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1. Introduction

Biomass describes biological organisms, dead or alive, excluding biological mass that has been transformed by geological processes into substances such as coal or petroleum. Biomass is a renewable and CO_2-neutral energy source and can be used for non-polluting and environmentally-friendly heat, electricity and fuel production.

The use of biomass contributes to the reduction of the emission of green house gases and therefore helps to fulfil the Kyoto commitments.

Therefore, it is essential to promote biomass also in urban and not only in rural areas, where biomass has traditionally been used for heating purposes.

Lack of information is a main barrier for the implementation of biomass projects in urban areas. This report tries to identify the main information deficits, which are a barrier for the increased use of biomass in urban areas, and shows how these deficits can be overcome.

This survey includes a theoretical part, which deals with the definition of the term "information", with general possibilities to obtain valuable information and a definition of the term "information management". Another part of the study describes important ways of provision of information on biomass and the main information deficits concerning biomass use in urban areas. In addition various possibilities to cope with these information deficits are shown. The survey is completed by a short case study showing how in Upper Austria information deficits concerning biomass in urban areas are successfully reduced.

2. Theory of provision of information and information management

2.1. The term "information"

A universally valid definition of the term "information" does not exist, although numerous scientists were engaged in this topic. The diversity of meanings in different areas might have caused the difficulties in defining the term. Below some

explanations and statements are listed, which show the varying perception of the term "information":

Information is …

- ***useable answer to a precise question.*** (Carl August Zehnder in "Informationssysteme und Datenbanken" in the article "Leben mit Information")

- ***a difference that makes a difference.*** (Gregory Bateson in "Mind and Nature" (1979))

- ***"the process by which knowledge is acquired".*** (Heinz von Foerster in Buch "Wissen und Gewissen" in the article "Perception of the future and the future of perception" (1971))

- ***the specific knowledge needed in certain situation to e.g. solve a problem.*** (Werner Hartmann, Michael Näf, Peter Schäuble in "Informationsbeschaffung im Internet" (2000))

- ***the process that leads to a growth of knowledge.*** (Christian Schucan in "Effektivitätssteigerung mittels konzeptionellem Informationsmanagement" (1999) in the article "Begriffliche Abgrenzung")

- ***data in a context and can be explicated and stored in an information system.*** (Remo A. Burkhard in the dissertation "Knowledge Visualization" (2005))

- ***data that has been given meaning through interpretation by way of relational connection and pragmatic context.*** (Tanja Keller, Sigmar-Olaf Tergan in "Knowledge and Information Visualization" (2005) in the article "Visualizing Knowledge and Information: An Introduction").

When consulting the online-encyclopaedia Wikipedia (www.wikipedia.org), the following explanations for the term "information" are given:

Information (from the Latin verb *informare*, to give form to, to form an idea of) is a potentially or actually available pattern of matter or energy, which is really used or at least utilizable and which is of relevance for an observer. Essential for this definition is the recognizability and recency of the model. The used model modifies the

observer's status – especially his/her knowledge. Simply stated, information is a message received and understood.[1]

The word "information" is often used without careful consideration of the various meanings it has acquired. In colloquial use and in a few subject areas (semiotics, information science) "information" is a synonym for "meaning" or "transferred knowledge". Different scientific fields use their own definition of the term "information".[1] Below some explanations are listed to illustrate the diversity of meanings the term "information" holds in different areas.

Semiotics
According to semiotics information is data with a certain semantic which enlarge knowledge. Prior sources define "information" as knowledge with a certain semantic.[1]

Information science
Information science uses the word "information" similar to the semiotic approach. Essential are the terms "knowledge" and "information". Information is viewed as transfer of knowledge or the process of knowledge transfer. On this note information arises only if a person requires knowledge to solve a problem. This knowledge is transferred as information from one pool of knowledge to another, e.g. from a data base to the pool of knowledge of a person. Knowledge is internally represented; information is presented – to make it plain for persons seeking information.[1]

Information theory
Information theory views information as antipode of information entropy. Important is the information content of a message, which is according to Claude Shannon defined by the statistical significance of individual symbols.[1]

Information as economic good
Information is often regarded as economic good, because information can be bought or produced with the use of other production factors (employees, computer, software, communication, etc.). Thus information has a value, which is tradeable. This value results from the usefulness of information and the costs for production, provision and forwarding. However, the information's value is sometimes not discernable in advance. The potential customer recognises the value not until the conclusion of deal (paradox of information).

In addition information is sometimes viewed as a production factor. Consequently information can not only be consumed but also applied productively.[1]

To some extent information is not only regarded as economic good, but also as a competition factor – in national economy as well as in international trade. In this context information is taken as equal to the classical three production factors, human labour, land and capital goods.[3]

Information as an influence which leads to a transformation

Information is any type of pattern that influences the formation or transformation of other patterns. In this sense, there is no need for a conscious mind to perceive, much less appreciate, the pattern. Consider, for example, DNA. The sequence of nucleotides is a pattern that influences the formation and development of an organism without any need for a conscious mind. Systems theory at times seems to refer to information in this sense, assuming information does not necessarily involve any conscious mind, and patterns circulating (due to feedback) in the system can be called information. In other words, it can be said that information in this sense is something potentially perceived as representation, though not created or presented for that purpose.[1]

In this survey information is mainly understood in terms of semiotics, as data with a certain semantic enlarging knowledge. Since this study is dealing with private individuals as well as with businesses, information also has the meaning of an economic good - with an outstanding commercial relevance that is unfortunately often underestimated.

2.2. Provision of information

Considering catchwords like "Information is becoming the primary economic good", "Information is power" or "Information is the most important economic factor" it is obvious, that information and the provision of information play a decisive role in our today's businesses.

Before a comprehensive investigation is started, the actual state of information should always be accurately analysed:

- Actual level of information – missing information (check list)
- Check on sufficiency and actuality of information
- Check of sources of information

The following sources of information are appropriate for job-related and professional provision of information:

- employees and staff members
  - basic knowledge (schooling)
  - further vocational training of employees
  - private further education
  - knowledge based on professional experiences
  - captive special knowledge
- literature
  - primary literature (articles in professional journals, master thesis, dissertations, wordings of laws, patents, etc)
  - secondary literature (books, educational books, monographs, biographies, etc)
  - reference books, encyclopaedias, lexica
- Internet (search engines, databases, online services, online provision of literature…)
- media (radio, TV, Print media,…)
- consulting

In a job-related situation it is always advantageous to ask staff members or colleagues for information. If required, new staff is recruited. These employees profit from captive knowledge or knowledge based on schooling, further vocational training, professional experiences or private further education. Captive special knowledge includes knowledge about manufacturing processes and technologies, but also about sales figures and price history. For effective use of staff member knowledge and captive knowledge a well-organised information management system is essential. (see 1.3. Information management).

Literature offers manifold information on various topics. Looking for information on a specific subject it is advisable to consult reference books and encyclopaedias (also referred to as tertiary literature) first. Tertiary literature provides a short introduction and basic information on the respective issue. Additionally important references are listed – particularly educational books and important publications. Educational books and monographs belong to secondary literature and mostly offer a detailed and extensive description of a topic. To obtain most actual information and reports on research activities it is necessary to study professional journals (primary literature). For understanding these articles it is often useful to read the corresponding secondary literature.

The result of a comprehensive investigation is often a hardly manageable information overload. Critical examination of each piece of information and its source is essential to cope with such an information flood. A detailed data check is especially necessary in case of the Internet or mass media as information sources.

Nearly everybody is able to post information on the internet, very often without any costs. This leads to a hardly manageable amount of information. It is the internet user's business to check the usefulness and the validity of the offered information. Quality control, which is done by editors and correctors in case of print media and literature, must be performed by the individual internet user.
The following criteria can be used for check of information published on the internet:

- Is the author or initiator identifiable? Is a possibility offered to contact the author?
- In what connection is the information presented? (homepage of a university or school, public utility, firm, private homepage, etc.)
- Which parts were written by the author and which are copied? Are copied parts marked as citations?
- Does the author specify his/her sources of information? If yes, which sources did he/she use?
- Is a creation date discernable? Is the information up-to-date or out-dated?
- Which motives are behind the publication?
- Is the information free of charge or do internet users have to pay for it?

An important advantage of the internet is that the possibility to use e-mails, homepages and on-line services simplifies the approach to public utilities, firms, organisations, etc…

However, the internet is a very young medium. The full potential of the World Wide Web is only slowly discovered. Even today some companies or organisations do not offer homepages or internet services.

The digitalisation of literature of past centuries is time-consuming and labour-intensive. Paper is still the medium on which the major part of information is stored. Uncountable documents older than 15 – 20 years will never be posted on the Internet for reasons of economy.

Another information source, which is very important today, is **mass media**. Radio and TV are information sources mostly used for private issues. Evaluation and

examination of information is extremely difficult because the author and sources of information are hardly ever identifiable. However, **print media** are also appropriate for job-related and professional provision of information. Evaluation of information provided by print media is usually relatively easy. In addition a quality control is done by editors and correctors before the information is published. Nevertheless, a selective search of certain pieces of information is difficult and time-consuming.

Another external source of information is **consulting service**. Charging a firm specialised on consulting is an easy, but cost-intensive way to obtain information. In some areas consulting is offered free of charge (under certain conditions) by non-profit organisations or public utilities. Due to the price advisors and consulters are mainly used by companies and firms. For private persons the cost factor acts as a deterrent. That is why private persons often start a data investigation on their own.

2.3. Information management

All measures for provision and documentation of information in businesses are referred to as information management. Information management is regarded as part of management or as a challenge for a department primarily specialising in documentation and provision of information.[3]

The terms "information management", "knowledge management" and "documentation" are not clearly defined and frequently confused. Information management does not deal with individual or organisational learning.[3]

There are several theories to explain the term "information management". The most important explanations are summarised below:

- **Information resource management**
  Information resource management comprises usage, planning and control of external and internal information resources in an enterprise or organisation. Information is regarded as production factor. The management has the task of assuring the availability of production factors and of providing appropriate equipment for the satisfaction of the demand for information. This includes the development and maintenance of internal and external facilities for provision of information.[2]

- **Personal information management**
  Emphasis is put on the individual handling of information on the personal workplace (information handling). The management supports individual information processing by performing operational and administrative tasks.[3]

- **Process-oriented information management**
  The company organisation is geared strategically to business processes; consequently also information infrastructure is designed for the support of business processes. The management comprises the integration of functional areas into information processing.[3]

- **Performance-linked information management**
  The management acts performance-linked regarding information and communication in the enterprise. Performance-linked information management is applied to all managerial functions, which deal with communication within the enterprise or in the enterprises' direct environment.[3]

Information management views information as production factor, thus information is producible. The tasks of information management are separated into three fields of activities:

- **Recording the demand for information**
  It is necessary to identify and register all pieces of information required for optimal completion of tasks. Content of information, display format, time of demand and context have to be acquired in detail.[3]

- **Planning the offer of information**
  Internal stock of information and information sources are to be identified. In addition external information sources need to be analysed. These steps result in the definition of a portfolio of information resources.[3]

- **Providing required information**
  Fast access to all internal and external information resources in technical and legal respect must be guaranteed. Information has to be adequately prepared (physically and logically).[3]

Information management in the field "bio-energy project in urban areas" is mainly necessary for businesses and organisations. Information required for the implementation and planning of bio-energy projects has to be provided, appropriately prepared and made available in time for all employees dealing with the subject.

3. Provision of information and information deficits in the range of "bio-energy projects in urban areas"

3.1. Which pieces of information are needed?

Fundamental questions appear during the planning and implementation of biomass-projects. Some basic problems arise irrespective of the type or position of the projected installation:

- Which ways to finance bio-energy projects do exist? Are there any subsidies offered?
- Which laws and regulations must be fulfilled? (emission of limited pollutants, storage of fuel, fire protection requirements, etc.)
- Which fuel is applicable (e.g. pellets, wood chips or other forms of biomass)?
- Who delivers the fuel? (What about supply guarantee?)
- How expensive is the fuel? What is known about future price development?
- How is the fuel stored? How much space is required?
- Which firms and companies are adept at the construction of biomass-installations?
- Which plant capacity is advisable?
- Which technology, which type of boiler can be recommended?
- Do any reference plants exist? Where are they?
- Can biomass technologies be combined with technologies using other sources of energy?

Other questions often depend on the type of the designed plant. For example for planning a biomass district heating network it is essential to know the estimated grid length and the expected number of connections. When designing bio-energy projects in urban areas it is decisive that citizens accept or even support the project. Citizens perhaps worry about increased air pollution, noise exposure and volume of traffic. It is necessary to inform the local population right from the design or planning stage to avoid opposition against the bio-energy project. The example of the project "biomass plant Berlin-Gropiusstadt" shows how important information can be to reach acceptance among the local population. In the year 2003, a biomass-CHP-plant with a power of 20 MW_{el} and 64 MW_{th} was put into operation. But the project was complicated by a major opposition among the local population. The inhabitants of

Gropiusstadt feared an increased volume of traffic because of the transport of fuel and an additional air pollution e.g. because of the combustion of contaminated wood. Thus about 30 informative meetings were organised, which gave citizens the possibility to voice their objections. Politicians and the operators of the projected plant discussed these issues with citizens and so most doubts and reservations against the installation could be dispelled.[4] This shows again, that bio-energy plants especially in urban areas can obtain acceptance among the citizens, if the population is informed right from the planning state.

In many countries in rural areas, the number of buildings heated with wood is traditionally higher than in towns. The inhabitants have been used to the usage of wood for energy purposes since they were children. These persons are able to utilise detailed information on wood heating installations or the storage of firewood. Inhabitants of urban areas usually lack these information. In addition rural population has a more positive attitude towards the use of biomass for energy purposes. In these areas buildings completely or partly heated by wood are common, but in urban areas they are still exceptional and unusual. That is why the urban population needs additional information on the usage of wood and biomass for heating and hot water provision.

3.2. Sources of information

Private households, companies or organisations, who want to implement bio-energy projects, may use a number of sources of information – independent of the type and the location of the designed installation. Some contact points for people looking for information on biomass are listed below considering Austria as an example.

Example Austria:

- **Österreichischer Biomasseverband** (www.biomasseverband.at)
  The association "Österreichische Biomasse-Verband" appeals for a sustainable and environmentally-sound energy supply in Austria and for an increased use of biomass for energy purposes. The "Österreichische Biomasse-Verband" was founded in 1996 to act as an information- and discussion forum for measures to boost the use of renewable energy sources.

- **Oberösterreichischer Energiesparverband** (www.energiesparverband.at)
  The O.Oe. Energiesparverband is a regional energy agency set up to promote energy efficiency, renewable energy sources and innovative energy technologies located in Linz/Austria. Main target groups are private households, trade/commerce and industry, and professional associations. The O.Oe. Energiesparverband offers technical information (energy technologies, energy efficiency, usage of renewable energy) as well as information on subsidies (e.g. Third Party Financing Programme) in addition to a number of information and awareness raising activities.

- **Upper Austrian Chamber of Agriculture**
  (www.landwirtschaftkammer.at or www.lk-ooe.at)
  The Upper Austrian Chamber of Agriculture consults and supports Upper Austrian farmers, who intend to implement bio-energy projects (biomass heating installations, district heating grids, biogas plants, etc.). The Chamber of agriculture helps with the planning of biomass cogeneration plants, coordinates the selling of heat and checks the economic efficiency of projects.

- **energytech.at** (www.energytech.at)
  energytech.at is an initiative of the Federal Ministry of Traffic, Innovation and Technology (Department for Energy and Environmental Technologies) and the Austrian Energy Agency. energytech.at is a virtual exhibition and information platform for energy technologies in the area of renewable energy sources and energy efficiency. The platform provides valuable information especially for planners and experts in enterprises, who search for innovative solutions for their special energy problem.

- **Local authorities**
  In urban areas the public administration (“Magistrat”) is the first contact to obtain information on rules and regulations concerning emissions, fire protection requirements, storage of fuel, etc.

- **Internet – search engines**
  Information on biomass and biomass heating installations are easy to find on the Internet. Using the search engine "Google" 200.000 answers are obtained when searching for Austrian web pages only. 2.000.000 search results are achieved if all web pages written in German are included in the search.

In spite of this information overload it is not difficult to identify high quality information. Sufficient information of higher value concerning the following topics is offered: basic information on biomass, types of fuel, environmental relevance, comparison of costs between biomass and fossil fuels, statistical data, technical reports on innovative pilot projects, scientific papers on biomass for energy purposes, etc. Much more difficult to find is application-oriented information e.g. contacts to boiler manufacturers, pellets suppliers and plumbers, who are experienced in the installation of biomass heating systems. Questions like "Which fuel and which technology is appropriate for which objects or applications?" can only be answered after time-consuming and laborious investigations. Homepages of boiler manufacturers possibly help to answer these questions. But for laymen it is sometimes difficult to distinguish promotion and advertisements, which are often found on web pages of enterprises, from objective information.

A very interesting homepage especially for persons, who are building or retrofitting their single family house, is the Internet platform buw.at edited by the publishing company FamilyNetwork Verlag und Werbe Gmbh. On www.buw.at comprehensive information on various topics related to the construction of homes (planning, financing, gardening, etc.) is offered. The topic heating is described in detail, the subjects climate protection and pollution control are also mentioned. Several biomass fuels (pellets, wood chips, briquettes, etc.) and boiler types are presented. Topics like boiler dimensioning, solar heating installations, efficient regulation of heating systems, etc. are discussed. A mentionable advantage of the platform buw.at is the fact, that promotion and advertisements are relatively easy to distinguish from articles offering substantial objective information. Articles, that are created by enterprises belonging to the building industry or the energy sector and thus have to be classified as promotion, are clearly labelled with the respective company logo.

There are also a few search engines online especially for persons building or retrofitting their single family house. These search engines should facilitate the search for web-pages of firms, which offer services or products needed for the construction or retrofitting of a house.

www.hausbaufuehrer.at is one of these search engines. Starting a search for Upper Austrian companies active in the sector "biomass" just one answer (a pellets supplier) is obtained. (The search was done on 20.12.2005.)

Using the search engine www.bau-plattform.at for a product search in the Upper Austrian biomass sector two answers are the result: the addresses of a plumber

and an electric utility. (The search was done on 20.12.2005.) It is obvious that these special search engines are not a great help to persons interested in the usage of biomass for heating purposes.

- **Plumbers/building services engineers**
  To answer application-oriented questions, it is recommendable to ask a plumber or building services engineer, who is adept in the installation of modern biomass heating systems. In rural areas it is often easy to find out, which of the countless resident firms successfully implemented bio-energy projects. In urban areas you often have to rely on the classified directory or the firms' own specifications. In this regard in urban areas it is more difficult to obtain reliable information sources - especially for individuals.

- **Mass media**
  TV and print media now and then offer articles or telecasts concerning the use of biomass for energy purposes. Information given by mass media is mostly basic information intended as thought-provoking impulse. Many hand sheets and leaflets delivered with the daily post serve a similar purpose. They should make aware that there is an alternative to fossil fuels. Persons, who want detailed information, have to refer to other information sources, which are often mentioned in the leaflets, articles or telecasts.

- **Fairs**
  Fairs, like the annual "Energiesparmesse" (exhibition and trade fair on energy efficiency and renewable energy sources) taking place in Wels in Upper Austria, are an opportunity to catch up on new innovations or established technologies related to the energy sector. Target group are persons, who intend to build or retrofit homes. Emphasis is placed on energy efficiency, renewable energy, energy saving and modern building services engineering. Among the exhibitors are boiler manufacturers, building services engineers and plumbers as well as energy advisors and the O.Oe. Energiesparverband.

- **Literature**
  A large quantity of literature on biomass and its usage for energy purposes exists. The technical literature is mostly read by persons, who want to answer job-related or educational questions. Public or academic libraries and the book selling trade offer a wide range of primary and secondary literature. Current publications dealing with pilot projects or innovative technologies are often offered on-line by

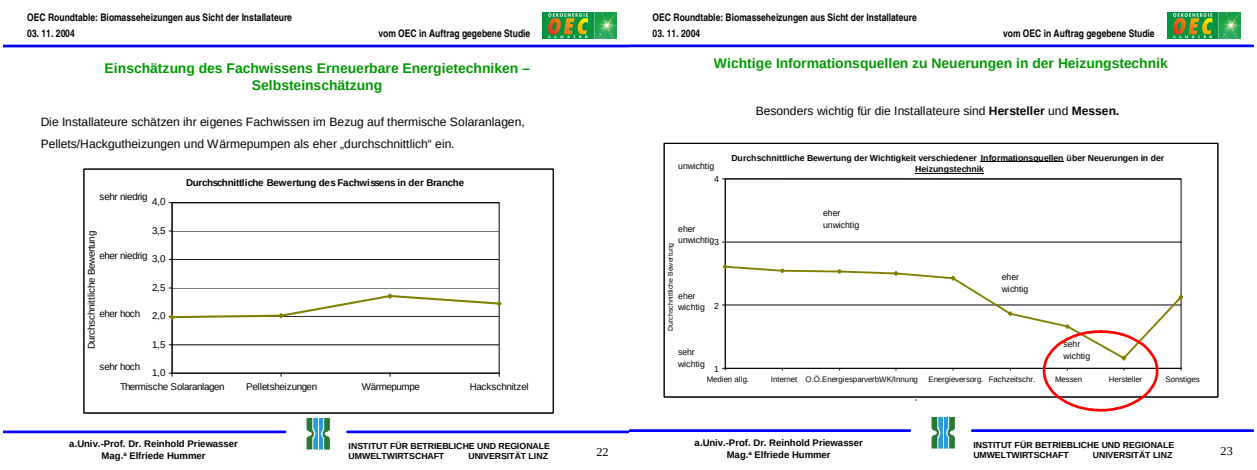
Universities and research institutes. This service is sometimes even free of charge.

3.3. Information deficits

A number of studies and research papers show clearly that information deficits still exist despite the information overload on biomass that is offered especially on the internet.

As an example, the institute for "betriebliche und regionale Umweltwirtschaft" on the Johannes Kepler University Linz interviewed 108 Upper Austrian plumbers on behalf of the "Ökoenergie Cluster" (Upper Austria's Network of "Green-Energy" Businesses) in the year 2004.

Among other things questions about the division of functions between plumbers and boiler manufacturers, about the rating of different heating systems and about the most used information source were asked.[5] This survey approved the existence of a high information demand on biomass among plumbers. The installation and start-up of oil and gas fired central heating systems are mostly done by the plumber him/herself, whereas for the installation of biomass central heating systems the assistance of boiler manufacturer is more often needed. More than 50% of oil or gas heating systems are installed by the plumber, but just 30% of pellets and wood chips central heating systems. Plumbers also need the assistance of boiler manufacturers more often for maintenance and fault clearing service of biomass systems than for the servicing of fossil fuel systems.[5]



Another indication for a high information demand among plumbers is that the plumbers themselves rank their own technical knowledge on renewable energy technologies (solar thermal collectors, pellets and wood chips fired heating systems and heat pumps) just as average. It is astonishing that even plumbers still spread the misbelief that for pellets heating systems noticeably more space is required than for other heating sytems.[5]

Information sources preferred by plumbers are fairs and boiler manufacturers. Plumbers are especially interested in information on innovative heating techniques and subsidies for the installation of modern central heating systems. [5]

The removal of information deficits among plumbers is especially necessary, because plumbers and heating engineers are the most important information source for private household choosing their new heating system.[5]

In the year 2002 the Association "Verein zur Förderung der Bioenergie in Österreich" made a survey on behalf of the Federal Ministry of Agriculture, Forestry, Environment and Water Management and the Federal Ministry of Transport, Innovation and Technology. Among other things this study with the title "Holz am Wärmemarkt der Zukunft" deals with the information demand among building promoters of multiple-family dwellings on modern biomass technologies and showed the following results: Building promoters, who have already constructed biomass-heated multiple-family dwellings, point out, that the knowledge about positive case studies can be of vital importance for the decision to realise biomass-heated housing estates on one's own. Well documented exemplary installations as well as the possibility to visit them make an important contribution to the further increase of the share of biomass heated multiple dwellings.[6] Of particular importance is information on building services engineers experienced in the area biomass heated multiple dwellings, information on the boiler market, possibilities and problems concerning the fuel supply, etc.

The share of wood heated multiple dwellings is still low. This fact is also shown by an inquiry among housing associations carried out in 2004 by the O.Oe. Energiesparverband. More than 90% of the respondents stated that their current projects also comprise particularly energy saving measures. Thus environmental protection plays a decisive role in the planning of multiple family dwellings. Great importance is attached to improved thermal insulation and the installation of thermal solar collectors. Innovative biomass heating systems just play a minor role. Only 4 of 25 respondents indicated, that at least in one current project the installation of a biomass heating system is intended.[7]

In the final report of a research project carried out within the scope of the "Impulsprogramm Nachhaltig Wirtschaften" (Austrian Program on Technologies for Sustainable Development) a lack of information is stated to be the main obstacle for innovative projects. This project with the topic "Analyse fördernder und hemmender Faktoren bei der Markteinführung von innovativen Wohnbauten" (Analysis of promotional and repressive factors for the market launch of innovative dwellings) was accomplished in the year 2001. According to this survey users of dwellings as well as employees in construction companies and planners show information deficits.

The authors of the study point out that users of prefabricated houses have an extremely low level of information. A noticeable amount of persons just have heard the names of innovative technologies. Numerous technologies (e.g. pellets central heating systems) are nearly totally unknown among users of off-the-shelf buildings and therefore these persons are not able to take innovative technologies into consideration when planning their individual one-family house. It is observable, that the specific level of information of individuals is basically dependent on their relation to the construction or building branch. Persons, who built their own one-family home, show the highest level of information. But their specific knowledge was only acquired during the construction of the building and is not available at the planning stage. A dependence of the level of information on the level of education could not be detected.[8]

The above-mentioned research reports show clearly that information deficits are an essential barrier for the implementation of biomass projects. It must be admitted that especially the information level of users of prefabricated houses was increased by intensive awareness raising campaigns in resent years.

Consequently in Upper Austria about 2.000 new pellets central heating systems were installed - so that all in all about 9.500 pellets heating systems are in operation.[9] Sustained success was also achieved in the field of biomass major projects. Until now more than 280 biomass large scale plants have been put into operation, most of them are small district heating networks.[9]

Nevertheless especially in urban areas a lot is still to be done. Biomass is often considered as a "rural" energy source. Nevertheless, modern biomass technologies like pellets heating systems or automatic wood chips heating installations are – also in urban areas - a cost-effective and environmentally friendly alternative – in particular if there is no possibility for a connection to a district heating system. In this regard it is important to provide information on fuel supply, supply guarantee and price development.

Housing associations, building promoters, building service engineers and planners still require detailed high quality information on modern biomass heating systems in order to increase the amount of biomass-heated multiple dwellings. Biomass heating systems are sometimes regarded as an additional risk. In some respect the enormous lack of information in fact creates risks, which is shown by significant faulty designs and design errors.[6] In this respect it is especially important to show by means of exemplary projects, that biomass heated multiple dwellings are efficient, environmentally friendly and cost saving alternatives and that biomass heating installations do not stand for a higher risk than conventional heating systems. By compact information brochures and well documented exemplary installations potential sources of error can be identified and suggestions for improvement can be presented. That is a quick and uncomplicated way to provide relevant persons with information required. In addition an increased presence on fairs will significantly improve the level of information among plumbers.

For the implementation of large-scale biomass projects, e.g. biomass CHP plants or biomass district heating networks, detailed and specific information is needed, which cannot be provided by information brochures or leaflets. However these brochures are able to create an increased awareness for environmental friendly and climate protective alternatives, which are cost effective, too. Opposition against large-scale biomass projects in urban areas is often caused by a lack of information or even misinformation. Therefore it is important to involve the local population right from the design or planning stage to avoid resistance against the project.

In recent years the level of information on biomass and its applications for energy purposes was certainly increased. This was reached by targeted information campaigns and by the rising oil prices that aroused public interest for renewable energy sources. So it may be stated, that despite the achievements of recent years, the removal of information deficits concerning biomass projects – especially projects in urban areas – remains an important challenge for the future in order to increase the share of renewable energy.

3.4. Case study "Upper Austria" – Measures to remove information deficits in "bio-energy projects in urban areas"

Upper Austrian has worked with commitment and success on increasing the share of renewable energy sources and raising energy efficiency for years. In the field renewable energy sources biomass plays a decisive role. Consequently the improvement of the information level and the removal of information deficits concerning biomass for energy purposes are important measures to facilitate the implementation of bio-energy projects.

The following summarization of the main measures taken to inform about energy applications of biomass shows a possible way to reduce information deficits. Most of the following steps were intended to push biomass projects in both urban and rural areas. Nevertheless some of the measures are especially targeted at biomass projects in urban areas. Mainly responsible for energy information provision in Upper Austria is the O.Oe. Energiesparverband.

The O.Oe. Energiesparverband is a regional energy agency set up to promote energy efficiency, renewable energy sources and innovative energy technologies located in Linz/Austria. The O.Oe. Energiesparverband is one of the main providers for energy advice and information on energy in Europe. The following measures are implemented to inform the Upper Austrians about the possibilities for the use of biomass for energy purposes:

Energy advice and consulting:

- About 15,000 energy advice sessions per year for private households, public institutions and companies
- Energy hotline
- Third Party Financing Programme

Energy information and public awareness:

- Organisation of conferences, seminars and workshops, site-visits
- E.g. the annual international conference WORLD SUSTAINABLE ENERGY DAYS; "Wärme aus Biomasse für Betriebe" ("Heat from biomass for businesses") on 31. Jänner 2006; workshop "Solar & Pellets-Trends: Informationsevent für Installateure" (informative meeting for plumbers about thermal solar collectors and pellets heating systems) on 18. November 2005; seminar "Innovative

Biomassebrennstoffe – Potentiale für die Zukunft" ("Innovative biomass fuels – potential for the future") on 04. November 2005

- Serial of sight visits "Ökoenergie on Tour", e.g. "Pelletstour" on 19. Oktober to the Upper Austrian district Traunviertel
- Serial of seminars "Hausbauseminar" (5-day seminar for private persons intending to construct their own single-family house including a sight visit and a workshop)
- CD-ROMs, videos, internet: www.esv.or.at
- Media campaigns
- Publications, a number of them focusing on biomass use

Sustainable buildings programmes:

- Operation of energy programmes for new and retrofitted buildings
- Calculation of an energy performance indicator for 50,000 houses so far and 50,000 individual energy advice sessions for people who intend to build a new home or retrofit their home

Training and education:

- Specialised training courses and seminars for different target groups, e.g. education of energy advisers, specialised courses in the building sector, for banks, for the administration etc.
- Training programme for energy advicers
- A new profession, the "Oekoenergie-Installateur" was created
- A new university study "Eco-Energy Engineering" was started

Oekoenergie-Cluster (OEC)

- Management of the Oekoenergie-Cluster, a network of green energy businesses including: solar energy, biomass, biogas, wind energy, heat pumps, geothermal energy, small hydro power
- So far, 140 companies and organisations with about 2.300 employees have joined the OEC partnership (as of January 2006). All in all the members acquire an annual turnover of nearly 274 mio € and their export rate is more than 50 %.

International co-operation

- Participation in more than 60 EU projects
- Vice-president of FEDARENE, the European Federation of Regional Energy and Environment Agencies
- Member of the board of EUFORES, the European Forum for Renewable Energy Sources

Services for Municipalities

- Assistance to local and regional authorities in developing and implementing energy action plans and innovative energy projects
- "Energy advice days": on spot energy advice for citizens for free

Energy technology

- Regional R&D energy technology programme to support innovative and sustainable energy projects
- Research and pilot projects

- **Energiesparmesse**
- Exhibition and trade fair on energy efficiency and renewable energy sources
- More than 800 exhibitors offer information on energy efficiency, renewable energy, energy saving and modern building services engineering
- Among the exhibitors are boiler manufacturers, building service engineers, plumbers as well as energy advisors and the O.Oe. Energiesparverband.

This selection of measures shows clearly that great efforts are made to remove information deficits on biomass. By the wide range of measures different polulation groups are interested for the topic bio-energy. In addition all possible target groups (private persons, municipalities, housing associations, businesses, etc.) are provided with comprehensive, qualified and updated information. The case study “Upper Austria” shows how professional information policy and awareness raising activities can contribute to increase the use of biomass for energy purposes.

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