political institutions

The European Union could have an important role in establishing, designing, steering and professionalizing these processes (financially and by giving organisational support, providing key lecturers etc.).

Some concrete ideas and **model activities** would be:

a) within the 'bioenergy-community'

► Creation of a European "Centre of Competence", which should provide the following functions to national and regional institutions:

- Comprehensive and sound information basis
  - preparing and distributing scientific, legal and technological information
  - preparing and distributing market information (incl. research on market potential, target groups & their motives, feedback on preferred technologies)
  - user-oriented preparation and distribution of examples for solutions of various kinds (technologically, successful campaigns, successful examples of communication, etc.)
  - user-friendly preparation and distribution of information offers (www.soltherm.org is a good example in the solar energy area)
- Coordination and service centre

    - organise meetings, symposia and workshops
    - provide training and continuing education (on technological aspects as well as on aspects of implementation and communication)
    - offer user-oriented ‘guidelines’ for campaigning, public relation activities, marketing, etc.
    - offer ready-to-use media and communication packages (incl. pictures, DVDs, background information, info-database etc.)
  - Training and education
    - training and education programmes for relevant topics such as marketing, PR, political lobbying, etc.
    - “train-the-trainer”-programmes for national / regional training programmes aiming at relevant target groups and multipliers

► Provide funding to support coordination and information transfer within the bioenergy community

  - support an exchange of experiences (also across energy applications, e.g. from wind industry to bioenergy community),
  - support the joint development of (national/ European) marketing strategies,
  - by co-funding specific meetings & side-events, by granting individual scholarships, and by refunding travel costs, etc.
  - by strengthening existing platforms of exchange and multiplication (e.g. erec-renewables.org, itebe.org, bioguide,org, iclei.org, practicalhelp.org, etc.)

► Know-how transfer between the key players (institutions, associations,..) of different countries

  - create regular exchange
  - interactive dialogue, e.g. via the web

- „Competence Centre“ as a Europe-wide umbrella organisation (not in a hierarchical sense, but with a clear, service-oriented mission to provide information, know-how and specific support

► Support joint scenario building among associations and the development of European marketing strategies for selected bioenergy applications

- by the commissioning of respective market research
- by funding the development of European strategies (similar to the outcome of the EU-project “Sun in Action II” for solar thermal heating (see: estif.org).

► Development and awarding of “seals of quality” for bioenergy products and solutions. Such instruments could have various positive effects:

- communication effects
- quality assurance and improved, comparable quality management
- establishment of comparable and possibly binding standards; opportunities for benchmarking

b) For producers, suppliers and distributors

► provide training and education programmes for marketing and PR activities

► provide, enable or support market research (could also be the task of the Competence Centre)

► provide updated information about technological standards and developments, examples of best-practice etc.

► support the development of better communication and sales skills for installers, planners, advisors and maintenance personnel

► information about successful promotion and marketing strategies for bioenergy but also in related areas (e.g. solar energy) – through market research, workshops, media, the Internet

► measures to empower bioenergy associations and to increase their relevance and influence in society and public debate (politically,

economically, with regard to their capacities, competence and professionality)

- ► create a special fund for integrated national or regional communication campaigns with a jury of marketing experts

c) Regarding target groups relevant for buying decisions

- ► Training and education about the advantages of new technologies and products (for installers, architects, etc.)
  - implementation in co-operation with regional partners (bioenergy associations, environmental organisations, energy agencies, etc.)
- ► Adapt education programmes to introduce the new technological developments into daily planning & work
  - positive example: training programme for solar architecture at the University for Continuing Education, Krems, Austria
  - specific programmes or modules in existing education programmes
  - continuing education for training and education centres (should be done in cooperation with industry associations)
- ► Support measures to improve the image of bioenergy in different target groups and at national / regional level
  - awards / certifications / specific labels (can also be connected to education programmes), e.g. the approved “wood heating specialist” or certified “sustainable energy solutions provider”
  - exchange programmes / study tours for municipal / regional representatives to visit and learn about successful examples in other countries
  - development and implementation of quality seals
  - etc., etc.

d) Regarding authorities and political institutions

- Political lobbying and conscious inclusion of decision makers in politics and administration is of utmost importance for innovative and dynamically developing areas.

4.2) Image gain by communicating problem solving competence

A wealth of attractive, innovative and successful solutions already exists in the bioenergy area. What is often missing is the targeted and systematic communication of examples to improve image on the one hand, and to offer more opportunities to copy successful implementation strategies.

Therefore a conscious focus should be put on the competence to provide viable bioenergy solutions:

- research and database of model projects and initiatives
- awards at EU or national level: for innovation, design, efficiency
- preparation of high quality material on successful projects for the media
  - texts, photos, film clips (usable for TV, i.e. on betacam), etc.
  - testimonials (by successful project planners and VIPs)
  - preparation of demo-CDs or DVDs (to be used for trade fairs, customer contacts, training programmes etc.)
- creation of exchange programmes (excursions to successful projects in combination with on-site workshops to disseminate successful promotion strategies)

4.3) Targeted support with communication and promotion

The actual work with target groups will have to be carried out by local key players. Because of their presumably restricted resources and possibilities, targeted and concrete support may greatly enhance the effectivity of their communication programme. Suitable measures could be:

- development of media- and communications packages

- attractive and professional photo material (analogue and digital)
- creation of a photo database, providing media-ready material for various target groups (i.e. presentation of products and solutions, but also “stylish” pictures which communicate the positive aspects of bioenergy applications, e.g. living room with ‘cosy’ open fire; farmer supplying wood chips to a biomass district heating plant etc.)
- attractive and professional film material (on DVD, but also suitable for television broadcasting on betacam) about successful projects, research, etc.
- preparation of texts (background information, instructive case studies and model projects, data collection, facts & figures about market potential etc.)
- database with facts and figures
- results from current market research projects
- collection of statements and testimonials – on the one hand from publicly well-known persons, on the other hand from key players within the European Union; theme: emphasising the advantages of bioenergy and its problem-solving capacity
- important: preparing the material suitable for use in the media and distribution via CD-ROM and/or DVD or free download via the Internet

► support with speakers and experts

- a pool of interesting, Europe-wide relevant spokespersons to support regional initiatives
- if possible, speakers should be
    - politically / administratively well positioned
    - high-level experts
    - rhetorically outstanding
- financing of workshops, symposia, etc.

4.4) European promotion campaign

Technologies and solutions in the bioenergy field are ready for a wider market penetration. In many cases the industry branch, however, lacks appropriate know-how and sufficient budgets to launch competent and professional marketing campaigns.

A European “Umbrella campaign” to promote the problem-solving capacity of specific applications of bioenergy would thus be a valuable instrument to help biomass technologies with a breakthrough on the market.

However, such campaigns should be:

- ► focussing on the concrete application, not on the rather abstract notion of bioenergy
- ► adapted to the national / regional needs and state of knowledge (incl. nationally / regionally preferred bioenergy technologies)
- ► take account of the national ‘communication culture’ and the national level of consciousness on environmental / heating issues
- ► closely coupled to key players in nations / regions to give them the opportunity to tune their regional implementation strategies to these European efforts
- ► exclusively work with positive arguments (technology, environment, security of supply, design, emotion etc.) and avoid any negative statements about other energy carriers.

Moreover, thematic European campaigns should set clear priorities on specific bioenergy applications. Two examples of potential priorities can be found below.

SUGGESTED PRIORITY ACTIONS

Due to the heterogeneity of bioenergy applications EU-wide communication strategies should concentrate on a limited number of priorities. Based on the interviews with experts in the promotion of bioenergy and on the considerations

put forward in the action plan, exemplary action at EU-level could give priority to the fields described below. Criteria for selection are

- the maturity and robustness of technology (priority should be put on rather mature technologies which are close to a 'break through' on the market')
- the relevance of a wide public acceptance to disseminate this application,
- the potential for ecological benefits,
- the economic feasibility and market potential,
- the possibilities of support by European agencies.

Two bioenergy applications are suggested on this basis: small-scale pellet heating systems (for households and larger buildings) as well as the sustainable re-use of organic waste. Both applications are highly relevant for a wide dissemination of bioenergy use, both have (or need) a strong resonance with public perception and application, for both technologies a number of support and marketing programmes exist in several EU-member states. Supporting a market breakthrough of these applications at EU-level could be highly relevant at this time. Such a support could improve learning between campaigns, speed up the process in countries where adoption is already picking up and help countries without specific initiatives and low dissemination rates to catch up.

1) Promoting pellet heating systems

Major technological breakthroughs in the last decade have made the use of wood fuels such as pellets (small compressed pieces of sawdust) or woodchips a viable option for supplying renewable energy for heating. State of the art automatic wood boilers can supply heat at the same degree of comfort and reliability as oil or gas heating systems. They cause very low emissions and do not contribute to the greenhouse effect. Wood that could be used as fuel is available throughout Europe in abundance.

Although often yielding a cheaper solution, biomass heating systems for residential buildings are not used more commonly. The use of biomass for heating today is in the same situation as wind energy 10 years ago. Efficient technology is available and used in a few selected countries but still not accepted as a viable option. Coordinated efforts to improve public awareness

and acceptance could facilitate a break-through of this technology in many European countries.

a) Promoting wood-pellets for single home heating systems

Objectives:

Substantial increase (e.g. + 30%) in the percentage of wood-pellet heating systems among all replaced and among all newly installed heating systems in private houses (within two years).

Specific advantage of bioenergy application:

- Substituting fossil fuels by CO2-neutral wood.
- Providing a high level of comfort.
- Well advanced technology with high dissemination potential.
- Creating wealth and employment in pellet supply industry/ forestry.

Specific target groups:

- End users: people owning an old or building a new house.
- Facilitators: planners & architects, installers, maintenance services, chimney sweepers.
- Disseminators: media, environmental & consumer organisations.

Example applications:

Heating systems (central heating, ovens) with a capacity of less than 100 kW for the heating of floor space by using automatic feeding of wood pellets.

Main message:

- Wood pellet heating systems are comfortable and clean in use.
- They rely on a cheap, ecologically sound and regionally available fuel.
- Pellet heating systems are innovative and technologically highly advanced.
- “Pellets are cool!”

Example activities:

Some of the activities of the European Association for Wood energy (ITEBE.org) and e.g. of the German national agency “Fachagentur Nachwachsende Rohstoffe” (fnr.de), Pelletsverband Austria or the British LogPile project in disseminating information on wood heating can serve as examples for such activities. They need to be more and strategically integrated though and reach out to more intermediary target groups, especially to planners, architects and installers.

Suggested EU-Activities: (in concerted action)

1. Initiating a network of regional/ national campaigns to exchange best practice & join forces
2. Supporting these campaigns and the establishment of new campaigns financially or by providing media material (texts, images, film footing), etc.
3. Awarding prices for the design of most suitable promotion campaigns
4. Financially supporting marketing campaigns (especially aiming at installers)
5. Supporting technology transfer and the market appearance of nationally/regionally operating companies (boiler producers) at a European level
6. Supporting the establishment of regional fuel logistics (e.g. fund stock keeping)
7. Support national actors in establishing the legal framework for market take off

8. Creation/ strengthening of a European competence centre (for activities 1-6)

b) Promoting wood for the heating of public buildings and blocks of flats

Background

The area of application 'large buildings' appears highly advantageous, because the use of wood fuels is particularly economical in this sector. Modern wood boilers are more expensive than oil or gas boilers but wood fuels are significantly cheaper (in most European countries). If heat demand is relatively high – as in large buildings – heating with wood fuels can be considerably cheaper than heating with oil in most European countries.

Objectives:

Installation of wood based heating systems (>70 kW) in public buildings, blocks of flats in a substantial proportion of municipalities.

Specific advantage of bioenergy application:

- Substitution of fossil fuels (CO_2-neutral).
- Security of cheap supply due to regional base of resources.
- Closing the gap between district heating systems and central heatings in single family houses.
- Creation of (regional) employment in fuel supply and development of new service companies.

Specific target groups:

- End users: municipalities, landlords, building associations, builders.

- Farmers cooperatives and companies to provide bioheat service
- Facilitators: planners & architects, installers, financing partners, …

Example applications:

Wood heating systems bigger than 100 kW heat and combined heat and power generators used for space heating based on wood (pellets, chips or logs).

Main message:

Wood is economically most feasible (considering investment, fuel costs & maintenance). High level of service for building owners as energy service companies provide heat by operating boiler, providing maintenance and fuel supply.

Example activities:

The groundwork laid by the project www.Bioheat.info in this sector can be built upon. The national and regional activities by ADEME in France, FNR in Germany or Motiva in Finland can be taken as examples for activities, that could to be improved and linked up with each other.

Suggested EU-Activities: (in concerted action)

1. Initiate European networks of market actors and campaigning institutions (building upon existing starting points such as bioheat.info, iclei.org, itebe.org etc.)
2. Supporting marketing and awareness campaigns for the supply of large buildings with bioheat (based on new heat services)
3. Funding & supporting the development of documents giving advice for investors and staff in building management
4. Funding & supporting the provision of individual advice for investors & building managements in the respective buildings

5. Supporting the establishment of regional fuel logistics (funding of stock keeping) and of regional service companies, offering to supply fuel, as well as operate and maintain pellet burners in blocks of flats.
6. Empowering national actors to help improve the legal framework for market development in this segment (especially allocation of costs for eco-refurbishment in rental buildings)

2) Reuse of residuals: Promoting bio-waste to energy conversion

The use of biomass waste and residues (used wood, organic fraction of household waste, municipal solid waste, manure, residues from food processing industry etc.) is a highly disputed topic. On the one hand there often is more public support than one would expect (e.g. use of organic household waste in Netherlands), on the other hands the establishment of new plants often meets strong public opposition or opposition from environmental groups. At the same time the potential of using such residues for the generation of bioenergy is high and the technologies are mature and competitive. The aim of an EU wide information and image campaign should be to promote a sustainable and ecologically friendly use of biomass waste and thereby creating a more positive image and forward-looking strategy (e.g. focusing on re-use instead of waste).

Objectives:

Let every producer of relevant volumes of biomass (e.g. in the food industry, in certain sectors of agriculture and stock keeping) take note of the possibility to produce heat (& power) by feeding modern power generators with this kind of waste (e.g. reach the last one by 2006).

Specific advantage of bioenergy application:

- Savings in expensive waste disposals – creation of additional (regional) income
- Avoiding ecologically problematic waste disposal (toxic or hypertrophic wastes etc.)

Specific target groups:

- Certain sectors of (agricultural) industry and service providers (waste disposal companies etc.)
- Intermediaries: extension workers, environmental organisations,

- Municipalities, water providers (actors & authorities of ground water protection)

Example applications:

Biogas production in decentral or semi-central CHP-plants or fed into the distribution net for natural gas.

Main message:

- Production of bio gas helps solving waste problems.
- Production of bio gas is a feasible diversification of products.
- Production of bio gas is a modern, environmentally friendly way of energy production

Example activities:

Efforts are currently undertaken by Novem in the Netherlands to improve the cooperation between industry and environmental groups on this issue and to develop sustainability criteria to promote a more sustainable use of waste for energy generation.

The international Project “Pressea”, funded by GEF/UNDP/NEPO, aiming to create a “One-Stop Clearing House with an information-, a technical-, a financing service- and a policy cell […] to support biomass co-generation and power generation in Thailand” http://www.aseanenergy.org/pressea/thailand/biomass/institutional_setup_and_financing.htm can serve as an illustration for an attempt to establish an agency to support the agro-industry to combust bio-waste. Similar activities in European countries could be supported by a respective European agency, building upon the already existing structures.

Suggested EU-Activities: (in concerted action)

1. Supporting feasibility studies and impact assessments in most promising sub-sectors
2. Develop sustainability criteria for the use of biomass waste and residues for energy production. Promote a discussion process on these criteria between industry associations and environmental groups
3. Disseminating best practice examples and sustainability criteria to target groups
4. Funding guidelines and model projects of more inclusive and participative planning processes
5. Funding the dissemination of documents giving advice for managers in agro-/ food industry
6. Funding the provision of individual advice for investors & managements on farm/ in factory
7. Promoting the dialogue between industry and environmental organisations
8. Empowering national actors to help improve the legal framework for market development in this segment (e.g. allowance to bring out dung after fermentation in areas of water protection..)
9. Funding feasibility studies and impact assessment of (demonstration) plants.

Further priorities could also concentrate on “green electricity” from bioenergy or biomass-based district heating systems.

A SHORT BIBLIOGRAPHY ON THE PUBLIC PERCEPTION OF BIOENERGY

AEA Technology (2001): *Comparison of public acceptability of energy from waste and energy from biomass residues in 5 EU states*, Brussels: European Commission - Directorate-General for Energy and Transport

Barbiére, Jane (2002): "Planning Barriers to Renewable Energy Deployment." In: *Proceedings of the Workshop "Accelerating the Deployment of Renewable Energy / Distributed Generation in the Baltics"*, Riga: International Energy Agency

Bioenergy Forum (van Son, Paul / Rob Remmers and others) (2002): *Sustainable Bio Energy: A Vision on Socially Acceptable Bio Energy*, The Netherlands: Bio Energy Forum

Bohlin, Folke / Anders Roos (2002): "Wood fuel supply as a function of forest owner preferences and management styles", *Biomass & Bioenergy* 22, pp. 237-249

Bruton, Charlotte / George Kavadakis / Anastasia Nikolau / Keith Richards / Calliope Panoutsou (2002): "Progress with Biodiesel Uptake in Europe: A Status Report." In: *Proceedings of the World Renewable Energy Congress VII - Biomass for Energy and Materials*, Cologne: WREN

Chatziathanassiou, Artemios / Ioannis Boukis (2000): "Constraints and Strategy for the Development of Anaerobic Digestion in Livestock Farming in Greece." In: *Proceedings of the 1st World Conference on Biomass for Energy and Industry*, Sevilla: James & James, pp. 1294-1297

Chatziathanassiou, Artemios / Konstantinos Sioulas / Daphne Mavrogiorgos / Athina Veneti (2002): "Stakeholders' Perceptions for Anaerobic Digestion Energy Schemes in Greece." In: *Proceedings of the 12th European Conference and Technology Exhibition on Biomass for Energy, Industry and Climate Protection*, The Netherlands

Conter, Gérard (2003): "Favourable policy conditions to the development of biogas production as a sustainable form of energy in Luxemburg." In: *Proceedings of the OECD Workshop on Biomass and Agriculture*, Vienna:

OECD

Danielsen, Oluf / Roger Hackstock and others (2001): *What makes renewable energy work?* Vienna: EVA

EurObserv'ER (2002): "European Barometer 2002: The 2002 Overview of Renewable Energies", *Systémes Solaires* 148

Goldemberg, José / Suani Teixeira Coelho (2003): “Renewable energy – traditional biomass vs. modern biomass” In: *Energy Policy 32 (2004) 711-714*, São Paulo: University of São Paulo, pp. 711-714

Gray, AJ / Pat Delbridge / E. Trevorrow / C. Pile (2001): *Development and Delivery of a Workshop Methodology: Planning for Biomass Power Plant Projects*: DTI Sustainable Energy Programmes

Haas, R. et al. (2003): “How to promote renewable energy systems successfully and effectively” In: *Energy Policy 32 (2004) 833-839*, Vienna: University of Technology, pp. 833-839

Helby, Peter ed. (2003): *Market development problems for sustainable bioenergy systems in Sweden (The BIOMARK project),* Lund University: Section for Environmental and Energy Systems Studies

Hübner, Gundula / Georg Felser (2001): *Für Solarenergie: Konsumenten- und Umweltpsychologie strategisch anwenden*, Heidelberg: Asanger Verlag

IEA Renewable Energy Working Party (1999): *The Evolving Renewable Energy Market*, Sittard: Novem

IEA Renewable Energy Working Party (2002): *Renewable Energy ...into the mainstream*, Sittard: Novem

International Energy Agency (2002): *Renewables Information 2002*, Paris: IEA

Kahn, Robert (2000): "Siting Struggles: The Unique Challenge of Permitting Renewable Energy Power Plants" In: *The Electricity Journal*, Elsevier Science Inc., pp.21-33

Kalf, Ria (2002): “De markt voor energie uit afval en biomassa. Communicatie omtrent biomassa”, Presentation for Euroforum, 6 November 2002, Arnhem:

Projectbureau Duurzame Energie

Kalf, Ria (2002): "De markt voor energie uit afval en biomassa. Communicatie omtrent biomassa." In: *Proceedings of the 9e Jaarcongres "De Markt voor Energie uit Afval en Biomassa"*, Arnhem: Projectbureau Duurzame Energie

Khan, Jamil (2003): *Wind power planning in three Swedish municipalities*, Lund University

Khan, Jamil (2002): *Siting Conflicts in Renewable Energy Projects: A Biogas Case Study*, Lund University

Kivisaari, Sirkku / Raimo Lovio / Erja Väyrynen (2002): "Public Private Partnership in Influencing Transitions: Comparing Public Interventions for Health Care and Energy Sector Transition." In: *Proceedings of the International Expert Meeting on Transitions to Sustainability through System Innovations*, Enschede: University of Twente

Kleindienst Muntwyler, Siegrid / Martin van Walwijk : *Deployment Strategies for Hybrid, Electric and Alternative Fuel Vehicles: A Report of the IEA Project*: IEA - International Energy Agency

Köpke, Ralf, Schmidtferick, Kerstin (2002): Mehr Müll als Bio? In: *Neue Energie* 5/2002

Kwant, Kees W. (2003): "Renewable energy in The Netherlands: policy and instruments", In: *Renewable Energy 24 (2003) 265-267 ,*Utrecht: Novem B.V., pp. 265-267

Lansdowne Market Research (2003): *Attitudes Towards Wind Farms And Wind Energy in Ireland*: Presentation to Sustainable Energy Ireland

Löfstedt Ragnar E. (1995): “Why are public perception studies on the environment ignored?” In: *Global Environmental Change, Vol.5, No.2,* Elsevier Science Ltd., pp. 83-85

Nemac, Franko / Ales Bratkovic (2001): "Economical Growth Potential of Energy Biomass use in Slovenia." In: *Proceedings of the 18th Congress of World Energy Council*, Buenos Aires

OECD (2002): *OECD Guidelines towards Environmentally Sustainable Transport*, Paris: OECD

OECD/IEA (2003): *Creating Markets for Energy Technologies*, Paris: IEA

Panoutsou, Calliope S. / Anastasia Nicholaou / Stelios Rozakis (2000): "Energy Production from Agricultural Biomass in Greece: Synergies and Antitheses of Actors involved in the Bioguide Project." In: *Proceedings of the 1st World Conference on Biomass for Energy and Industry*, Seville: James & James, pp. 1173-76

Rakos, Christian (2002): *Bioheat: Promoting biomass heating in large buildings and blocks*, Vienna: EVA

Rakos, Christian (1996): *The Introduction of Biomass into the Energy Markets of Austria and Sweden - Driving Forces and Nontechnical Barriers under Different Economic Frame conditions. Paper prepared for Task 4.3 of the IEA* , Vienna

Rakos, Christian (2003): "Key factors for successful market development of bioenergy. Experiences from Austria." In: *Proceedings of the OECD Workshop on Biomass and Agriculture*, Vienna: OECD

Rakos, Christian and others (1995): *Pathways from small scale experiments to Sustainable Regional Development: The Diffusion of Biomass District Heating in Austria*, Vienna: Institute of Technology Assessment

Rakos, Christian / Roger Hackstock (2000): *Untersuchungen zum Einsatz von Holz als Energieträger am Wärmemarkt*, Wien: EVA

Rogulska, M. / A. Oniszk-Poplawska / M. Pisarek / G. Wisniewski (2003): "State of the art of bioenergy in Poland - barriers and opportunities." In: *Proceedings of the OECD Workshop on Biomass and Agriculture*, Vienna: OECD

Roos, Anders (2001): "Bioenergy Markets: Economic and Dynamic Issues of Biomass Energy Implementation." In: *Proceedings of the Workshop "Greenhouse Effect Countermeasures & Problems of Sustainable Rural Development in Relation to Biomass, Biofuels and Fuel Cells"*, Warsaw

Roos, Anders (2001): "Policy and Institutional Factors Affecting Forest Energy."

In: J. Richardson / R. Björheden et al. (Eds.), *Bioenergy from Sustainable Forestry: Guiding Principles and Practice,* The Netherlands: Kluwer Adacemic Publishers

Roos, Anders / Robin L. Graham / Bo Hektor / Christian Rakos (1999): "Critical factors to bioenergy implementation", *Biomass & Bioenergy* 17 (1999) 113-126, Uppsala: Swedish University of Agricultural Sciences, pp. 113-126

Ross, Raymond (2003): "Public perception of MSW and energy recovery. Waste has a chance of a second life." In: *Proceedings of the ThermoNet meeting*, Florence

Støer Deborah / Keming Yang (2003): *Who's For Renewable Energy and Why? Answers from a Sample Survey in Reading, Newbury: TV Energy and University of Reading*

Støer Deborah / Keming Yang (2003): *Osney sustainable Island group survey report,* Newbury: TV Energy

The European Opinion Research Group (EORG) (2002): *Eurobarometer. Energy: Issues, Options and Technologies. Science and Society*, Brussels: European Commission

Upreti, B.R. (2004): "Conflict over biomass energy development in the United Kingdom: some observations and lessons from England and Wales" In: *Energy Policy 32,* pp. 785-800

Upreti, B.R. / D. van der Horst (2004): "National renewable energy policy and local opposition in the UK: the failed development of a biomass electricity plant" In: *Biomass and Bioenergy 26*, pp. 61-69

van den Hoogen, W.M. / G. Hübner / A.L. Meijnders / C.J.H. Midden (2002): "Biomass: How people think and feel about it" In: *12th European Conference and Technology Exhibition on Biomass for Energy, Industry and Climate Protection, June 2002*, Eindhoven: Technical University of Eindhoven

Vinterbäck, J. / A. Roos (2000): "Consumers of Wood Pellets for Residential Heating in Austria, United States and Sweden." In: *1st World Conference on Biomass for Energy and Industry,* Sevilla*:* James & James, pp. 1362-1365

Wolsink, Maarten (2000): "Wind Power and the NIMBY-myth: institutional capacity and the limited significance of public support" In: *Renewable Energy 21*, pp. 49-64

Zilian, H. G. (2000): *Ein Markt in Entstehung - Die Angebotsseite von Biomasse-Kleinfeuerungsanlagen*, Graz: Büro für Sozialforschung

APPENDIX

1) BIOENERGY-ACTORS

As a basis for the identification and selection of interview partners and the search for reports and relevant material on the public perception of bioenergy, a database of bioenergy-related institutions has been built up. By checking the profiles of these institutions (e.g. do webpages mention any projects or assessments of the issue of public perception) and considering the organisations to be interviewed within the project team and in exploratorx interviews with bioenergy experts, approximately 50 interview partners have been selected (and interviewed). More information on the institutions is included in the enclosed CD-ROM, below a list of the organisations is given sorted by country.

Europe / International

- AEBIOM - European Biomass Association / Secretariat
- EREC - European Renewable Energy Council
- EUBIA - European Biomass Industry Association
- EUREC Agency
- Energie-Cities
- EUROSOLAR eV / European Association for Renewable Energies
- European bioenergy networks
- FEDARENE – European Federation of Regional Energy- and Environment Agencies
- IEA Bioenergy
- IEA-Task 29: Socio-Economic Drivers in Implementing Bioenergy Projects

Austria

- Austrian Biofuels Institute - Verein Österreichisches Biotreibstoff Institut
- Oesterreichischer Biomasse-Verband / Austrian Biomass Association
- Bioenergy Austria
- EVA - The Austrian Energy Agency / Energieverwertungsagentur
- Joanneum Research / Institute of Energy Research
- LandesEnergieVerein Steiermark
- OÖ Energiesparverband
- Pelletsverband Austria – Pellets Association Austria

Belgium

- 3E
- ERBE - Agence Régionale Biomasse Energie / Wallonia Regional Energy Agency
- ValBiom - Valorization of Biomass

Bulgaria

- ABEA - Association of Bulgarian Energy Agencies
- BBA - Bulgarian Biomass Association / Agricultural University
- EEA - Energy Efficiency Agency, Bulgaria
- Energy Agency of Plovdiv
- Foundation Regional Energy Center
- Municipal Energy Agency - Rousse
- Sofia Energy Centre (SEC) / FEMOPET Bulgaria
- SOFENA - Sofia Energy Agency

- Union of Bulgarian Black Sea Local Authorities

Czech Republic

- CZ BIOM - Czech Biomass Association
- Ecoconsultig
- Enviros Ltd
- Ministry of Environment of the Czech Republic
- TCASCR - Technology Centre of the Academy of Sciences of the Czech Republic

Denmark

- Biogas Association of Denmark
- University of Southern Denmark - Bioenergy Department
- COWI A/S
- DANBIO - Danish Biomass Association / and Danish Biogas Plant Association
- Danish Energy Authority DEA
- dk-TEKNIK ENERGY & ENVIRONMENT
- Esbensen Consulting Engineers A/S
- Tech-wise

Estonia

- EBA - Estonian Biomass Association
- REC Estonia - Regional Energy Centres in Estonia, Voru

Finland

- Central Finland Energy Agency / Keski-Suomen Energiatoimisto
- Energy Agency of Nummela / Nummelan Energiatoimisto
- Energy Agency of Southwest Finland / Varsinais-Suomen energiatoimisto
- FINBIO - Finnish Bioenergy Association
- MOTIVA Oy
- TTS Institute

France

- ADEME - Agence de l'Environnement et de la Matrise de l'Energie
- AFB - French Biomass Association c/o ADEME
- AJENA energie et environnement en Franche-Comt / Association Jurassienne pour la diffusion des ENergies Alternatives
- ARENE - Agence Régionale de l'ENErgie Provence Alpes Côte d'Azur
- Association Hespul
- Biomasse Normandie
- CREED - Vivendi Environnement - Dalkia
- GERES - Groupe Energies Renouvelables et Environnement
- ITEBE - Institut Technique Europeen du Bois-Energie
- Quercy Energies
- RAEE - Rhônalpénergie-Environnement
- Transenergie

Germany

- Arbeitsgemeinschaft Qualitätsmanagement Biodiesel e. V. / working group quality-management biodiesel
- BIZ - Biomasse Info-Zentrum / Biomass - Information – Centre
- CARMEN ev
- CCS - Competence Center Suderburg
- DEPV - Deutscher Energie-Pellet-Verband e.V.
- Ecofys GmbH
- Energie 2000 eV - Energieagentur im Landkreis Kassel
- Energieagentur Regio Freiburg GmbH
- Energieagentur Schleswig-Holstein
- EHB – Energieholzbörse
- Fachagentur Nachwachsende Rohstoffe e.V.
- Forschungsstelle fuer Energiewirtschaft e.V. (FfE e.V)
- German Bioenergy Initiative / BBE - Bundesinitiative BioEnergie
- IE - Institut für Energetik und Umwelt gGmbH / Institute for Energy and Environment
- IER - Institute of Energy Economics and the Rational Use of Energy / University of Stuttgart
- Institut für Solare Energieversorgungstechnik (ISET)
- IZES - Institut für ZukunftsEnergieSysteme an der Hochschule für Technik und Wirtschaft
- WIP
- ZAB-Energie - ZukunftsAgentur Brandenburg GmbH
- ZREU - Zentrum für rationelle Energieawendung und Umwelt GMbH / Centre for Rational Use of Energy and Environment Limited

Greece

- CRES - Centre for Renewable Energy Sources
- National Technical University of Athens, RENES, Unit for RENewable Energy Sources
- Elinoil SA
- Energy Center of Trikala Area
- HELLABIOM - Greek Biomass Association – (c/o CRES)
- PECL - Prefectural Energy Center of Larissa
- Regional Energy Agency of Crete

Hungary

- Csanady&Partners Consulting Ltd
- Energy Centre Hungary
- HBA - Hungarian Biomass Association
- Innoterm Energetics Ltd

Ireland

- Cork County Energy Agency
- Donegal Energy Action Team
- Energy Innovation Ltd
- GEAL - Galway Energy Agency Ltd
- IrBEA - Irish Bioenergy Association (c/o Tipperary Institute)
- Meath Energy Agency / (Meath County Council - Environment)
- REIO - Renewable Energy Information Office

- SEI - Sustainable Energy Ireland / Headquarters
- TEA - Tipperary Energy Agency Limited
- Wexford Energy Management Agency Ltd

Italy

- AEA - Agenzia per l'Energia e l'Ambiente della Provincia di Perugia
- AESS - Agenzia per l'Energia e lo Sviluppo Sostenibile di Modena
- ALERR - Agenzia lucchuse per l'Energia ed il recupero delle Risorse
- APEVV - Agenzia Provinciale per l'Energia del Vercellese e della Valse / Energy Agency of the Province of Vercelli
- ARAEN - Agenzia Regionale per l' Energia della Regione Abruzzo
- ARE - Agenzia Regionale per l'Energia di Liguria / Regional Energy Agency of Liguria
- AREA - Agenzia Regionale per l'Energia e l'Ambiente della Sicilia
- ARPA Lombardia - Agenzia Regionale per la Protezione dell'Ambiente
- Adiconsum
- Agenbiella - Agenzia Provinciale per l'Energia
- ENEA - Ente per le Nuove tecnologie l’Energia e l’Ambiente / Italian National Agency for New Technology, Energy and the Environment
- ETA - Renewable Energies
- Entire Power
- Florence Energy Agency Ltd / Agenzia Fiorentina per l'Energia
- Geofilos
- INTERENERGY s.r.l.
- ITABIA - Italian Biomass Association
- Orion

- Punto Energia Brescia / c/o Provincia di Brescia
- Punto Energia Varese
- RENAEL - National Net of Regional and Local Agencies for Energy Manage
- SEA - Societa' Energetica Aostana / Autoporto Region
- SolarDesign

Latvia

- Ekodoma Ltd
- Institute of Physical Energetics / Latvian Academy of Sciences

Lithuania

- Energy Agency, Lithuania
- Energy Efficiency Centre
- LEI - Lithuanian Energy Institute / OPET Lithuania

Luxembourg

- AEL - Agence de l'Energie du Luxembourg
- Administration de l'Environnement

Poland

- APE SA - Agency for Energy Conservation / Agencja Posz. Energii Lódz
- Association of Polish Energy Actors at Local and Regional Level EC BREC/IBMER - EC Baltic Renewable Energy Centre
- BAPE - Baltycka Agencja Poszanowania Energii SA Baltic Energy Conservation Agency

- FEWE - The Polish Founadtion for Energy Efficiency
- KAPE – The Polish National Energy Conservation Agency
- MAES - Malopolska Agencja Energii i Srodowiska Region of Malopolska (Krakow) Energy Agency
- ONT Biopaliwa
- POLBIOM - Polish Biomass Association

Portugal

- ADENE - Agência para a Energia
- AEAVE - Agência de Energia e Ambiente do Vale do Ave
- AMEL - Agencia Municipal de Energia de Loures
- APREN – The Portuguese Association of Independent Producers of Electric Energy from Renewable Sources
- AREAL - Agência Regional de Energia e Ambiente do Algarve
- ARENA - Energy Agency of Azores / Agencia Regional da Energia da Regio Autonoma dos Acores
- CBE – Centro da biomassa para a energiea - [pt]
- ENERDURA - Agência Regional de Energia da Alta Estremadura
- ENERGAIA - Energy Management Agency of Gaia / Agência de Energia e Ambiente de Vila Nova de Gaia
- INETI - National Institute of Industrial Engineering and Technology
- Leaderoeste Associao para o Desenvolvimento Rural CEIDRO-Carrefour Oeste

Romania

- ARCE Romanian Agency for Energy Conservation (ARCE)

- ENERO - Centre for Promotion of Clean and Efficient Energy in Romania
- IPA SA
- ISPE - Institute of Power Studies and Design / Instituti de Studii si Proiectari Energetice
- Intertermo Concept Ltd

Slovakia

- Biomasa Association
- Marvel Group
- REMA Zilina - Regional Energy Management Agency in Zilina
- Slovak Energy Agency (SEA)
- SK-BIOM - Slovak Biomass Association
- TU Zvolen - Technical University in Zvolen

Slovenia

- Energy Agency of the Republic of Slovenia
- Ape - Agencija za prestrukturiranje energetike / Energy Restructuring Agency
- Agency for Efficient Energy Use - AURE
- Eco Consulting
- SLOBIOM - Slovenian Biomass Association

Spain

- ALESevilla - Agencia Provincial de la Energia Sevilla
- APEA - Agencia Provincial de la Energia de Avila / Energy Agency of the Province of Avila

- APEH - Agencia Provincial de la Energia de Huelva
- ARGEM - Agencia Regional de la Energia de Murcia
- Abengoa Bioenergia
- Agència d'Energia de les Illes Balears / Direcció General d'Energia
- Alcoucer Consultores / Energy Consultants Division
- CIRCE Foundation - Centre of Research for Energy Resources and Consumption
- Department of Renewable Energies – CIEMAT
- ENERNALON - Local Energy Agency for the Nalon Region Fundación Agencia Local de la Energía del Nalón
- ESCAN SA
- EVE - Ente Vasco de la Energía
- FAEN - Fundacion Asturiana de la Energia
- Fundació Tàrraco Energia Local
- IDAE - Instituto para la Diversificación y Ahorro de la Energía
- INEGA - Instituto Enerxético de Galicia
- CEDER (Centre for the Development of Renewable Energy Sources) / CIEMAT
- SODEAN SA - Sociedad para el Desarrollo Energetico de Andalucia
- SOLARIS energias renovables
- Spanish Association of Renewable Energy Producers Asociación de Productores de Energías Renovables

Sweden

- Department of Bioenergy at the Swedish University of Agricultural Sciences

- EIV - EnergiInformation Värmland / Region Värmland
- Energikontor Sydost / Energy Agency for Southeast Sweden
- Energikontoret Jämtland / Jämtland County Energy Agency
- FVB-Fjarrvarmebyran ab
- GDE-Net - Gavleborg/Dalarna Energy Network
- KanEnergi Sweden AB
- Malardalen Energy Network / Mälardalens Energikontor
- NENET - Norrbottens Energikontor AB
- Nykomb Synergetics AB
- Ratchoff Consulting
- STEM - Swedish Energy Agency
- SVEBIO - Swedish Bioenergy Association
- Skane Energy Agency
- ZW Energiteknik AB

The Netherlands

- BTG - Biomass Technology Group / Head Office
- Cythemadim bv
- Ecofys BV
- NL-BEA - Netherlands Bio-energy Association / Stichting Platform Bio-Energie
- NOVEM - Netherlands Agency for Energy and the Environment
- Projectbureau Duurzame Energie (PDE)
- TechForce Innovations nl

United Kingdom

- Aberdeen - Save Cash and Reduce Fuel (SCARF) / Aberdeen & North East EEAC
- Allied Biodiesel Industries (UK)
- B9 Energy Biomass Ltd
- Brent Energy Network
- British BioGen
- CPL Press
- CREST - Centre for Renewable Energy Systems Technology
- Cheshire Renewable Energy Initiative / Cheshire County Council, Environmental Planning
- Defra - Department of the environment, food and rural affairs / Sustainable Policy Division
- Dulas Ltd / Wales OPET Cymru
- ESD Ltd
- Enact Energy
- FES - Future Energy Solutions / AEA Technology Environment
- Hoare Lea
- IT Power Ltd
- Impax Capital Corporation
- Kirklees Metropolitan Council / Environment Unit
- NEF Renewables
- PyNe - Pyrolysis Network
- Sundance Renewables
- Sustain Limited
- TNEI - The Northern Energy Initiative

- TV Energy - Thames Valley Energy Management Agency
- ThermoNet
- WREN - World Renewable Energy Network

2) INTERVIEW GUIDELINE

With approx. 50 organisations semi-structured interviews based on interview guidelines have been carried out. The guideline is given below:

INTERVIEW GUIDELINE

Improving the Public Perception of Bioenergy

We are carrying out a project for DG TREN which focuses on improving the public perception of bioenergy. The information gathering part of this project is based on sociological survey data from different European countries, looking into projects and experiences with successful initiatives and action plans at national and EU level.

To maximise the available data we are also conducting telephone interviews with biomass experts from all over Europe – this is why we also would like to include your experience and your response to our questionnaire.

For our survey we address all different types and uses of bioenergy – fuel wood (e.g. wood chips for domestic boilers, but also for co-firing with coal in power plants), biogas, bio-fuels, the use of municipal biomass waste, landfill gas and so on. However, the main strategy of our project is not to generate additional data, but to re-analyse existing projects and to build upon the opinion and experiences of a large variety of experts in this field.

Topic A:

Public Acceptance/Awareness of Bioenergy

1. Do you know of studies or surveys which have investigated the acceptance and attitudes of the public or specific user groups of bioenergy
   - in your country
   - within EU-projects
   - within other European countries.

2. Who would be the most resourceful and relevant people to ask in your country or in your organisation about such studies?
3. How strong is the public perception of bioenergy in your country?
    - Is the improvement of the public perception an important issue for the further dissemination of bioenergy which can be given more attention?
    - Should priority rather be put on other aspects like the improvement of technologies or the introduction of specific taxes or regulations?
4. What are the key factors in your opinion, which might help to improve the public perception of bioenergy?
    - in your country
    - on a European scale
5. Are there some kinds and uses of bioenergy that might have a stronger problem with acceptance than others? Which of them might that be and why?
6. What is in your opinion the basis for problems with acceptance of bioenergy? Are they based on
    - the way the use of bioenergy is communicated
    - the way bioenergy is introduced to the market
    - a potential general image deficit of bioenergy (e.g. dirty, expensive – please explain)
    - a lack of information about its benefits and potential?
7. Are there usages of bioenergy for which public opinion is not an important aspect anyway? Why? Which uses?
8. Which segments of the public and specific target groups are most relevant with respect to the acceptance of biomass technologies? Can you specify their relevance on a scale of 1 (very relevant) to 5 (not relevant at all)
    - Households/Consumers
    - Personal knowledge / contact to existing users of bioenergy technologies

- National policy makers / authorities
- Regional policy makers / authorities
- Municipalities
- NGOs
- Mass Media
- Special interest media
- Companies (as users of bioenergy)
- Companies (as providers of biomass technologies)
- Advertising
- etc.

Topic B:

Relevant Organisations in your Country

9. Who are the most important actors regarding the public acceptance of bioenergy?
    - in your country
    - on a European level
10. Which opinion leaders or ‚multipliers' could also be relevant for the acceptance of bioenergy. How can we identify these people?
11. Could you give us any recommendation about who should be interviewed to receive a thorough evaluation of this topic? (name, e-mail, tel; reason why; publications)

Topic C

Best Practice and Model Projects

12. Do you know about projects or regional initiatives to promote bioenergy
    - that can serve as a model for other regions?
    - that did not work out as expected? Please give as detailed references as possible, incl. contacts for further information and description of the project.
13. What are the lessons that can be learned from these projects, both successes and failures – on a local / regional and on a European level?
14. If you compare bioenergy with other renewables like wind energy or PV: Do you know of implementation strategies or projects in these areas that could be transferred to the promotion of bioenergy?
15. Which activities are necessary from your perspective to improve the public acceptance of bioenergy?
16. Do you know of any especially original or noteworthy projects or activities?

Topic D

EU Action Programme

17. Which kind of activities would you wish to see at EU level to improve the public perception of bioenergy and to promote the dissemination of this energy carrier?
18. Which target groups or applications should be especially addressed by these actions?
19. Should EU-activities in this area be high profile or should they rather focus on the coordination and support of initiatives at national and regional level?

3) LIST OF CONTACTS WITH RELEVANT BIO-ENERGY ACTORS

Face-to-face-Interviews

Country	**Association**	**Contact**	**Address**	**email**
A	EVA - The Austrian Energy Agency	Mr. Christian Rakos	Otto Bauerg. 6 A-1060 Wien, Austria	rakos@eva.ac.at
A	Joanneum Research, Institute for Energy Research (IEF)	Mr. Josef Spitzer	Elisabethstraße 5 / I A-8010 Graz. Austria	josef.spitzer@joanneum.at
BE	EUBIA	Mr. Giuliano Grassi	Roind point schuman 6 BE-1040 Brussels, Belgium	eubia@eubia.org
BE	AEBIOM	Mr. Jean-Marc Jossard	Croix du Sud 2, BE-1348, Louvain-la-Neuve, Belgium	Jossart@ecop.ucl.ac.be
BE	EUREC	Mr. Karel Dervaux	Rue du Trône 26 BE-1000 Brussels, Belgium	derveaux@eurec.be
CH	Centre for Energy Policy and Economics (CEPE), Swiss Federal Institutes of Technology,	Mr. Reinhard Madlener	ETH Zentrum WEC C 25 CH-Zurich, Switzerland	reinhard.madlener@cepe.mavt.ethz.ch

D	WIP	Mr. Christian Epp	Sylvensteinstraße 2, D-81369 Muenchen, Germany	Christian.Epp@wip-munich.de
D	WIP	Mr. Peter Helm	Sylvensteinstraße 2 D-81369 Muenchen, Germany	peter.helm@wip-munich.de
D	fesa e.V.	Ms. Marissa Walzer	Wippertstraße 2 D-79100 Freiburg, Germany	walzer@fesa.de
D	Energy BASE (ex ICLEI)	Mr. Volker Krauth	Grünwälderstraße 10-14 D-79098 Freiburg, Germany	volker.krauth@energy-base.org
NL	Projectbureau Duurzame Energie	Ms. Ria Kalf	Jansbuitensingel 7, Postbus 10 NL-6800 AA Arnhem, The Netherlands	rkalf@pde.nl
NL	Technische Universiteit Eindhoven, TU/e, Human Technology Interaction (MTI)	Ms. Anneloes L. Meijnders	Den Dolech 2, IPO 1.17, P.O. Box 513 NL-5600 MB Eindhoven, The Netherlands	a.l.meijnders@tm.tue.nl
NL	Technische Universiteit Eindhoven, TU/e, Human Technology Interaction (MTI)	Ms. Gundula Hübner	Den Dolech 2, IPO 1.17, P.O. Box 513 NL-5600 MB Eindhoven, The Netherlands	
NL	Technische Universiteit	Mr. Wouter van den Hoogen	Den Dolech 2, IPO 1.17, P.O. Box	W.M.v.d.Hoogen@tm.tue.nl

	Eindhoven, TU/e, Human Technology Interaction (MTI)		513 NL-5600 MB Eindhoven, The Netherlands	

In-depth-interview via telephone

Country	**Association**	**Contact**	**Address**	**email**
A	Global 2000 – Austria	Mr. Heinz Högelsberger	Flurschützstraße 13 A-1120 Wien	
A	Greenpeace – Austria	Mr. Jurrien Westerhof	Siebenbrunnengasse 44 A-1050 Wien, Austria	jurrien.westerhof@greenpeace.at
BE	ERBE – Agence Régionale Biomasse Energie	Mr. Regis Vankerkove	146, Chaussée de Namur BE-5030 Gembloux, Belgium	vankerkove@cra.wallonie.be
BG	BBA	Ms. Anna Aladjadjiyan	Mendeleev Str. 12 BG-4000 Plovdiv, Bulgaria	anna@au-plovdiv.bg
D	CARMEN ev	Mr. Gilbert Krapf	Schulgasse 18 D-94315 Straubing, Germany	cs@carmen-ev.de
D	Fachagentur Nachwachsende Rohstoffe	Mr. Torsten Gabriel	Hofplatz 1 D-18276 Gülzow, Germany	t.gabriel@fnr.de
D	BIZ – Biomasse Info-	Mr. Joachim Fischer	IER, Universität Stuttgart	jf@biomasse-info.net

	Zentrum		Hessbrühlstraße 49a D-70565 Stuttgart, Germany	
D	Solar Promotion	Mr. Horst Duffner	P.O.Box 100170 D-75101 Pforzheim, Germany	dufner@intersolar.de
ES	CIRCE Foundation – Centre of Research for Energy Resources and Consumption	Mr. Fernando Sebastian	Centro Politecnico Superior María de Luna, 3 ES-50018 Zaragoza, Spain	sabina@posta.unizar.es
ES	CEDER (Centre for the Development of Renewable Energy Sources) / CIEMAT	Mr. Juan Carrasco	altos de Lubia ES-42290 Lubia (Soria), Spain	juan.carrasco@ciemat.es
ES	Spanish Association of Renewable Energy Producers	Mr. Manuel Bustos	C/ Paris, 205 ES-08008 Barcelona, Spain	mbustos@appa.es
F	Institut Technique Européen du Bois-Energie (ITEBE)	Ms. Marie Maud Gerard	28 boulevard Gambetta BP 149 F-39004 Lons le Saunier Cedex, France	marie-maud.gerard@itebe.org
FIN	MOTIVA	Mr. Juha Rautanen	MOTIVA OY, PL / P.O.Box 489 (Urho Kekkosen katu 4-6 A) FIN-00101 Helsinki, Finland	juha.rautanen@motiva.fi

GR	CRES	Ms. Calliope Panoutsou	19th km Marathonos Ave GR-19009,Pikermi Attiki, Greece	
HU	Csanady&Partners	Mr. Wolfgang Lehner	Tatra u. 12/b HU-1136 Budapest, Hungary	csanady.w@chello.hu
IRL	SEI – Sustainable Energy Ireland	Mr. Pearse Buckley	Glasnevin IRL-Dublin 9, Ireland	pearse.buckley@sei.ie
IRL	TEA – Tipperary Energy Agency Limited	Mr. Seamus Hoyne	Tipperary Institute IRL-Thurles, Co. Tipperary, Ireland	shoyne@tippinst.ie
IT	ITABIA – Italian Biomass Association	Mr. Giuseppe Caserta	via Cristoforo Colombo 185 I-00147 Roma, Italy	caserta.g@libero.it
LT	Lithuanian Energy Institute	Mr. Vladislavas Katinas	3 Breslaujos str. LT-3035 Kaunas, Lithuania	res@isag.lei.lt
NL	Netherlands Bio-energy Association	Mr. Michel Arninkhof	P.O. Box 85096 NL-3508 AB Utrecht, The Netherlands	
PL	KAPE	Mr. Ryszard Wnuk	ul. Nowogrodzka 35/41 (XII floor) PL-00-691 Warsaw, Poland	rwnuk@kape.gov.pl
PL	PLBIOM	Ms. Magdalena Rogulska	c/o Institute for Building. Mech., IBMER Rakowiecka, 32	mrogul@ibmer.waw.pl

			PL-02-532 Warsaw, Poland	
PL	FEWE	Mr. Adam Gula	Ul. Wierzbowa PL-40169 Katowice. Poland	adamgula@ceti.pl
PT	INETI	Mr. Santino Di-Berardino	Estrada do Paço do Lumiar, 22 PT 1649-038 Lisboa, Portugal	
SE	Swedish Energy Authority	Mr. Anders Östman	Box 310 S-631 04 Eskilstuna, Sweden	anders.ostman@ kemiinformation.com
SK	Slovakian Biomass Association	Mr. Ladislav Zidek	Jareninski dol, 2 SL-2221 Jarenina, Slovakia	biomasa@stonline.sk
UK	TV Energy – Thames Valley Energy Management Agency	Mr. Keith Richards	TV Energy Ltd, Liberty House, New Greenham Business Park UK-RG19 6HW Newbury, Berkshire, United Kingdom	keith.richards@tvenergy.org
UK	NEF Renewables – The National Energy Foundation	Ms. Sandra Hayes	Davy Avenue, Knowlhill, UK-MK5 8NG Milton Keynes, United Kingdom	andra@greenenergy.org.uk

E-mail communication

Country	Association	Contact	Address	email
BE	EREC	Ms. Christine Lins	Rue du Trône 26 BE-1000 Brussels, Belgium	lins@erec-renewables.org
CZ	CZ BIOM	Mr. Vaclav Sladky	Tomanova, 8 CZ-169 00 Praha 6, Czech Republic	sladky@vurv.cz
D	Institut für Energetik und Umwelt gGmbH	Mr. Martin Kaltschmitt	Torgauer Str. 116 D-04347 Leipzig, Germany	mkaltschmitt@energetik-leipzig.de
D	Solar Promotion	Mr. Markus Elsaesser	P.O.Box 100170 D-75101 Pforzheim, Germany	info@holzenergieforum.com
EE	EBA	Mr. Jaan Akerman	Kreutzwaldi 5 EE-44314 Rakvere, Estonia	greencoal@hot.ee
ES	IDAE	Mr. Luis Garcia	Castellana, 95 E-28046 Madrid, Spain	
F	Alter Alsace Energie	Mr. Laurent Atienza	4 rue Foch F-68460 Lutterbach, France	atienza@alteralsace.org
F	Agence Loc d l¹E d	Ms. Christel Sauvage	La Grange aux Bois	christel.sauvage@ale08.

	Ardennes		F-08000 Warcq, France	org
FIN	VTT Processes	Ms. Eija Alakangas	P.O. Box 1603 FIN-40101 Jyvaskyla (Koivurannantie 1), Finland	eija.alakangas@vtt.fi
HU	Energy Centre Hungary	Mr. Tibor Bertok, Ms. Rita Biacs	Raday U. 42-44 HU-1092 Budapest, Hungary	tibor.bertok.jr@ energycentre.hu rita.biacs@energiakozpont. hu
IRL	IrBEA - Irish Bioenergy Association	Mr. Kevin Healion	Tipperary Institute, Thurles, IRL-Co. Tipperary, Ireland	khealion@tippinst.ie
LT	Lithuanian Energy Agency	Mr. Rimantes Sevastijanciukuas	Gedimino ave. 38/2 LT-2600 Vilnius, Lithuania	sevastijanciukas@eec.lt
RO	ENERO	Ms. Dana Dutianu	Energeticienilor Bvd 8 RO-74568 Bucharest, Romania	femopet@icemenerg.vsat. ro
SE	Lund Institute of Technology (LTH) Environmental and Energy Systems Studies	Mr. Peter Helby	Gerdagatan 13 S-223 62 Lund, Sweden	Peter.Helby@miljo.LTH.se
SE	Department of Bioenergy at the Swedish University of	Mr. Matti Parikka	P.O. Box 7060 S-750 07 Uppsala, Sweden	matti.parikka@bioenergi.slu .se

	Agricultural Sciences			
SE	SLU, Department of Forest Products and Markets	Mr. Anders Roos	P.O. Box 7060 S-750 07 Uppsala, Sweden	Anders.Roos@spm.slu.se
SE	Environmental and Energy Systems Studies, Lund University	Mr. Jamil Khan	Gerdagatan 13 S-223 62 Lund, Sweden	Jamil.Khan@miljo.lth.se
UK	TV Energy	Ms. Deborah Støer	Liberty House, The Enterprise Centre, New Greenham Park UK-RG19 6HW Newbury, United Kingdom	deborah.stoer@tvenergy.org