Non-cost barriers to renewables – *AEON* study

National report Austria

Client: DG TREN

ECORYS Nederland BV

Ms Tatjana Tupy (eclareon)
Mr Raffaele Piria (eclareon)

Contact author: Raffaele Piria, rp@eclareon.com

Berlin / Vienna, 7th May 2010

ECORYS Nederland BV
P.O. Box 4175
3006 AD Rotterdam
Watermanweg 44
3067 GG Rotterdam
The Netherlands

T +31 (0)10 453 88 00
F +31 (0)10 453 07 68
E netherlands@ecorys.com
W www.ecorys.com
Registration no. 24316726

ECORYS Macro & Sector Policies
T +31 (0)10 453 87 53
F +31 (0)10 452 36 60

Table of contents

Interviewed experts

We would like to thank all interviewed experts for their very valuable input and their support for this study. We highly appreciate their expert knowledge and their availability in the framework of the AEON Project on behalf of the European Commission.

For this country study, the following experts were interviewed:

Rainer Anzböck
FGW - Fachverband der Gas- und Wärmeversorgungsunternehmungen

Michael Cerveny
ÖGUT – Österreichische Gesellschaft für Umwelt und Technik

Johann Goldbrunner
TU Graz – Institut für angewandte Geowissenschaften, Technische Universität Graz

Roger Hackstock
Austria Solar - Verein zur Förderung der thermischen Solarenergie

Katharina Hochmair
VEÖ – Verband der Elektrizitätsunternehmen Österreichs

Heinrich Huber, Gundula Tschernigg
AIT – Austrian Institute of Technology

Claudia Hübsch
BWP - Bundesverband WärmePumpe Austria

Horst Jauschnegg
Landwirtschaftskammer Steiermark

Franz Kirchmeyr
ARGE Kompost & Biogas Österreich

Hans Kronberger
Bundesverband Photovoltaic Austria

Vitaliy Kryvoruchko
HEI Eco Technology GmbH

Leopold Lasselsberger
Biowärme-Forum Austria

Ursula Nährer
IGW - Interessengemeinschaft Windkraft Österreich

Christoph Pfemeter
Österreichischer Biomasse-Verband

Martina Prechtl
KÖ - Kleinwasserkraft Österreich

Christian Rakos
proPellets Austria - Netzwerk zur Förderung der Verbreitung von Pelletsheizungen

Stephan Schuster
Cycleenergy Beteiligungs- und Management AG

Christine Widmann
LGWA - Leistungsgemeinschaft Wärmepumpe Austria

Introduction

While Austria can without doubt still be counted among the leading countries where the use of renewable energy sources is concerned, developments are not always as bright as they seem to be at a first glance. When taking a closer look at the situation, one cannot help stumbling across some fundamental problems constituting serious barriers for further renewable energy development.

What is missing in Austria is a clear political commitment to the development of renewable energy sources in their whole variety, translating into ambitious and continuous policies for their promotion. This basic problem has been repeatedly brought up during the interviews with the different stakeholders. Instead of actively trying to reach the 34% goal set by the Directive 2009/28/EC, the starting basis for the Austrian goal is called into question. While the Directive acts on the assumption of a share of energy from renewable sources of 23.3% in 2005, the recently published Austrian Energy Strategy operates with a value of 24.4% and according to representatives of the renewable energy industry, the correct value might be even higher. The Energy Strategy is also heavily criticised in several other points, e.g. no ambitious goals for technologies with very large potentials such as PV and an overall vagueness on concrete steps that are planned. It is a moot question whether this can be considered the starting point of a continuous policy of renewable energy promotion.

Before summing up the main findings on non-cost barriers for renewable energy sources in Austria, it should be mentioned that for some technologies, namely PV, geothermal energy and biogas injection into the natural gas grid, cost barriers seem to be the main issue at the moment. The renewable energy sector stresses that inexistent or inefficient support schemes impede significant development in these sectors. This point of view is not shared by stakeholders from the traditional energy sector who argue that it makes sense from a broader economic point of view to focus on the promotion of the already cheaper renewable technologies. Independent from the point of view one takes it can be noted that as a consequence of the dominance of cost-barriers for some technologies, certain non-cost barriers identified are still of a rather theoretical nature. Other barriers will only show themselves as soon as a considerable growth in these areas will be initiated.

Austria, being a federal state with nine different “Bundesländer”, is not always easy to analyse. Several issues covered by the present study tackle domains that derive from the competence of the regions and are thus not regulated in a uniform way throughout the country. As the thorough examination of the different provisions in all federal states goes beyond the scope of this study, the authors restricted themselves to highlighting good or worst practice examples and analysing representative examples from selected regions. While the variety of existing regulations is in some points criticised by the RES industry,

the federal structure cannot only be considered a barrier for renewable energy deployment. A certain competition between the nine federal states often also leads to a gradual adaptation of the highest standards.

Administrative procedures in Austria can be considered as working rather well, with some problems causing unnecessary delays in the fields of wind power, small hydro power, biogas and heat pumps. Except for large minimum distances for wind power plants, no serious problems in the area of spatial planning could be identified. Competing public interests such as air pollution control or environmental protection have been considered severe barriers for renewable energy development by the stakeholders of the RES industry. While provisions deriving from competing public interests are of course legitimate and in principle comprehensible, a more holistic point of view with better weighed interests should be aimed at.

Technical specifications in support schemes do not constitute barriers to trade. The access to support schemes is not restricted to products carrying Austrian quality labels. Technical specifications are either formulated in a neutral way or refer to European standards. Only in the case of the type approval procedure for biomass boilers certain problems may arise for products tested in laboratories outside Austria or Germany. One might also criticise the lack of technical specifications that can mainly be observed in national support schemes.

Building integrated technologies face substantial barriers in multi-storey buildings because of to the unsolved investor/user dilemma in tenancy and ownership law. This issue is already under discussion in Austria since more than a decade but due to political conflicts between the different interest groups no solution has been found yet. Looking at the exemplary role of public buildings, a rather negative picture has to be drawn too. Stronger efforts still have to be made, especially on a national but also on a regional level. Where renewables obligations are concerned, the country has chosen a slightly different approach to enhancing the share of RES in buildings, based on incentives rather than on obligations. The conditions set by the federal states for obtaining the housing subsidy include the use of RES. This approach is in general considered as quite effective, covering large parts of the residential building stock, as only a very small number of buildings is built or renovated without making use of the housing subsidy. Nevertheless, the regulations are of different quality and there is still room for improvement in some federal states. Furthermore, no similar provisions exist for commercial and industrial buildings.

Energy efficiency standards of renewable energy equipment are in general very high in Austria and cannot be considered a real problem. The provisions on small biomass systems partly lag behind though and are not yet consistent with the provisions of Art.13 (6) of the Directive 2009/28/EC. In addition, there is a lack of substitution of existing inefficient systems that needs to be tackled. All legal provisions analysed contain quite strict efficiency requirements for heat pumps. The efficiency standards for the EU Eco-label are expressed in terms of the COP though, while the Austrian legislation almost always refers to the SPF, being considered a better indicator for the efficiency of heat pumps. It is thus difficult to assess whether the efficiency specifications fulfil the requirements of Art.13 (6) of the Directive 2009/28/EC.

On the whole, **information and awareness** levels of the general public on renewable energy sources are quite high in Austria in European comparison. At the same time, a certain short-sightedness concerning the assessment of the energy price development and the availability of fossil fuels as well as the potential of renewable energy sources prevails. This is true for the general public as well as for political decision makers and can be considered a serious barrier for further renewable energy development in Austria. Public budgets for campaigns and other information measures are available but proponents of some RES technologies see a need for more public engagement. For certain target groups acting as disseminators, the distribution of more specific information would be helpful. Information on support measures is in general provided in a well-structured and easily accessible way.

Qualification and certification for installers of renewable energy systems in Austria is mainly carried through by the Austrian Institute of Technology (AIT), a certification body accredited by European law. There are no substantial problems with training or certification possibilities. With the exception of the field of biomass, installers already can get training and certification compliant with the requirements of the Directive 2009/28/EC. Almost all interviewees agreed though, that in the domain of vocational training renewable energy systems are not yet considered in a sufficient way, mainly due to resistance from the professional guilds as well as the Austrian Federal Economic Chamber. Substantial efforts in this field still have to be made.

In European comparison, the Austrian electricity grid is in quite a good condition. Nevertheless, improvements of **infrastructure** are necessary in order to satisfy the rising demand and deal with the higher amount of electricity from renewable energy sources. The main weaknesses of the Austrian electricity grid are well-known and very concrete medium- to long-term plans for grid reinforcement and expansion exist. Problems arise though with the implementation of the plans. The realisation of grid infrastructure projects currently lasts eight years or longer. Grid operators thus see a strong necessity for an amelioration of the existing legal and administrative framework. The APG is actively involved in the planning of a Trans-European Electricity Network. No major barriers have been identified. Concerning short to medium-term infrastructure development, from the point of view of the RES industry, no substantial problems exist in Austria. In general, grid operators carry out necessary expansion works without undue delay and also develop medium to long-term concepts for areas where a strong renewable energy development can be expected in the future. This cooperative attitude might however partly be attributed to the common praxis that the plant operators do not only bear the costs for grid connection but also take over the costs for all reinforcement works on the next network level.

Power grid issues are certainly a topic to be tackled. Renewable energy sources do not have the best legal framework conditions in Austria. They are neither entitled to priority grid connection, nor to priority grid expansion but are subject to the general provisions of energy law. Only priority grid usage is foreseen by law. The collaboration with TSOs and DSOs works rather well, mainly because plant operators show a willingness to pay for grid expansion works even though this is not their clear legal duty. While this situation is of course criticised by the RES industry, they also see certain positive elements as this at

least guarantees a rather smooth grid connection process. Nevertheless, the current circumstances can be considered far from being ideal for further RES development.

The large majority of the existing biogas plants in Austria are used for electricity generation, whereas the **injection of biogas** into the natural gas grid is still at its beginnings. All biogas plants that are connected to the natural gas grid have been built in close cooperation with energy supply companies. This shows a positive attitude at least from the side of certain gas suppliers, however the large majority does not show any activity in this domain at all. To date, there are no practical experiences with the transmission of biogas over longer distances and the conclusion of the respective contracts with the different grid operators. It is thus rather difficult to assess, whether this would work smoothly or not. In addition to the unfavourable situation created by the existence of a feed-in tariff for electricity from biogas and the absence of an equivalent financial incentive for the injection of biogas into the natural gas grid, several barriers exist due to a legal framework not taking into account the special characteristics of biogas. Clear provisions should be introduced creating a favourable environment for the injection of biogas into the natural gas grid on a larger scale. In addition, the creation of biogas micro grids in off-grid regions should be taken more into consideration.

District heating is relatively wide spread in Austria. At the countryside, extensive housing sprawl is a serious barrier for DHC development though. While policies and support schemes for the initiation and expansion of DH systems largely based on RES are considered as relatively efficient, larger difficulties are encountered for the increase of the share of renewables in existing DH systems. The large amounts of waste heat produced render the additional injection of heat from renewable energy sources unnecessary in some parts of Austria. This cannot be considered a real barrier though. The potential for biomass district heating is already exhausted to quite a large extent; the integration of solar thermal systems still has massive potentials and needs more efforts.

1 Issue 1 Administrative Procedures

1.1 Introduction

In Austria, the competence for permission procedures for RES, including spatial planning matters, lies at regional level. Provisions thus differ from region to region. On the whole, authorisation procedures work quite well, with some problems causing unnecessary delays in the fields of wind power, small hydro power, biogas and heat pumps. Except for large minimum distances for wind power plants, no serious problems in the area of spatial planning could be identified. Competing public interests such as air pollution control or environmental protection have been considered severe barriers for renewable energy development by the stakeholders of the RES industry. While provisions deriving from competing public interests are of course legitimate and in principle comprehensible, a more holistic point of view with better weighed interests should be aimed at.

According to the recently published Austrian Energy Strategy, the government plans to introduce the goals of energy and climate protection into the different planning acts. Concrete measures shall be laid down in an "Austrian spatial planning concept" in 2011 (BMWFJ / BMLFUW 2010). Whether those steps will effectively tackle the existing problems for RES development cannot yet be assessed.

For **solar thermal systems** no important administrative barriers exist. In general, private costumers in the federal states do not require a building permission for small solar thermal systems. For lager systems (> 20 m²), a simple notification is necessary in some states. Monumental protection has not proofed to be a barrier for the installation of solar thermal systems either (Austria Solar 2010; www.solarwaerme.at 2010).

The **photovoltaic** sector criticises a certain complexity of administrative procedures due to different building regulations in the federal states. On the whole, the building regulations are quite favourable for PV though, with the exception of Carinthia and Styria, where the requirements are regarded as exaggerated by the PV industry association. No substantial problems have so far occurred related to spatial planning, monumental protection or environmental protection. This might partly be due to the little density of PV systems in Austria, as the financial incentives e.g. through the feed-in tariff are not attractive enough to trigger a considerable development of photovoltaic installations (PV Austria 2010).

In the field of **wind power**, legal regulations on administrative procedures can on the whole be considered as favourable for wind power development. According to the Austrian wind energy association problems can arise though if the responsible civil servants or authorised experts (Sachverständige) do not show themselves very

cooperative and as a consequence procedures are delayed. Where spatial planning is concerned, mainly two Austrian regions have large potentials for wind power development: Lower Austria and the Burgenland. Whereas the procedures in the Burgenland are on the whole quite favourable to wind power development, the Lower Austrian provisions contain several important barriers such as especially restrictive rules on minimum distances from residential areas (Nährer 2010).

Permission procedures for **small hydro power plants** are considered as being too lengthy due to overlapping competences and requirements. Another problematic field is the very strict Austrian interpretation of the European Water Directive. Substantial barriers in spatial planning do not exist (KÖ 2010).

Administrative procedures for **biomass plants** of all sizes are running smoothly with no substantial problems arising (Cycleenergy 2010; proPellets Austria 2010). Also in the domain of spatial planning no significant barriers occur (Cycleenergy 2010). Serious problems stem from very far-reaching requirements on emissions though (proPellets Austria 2010).

For **biogas plants** the most important problem consists in non-uniform authorisation procedures. In addition, authorising bodies show a tendency of setting ever stricter standards and asking for exaggerated requirements for the permission of biogas plants (ARGE Kompost & Biogas 2010). At the same time, missing regulations on the storage of substrata and digestates are criticised (tatwort / HEI 2008). No substantial barriers are known in the domain of spatial planning (ARGE Kompost & Biogas 2010).

For **heat pumps**, the main administrative barrier consists in long-lasting authorisation procedures (BWP 2010; LGWA 2010).

Even if administrative procedures in the field of **deep geothermal energy** are rather strict, they are running quite smoothly. The only important problem identified concerns far-reaching provisions in water law on the ownership of ground water. In addition, the question of CO_2 sequestration might become a barrier in the future (TU Graz 2010).

1.2 Description of barriers & solutions

1.2.1 Detailed description of the barriers and solutions

Barrier 1.1 – Inefficient general administrative procedures for RES (including no/insufficient specific rules for building integrated/small scale installations)

- In general, administrative requirements for photovoltaic systems are regarded as appropriate and cannot be considered a barrier, except for the difficulty that one has to deal with different building regulations in all federal states. For systems up to 5 kW a simple notification is necessary. Only the regulations in Carinthia and Styria are regarded as rather restrictive, as for the installation of medium systems on buildings a building permit has to be obtained (PV Austria 2010). In Styria this is e.g. the case for systems larger than 40 m² (www.pvaustria.at).

- For **wind power**, administrative requirements as laid down by law cannot be considered a barrier as long as the political decision makers and in consequence also the responsible civil servants show a favourable attitude towards wind power development, trying to find the best possible solution together with wind park developers. If this is not the case, some regulations may be interpreted in a very strict sense and can lead to considerable delays: A decision of the Higher Administrative Court asks for very restrictive measures concerning the ice fall from wind turbines even when standing still. It has to be assured that neighbouring plots within a radius of 160 m are not endangered. This decision is considered as not being appropriate by the Austrian wind energy association, an opinion also shared by some civil servants, as no similar provisions exist for bridges, buildings or mobile phone masts (IGW 2010).

- Authorisation procedures for **small hydro power plants** tend to be rather lengthy. This is mainly due to overlapping requirements (e.g. concerning residual water) in water law, energy law and nature protection.
  Possible options: The Austrian small hydro power association proposes to abolish overlaps in the permission procedures through the assignment of clear competences to the different authorities involved. In addition, checklists could be introduced, offering the possibility to control certain aspects already before the beginning of the official permission procedure. Regarding the revitalisation of existing small hydro power plants, the introduction of an accelerated procedure is aimed at (KÖ 2009a; KÖ 2010).

- The decisions of the regional/local authorities involved in the authorisation procedure for **small hydro power plants** are not uniform and frequently not comprehensible. According to the Austrian small hydro power association, some federal states have adopted a very strict interpretation of the laws. In Tyrol for example, a checklist for nature protection has been issued for hydro power plants up to 15 MW. The requirements of the list are so restrictive, that numerous projects were already sorted out before the beginning of the actual authorisation procedure. Also in Styria the situation is getting more and more difficult due to the approach of the Environmental Advocacy Office (KÖ 2009a; KÖ 2010). Of course, a careful consideration of environmental protection interests is necessary when thinking of changing the procedures towards a more favourable approach for hydro power.

- Authorisation procedures for **biogas plants** in Austria are not uniform. Every authorised expert proceeds in a different way and the exact procedure is not predictable for the plant operator. Furthermore, depending on the responsible authorised expert, very strict requirements in the authorisation procedures can be a barrier for biogas plants. The Austrian biogas association states a tendency of authorising bodies to set ever stricter standards, e.g. the condition of using 100% of the heat or asking for very strong safety requirements also for small plants, thus making their economic operation impossible. Comparing the different regions, most problems in this regard arise in Upper Austria (ARGE Kompost & Biogas 2010) but also in the Burgenland problems with the authorisation procedure have been noted (tatwort / HEI 2008).

- A further problem in the **biogas** sector consists in missing regulations in certain domains. About a fifth of the biogas plant operators use open storages instead of closed ones for the substrata and an even higher share of plant operators has constructed open storages for digestates. This does not only lead to a substantial loss of substrata and the emission of methane but also to odour nuisance for the residents.
  Possible options: It should be compulsory for biogas operators to use covered silos with solid exterior walls for storage purposes (tatwort / HEI 2008).

- Authorisation procedures for **heat pumps** are different from region to region. Divergent provisions in water rights, deadlines, technical specifications etc. constitute a barrier for the development of the heat pump sector (BWP 2010; Lutz 2007).
  Possible options: The heat pump sector proposes country-wide uniform technical guidelines for the installation of heat pumps (Lutz 2007).

- In some of the district authorities (Bezirkshauptmannschaft) responsible for the authorisation of **heat pumps**, procedures are rather long. This mainly depends on the approach of the responsible civil servant and is first and foremost a barrier in Tyrol and Upper Austria.
  Possible options: The industry associations would welcome the introduction of fixed periods during which the authorization requests have to be treated in order to speed up the procedures (BWP 2010; LGWA 2010; Lutz 2007).

- Where geothermal as well as water-to-liquid **heat pumps** are concerned, authorization procedures are long-lasting and rather complicated, as decisions are made on a case-to-case basis according to expert reports (BWP 2010; LGWA 2010).
  Possible options: The industry association LGWA suggests the introduction of a scheme of pre-defined regions. Like this, standards for appropriate technical requirements in regions with comparable water and geologic conditions could be laid down and decisions would not have to be made on a case-to-case basis any more (LGWA 2010).

- Austrian water law contains very far-reaching provisions on the ownership of ground water. All water resources lying underneath a plot are part of the property, independent from their depth. This means that in case of deviating **deep geothermal** drillings, the concerned landowners have legal standing (Parteistellung) in the authorisation procedure. Plant operators thus need to conclude contracts with the landowners, leading to a delay of the procedures of at least one or two months. In addition, it sometimes happens that landowners have financial claims against plant operators.
  Possible options: Representatives of the geothermal industry would welcome the introduction of provisions similar to the ones existing in Germany. In so-called geothermal permission zones (Erdwärmeerlaubnisfeld), property owners do not have a right to object on the use of water in depths deeper than 100 m (TU Graz 2010).

Barrier 1.2 – RES not or insufficiently considered in spatial planning

- The planning acts of the nine federal states foresee different minimum distances from residential areas for **wind power** plants. Provisions are especially restrictive in Lower Austria, requiring a distance of 1,200 m to residential building land and even 2,000 m

to residential building land of the neighbouring municipality. Those distances are quite large in European as well as national comparison, as the other Austrian regions only ask for distances between 800 and 1,000 m.

Possible options: The Austrian wind energy association would like to see distance requirements in Lower Austria being reduced to 1,000 m. In addition, it would make sense to introduce special rules for small wind power plants into the planning acts, as they are currently treated in the same way as large wind parks (IGW 2010).

Barrier 1.3 – Competing public interests

- In the field of **wind power**, ornithological issues are taken very seriously in Austria. In the framework of the EIA, an ornithological study lasting a whole year has to be conducted. This stems from the comprehensible interest of bird protection and does not constitute a problem per se. Problems only arise when civil servants insist on getting an ornithological expert report twice from different people, once in the framework of the SEA and a second time for the EIA. In those cases the whole administrative procedure is considerably delayed. (IGW 2010).

- According to the Aviation Safety Act (Luftfahrtssicherheitsgesetz), **wind turbines** have to be marked in order to assure their visibility. Especially in Lower Austria, this regulation is interpreted in a very restrictive way. Every single wind turbine has to have red-white-red rotor tips. In addition, the responsible official expert tends to ask for hazard beacons not only on the top of the turbines but also at half height. In other regions in contrast, only the turbines situated at the edges of a wind park have to be marked. (IGW 2010).

- For **small hydro power**, a number of difficulties arise in connection with the implementation of the European Water Framework Directive in Austria. The legal framework has not yet been completely established, leading to uncertainties. In addition, in some domains, the Austrian interpretation of the Directive is very restrictive in comparison to the regulations in other European countries. This is for example the case with the size of the water bodies. In Austria very short water bodies are fixed, which means that interferences have a more significant impact than they would have if longer water bodies were defined. This leads to problems with the need to improve and the prohibition to deteriorate the ecological status of the water (KÖ 2010).

- There is a tendency on a European as well as on a national level to simultaneously issue provisions on renewable energy sources as well as on climate and environmental protection (e.g. the Water Framework Directive) that are not really compatible with each other. This is mainly but not exclusively an issue in the fields of **biomass** and **hydro power**.

  Possible options: Proponents of renewable energy development would favour a more holistic approach in legislation, trying to find a balance between the different competing interests (Beirat für Wirtschafts- und Sozialfragen 2009; Landwirtschaftskammer Steiermark 2010).

- The amendment of the Air Immission Control Act (Immissionsschutzgesetz Luft) constitutes a substantial threat for **biomass** heating systems having to undergo

permission under trades law, if enacted as currently planned. § 20 section 3 of the proposed amendment may lead to the prohibition of the erection of biomass systems in particulate matter redevelopment zones (Feinstaubsanierungsgebiete). These zones are widely spread across the whole country, mainly covering the most populated areas. Systems contributing to a relevant rise in emissions, defined as a rise of 1%, may not get authorisation. While the aim of particulate matter reduction is of course comprehensible, the industry association proPellets Austria does not consider the approach followed with the amendment of the Air Immission Control Act to be adequate. Rather than prohibiting highly efficient new biomass heating systems, they ask for policies aiming at the replacement of inefficient traditional biomass heating systems (proPellets Austria 2009). This point of view is also shared by independent experts (ÖGUT 2010). The pellet industry states that the biomass systems dominating today's market and lying well underneath the legal emission limits, should be exempt from the mentioned provisions of the Immission Control Act. Alternatively, the emission limits could be considerably lowered, taking into account the state of the art of the technologies (proPellets Austria 2009).

- A further problem linked to emissions is already on its way and might become an issue in the near future. In the course of the European efforts on nitrogen oxide reduction, Austrian authorities responsible for air pollution control have started to criticise nitrogen oxide emissions from wood fuels. The **biomass** industry fears that very strict requirements in this field might lead to serious barriers for the use of biomass for heating purposes, as in small biomass systems the reduction of nitrogen oxides is almost impossible. Its representatives argue that the emissions from wood fuels are part of a natural circuit and are mainly emitted in winter when ozone formation is not an issue (proPellets Austria 2010).

- The Waste Management Act (Abfallwirtschaftsgesetz) contains very strict provisions on the use of wood ash. This is on the one hand comprehensible, as the risk of heavy metal being spread needs to be minimised. On the other hand, the fact that **biomass** plant operators have to carry these costs makes it almost impossible to operate small biomass heat plants (that have a high potential in Austria) on a cost-effective basis (Landwirtschaftskammer Steiermark 2010). Roughly estimated, more than 10% of the total turnover of a small biomass heating plant is used for the ash disposal (Cycleenergy 2010).
  Possible options: As strictly speaking the society as a whole can be made responsible for the existence of heavy metal in wood, the biomass industry would like to see the general public taking over the costs of the wood ash treatment (Landwirtschafts-kammer Steiermark 2010). Taking into account the subsidies for biomass heat plants already provided by the state, this demand seems to be rather far-reaching and the barrier cannot be considered being very fundamental. A different perspective consists in initiating further research on alternative types of wood ash use, trying to find ways to extract harmful substances such as heavy metals and nitrates, making it possible to use the ash as a fertiliser (ÖGUT 2010). First projects in this domain already exist in Austria but the research is still at its very beginnings (Cycleenergy 2010).

- In case that CO_2 sequestration will become an issue in the future, the further development of **deep geothermal energy** might be seriously prevented (TU Graz 2010).

1.2.2 Best practice elements and indicators

No.	Technology	Benchmark/comments	Result
1.1		**Is one stop-shopping possible?**	
	Wind onshore, 2MW, 80m height	One-stop-shopping only for wind parks > 20 MW.	No
	Biogas plant < 2MW		No
	Biomass < 2MW		No
	Biomass > 10MW		No
1.2		**Amount of money to be invested in administrative process (including cost of work and costs like fees) (in EURO)**	
	Wind onshore, 2MW, 80m height		min. 100,000 €
	Biogas plant < 2MW		N/A
	Biomass < 2MW		min. 5,000 €
	Biomass > 10MW		up to 400,000 – 500,000 €
1.3		**Time to be spent for administrative permission process (duration in months)**	
	Wind onshore, 2MW, 80m height		min. 24-36 months
	Biogas plant < 2MW		N/A
	Biomass < 2MW		3-9 months
	Biomass > 10MW	In case of disputes with the neighbours up to 24 months.	3-9 months
1.4		**Number of all permits that need to be obtained (#)**	
	Wind onshore, 2MW, 80m height		min. 4
	Biogas plant < 2MW		N/A
	Biomass < 2MW		2
	Biomass > 10MW		2

1.3 Literature

ARGE Kompost & Biogas (2010): ARGE Kompost & Biogas Österreich; Franz Kirchmeyr. Interview in Vienna on 10.03.2010

Austria Solar (2010): Austria Solar - Verein zur Förderung der thermischen Solarenergie; Roger Hackstock. Interview in Vienna on 25.02.2010

Beirat für Wirtschafts- und Sozialfragen (2009): Herausforderungen in der Energiepolitik. Weißbuch der österreichischen Sozialpartner (www.arbeiterkammer.at/bilder/d102/WeissbuchEnergiepolitik.pdf)

BMWFJ / BMLFUW (2010): Bundesministerium für Wirtschaft, Familie und Jugend / Bundesministerium für Land- und Forstwirtschaft, Umwelt und Wasserwirtschaft Eckpunkte der Energiestrategie Österreich (www.energiestrategie.at/images/stories/pdf/PKPapier/eckpunkte_energiestrategie_100311.pdf)

BWP (2010): Bundesverband WärmePumpe Austria. E-mail questionnaire from 11.03.2010

Cycleenergy (2010): Cycleenergy Beteiligungs- und Management AG; Stephan Schuster. Telephone interview on 14.04.2010

IGW (2010): Interessengemeinschaft Windkraft Österreich; Ursula Nährer. Telephone interview on 09.03.2010

KÖ (2009a): Kleinwasserkraft Österreich; Maßnahmenvorschlag für den Neubau von Kleinwasserkraftanlagen im Zuge der Energiestrategie für Österreich. Not published

KÖ (2009b): Kleinwasserkraft Österreich; Maßnahmenvorschlag für die Revitalisierung von Kleinwasserkraftanlagen im Zuge der Energiestrategie für Österreich. Not published

KÖ (2010): Kleinwasserkraft Österreich; Martina Prechtl. Telephone interview on 17.03.2010

Landwirtschaftskammer Steiermark (2010): Landwirtschaftskammer Steiermark; Horst Jauschnegg. Telephone interview on 09.03.2010

LGWA (2010): LGWA – Leistungsgemeinschaft Wärmepumpe Austria; Christine Widmann. Telephone interview on 16.03.2010

Lutz, Gerald (2007): Wärmepumpen-Aktionsplan für Österreich (www.bwp.at/documents/Waermepumpen_Aktionsplan_Oesterreich_Langfassung.pdf)

ÖGUT (2010): Österreichische Gesellschaft für Umwelt und Technik; Michael Cerveny. Telephone interview on 10.04.2010

proPellets Austria (2009): proPellets Austria - Netzwerk zur Förderung der Verbreitung von Pelletsheizungen; Christian Rakos; Stellungnahme zur Novellierung des IG-Luft. Not published

proPellets Austria (2010): proPellets Austria - Netzwerk zur Förderung der Verbreitung von Pelletsheizungen; Christian Rakos. E-mail questionnaire from 28.02.2010 & interview in Vienna on 09.04.2010

PV Austria (2010): Bundesverband Photovoltaic Austria; Hans Kronberger. Interview in Vienna on 02.04.2010

tatwort / HEI (2008): tatwort – Gesellschaft für Kommunikation und Projektmanagement / HEI Eco Technology GmbH: Biogas Branchenmonitor Endbericht 2008. Erhebung von Wirtschaftsdaten und Trends zu Biogas in Österreich, im Auftrag des BMVIT, Wien.

TU Graz (2010): Technische Universität Graz, Institut für angewandte Geowissenschaften; Johann Goldbrunner. Telephone interview on 16.04.2010

Websites:
www.pvaustria.at
www.solarwaerme.at

2 Issue 2 Technical Specifications

2.1 Introduction

This chapter analyses if the provisions of the renewable Directive 28/2009/EC, mainly Art. 13 (2), concerning technical requirements in support schemes are fulfilled in Austria.

In Austria several dozen support schemes for RES exist, since in addition to national schemes, the regional authorities also provide a number of specific financial incentives. For this study, the most important schemes on a national level, as well as some examples at regional level have been analysed, namely:

- The **feed-in tariff for electricity** from renewable energy sources: The Green Electricity Act (Ökostromgesetz) does not define detailed technical specifications for the systems to be supported (Ökostromgesetznovelle 2008).

- Calls for proposals for **subsidies for small PV systems** up to 5 kW by the „Klima- und Energiefonds“: The analysed calls for proposals do not define detailed technical specifications for the PV systems to be supported (Klima- und Energiefonds 2009a; Klima- und Energiefonds 2009b).

- **Allowance of special expenses from the income/wage tax for solar thermal installations and heat pumps**: The Income Tax Act does not define detailed technical specifications for the systems to be supported (Einkommensteuergesetz 1988).

- **Environmental subsidies for small heat pumps, biomass and solar thermal systems** - “Betriebliche Umweltförderung im Inland”: As a technical prerequisite for subsidising heat pumps, a minimum COP of 4.0 for water and brine-to-water heat pumps, resp. a minimum COP of 3.5 for air-to-water heat pumps is asked for. Technical specifications for small biomass systems up to 300 kW are clearly defined, referring to the European standard EN 303-5. For small solar thermal systems up to 100 m² no detailed technical specifications need to be fulfilled (Kommunalkredit Public Consulting 2007; UFG 2009).

- Several **regional subsidy schemes supporting small RES systems** in the four most populous federal states, encompassing more than 70% of the Austrian population: Vienna, Lower Austria, Upper Austria and Styria. While the national support schemes scarcely include technical specifications, the federal states tend to set at least certain technical standards. The exact provisions differ a lot from region to region. Generally speaking, technical requirements for solar thermal and PV systems are

often expressed in a very simple way, frequently referring to a single European standard or quality label. In some cases, no requirements for small systems are defined (Direktförderung für Solaranlagen Steiermark 2010; Direktförderung von Photovoltaikanlagen Steiermark 2010; Förderung für Solar-, Wärmepumpen- und Photovoltaikanlagen Niederösterreich 2010; Förderung solarthermischer Anlagen in Wien 2009; Förderung von thermischen Solaranlagen Oberösterreich 2010; Ökostromförderung Wien 2007). For heat pumps all analysed regional schemes ask for a minimum COP or SPF (JAZ) (Förderung für Solar-, Wärmepumpen- und Photovoltaikanlagen Niederösterreich 2010; Förderung von Wärmepumpen Oberösterreich 2010; Ökoförderung Wien 2010). All support schemes define technical specifications for small biomass systems but in quite different ways. Lower Austria asks for the CE mark, Styria refers to several EN standards as well as the Austrian ecolabel (but only as a reference) and Vienna opted for a detailed list of specifications without naming a specific standard. The Viennese, the Styrian as well as the Upper Austrian support scheme require a type test in an accredited laboratory, a condition that has to be met by all biomass boilers sold in Austria. The location of the laboratory is not defined (Biomasseheizungsanlage – Förderaktion Wien 2008; Biomasseheizanlagenförderung Oberösterreich 2009; Direktförderung für moderne Holzheizungen Steiermark 2010; Wohnbauförderung Niederösterreich 2010).

2.2 Description of barriers & solutions

2.2.1 Detailed description of the barriers and solutions

Barrier 2.1 – Specifications not clearly defined (weak definitions)

This is not considered a real barrier by the stakeholders of the Austrian RES industries. There is however a potential for unification and simplification, as the schemes at regional level use very different technical specifications and it is not easy to get an overview. One might also criticise the lack of technical specifications that can mainly be observed in national schemes.

- Even though for heat pumps and solar thermal systems European labels exist – the EHPA quality label resp. the Solar Keymark label – up to date only a few subsidy schemes refer to them. The EHPA label is required exclusively in the federal states of Vorarlberg and Salzburg, the Solar Keymark label in some schemes such as the direct subsidy in Upper Austria or the subsidy for multi-storey buildings in Vienna. According to Austria Solar, the missing technical requirements in several subsidy programmes are not considered to lead to the spreading of low quality systems though, as about two thirds of the collectors installed in Austria carry the Solar Keymark certificate even without any obligation in place. The heat pump industry on the other hand sees the further dissemination of the EHPA quality label in Austria as a necessary requirement for assuring a good quality of the installed heat pumps (BWP 2010; Austria Solar 2010; Lutz 2009).

- Some support schemes for photovoltaic systems refer to EN standards, while others do not set any technical requirements at all. As the existing EN standards are very

weak and almost all systems already carry them, the Austrian PV industry association sees no need for their widespread use in the support schemes. It would however welcome the development of a European quality label or stricter quality standards and their introduction as a requirement into support schemes (PV Austria 2010).

Barrier 2.2 – Specifications not expressed in terms of EU-standards or specified locations for testing and/or certification required

Except for the case of biomass boilers, where a European label does not exist yet, this cannot be considered a barrier in Austria. The access to support schemes is not restricted to products carrying Austrian quality labels. Technical specifications are either formulated in a neutral way or refer to European standards.

- The requirements for biomass systems in regional support schemes are in general very strict in Austria. Several schemes refer to the Austrian ecolabel (Österreichisches Umweltzeichen). The access to those support schemes is not restricted to products carrying this label however. Also systems that fulfil comparable technical requirements are eligible. This can be proofed through a type approval by an accredited laboratory (Biowärme-Forum Austria 2010; proPellets Austria 2010). Even though the laboratory does not have to be situated in Austria, de facto only the recognition of type approvals from Austria and Germany works easily, as it is often not known which laboratories in other countries are accredited (Biowärme-Forum Austria 2010).

2.2.2 Best practice elements and indicators

No.	Technology	Benchmark/comments	Result
2.1		**Are the technical specifications to be eligible for subsidies / building obligations expressed in terms different than European standards (including eco-labels, energy labels and other technical reference systems), though such European references exist?**	
	PV		No
	ST (domestic hot water)	In most cases no specific technical requirements exist; if so, they are expressed in terms of European standards.	No
	Heat pumps		No
	Biomass boilers		No

2.3 Literature

Austria Solar (2010): Austria Solar - Verein zur Förderung der thermischen Solarenergie; Roger Hackstock. Interview in Vienna on 25.02.2010

Biomasseheizungsanlage – Förderaktion Wien (2008): Förderrichtlinien Biomasseheizung (www.wien.gv.at/wohnen/wohnbaufoerderung/ahs-info/pdf/info-biomasse.pdf)

Biomasseheizanlagenförderung Oberösterreich (2009): Einzelbetriebliche Biomasseheizanlagenförderung einschließlich Impulsförderung (www.ooe.gv.at/cps/rde/xchg/SID-674F4957-B3DA4621/ooe/hs.xsl/biomasseheizanlagenfoerderung_DEU_HTML.htm#Sub%20Einbau%20einzelbetr.%20Hackgut-,%20Pellets-,%20Scheitholzfeuerung)

Biowärme-Forum Austria (2010): Biowärme-Forum Austria; Leopold Lasselsberger. Telephone interview on 16.03.2010

BWP (2010): Bundesverband WärmePumpe Austria. E-mail questionnaire from 11.03.2010

Direktförderung für moderne Holzheizungen Steiermark (2010): Richtlinie für die Direktförderung von modernen Holzheizungen (www.verwaltung.steiermark.at/cms/dokumente/10098196_2628408/3453e628/RL%20Biomasse%202010.pdf)

Direktförderung für Solaranlagen Steiermark (2010): Richtlinie für die Direktförderung von thermischen Solaranlagen für Brauchwassererwärmung und Raumwärmeversorgung (www.verwaltung.steiermark.at/cms/dokumente/10098196_2628408/ade1bed7/RLThermischeSolaranlagen17032010.pdf)

Direktförderung von Photovoltaikanlagen Steiermark (2010): Richtlinie für die Direktförderung von Photovoltaikanlagen (www.verwaltung.steiermark.at/cms/dokumente/10098196_2628408/9b94ef49/RL%20PV%202010.pdf)

Einkommensteuergesetz (1988): Einkommensteuergesetz 1988, § 18 Sonderausgaben, 533 (www.lohnsteuerverein.at/lohnsteuer/07_sonderausgaben_0429.htm)

Förderung für Solar-, Wärmepumpen- und Photovoltaikanlagen Niederösterreich (2010): NÖ Wohnungsförderungsrichtlinien 2005 (www.noe.gv.at/bilder/d8/Richtlinien2005UndBeilagen.pdf)

Förderung solarthermischer Anlagen in Wien (2009): Förderung solarthermischer Anlagen in Wien - Richtlinien 2009 (www.wien.gv.at/wohnen/wohnbautechnik/ahs-info/solar-richtlinien.html)

Förderung von thermischen Solaranlagen Oberösterreich (2010): Thermische Solaranlagen bis 100 m² (www.land-oberoesterreich.gv.at/cps/rde/xchg/SID-B268F5F9-1A0DB7A6/ooe/hs.xsl/89719_DEU_HTML.htm)

Förderung von Wärmepumpen Oberösterreich (2010): Wärmepumpen bis 400 kW thermische Leistung (www.land-oberoesterreich.gv.at/cps/rde/xchg/SID-B268F5F9-1A0DB7A6/ooe/hs.xsl/89740_DEU_HTML.htm)

Klima- und Energiefonds (2009a): Richtlinien des Klima- und Energiefonds für die „Förderung von Photovoltaik-Anlagen“ 2009 (www.klimafonds.gv.at/fileadmin/media_data/Dateien/downloads/GIPV/2009-10-29_Richtlinien_GIPV_in_Fertighaeusern.pdf)

Klima- und Energiefonds (2009b): Richtlinien des Klima- und Energiefonds für die „Förderung von Gebäudeintegrierten Photovoltaik-Anlagen in Fertighäusern“ 2009 (www.klimafonds.gv.at/home/foerderguide/details/themenfeld/foerderaktion-photovoltaik-1.html)

Kommunalkredit Public Consulting (2007): Auszahlungsbedingungen und Technische Auflagen (www.public-consulting.at/uploads/mustervertrag_ufi.zip)

Lutz, Gerald (2009): Roadmap Sonnenheizung Österreich 2020. Mit Umgebungswärme zum Ziel (www.bwp.at/documents/20100126_RoadmapSonnenheizungprint.pdf)

Ökoförderung Wien (2010): Ökoförderung - Umstellung einer bestehenden Heizung auf Wärmepumpe in einem Eigenheim, Kleingartenwohnhaus oder Reihenhaus (www.wien.gv.at/wohnen/wohnbautechnik/ahs-info/pdf/waermepumpe-wp-solar-san.pdf)

Ökostromförderung Wien (2007): Förderungsrichtlinien 2007 für die Förde-rung der Erzeugung von Ökostrom (www.wien.gv.at/wirtschaft/eu-strategie/energie/pdf/richtlinieoekostrom.pdf)

Ökostromgesetznovelle (2008): Ökostromgesetznovelle 2008 (www.parlament.gv.at/PG/DE/XXIII/I/I_00562/fname_110851.pdf)

proPellets Austria (2010): proPellets Austria - Netzwerk zur Förderung der Verbreitung von Pelletsheizungen; Christian Rakos. E-mail questionnaire from 28.02.2010 & interview in Vienna on 09.04.2010

PV Austria (2010): Bundesverband Photovoltaic Austria; Hans Kronberger. Interview in Vienna on 02.04.2010

UFG (2009): Umweltförderungsgesetz. Bundesgesetzblatt Nr. 185/1993 vom 16. März 1993 in der Fassung des Bundesgesetzblattes I Nr. 52/2009 vom 17. Juni 2009

Wohnbauförderung Niederösterreich (2010): Förderung von Heizungsanlagen mit fester Biomasse oder Fernwärmeanschluss (www.noe.gv.at/Bauen-Wohnen/Heizen-Energie/Biomasseheizung-und-Fernwaermeanschluss-Foerderung.html)

3 Issue 3 Building Integrated Technologies

3.1 Introduction

In the strict sense, no **renewables obligations** exist in Austria so far. The country has chosen a slightly different approach to enhancing the share of RES in buildings, based on incentives rather than on obligations. The different federal states offer subsidies and/or soft loans, the so called "Wohnbauförderung", for the construction of new residential buildings as well as for their refurbishment. According to an agreement between the national and the regional governments based on Art. 15a Bundes-Verfassungsgesetz (BGBl. Nr. 1/1930), the regions are obliged to set criteria on energy efficiency and the use of RES as a condition for obtaining the housing subsidy. This approach is in general considered as quite effective by the solar thermal industry, the biomass industry and independent experts, covering large parts of the residential building stock, as only a very small number of buildings is built or renovated without making use of the housing subsidy. Nevertheless, the regulations are of different quality and there is still room for improvement in some federal states. With the Art. 15a-agreement (BGBl. II Nr. 251 2009), the main directions for the development of the next years are already laid out and can be considered to provide a good basis for further RES development in the residential building sector (Austria Solar 2010; proPellets Austria 2010; ÖGUT 2010). Mainly the heat pump industry would favour the introduction of a renewables obligation in the building codes instead, as they feel that heat pumps are not sufficiently taken into account by the regulations on the housing subsidy (BWP 2010; LGWA 2010). Strictly speaking, the technological choices provided in the regulations on the housing subsidy cannot be regarded as a discrimination of certain technologies though, but rather as a non-preferential treatment (ÖGUT 2010).

Where the **exemplary role of public buildings** is concerned, a rather negative picture has to be drawn so far. According to estimations by Austria Solar, only about 2% of regional and 1% of federal public buildings are equipped with a solar thermal system (Austria Solar 2010). For the other technologies the situation is similar. The different RES industries thus ask for stronger efforts, especially on a national but also on a regional level. The so-called "15a agreement" between the national and the regional governments foresees a wide use of RES in new public buildings as well as public buildings undergoing major renovation. In addition, the federal states should invite the municipalities to proceed in a similar way (BGBl. II Nr. 251 2009). In case that this agreement is put into practice as intended, public buildings might live up to their exemplary role in a more satisfying way.

Tenancy and ownership law constitute a strong barrier for the installation of RES in multi-storey buildings, mainly due to the unsolved investor/user dilemma. This issue is

already under discussion in Austria since more than a decade but due to political conflicts between the different interest groups no solution has been found yet (Austria Solar 2010; BMLFUW 2008; ÖGUT 2010; proPellets Austria 2010).

3.2 Description of barriers & solutions

3.2.1 Detailed description of the barriers and solutions

Barrier 3.1 – Renewables obligations insufficient:

- In all federal states renewables obligations in the framework of the housing subsidy schemes already exist, the first one since July 2008, the last one since April 2010. Looking at the existing regulations, Vienna, Lower Austria, Salzburg, Vorarlberg and Tyrol have adopted the farthest reaching provisions including renewables obligations for new buildings, renovations and the exchange of old heating systems in one-family houses, row houses as well as multi-family houses. The obligations in the other regions are less ambitious and effective: in the Burgenland one-family houses are not covered, in Styria, Upper Austria and Carinthia the obligation only applies to new buildings, thus room for improvement exists. The Viennese renewables obligation in the framework of the housing subsidy scheme is seen as best practice example by the solar thermal industry. According to the Austrian solar thermal industry association Austria Solar, it would be desirable to apply the Viennese model in all federal states, as this would lead to a very high penetration of RES. From the point of view of the solar thermal industry, this option seems even more promising than introducing renewables obligations in the building codes as they might tend to only covering new buildings, as the example of the solar obligation currently planned in Styria suggests (Austria Solar 2010; dena 2009).

- Even if the existing provisions are largely seen as positive, some representatives of the **biomass** industry criticise that not in all federal states biomass boilers are integrated in an adequate way into the housing subsidy schemes. They would like to see the introduction of a real renewables obligation in the building code. This should not be limited to one technology, as it is the case with the solar obligation planned in Styria, but leave the choice of the RES technology open (Biowärme-Forum Austria 2010; Landwirtschaftskammer Steiermark 2010). This solution is also favoured by the **heat pump** industry associations. They would also welcome the introduction of certain primary energy and CO_2-emission limits for the total building (including the heating and cooling system) as a prerequisite for the obtaining of the building permit, as mentioned in the Austrian Energy Strategy (BWP 2010; LGWA 2010).

- The current renewables obligations based on the housing subsidies have very positive effects on the residential building sector, whereas commercial and industrial buildings are completely left aside. In this field, policies still need to be developed (proPellets Austria 2010).

Barrier 3.2 – Exemplary role of public buildings neglected:

- Even though a legally binding declaration of intent in the form of an agreement between the national and regional governments based on Art. 15a Bundes-

Verfassungsgesetz exists (BGBl. II Nr. 251 2009), members of the RES industries agree that the exemplary role of public buildings is not yet fulfilled in a sufficient way in practice (Landwirtschaftskammer Steiermark 2010; Austria Solar 2010; Biowärme-Forum Austria 2010; LGWA 2010; PV Austria 2010). According to estimations by Austria Solar, only about 2% of regional and 1% of federal public buildings are equipped with a solar thermal system (Austria Solar 2010). Mainly at the level of the municipalities, certain efforts in making public buildings fulfil an exemplary role have already been made, depending on the engagement of the different mayors. Also certain federal states are on a good way. In Lower Austria for example, a directive prescribing almost passive house standards and renewable energy use for new public buildings exists. Also in the case of major renovations, the use of RES has at least to be taken into consideration. Certain other federal states are taking this as an example; the situation in Vienna is different due to a rather negative attitude towards biomass and a strong preference for natural gas (ÖGUT 2010). On a national level however, there is still a significant backlog in this domain. The central administration of public buildings BIG ("Bundesimmobiliengesellschaft") does not make efforts to include RES in its buildings but only acts according to the principle of the best bidder (Biowärme-Forum Austria 2010; Landwirtschaftskammer Steiermark 2010; LGWA 2010; ÖGUT 2010; proPellets Austria 2010).

Possible options: The BIG could be encouraged (or even obliged) to privilege renewable energy sources in its choices (Biowärme-Forum Austria 2010; Landwirtschaftskammer Steiermark 2010; LGWA 2010). It might also already help if it did not only take into account the investment costs in a heating system but also the costs of operation and maintenance. Like this renewable energy sources would become a more interesting option from a purely economic point of view (Lutz 2009). In addition, a recommendation including realistic estimations of future energy prices to be used for economic efficiency calculations could be a very helpful tool for stronger renewable energy development in the public sector (ÖGUT 2010).

Barrier 3.3 – Tenancy law and ownership law impede the development of building integrated RES technologies:

- Several laws include strong barriers for the installation of RES, namely **solar thermal systems** and **biomass systems**, in multi-storey residential buildings: the Act on Tenancy Law ("Mietrechtsgesetz"), the Condominium Act ("Wohnungseigentumsgesetz"), the Act on Dwellings of Common Public Interest ("Wohnungsgemeinnützigkeitsgesetz") and the Act on Heat Cost Billing ("Heizkostenabrechnungsgesetz"). The main problem consists in regulations hindering the landlord to pass on installation costs of a RES system to the tenants. As only the tenants benefit from a possible installation of a renewable energy system due to lower heating costs, the landlords do not have any incentive to invest. This so-called investor/user dilemma has been discussed for more than a decade, mainly related to energy efficiency measures. Political conflicts between the different interest groups such as the Austrian Chamber of Labour (Arbeiterkammer) and the responsible ministries could not yet been solved. The Austrian Chamber of Labour acts according to the principle that housing and thus also energy provision has to be as cheap as possible in order to protect the interests of the consumers. Instead of following a long-term vision taking into account the rising prices for fossil fuels, it adopts a very short-sighted point of view and fights against the initially higher investments in RES and energy efficiency

(see also Issue 5). It would however be necessary to find a solution to this issue, taking into account the interests of the tenants as well as the interests of the landlords, in order to allow for a strong RES development also in this segment (Austria Solar 2010; Biowärme-Forum Austria 2010; BMLFUW 2008; Landwirtschaftskammer Steiermark 2010; ÖGUT 2010). Where **heat pumps** are concerned, problems in tenancy and ownership law have not yet been noticed as a significant barrier, as they have so far been mainly used in detached houses. However, with the further penetration of heat pumps in multi-storey buildings, this might also become an issue in the future (LGWA 2010). The Austrian Energy Strategy only vaguely mentions the necessity of an amendment of tenancy and ownership law guaranteeing a socially balanced improvement of the thermal quality of residential buildings, without directly mentioning RES (BMWFJ / BMLFUW 2010). It is to be seen, if concrete actions follow.

Barrier 3.4 – Other barriers

- The mineral oil industry is carrying through (privately financed) actions on a regular basis, promoting the use of heating systems based on fossil fuels. This counteracts the efforts of public authorities for the introduction of RES and leads to a situation where the use of renewable heating systems is delayed for at least 20 more years in households investing e.g. in a new natural gas or oil heating (Biowärme-Forum Austria 2010; Landwirtschaftskammer Steiermark 2010).

- Energy efficiency policies in Austria are very much focused on the insulation of buildings but tend to leave aside the problem of outdated inefficient heating systems. This approach is for example reflected in the focus set by financial support measures such as the economic stimulus package of 100 Mio. Euro for thermal renovation in 2009. Also the current design of the Energy Performance Certificate for buildings does not take into account the heating system and its CO_2 emissions in a sufficient way.

  Possible options: The Energy Performance Certificate could be expanded by a separate section dedicated to the heating system. It would make sense to include information on the annual efficiency of the heating system as an obligatory and integral part of the Certificate in order to raise the awareness on the energy losses of old heating systems (proPellets Austria 2010).

3.2.2 Best practice elements and indicators:

No.	Technology	Benchmark/comments	Result
3.1		**Is this installation type in normal cases exempted from an authorization procedure (building permit)?**	
	PV rooftop 1-3kW		Yes
	Solar thermal ~9m² collectors	Regulations differ from region to region, but in general no authorisation is necessary for small systems, for larger systems (> 20 m²) some federal states require a simple notification.	Yes
	Geothermal heat pump < 10kW		No

No.	Technology	Benchmark/comments	Result
3.2		**Are legal-administrative requirements adequate for this installation type?**	
	PV rooftop 1-3kW		Positive
	Solar thermal ~9m² collectors		Positive
	Geothermal heat pump < 10kW	Adequate only for liquid-to-water heat pumps as well as direct heat exchangers, as certain risks for ground water exist. For other types of heat pumps requirements are exaggerated.	Average
3.3		**Number of administrations that must be contacted (#)**	
	PV rooftop 1-3kW		1
	Solar thermal ~9m² collectors		0
	Geothermal heat pump < 10kW		1

3.3 Literature

Austria Solar (2010): Austria Solar - Verein zur Förderung der thermischen Solarenergie; Roger Hackstock. Interview in Vienna on 25.02.2010

Beirat für Wirtschafts- und Sozialfragen (2009): Herausforderungen in der Energiepolitik. Weißbuch der österreichischen Sozialpartner (www.arbeiterkammer.at/bilder/d102/WeissbuchEnergiepolitik.pdf)

BGBl. II Nr. 251 (2009): Vereinbarung gemäß Art. 15a. B-VG zwischen Bund und den Ländern über Maßnahmen im Gebäudesektor zum Zweck der Reduktion des Ausstoßes an Treibhausgasen, ausgegeben am 30. Juli 2009

Biowärme-Forum Austria (2010): Biowärme-Forum Austria; Leopold Lasselsberger. Telephone interview on 16.03.2010

BMLFUW (Ed.) (2008): Bundesministerium für Land- und Forstwirtschaft, Umwelt und Wasserwirtschaft; Solarwärme 2020. Eine Technologie- und Umsetzungsroadmap für Österreich (www.aee-intec.at/0uploads/dateien645.pdf)

BMWFJ / BMLFUW (2010): Bundesministerium für Wirtschaft, Familie und Jugend / Bundesministerium für Land- und Forstwirtschaft, Umwelt und Wasserwirtschaft; Eckpunkte der Energiestrategie Österreich (www.energiestrategie.at/images/stories/pdf/PKPapier/eckpunkte_energiestrategie_100311.pdf)

BWP (2010): Bundesverband WärmePumpe Austria. E-mail questionnaire from 11.03.2010

dena (2009): dena Förderübersicht EU-27 REG Wärme, November 2009. Berlin.

Landwirtschaftskammer Steiermark (2010): Landwirtschaftskammer Steiermark; Horst Jauschnegg. Telephone interview on 09.03.2010

LGWA (2010): LGWA – Leistungsgemeinschaft Wärmepumpe Austria; Christine Widmann. Telephone interview on 16.03.2010

Lutz, Gerald (2009): Roadmap Sonnenheizung Österreich 2020. Mit Umgebungswärme zum Ziel (www.bwp.at/documents/20100126_RoadmapSonnenheizungprint.pdf)

ÖGUT (2010): Österreichische Gesellschaft für Umwelt und Technik; Michael Cerveny. Telephone interview on 10.04.2010

proPellets Austria (2010): proPellets Austria - Netzwerk zur Förderung der Verbreitung von Pelletsheizungen; Christian Rakos. E-mail questionnaire from 28.02.2010 & interview in Vienna on 09.04.2010

PV Austria (2010): Bundesverband Photovoltaic Austria; Hans Kronberger. Interview in Vienna on 02.04.2010

4 Issue 4 – Promotion of Energy Efficient Renewable Energy Equipment

4.1 Introduction

Purpose of this chapter is to verify whether the provisions of Art. 13 (6) of the Directive 2009/28/EC concerning the promotion of energy efficient renewable energy equipment in building regulations and codes are fulfilled in Austria. As building regulations and codes are part of the competences of the federal states, in addition to the national legal framework, a number of regulations in the four most populous federal states, encompassing more than 70% of the Austrian population, have been taken into account: Vienna, Lower Austria, Upper Austria and Styria. In addition, several national and regional subsidy schemes for renewable heat have been included in the analysis.

For solar thermal systems, no requirements on the use of certified equipment and systems based on European standards have been found in the legal provisions analysed in addition to those already mentioned in Issue 2. No further conclusions can thus be added. As a consequence, this chapter focuses on heat pumps and biomass systems only.

The following sources have been analysed for this chapter:

- The **agreement between the national and regional governments on energy savings** as well as the **associated regional provisions**: In Austria, small heating systems up to 350 kW, including those using biomass, need to undergo a type approval procedure for getting a permission to be made available on the market. The framework conditions for the type approval procedure, including requirements on minimum degrees of efficiency, are laid down in the mentioned agreement (Vereinbarung Art. 15a B-VG Einsparung von Energie 1995). Detailed provisions are issued by the different federal states (NÖ BTV 1997; Oö. HaBV 2005; Steiermärkisches Feuerungsanlagengesetz 2001; Wiener Kleinfeuerungsgesetz 2005).

- The **agreement between the national and regional governments on the reduction of greenhouse gas emissions** as well as several **regional legislations relevant for the allocation of subsidies in the framework of the "Wohnbauförderung"**: As already explained in Issue 3, no renewable building obligations in the strict sense exist in Austria. Instead, the use of renewable energy systems is promoted indirectly through the so called "Wohnbauförderung" for the construction of new residential buildings as well as for their refurbishment. The mentioned agreement contains framework conditions for the "Wohnbauförderung", including provisions on the use of renewable energy systems, which have to be adopted and further elaborated by the different federal states (Vereinbarung Art. 15a. B-VG Reduktion des Ausstoßes an Treibhausgasen 2009). In addition to the national legal framework, the specific

regional regulations on the allocation of the "Wohnbauförderung" have been analysed (NÖ Wohnungsförderungsrichtlinien 2010; Sanierungsverordnung Wien 2008; Wohnbauförderung Oberösterreich 2010; Wohnbauförderung Steiermark 2010).

- **Environmental subsidies for small heat pumps and biomass systems** - "Betriebliche Umweltförderung im Inland": Even though Art. 13 (6) of the Directive 2009/28/EC does not refer to support schemes, the efficiency levels for heat pumps as well as biomass systems in the national environmental subsidy schemes have also been analysed (Kommunalkredit Public Consulting 2007; UFG 2009).

- Several **regional subsidy schemes supporting small RES systems**: Also the regional subsidy schemes for heat production from RES already examined for Issue 2 have been taken into account for this chapter (Biomasseheizungsanlage – Förderaktion Wien 2008; Biomasseheizanlagenförderung Oberösterreich 2009; Direktförderung für moderne Holzheizungen Steiermark 2010; Förderung für Solar-, Wärmepumpen- und Photovoltaikanlagen Niederösterreich 2010; Förderung von Wärmepumpen Oberösterreich 2010; Ökoförderung Wien 2010; Wohnbauförderung Niederösterreich 2010).

For **small biomass systems** it is rather difficult to say whether the Austrian legal provisions are consistent with the requirements of Art. 13 (6) of the Directive 2009/28/EC, as the wording of the Directive is not very precise. It is for example not clear, whether the values for the conversion efficiency have to be applied to the firing equipment only or to the whole heating system. Another open question is whether the auxiliary energy has to be included into the calculation of the conversion efficiency or not. According to representatives of the Austrian biomass industry, the firing equipment currently sold in Austria has an average conversion efficiency of more than 90% (Biowärme-Forum Austria 2010). The efficiency levels of current systems are thus not being considered a problem, even if the legal requirements partly lag behind. The biomass industry however strongly criticizes the lack of substitution of existing inefficient systems (Landwirtschaftskammer Steiermark 2010; proPellets Austria 2010). According to the Austrian biomass association, there are around 500,000 boilers in use that are older than 20 years (www.biomasseverband.at). Another problem concerns the missing knowledge of installers on the correct installation of the systems (see Issue 6), leading to a situation where the efficiency levels are by far not reached in practice due to fundamental errors in the design of the heating system (ÖGUT 2010).

At the first sight it is difficult to assess whether the efficiency specifications for **heat pumps** fulfil the requirements of Art. 13 (6) of the Directive 2009/28/EC. All the legal provisions analysed contain efficiency requirements for heat pumps. The efficiency standards for the EU Eco-label are expressed in terms of the COP though, while the Austrian legislation almost always refers to the SPF, being considered a better indicator for the efficiency of heat pumps. In addition, Austrian consumers are already used to the SPF and a change towards the COP would certainly need a transition period of at least a decade where both indicators are used in parallel (ÖGUT 2010). The Austrian heat pump industry association BWP states that the efficiency criteria applied in Austria are in general very strict and sufficient (BWP 2010).

4.2 Description of barriers & solutions

4.2.1 Detailed description of the barriers and solutions

Barrier 4.1 – Non-compliant building regulations/codes and promotion schemes

Even though the provisions of Art. 13 (6) of the Directive 2009/28/EC are not yet completely implemented in Austria, the efficiency requirements in building regulations and codes as well as promotion schemes are in general considered as being sufficient.

- It is rather difficult to assess whether the efficiency requirements for **biomass** set by the Directive are met. The efficiency requirements in the Austrian legal provisions are very detailed and normally differentiate between one or several of the following characteristics: nominal power, full/part load, manual/automatic loading, usage as space heater & stove, for hot water or as central heating. In general, efficiency requirements are quite high, although in some cases they are below the 85% required by the Directive (Biomasseheizungsanlage – Förderaktion Wien 2008; Biomasseheiz-anlagenförderung Oberösterreich 2009; Direktförderung für moderne Holzheizungen Steiermark 2010; NÖ BTV 1997; NÖ Wohnungsförderungsrichtlinien 2010; Oö. HaBV 2005; Sanierungsverordnung Wien 2008; Steiermärkisches Feuerungsanlagen-gesetz 2001; Vereinbarung Art. 15a B-VG Einsparung von Energie 1995; Wiener Kleinfeuerungsgesetz 2005; Wohnbauförderung Niederösterreich 2010; Wohnbau-förderung Oberösterreich 2010; Wohnbauförderung Steiermark 2010). The low efficiency requirements in legal provisions are only a theoretical problem though, as according to representatives of the Austrian biomass industry, the firing equipment currently sold in Austria has an average conversion efficiency of more than 90% and the provisions are thus in general exceeded (Biowärme-Forum Austria 2010; ÖGUT 2010; proPellets Austria 2010).

- For **heat pumps**, all legal provisions analysed in general ask for a SPF of at least 4 for heat pumps used for heating purposes. Only in exceptional cases, e.g. for the use in passive houses or for air-source heat pumps, smaller SPF values are accepted. In addition, most provisions ask for a combination with solar thermal systems if possible, in the case of the "Wohnbauförderung" in Upper Austria a combination with a solar thermal or PV system or the provision with electricity from RES is a mandatory condition (NÖ Wohnungsförderungsrichtlinien 2010; Sanierungs-verordnung Wien 2008; Vereinbarung Art. 15a. B-VG Reduktion des Ausstoßes an Treibhausgasen 2009; Wohnbauförderung Oberösterreich 2010; Wohnbauförderung Steiermark 2010). The obligation to combine heat pumps with solar thermal systems is criticised as being too far-reaching by the heat pump sector. Its representatives argue that the increase in efficiency is too marginal to justify the higher costs for the customers (BWP 2010). The national environmental subsidies require a minimum COP of 4.0 for water and brine-to-water heat pumps, resp. a minimum COP of 3.5 for air-to-water heat pumps (Kommunalkredit Public Consulting 2007; UFG 2009). This is in line with the requirements of Art. 13 (6) of the Directive 2009/28/EC. The Austrian heat pump association BWP even criticises that in some cases the efficiency requirements are almost not reachable, e.g. a SPF of 4 for air-to-water heat pumps (BWP 2010).

Barrier 4.2 – Lack of substitution of existing inefficient systems

- Austria has a long tradition of the use of **biomass heating systems**. This leads to a situation where a large number of outdated inefficient systems are still in use today. From an efficiency point of view, as well as regarding air pollution control, this situation can be considered a real problem in Austria. The different promotion schemes make energy efficiency requirements a condition but this is not considered a sufficient incentive for the replacement of old biomass heating systems by representatives of the biomass industry. They ask for more political engagement in this field (Landwirtschaftskammer Steiermark 2010; proPellets Austria 2010).
  Possible options: The industry association proPellets Austria proposes to introduce regulative measures aiming at an accelerated substitution of old systems by new efficient ones (proPellets Austria 2010).

- For **heat pumps**, this is not considered a real barrier in Austria. The heat pump sector would however very much welcome the general introduction of the EHPA Quality label as a precondition for supporting heat pumps in all federal states, as this is considered a good guarantee for the installation of heat pumps with high efficiency levels (BWP 2010).

Barrier 4.3 – Assessment of conversion efficiency and input/output ratio not according to EU standards

This is not considered a barrier in Austria.

- The conversion efficiency and input/output ratio for **biomass boilers** is calculated according to the direct method that is common all across Europe: output divided by input multiplied by 100 makes the conversion efficiency in percent (Biowärme-Forum Austria 2010).

- The efficiency level of **heat pumps** in legal provisions in Austria is in most cases indicated as SPF value and not as COP, as is the case for the EU Eco-label or the EHPA Quality label. It is a moot question however, whether this is a real barrier, as the SPF is widely considered a better indicator for the efficiency of heat pumps.

Barrier 4.4 – Insufficient information on efficiency levels of RES equipment provided

This is not considered a barrier in Austria.

- Efficiency levels of **biomass boilers** produced in Austria are in general very high. This is known by politicians as well as the general public. Insufficient information on efficiency levels is thus not considered to be an issue (Landwirtschaftskammer Steiermark 2010).

- Also for **heat pumps**, this is not considered a barrier in Austria (BWP 2010).

Barrier 4.5 – Other barriers

- Stakeholders of the **biomass** industry mentioned problems concerning the type-approval procedure that is mandatory for small systems up to 400 kW in order to be eligible for distribution in Austria. In the framework of the type-approval procedure, the compliance with the efficiency requirements laid down in the national and federal

legal provisions is checked. There is a certain problem though due to foreign systems being distributed in building supplies stores that do not meet the efficiency requirements and thus should normally not be allowed in Austria. The mayors, being responsible for checking whether the boilers installed are compliant with Austrian law, have difficulties in meeting their obligations as controlling body (Biowärme-Forum Austria 2010, Landwirtschaftskammer Steiermark 2010).
Possible options: The establishment of standardised lists with all authorized biomass boilers could help the municipalities in better fulfilling their controlling obligations (Biowärme-Forum Austria 2010).

- The problem of inefficient **biomass systems** entering the Austrian market is in addition aggravated through the possibility of buying certificates from accredited laboratories e.g. in the Czech Republic, Poland and Italy, wrongly stating the compliance with the efficiency levels required in Austria. This is for example well-known where pellet stoves are concerned. While this can of course be considered a problem from an efficiency and air pollution control point of view, the damage caused by the distribution of inefficient systems goes even further. The so-called "black sheep" damage the image of the biomass sector as a whole and give proponents of extensive air pollution control good arguments for their cause (ÖGUT 2010; proPellets Austria 2010).
  Possible options: The responsible authorities should take action, banning the illegal systems from the building supplies stores (ÖGUT 2010).

4.2.2 Best practice elements and indicators

No.	Benchmark	Result
4.1	Are the requirements of Art 13 (6) of the Directive concerning the promotion of efficient bioheat and heat pumps fulfilled?	No

4.3 Literature

Biomasseheizungsanlage – Förderaktion Wien (2008): Förderrichtlinien Biomasseheizung (www.wien.gv.at/wohnen/wohnbaufoerderung/ahs-info/pdf/info-biomasse.pdf)

Biomasseheizanlagenförderung Oberösterreich (2009): Einzelbetriebliche Biomasseheizanlagenförderung einschließlich Impulsförderung (www.ooe.gv.at/cps/rde/xchg/SID-674F4957-B3DA4621/ooe/hs.xsl/biomasseheizanlagenfoerderung_DEU_HTML.htm#Sub%20Einbau%20einzelbetr.%20Hackgut-,%20Pellets-,%20Scheitholzfeuerung)

Biowärme-Forum Austria (2010): Biowärme-Forum Austria; Leopold Lasselsberger. Telephone interview on 16.03.2010

BWP (2010): Bundesverband WärmePumpe Austria. E-mail questionnaire from 11.03.2010

Direktförderung für moderne Holzheizungen Steiermark (2010): Richtlinie für die Direktförderung von modernen Holzheizungen (www.verwaltung.steiermark.at/cms/dokumente/10098196_2628408/3453e628/RL%20Biomasse%202010.pdf)

Förderung für Solar-, Wärmepumpen- und Photovoltaikanlagen Niederösterreich (2010): NÖ Wohnungsförderungsrichtlinien 2005 (www.noe.gv.at/bilder/d8/Richtlinien2005UndBeilagen.pdf)

Förderung von Wärmepumpen Oberösterreich (2010): Wärmepumpen bis 400 kW thermische Leistung (www.land-oberoesterreich.gv.at/cps/rde/xchg/SID-B268F5F9-1A0DB7A6/ooe/hs.xsl/89740_DEU_HTML.htm)

Kommunalkredit Public Consulting (2007): Auszahlungsbedingungen und Technische Auflagen (www.public-consulting.at/uploads/mustervertrag_ufi.zip)

Landwirtschaftskammer Steiermark (2010): Landwirtschaftskammer Steiermark; Horst Jauschnegg. Telephone interview on 09.03.2010

NÖ BTV (1997): NÖ Bautechnikverordnung 1997

NÖ Wohnungsförderungsrichtlinien (2010): Niederösterreichische Wohnungsförderungsrichtlinie 2005 (www.noe.gv.at/bilder/d8/Richtlinien2005UndBeilagen.pdf)

ÖGUT (2010): Österreichische Gesellschaft für Umwelt und Technik; Michael Cerveny. Telephone interview on 10.04.2010

Ökoförderung Wien (2010): Ökoförderung - Umstellung einer bestehenden Heizung auf Wärmepumpe in einem Eigenheim, Kleingartenwohnhaus oder Reihenhaus (www.wien.gv.at/wohnen/wohnbautechnik/ahs-info/pdf/waermepumpe-wp-solar-san.pdf)

Oö. HaBV (2005): Verordnung der Oö. Landesregierung über Sicherheits- und Umweltschutzvorschriften für Heizungsanlagen für feste und flüssige Brennstoffe sowie für die Verwendung und Lagerung fester und flüssiger Brennstoffe sowie sonstiger brennbarer Flüssigkeiten, LGBl. Nr. 7/2006

proPellets Austria (2010): proPellets Austria - Netzwerk zur Förderung der Verbreitung von Pelletsheizungen; Christian Rakos. E-mail questionnaire from 28.02.2010 & interview in Vienna on 09.04.2010

Sanierungsverordnung Wien (2008): Verordnung der Wiener Landesregierung über die Gewährung von Förderungen im Rahmen des II. Hauptstückes des Wiener Wohnbauförderungs- und Wohnhaussanierungsgesetzes – WWFSG 1989, LGBl. Nr. 02/2009

Steiermärkisches Feuerungsanlagengesetz (2001): Gesetz vom 12. Juni 2001 über das Inverkehrbringen, die Errichtung und den Betrieb von Feuerungsanlagen, LGBl. Nr. 73/2001

UFG (2009): Umweltförderungsgesetz. Bundesgesetzblatt Nr. 185/1993 vom 16. März 1993 in der Fassung des Bundesgesetzblattes I Nr. 52/2009 vom 17. Juni 2009

Vereinbarung Art. 15a B-VG Einsparung von Energie (1995): Vereinbarung zwischen dem Bund und den Ländern gemäß Art. 15a B-VG über die Einsparung von Energie, BGBl. II Nr. 388/1995

Vereinbarung Art. 15a. B-VG Reduktion des Ausstoßes an Treibhausgasen (2009): Vereinbarung gemäß Art. 15a. B-VG zwischen dem Bund und den Ländern über Maßnahmen im Gebäudesektor zum Zweck der Reduktion des Ausstoßes an Treibhausgasen, BGBl. II Nr. 251/2009

Wiener Kleinfeuerungsgesetz (2005): Gesetz über das In-Verkehr-Bringen von Kleinfeuerungen. LGBl. Nr. 43/2005

Wohnbauförderung Niederösterreich (2010): Förderung von Heizungsanlagen mit fester Biomasse oder Fernwärmeanschluss (www.noe.gv.at/Bauen-Wohnen/Heizen-Energie/Biomasseheizung-und-Fernwaermeanschluss-Foerderung.html)

Wohnbauförderung Oberösterreich (2010): Wohnbauförderung für die Errichtung eines Eigenheims (www.land-oberoesterreich.gv.at/cps/rde/xchg/SID-3DCFCFC3-F2F7CB0E/ooe/hs.xsl/34819_DEU_HTML.htm)

Wohnbauförderung Steiermark (2010): Die ökologische Wohnbauförderung II. Richtlinien gültig ab 01.04.2009, Stand 02.02.2010 (www.verwaltung.steiermark.at/cms/dokumente/10005006/7d4f5b16/oekori.pdf)

Websites:

www.biomasseverband.at

5 Issue 5 Information/Awareness Raising

5.1 Introduction

Information on support measures is in general provided in a well-structured and easily accessible way (Austria Solar 2010a; IGW 2010). Especially the databases on the websites of the solar thermal, photovoltaic and heat pump industry association give a good comprehensive overview of national and regional subsidies: www.solarwaerme.at, www.pvaustria.at, www.bwp.at (BWP 2010; LGWA 2010).

On the whole, **information and awareness levels** of the general public on renewable energy sources are quite high in Austria in European comparison. At the same time, a certain short-sightedness concerning the assessment of the energy price development and the availability of fossil fuels as well as the potential of renewable energy sources prevails. This is true for the general public as well as for political decision makers and can be considered a serious barrier for further renewable energy development in Austria (ÖGUT 2010; PV Austria 2010).

According to some RES associations, **public budgets** for campaigns and other information measures are in general provided in a sufficient way from national as well as regional governments. For certain target groups acting as disseminators, the distribution of more specific information would be helpful (Austria Solar 2010a; IGW 2010; KÖ 2010). Proponents of some technologies such as photovoltaic systems, the heat pump sector, deep geothermal energy or the bioenergy sector see a larger need for more public engagement (ARGE Kompost & Biogas 2010; BWP 2010; LGWA 2010; proPellets Austria 2010; PV Austria 2010). Taking the klima:aktiv programme for solar thermal systems, biomass systems and heat pumps as an example, the funds for the new edition have just been cut down to 100,000 Euro per technology, amounting to a third of the budget of the predecessor programme. With such small sums of money no actions with large impact can be carried through (proPellets Austria 2010). PV systems are not included in the klima:aktiv programme at all, neither are there other public information and awareness raising initiatives for this technology (PV Austria 2010).

Especially **solar thermal systems** have a very positive image in Austria. Campaigns for solar thermal systems have a long tradition on a national as well as on a regional level. The lack of campaigns thus is not really an issue. Some federal states could show more engagement though, as not all have started solar campaigns yet or have carried through campaigns with rather bad quality (Austria Solar 2010a; BMLFUW 2008). Some examples of campaigns are enlisted below.

- **„Clever ones heat with the sun!“ (Schlaue heizen mit der Sonne!)**
  The campaign has been started by the Ministry of the Environment, the Climate Fund and Austria Solar in February 2010 and will last until May. Information on solar thermal systems for hot water and heating are spread through TV, radio, newspapers and information brochures. In addition, a hotline gives interested people the possibility to get personal advice from solar experts. The campaign costs 550,000 Euros and is funded jointly by the Climate Fund and Austria Solar (Austria Solar 2010b; Kurier 2010; www.solarwaerme.at 2010).

- **“Climate:active solar heat” (klima:aktiv solarwärme)**
  www.klimaaktiv.at
  The largest solar campaign in Austria has been the initiative “klima:aktiv solarwärme” started by the Ministry of the Environment in 2004. The national programme led by AEE INTEC in cooperation with arsenal research (now AIT) and Austria Solar has been concluded in 2009. The financial means for the programme have been provided by the Ministry of the Environment and Austria Solar. The programme triggered investments of over 100 million Euros and reached a large number of people through brochures, folders, information events and booths, a hotline and press reports (www.solarwaerme.at 2010).

- **“Day of the sun” (Tag der Sonne)**
  www.solarwaerme.at/Aktionstag/
  The European Solar Days that were joined by 16 countries in 2009 have their roots in Austria, where the first “Day of the sun” took place in 2002. In 2009, 434 municipalities, companies, schools, kindergartens and information centres participated, around 40,000 people have been reached through the actions coordinated by the industry association Austria Solar in cooperation with the initiative klima:aktiv of the Ministry of the Environment, the Austrian Climate Alliance (Klimabündnis Österreich), the Environmental Consulting (Umweltberatung), regional energy agencies, utility companies and the regional guilds of installers. The organised actions are manifold: information desks, lectures, free solar advice, installation and inauguration of solar systems, open days in solar companies etc. The day of the sun in 2009 has found broad media coverage with around 550 press reports and a radio spot (Austria Solar 2009; www.solarwaerme.at 2010).

- **Regional campaigns**
  Numerous solar campaigns have also been carried through on a regional level. In 2003, the state of Carinthia started the first big campaign for solar thermal systems in Austria. Two years later, six further states followed the example with their own campaigns, a seventh one started in 2006 (www.solarwaerme.at 2010).

5.2 Description of barriers & solutions

5.2.1 Detailed description of the barriers and solutions

Barrier 5.1 – Insufficient availability of information on support measures:

- According to the **heat pump** industry associations, information on support measures is not provided in a very consumer-friendly way by the responsible authorities in the different federal states. The legal sources are difficult to find, the information on the websites is often incomplete, outdated and rather complicated, additional information can only be obtained by phone but at the same time the helpdesks are not always qualified to answer (BWP 2010; LGWA 2010).

Barrier 5.2 – Insufficient public funding for campaigns/programmes:

- Whereas the federal governments in Tyrol and Styria already supplied large amounts of public funding for perennial campaigns, some federal states, such as Burgenland, Vienna or Upper Austria, have not provided any funding for **solar thermal** campaigns yet. This does not necessarily coincide with a small number of installations, as the Upper Austrian example shows. In this number one solar thermal region in Austria, the companies have taken over the role of the main information providers. Nevertheless, additional public engagement could be helpful (Austria Solar 2010a).

- According to the Austrian **photovoltaic** industry association, no public funding is provided for information and awareness raising measures for PV. All campaigns are funded by the PV industry that can count on the very active support of the media (PV Austria 2010).

- The **heat pump** associations criticise that not enough public funding is made available for campaigns for the broader public but also for installers, where an even higher need for action exists (BWP 2010; LGWA 2010).

- In the field of **deep geothermal energy** a substantial lack of awareness on the side of political decision makers as well as the general public exists. Direct public funding for information measures is not made available (TU Graz 2010).

Barrier 5.3 – Insufficient campaign-/programme-design:

- Depending on the support and engagement of the federal government, regional **solar thermal** campaigns have not always been designed in a very efficient way. Good practice examples are the campaigns in Tyrol and Styria that lasted several years, or the campaign in Carinthia in 2003. In the Burgenland region, no solar campaign has been carried through yet; the campaign in Salzburg tackled all RES but did not focus on solar thermal systems (Austria Solar 2010a).
  Possible options: Further steps could include more target-oriented campaigns for people acting as disseminators, such as installers. In addition, the introduction of legal provisions favouring RES development should be accompanied by media work stressing the advantages for the national economy (BMLFUW 2008).

- Public funds for campaigns sometimes are not used in a very efficient way, as the example of a campaign for **PV systems** in 2009 shows. The Ministry of the environment published advertisements in newspapers for several weeks, promoting the technology and announcing a subsidy programme for small systems with less than 5 kW. The available funds of the subsidy scheme were used up less than one hour after its opening, thus questioning the sense of a far-reaching promotion campaign in advance (Landwirtschaftskammer Steiermark 2010).

- Even though the Austrian public has in general a rather positive attitude towards **small hydro power**, ecological interest groups show a certain tendency to cast a damning light on further hydro power development. The small hydro power association thus sees a need for information campaigns directed at the broad public showing that hydro power and ecologic interests do not exclude one another (KÖ 2010).

- The **small hydro power** association Kleinwasserkraft Österreich sees a lack of information for plant operators on the requirements they have to fulfil in consequence of the European Water Framework Directive. In addition to the prescribed ecological measures the reconstruction works could also be taken as an opportunity for technical adaptations leading to higher yields (KÖ 2009b; KÖ 2010). **Possible options:** Kleinwasserkraft Österreich suggests the provision of profound consulting services for plant operators on this issue (KÖ 2010).

- In the domain of **biomass systems**, not enough specific information is made available for architects, as the level of awareness of RES in this profession is still quite low (Landwirtschaftskammer Steiermark 2010).

- In general, the initiation of further campaigns on **biomass systems** for the broader public would be welcomed but at the same time the authorities are rather hesitant. As authorities such as the Landwirtschaftskammer Steiermark are in parallel responsible for the processing of support schemes and know that only limited funds are available, they do not dare to start far-reaching campaigns initiating a strong demand of subsidies they then cannot provide (Landwirtschaftskammer Steiermark 2010).

- The **biogas** sector still sees a substantial lack of information on the side of the broad public (ARGE Kompost & Biogas 2010). The advantages of sustainable biogas production as well as new technologies of biogas utilisation are considered as not being enough promoted (HEI 2010).

- Also on the side of the **biogas** plant operators a lack of information has been noted. A lot of biogas plants are operated in a rather inefficient way and certain arising problems can clearly be attributed to missing knowledge and expertise. This is mainly the case in the following areas: storage of substrata/digestates (see also Issue 1), biological optimization, capacity utilisation, use of the post-fermenter and use of the produced heat. There is thus a high need of qualified counselling for plant operators (tatwort / HEI 2008).

- The **heat pump** association BWP considers the information campaign klima:aktiv as inefficient due to the lack of information provision for consumers (BWP 2010).

Barrier 5.4 – Other barriers:

- A certain short-sightedness concerning the assessment of the energy price development, the availability of fossil fuels and the future potential of renewable energy sources prevails among the general public as well as political decision makers and interest groups such as the social partners. This translates into different barriers for the use of renewable energy sources e.g. in residential and public buildings (see Issue 3) as decisions are mainly taken on a short-term cost basis instead of following long-term considerations.

  Possible options: It might be helpful if the European Commission made a clear statement on its assessment on future energy prices and the availability of fossil fuels. As a consequence, interest groups acting against the further development of renewable energy sources, such as the Austrian Chamber of Labour, the Austrian Federal Economic Chamber or the Federation of Austrian Industries would lose ground for their current cost-related arguments based on very moderate future energy price assessments. Also the general public would be less reluctant towards investments into renewable energy equipment even without broad accompanying support measures (ÖGUT 2010; PV Austria 2010).

5.2.2 Best practice elements and indicators

No.	Benchmark	Result
5.1	Is sufficient information on support measures available?	Positive

5.3 Literature

ARGE Kompost & Biogas (2010): ARGE Kompost & Biogas Österreich; Franz Kirchmeyr. Interview in Vienna on 10.03.2010

Austria Solar (2009): Europäischer Tag der Sonne 15./16. Mai 2009. Ergebnisbericht (www.solarwaerme.at/libs/TDS_fuer_Roger/TDSBericht2009.LoRes.RGB.pdf)

Austria Solar (2010a): Austria Solar - Verein zur Förderung der thermischen Solarenergie; Roger Hackstock. Interview in Vienna on 25.02.2010

Austria Solar (2010b): Start der Infokampagne zu den Vorteilen der Solarwärme (www.ots.at/presseaussendung/OTS_20100218_OTS0107/start-der-infokampagne-zu-den-vorteilen-der-solarwaerme-bild/channel/wirtschaft)

BWP (2010): Bundesverband WärmePumpe Austria. E-mail questionnaire from 11.03.2010

HEI (2010): HEI Eco Technology GmbH; Vitaliy Kryvoruchko. E-mail from 04.05.2010.

IGW (2010): Interessengemeinschaft Windkraft Österreich; Ursula Nährer. Telephone interview on 09.03.2010

KÖ (2010): Kleinwasserkraft Österreich; Martina Prechtl. Telephone interview on 17.03.2010

Kurier (2010): Berlakovich pusht Kollektoren-Verkauf (kurier.at/wirtschaft/1978886.php)

Landwirtschaftskammer Steiermark (2010): Landwirtschaftskammer Steiermark; Horst Jauschnegg. Telephone interview on 09.03.2010

LGWA (2010): LGWA – Leistungsgemeinschaft Wärmepumpe Austria; Christine Widmann. Telephone interview on 16.03.2010

ÖGUT (2010): Österreichische Gesellschaft für Umwelt und Technik; Michael Cerveny. Telephone interview on 10.04.2010

proPellets Austria (2010): proPellets Austria - Netzwerk zur Förderung der Verbreitung von Pelletsheizungen; Christian Rakos. E-mail questionnaire from 28.02.2010 & interview in Vienna on 09.04.2010

PV Austria (2010): Bundesverband Photovoltaic Austria; Hans Kronberger. Interview in Vienna on 02.04.2010

tatwort / HEI (2008): tatwort – Gesellschaft für Kommunikation und Projektmanagement / HEI Eco Technology GmbH: Biogas Branchenmonitor Endbericht 2008. Erhebung von Wirtschaftsdaten und Trends zu Biogas in Österreich, im Auftrag des BMVIT, Wien.

TU Graz (2010): Technische Universität Graz, Institut für angewandte Geowissenschaften; Johann Goldbrunner. Telephone interview on 16.04.2010

Websites:
www.pvaustria.at
www.solarwaerme.at

6 Issue 6 Qualification/certification of installers

6.1 Introduction

Even if the general qualification level of installers in Austria can be considered being rather good in European comparison, problems exist. Bad quality installations are thus not a specific problem for the renewable energy sector but also concern other domains (ÖGUT 2010). Where renewables are concerned, the most severe problems in relation to the installation have been identified in the biomass and heat pump sector but also the installation of solar thermal and PV systems does not always run as smoothly as desired. In addition to further efforts in the areas of qualification and certification, monitoring projects could be an efficient tool for initiating a learning process (proPellets Austria 2010). Weak knowledge on the combination of different technologies as well as a lack of knowledge and competence on larger systems frequently leads to bad quality installations (AIT 2010).

Certification for installers of renewable energy systems in Austria is mainly carried through by the Austrian Institute of Technology (AIT), a certification body accredited under European law. The training as "Solarteur" which has its origin in Austria and is now offered in a number of countries around the world has practically no significance in its country of origin (Austria Solar 2010). Furthermore, the Solarteur-training is only certified according to the ISPQ training accreditation but not according to EN 17024. In brief, there are no substantial problems where training or certification possibilities are concerned. In the fields of PV, solar thermal energy and heat pumps, training and certification for installers is already offered in compliance with the requirements of the Directive 2009/28/EC. The only exception exists in the domain of biomass where installers cannot get certification yet. Almost all interviewees agreed though, that renewable energy systems are not yet considered in a sufficient way for vocational training, mainly due to resistance from the professional guilds as well as the Austrian Federal Economic Chamber. Substantial efforts in this field still have to be made. In the framework of the project "RETRAIN - Training Network Renewable and Energy Efficiency Technologies in Buildings" the existing trainings are currently evaluated and adapted (AIT 2010). This can be regarded as a good step forward.

For **solar thermal systems**, training by experts from AEE INTEC, Austria Solar and AIT with the possibility of certification by AIT exists for installers ("Zertifizierter Solarwärmeinstallateur") as well as for planners ("Zertifizierter Solarwärmeplaner") since 2004. According to Austria Solar, the training can be considered as best practice in Europe. With 4 to 5 courses per year, sufficient training possibilities exist. The list of certified installers and planners is available online. Austria Solar states that around 90% of solar thermal systems installed in Austria are of good quality, which proofs the success

of the certification system. The certification is well-known amongst installers; the level of information of the broad public could still be improved. Concerning guarantee and maintenance, the voluntary cachet "Austria-Solar Gütesiegel" provides for one of the highest quality levels of solar thermal installations in Europe. The cachet initiated in 2003 by Austria Solar, AIT and ASIC gives a minimum guarantee of 10 years for collectors and 5 years for storages. In addition, the maintenance contracts are checked by Austria Solar. About two thirds of the solar thermal systems sold in Austria carry the cachet (Austria Solar 2010; www.arsenal.ac.at 2010; www.solarwaerme.at 2010).

Also for **photovoltaic systems** training and certification is offered by AIT, similar to the one for solar thermal systems described above. The current further training possibilities are considered as being sufficient by the Austrian PV industry association. It sees however a lack of anticipation, as the policies in education and training do not take into account an expected stronger future PV development. If installers are to be prepared for further PV growth, strong efforts still have to be made. Severe problems concerning guarantee, warrantee and maintenance are not known (PV Austria 2010; www.arsenal.ac.at).

Certain efforts in the domain of training for installers as well as chimneysweepers for **biomass systems** have already been made. In cooperation with the professional guilds and the chamber of commerce, the Austrian biomass association offers three-day trainings for installers and chimneysweepers with theoretical as well as practical elements since about a decade, but these do not lead to accredited certification (Biowärme-Forum Austria 2010; www.biomasseverband.at 2010). Biomass boiler producers have quite efficient training programmes for their partner installers, in some cases with theoretical and practical training lasting more than 2 weeks (ÖGUT 2010). More emphasis still needs to be put on vocational training. Even if the situation has improved during the last years, with more and more vocational schools offering formation on biomass systems (Biowärme-Forum Austria 2010), the situation is not considered to be satisfactory by large parts of the biomass industry (Landwirtschaftskammer Steiermark 2010; proPellets Austria 2010).

For installers of **heat pumps**, qualification and certification possibilities are similar as for solar thermal systems and also offered by AIT. The training possibilities are considered as sufficient in number as well as in quality. According to the industry associations, the certification scheme is well-known by the installers and the consumers. Nevertheless, the number of qualified (and certified) installers is seen as far too low, also due to severe deficits in the field of vocational training. No substantial problems are known concerning the guarantee/warrantee/maintenance scheme (BWP 2010; LGWA 2010; www.lgwa.at 2010). Guarantee provisions as laid down in the regulations of the EHPA quality label are considered to be sufficient (LGWA 2010).

6.2 Description of barriers & solutions

6.2.1 Detailed description of the barriers and solutions

Barrier 6.1 - Lack of a certification body/scheme:

- In the **biomass** sector, no accredited certification scheme exists. The Austrian biomass association offers training courses only leading to an unofficial certification awarded to the company that can be obtained without having to pass an examination: "Certified biomass installer" and "Certified biomass chimneysweeper". The introduction of an accredited certification scheme similar to the ones available for the other RES technologies would be welcomed by the biomass industry (Biowärme-Forum Austria 2010; proPellets Austria 2010).

Barrier 6.2 - Lack of communication/information on certification:

- So far, the eligibility criteria for the different public support measures for renewable energy sources in general do not impose conditions on the qualification of installers. This partly explains that the percentage of installers not only attending the courses but also undergoing certification is quite low and only amounts to 10%. Another problem is that the awareness level of installers is not yet considered as sufficient. AIT has plans however to put more emphasis on communication towards installers as well as the general public (AIT 2010).

- The employment office, as well as some federal states, offer financial support for installers who want to undergo training and certification on renewable energy technologies. What is missing though is a targeted initiative aiming at the training of unemployed installers in order to give them the possibility to become active in the growing renewable energy sector (AIT 2010).

- The certification for **solar thermal systems** is in general well-known amongst installers. However, the level of information of the broad public cannot be considered as sufficient yet.
  Possible options: Broad information campaigns targeted at consumers could help raising the degree of awareness of people potentially interested in investing in solar thermal systems. This issue is already tackled by the recently launched national information campaign "Clever ones heat with the sun!", which has the communication of the certification as one of its major targets (for more information see chapter 5) (Austria Solar 2010).

- The **biomass** industry sees a certain lack of information on the side of the installers, expressed in decreasing participants of the training courses. It would thus welcome more campaigns directed at this target group, as they serve as multipliers (Biowärme-Forum Austria 2010). The decreasing participation rate cannot be reduced to missing information though. An important factor lies in the entirely voluntary qualification scheme not leading to official certification and a general resistance of installers towards advanced training (proPellets Austria 2010).

Barrier 6.3 - Lack of sufficient training possibilities:

- While the existing training possibilities are sufficient for the current small **photovoltaic** market in Austria, a missing medium- to long-term strategy is criticised by the PV industry association. A stronger future PV development is not reflected in the policies on education and training. A lack of qualified installers is to be expected in case that no efforts are made in this domain (PV Austria 2010). The situation in the **solar thermal** sector is similar (AIT 2010).

- Despite of certain efforts in the training sector, e.g. by the Austrian **biomass** association, the qualification level of installers is considered as being too low by the industry association proPellets Austria, as the large majority of installers does not possess the necessary knowledge to install efficient biomass heating systems. **Possible options:** proPellets Austria suggests a systematic programme aiming at the improvement of the qualification level of installers. The Ministry of the Environment has expressed a certain willingness to action in the framework of the program klima:aktiv but so far no concrete initiatives have been taken (proPellets Austria 2010).

- In the field of **heat pumps**, training and certification possibilities only exist for installers but not yet for planners. The latter are of growing importance though, as heat pumps are also becoming a more widely-used option for multi-storey buildings (LGWA 2010). According to AIT, the idea of offering trainings for installers of heat pumps in multi-storey buildings, hotels and industrial buildings is already under consideration (AIT 2010).

Barrier 6.4 - Renewable energies not sufficiently covered by vocational training:

- According to representatives of the different RES technologies, the current situation in the field of vocational training is by far not satisfactory (BWP 2010; Landwirtschaftskammer Steiermark 2010; LGWA 2010; PV Austria 2010). The training regulations for the vocational training for plumbing and building technicians contain a "voluntary specialisation module eco-energy technology", covering all RES technologies for small-scale renewable heating systems. The regulations for the formation as electrician mention basic knowledge on PV and heat pumps as one of the educational goals. In the training regulations of other professions such as chimneysweepers or roofers, RES are not mentioned (www.bmwfj.gv.at 2010). Even though the voluntary specialisation module eco-energy for plumbing and building technicians can be considered a first positive step, the RES industry would like to see basic training on renewable energy sources to become an integral and compulsory part of the vocational training of all concerned professions (BWP 2010; Landwirtschaftskammer Steiermark 2010; LGWA 2010; PV Austria 2010). At the moment, due to the voluntariness, the module on eco-energy is not offered in all vocational schools across the country. In addition, it cannot be completed as additional education by installers that have already accomplished their vocational training (BWP 2010; LGWA 2010). For chimney sweepers some vocational schools already offer modules on biomass heating (Biowärme-Forum Austria 2010).

- A large number of installers and electricians offer a broad variety of RES technologies to their customers. The weak knowledge on the combination of different technologies frequently leads to bad quality installations.
  Possible options: AIT suggests introducing modules on the combined use of different RES technologies in the vocational training of the concerned professional guilds (AIT 2010).

- Due to the predominance of small RES systems in Austria, a lack of knowledge and competence on larger systems exists. A broader use of the latter should be initiated though.
  Possible options: According to AIT, vocational training should impart knowledge on the installation, the quality assurance as well as on the monitoring of large RES systems (AIT 2010).

- Today, no certified "train-the-trainer" education in the field of **heat pumps** exists for vocational school teachers. This was part of the klima:aktiv programme of the Ministry of the Environment during the last four years, together with an educational programme for energy consultants. As public financial assistance for those trainings is no longer available, AIT has stopped the courses which cannot be offered in a profitable way (BWP 2010; LGWA 2010).
  Possible options: AIT is thinking of starting a new imitative as a reaction to the Directive 2009/28/EC, aiming at the formation of multipliers in order to satisfy the rising demand of qualified installers. In collaboration with the Federal Academy of Cooperative Education (Bundesberufsakademie) they would like to initiate a broad educational programme for the formation of trainers for vocational school teachers in the domain of heat pumps and the other RES technologies (AIT 2010).

Barrier 6.5 - Problems with the guarantee/warrantee/maintenance regime:

- No substantial problems concerning the guarantee/warrantee/maintenance regime exist in the field of **biomass**, as the manufacturers in general offer service contracts. Roughly estimated, only around one fourth to one third of biomass heating owners concludes maintenance contracts though. It would be desirable if it were more (Biowärme-Forum Austria 2010; Landwirtschaftskammer Steiermark 2010; proPellets Austria 2010).

6.2.2 Best practice elements and indicators

No.	Technology	Benchmark/comments	Result
6.1		**Are certification schemes or equivalent qualification schemes available for installers?**	
	PV		Yes
	Solar thermal		Yes
	Heat pumps		Yes
	Biomass boilers	Training exists but not leading to an officially recognised certification by an accredited body.	No
6.2		**Is sufficient training on RES provided during the standard education curriculum of installers?**	

No.	Technology	Benchmark/comments	Result
	PV		Negative
	Solar thermal		Negative
	Heat pumps		Negative
	Biomass boilers		Negative
6.3		**Number of certified installers.**	
	PV		ca. 40
	Solar thermal		ca.180
	Heat pumps		ca.100
	Biomass boilers	Ca. 1.000 installers & ca. 390 chimneysweepers carrying the inofficial certification of the biomass association.	0

6.3 Literature

AIT (2010): Austrian Institute of Technology; Heinrich Huber / Gundula Tschernigg. Interview in Vienna on 30.03.2010

Austria Solar (2010): Austria Solar - Verein zur Förderung der thermischen Solarenergie; Roger Hackstock. Interview in Vienna on 25.02.2010

Biowärme-Forum Austria (2010): Biowärme-Forum Austria; Leopold Lasselsberger. Telephone interview on 16.03.2010

BWP (2010): Bundesverband WärmePumpe Austria. E-mail questionnaire from 11.03.2010

Landwirtschaftskammer Steiermark (2010): Landwirtschaftskammer Steiermark; Horst Jauschnegg. Telephone interview on 09.03.2010

LGWA (2010): LGWA – Leistungsgemeinschaft Wärmepumpe Austria; Christine Widmann. Telephone interview on 16.03.2010

ÖGUT (2010): Österreichische Gesellschaft für Umwelt und Technik; Michael Cerveny. Telephone interview on 10.04.2010

proPellets Austria (2010): proPellets Austria - Netzwerk zur Förderung der Verbreitung von Pelletsheizungen; Christian Rakos. E-mail questionnaire from 28.02.2010 & interview in Vienna on 09.04.2010

PV Austria (2010): Bundesverband Photovoltaic Austria; Hans Kronberger. Interview in Vienna on 02.04.2010

Websites:
www.arsenal.ac.at
www.biomasseverband.at

www.bmwfj.gv.at
www.lgwa.at
www.solarteur.com
www.solarwaerme.at

7 Issue 7 Infrastructure Development

7.1 Introduction

In European comparison, the Austrian electricity grid is in quite a good condition (Beirat für Wirtschafts- und Sozialfragen 2009; Cycleenergy 2010). Nevertheless, improvements are necessary in order to satisfy the rising demand and deal with the higher amount of electricity from renewable energy sources. One of the main medium-term goals is to close the gaps of the 380 kV grid, as the north-south-lines Styria/Burgenland and Salzburg/Upper Austria are already overloaded. In addition, renewable energy deployment makes the development of a strong supra-regional supergrid necessary (Beirat für Wirtschafts- und Sozialfragen 2009). The recently published Austrian Energy Strategy mentions the development of the transmission and distribution grids in order to meet the needs of decentralised electricity production and higher flow rates as a central goal. In addition, the importance of the evolution of a trans-European grid is addressed (BMWFJ / BMLFUW 2010). It is not yet possible to tell if concrete steps will follow.

The main weaknesses of the Austrian electricity grid are well-known and very concrete medium- to long-term plans for grid reinforcement and expansion exist. The main Austrian transmission grid operator VERBUND-Austrian Power Grid AG (APG) has published a comprehensive plan for the transmission grid with the perspective 2009-2020 (VERBUND-Austrian Power Grid AG 2009). Problems arise though with the implementation of the plan. The realisation of grid infrastructure projects currently lasts eight years or longer. This makes it impossible for the grid operators to adapt the transmission grid to changing conditions in due time. They thus see a strong necessity for an amelioration of the existing legal and administrative framework (VERBUND-Austrian Power Grid AG 2009).

Concerning short to medium-term infrastructure development, from the point of view of the RES industry, no substantial problems exist in Austria. They state that they have a close collaboration with the Austrian Power Grid AG (PV Austria 2010). In general, grid operators carry out necessary expansion works without undue delay and also develop medium to long-term concepts for areas where a strong renewable energy development can be expected in the future. This cooperative attitude might however partly be attributed to the common praxis that the plant operators do not only bear the costs for grid connection but also take over the costs for all reinforcement works on the next network level (IGW 2010).

The APG is actively involved in the planning of a Trans-European Electricity Network. No major barriers have been identified (ENTSO-E 2010; UCTE 2008; VERBUND-Austrian Power Grid AG 2009).

7.2 Description of barriers & solutions

7.2.1 Detailed description of the barriers and solutions

Barrier 7.1 - Problems concerning the development of network infrastructure according to a long-term strategy:

A long-term strategy for the development of network infrastructure exists in Austria but the rapid implementation of the plans is hindered by the complexity of the authorisation procedures and a deficient legal framework:

- The realisation of large grid expansion projects lasts eight years or longer. 1.5 years for planning, 1.5 years for the elaboration of the documentation for the Environmental Impact Assessment (EIA), 3 years for the realization of the EIA and 1.5 to 2 years for the construction of the lines. This makes it impossible for the grid operators to adapt the transmission grid to changing conditions in due time. The main bottleneck is the EIA (VERBUND-Austrian Power Grid AG 2009). The Act on the EIA (Umweltverträglichkeitsprüfungsgesetz) foresees a duration of 1.5 years for the procedure (UVP-G 2000), in practice it lasts twice as long. The deadlines set by law are thus usually not met. The main reasons for this delay are the large number of parties involved, the opportunity to make representations throughout the whole duration of the EIA and insufficient staff and resources in the responsible authorities, the federal state governments and the Environmental Senate (Umweltsenat) (VERBUND-Austrian Power Grid AG 2009).

  Possible options: APG advocates for a tightening of the administrative procedures for large infrastructure projects. One of the starting points might be a more efficient design of the EIA. It would help if the responsible authorities had the possibility to close the period with an opportunity to make representations after a certain time (VERBUND-Austrian Power Grid AG 2009).

Barrier 7.2 - Problems concerning grid expansion processes of existing electricity networks

This is not considered to be an issue by RES associations. As they bear the full costs for grid expansion measures directly linked to grid connection, the grid expansion processes are in general carried out without undue delay. For more details see issue 8.

Barrier 7.3 - Problems concerning the development of a Trans-European Electricity Network

This is not considered a barrier in Austria. The APG is actively involved in the planning of a Trans-European Electricity Network (ENTSO-E 2010; UCTE 2008; VERBUND-Austrian Power Grid AG 2009).

7.2.2 Best practice elements and indicators

No.	Technology	Benchmark	Result
7.1		Presence of a satisfactory and efficient (in terms of capability of achieving its stated objectives) plan for the reinforcement of the interconnection capacity with neighbouring countries.	Positive
7.2		Presence of a satisfactory and efficient plan for the reinforcement of the connection capacity within the country.	Positive

7.3 Literature

Beirat für Wirtschafts- und Sozialfragen (2009): Herausforderungen in der Energiepolitik. Weißbuch der österreichischen Sozialpartner (www.arbeiterkammer.at/bilder/d102/WeissbuchEnergiepolitik.pdf)

BMWFJ / BMLFUW (2010): Bundesministerium für Wirtschaft, Familie und Jugend / Bundesministerium für Land- und Forstwirtschaft, Umwelt und Wasserwirtschaft; Eckpunkte der Energiestrategie Österreich (www.energiestrategie.at/images/stories/pdf/PKPapier/eckpunkte_energiestrategie_100311.pdf)

Cycleenergy (2010): Cycleenergy Beteiligungs- und Management AG; Stephan Schuster. Telephone interview on 14.04.2010

ENTSO-E (2010): European Network of Transmission System Operators for Electricity, Ten-year network development plan 2010-2010, Brussels

IGW (2010): Interessengemeinschaft Windkraft Österreich; Ursula Nährer. Telephone interview on 09.03.2010

PV Austria (2010): Bundesverband Photovoltaic Austria; Hans Kronberger. Interview in Vienna on 02.04.2010

UCTE (2008): Union for the co-ordination of transmission of electricity, UCTE Transmission Development Plan, Brussels

UVP-G (2000): Umweltverträglichkeitsprüfungsgesetz 2000; BGBl.Nr. 697/1993 zuletzt geändert durch BGBl. I Nr. 89/2000

VERBUND-Austrian Power Grid AG (2009): Masterplan 2009–2020 für das Übertragungsnetz. Die strategische Weiterentwicklung des Höchstspannungsnetzes der Verbund-Austrian Power Grid AG
In Kooperation mit der TU Wien und der TU Graz, Wien.

8 Issue 8 Power Grid Issues

8.1 Introduction

Renewable energy sources do not have the best legal framework conditions in Austria. They are neither entitled to priority grid connection, nor to priority grid expansion but are subject to the general provisions of energy law (www.res-legal.eu 2010). Only priority grid usage is foreseen by law.

The collaboration with TSOs and DSOs works rather well, mainly because plant operators show a willingness to pay for grid expansion works even though this is not their clear legal duty. While this situation is of course criticised by the RES industry, they also see certain positive elements as this at least guarantees a rather smooth grid connection process (ARGE Kompost & Biogas 2010; IGW 2010; KÖ 2010; Landwirtschaftskammer Steiermark 2010). Nevertheless, the current circumstances can be considered far from being ideal for further RES development.

In the field of **deep geothermal energy** only two electricity-producing plants exist in Austria so far. No severe problems concerning grid access occurred for these projects (TU Graz 2010).

8.2 Description of the barrier

8.2.1 Detailed description of the barriers and solutions

Barrier 8.1 - Problems concerning grid connection:

- Even though plant operators are legally only obliged to pay the costs directly linked to grid connection, it is common practice that they also pay for all necessary extension works in the next network level. Taking wind power as an example, this may lead to costs of 100,000 € per MW installed in some Austrian regions such as Lower Austria or the Burgenland. Wind power plant operators thus have to calculate with grid extension costs amounting to 6 to 8 percent of total investment costs (IGW 2010). Another unpleasant aspect in this regard is the fact that those costs are invoiced in the form of charges and do not count as investment of the plant operator. The investment is thus not taken into consideration e.g. when applying for a subsidy. Neither are the expenses allowed for tax purposes of the plant operator. Instead, the grid operator may deduct them from tax (KÖ 2010).
  Possible options: Clear rules on cost sharing and bearing should be established, with only the costs directly linked to the connection of the renewable energy system to be paid by the plant operator, while all works on the electricity infrastructure should be

taken over by the grid operator, that may then in a further step pass the costs on to all grid users (ARGE Kompost & Biogas 2010; IGW 2010; KÖ 2010; Landwirtschaftskammer Steiermark 2010).

- Grid operators are not obliged to connect renewable energy systems at priority. This has not been a problem so far, as plant operators have taken over all the arising costs and the grid operators willingly executed grid connection without any delays. This might change though in case that the costs for grid reinforcements are shifted from the plant operators to the grid operators in the future. Renewable energy associations thus favour the introduction of priority grid connection in the relevant legal provisions (IGW 2010).

Barrier 8.2 - Problems concerning grid usage:

- Renewable energy associations vehemently criticize the Order of the E-Control commission on the calculation of charges for use of the grid 2009 (Systemnutzungstarife-Verordnung 2009). This order makes it obligatory for all electricity producers to pay the so-called grid loss fee (Netzverlustentgelt), that before had been distributed amongst all consumers. This means a significant burden mainly for producers of renewable electricity with the production capacities already up and running, as the profitability of electricity production is strongly dependent on the feed-in tariffs and has been calculated without taking those additional fees into account. The order is currently assessed by the constitutional court, a final decision has not yet been taken (IGW 2010; KÖ 2009).

Barrier 8.3 - Problems concerning TSOs and DSOs:

- The data on grid conditions is not made publicly available by the grid operators. This leads to a situation where plant operators asking for grid connection cannot comprehend whether the costs charged by the grid operators are justified or not. Experiences from the biogas sector show that for biogas plants, cost differences for grid connection may be double or fourfold for comparable supply line lengths or triple in the course of two years (ARGE Kompost & Biogas 2010).

- Open rejection of the connection of RES plants to the grid by the grid operators does not take place in Austria. It happens though that TSOs or DSOs ask for such complicated and exaggerated technical connection requirements that grid connection is practically made impossible from an economic point of view (ARGE Kompost & Biogas 2010; IGW 2010).

- Grid operators ask for different requirements for the connection of **photovoltaic systems** and for the installation of metering points. While some of them try to proceed in a collaborative way, others apply very strict standards such as the obligation to use reinforced cables for the metering point or a restrictive handling of the question whether a two-phase or a three-phase connection is needed.
  Possible options: The Austrian photovoltaic industry association proposes the introduction of uniform rules grid operators have to respect (PV Austria 2010).

8.2.2 Best practice elements and indicators

No.	Technology	Benchmark/comments	Result
8.1		**Are the rules on cost sharing and bearing of grid connection objective, transparent and non-discriminatory?**	
	wind onshore > 10 MW		Average
	biomass > 10 MW		Positive
8.2		**Is the denial of grid connection by TSOs and DSOs a common problem, constituting an important barrier for RES development?**	
	wind onshore > 10 MW		Negative
	biomass > 10 MW		Negative
8.3		**Number of months for getting grid connection (considering also approval of grid connection)**	
	wind onshore > 10 MW		max. 12 months
	biomass > 10 MW		1.5 months
8.4		**Estimated connection costs in Euro (in case producer pays)**	
	wind onshore > 10 MW	including connection & grid reinforcement costs	1.5 Mio. €
	biomass > 10 MW	ca. 87.000 €/MW	870,000 €

8.3 Literature

ARGE Kompost & Biogas (2010): ARGE Kompost & Biogas Österreich; Franz Kirchmeyr. Interview in Vienna on 10.03.2010

Cycleenergy (2010): Cycleenergy Beteiligungs- und Management AG; Stephan Schuster. Telephone interview on 14.04.2010

IGW (2010): Interessengemeinschaft Windkraft Österreich; Ursula Nährer. Telephone interview on 09.03.2010

KÖ (2009): Kleinwasserkraft Österreich; Stellungnahme von Kleinwasserkraft Österreich zum Entwurf der Systemnutzungstarife-Verordnung 2009 (www.kleinwasserkraft.at/images/stories/dateien_content/koestellungnahmesntvo2009.pdf)

KÖ (2010): Kleinwasserkraft Österreich; Martina Prechtl. Telephone interview on 17.03.2010

Landwirtschaftskammer Steiermark (2010): Landwirtschaftskammer Steiermark; Horst Jauschnegg. Telephone interview on 09.03.2010

PV Austria (2010): Bundesverband Photovoltaic Austria; Hans Kronberger. Interview in Vienna on 02.04.2010

TU Graz (2010): Technische Universität Graz, Institut für angewandte Geowissenschaften; Johann Goldbrunner. Telephone interview on 16.04.2010

Websites:
www.res-legal.eu

9 Issue 9 Gas Network Issues

9.1 Introduction

The large majority of the existing biogas plants in Austria are used for electricity generation, whereas the injection of biogas into the natural gas grid is still at its beginnings. In 2005 a first pilot project has been started in Upper Austria. Today, a total of 4 biogas plants are connected to the natural gas grid, all in close cooperation with energy supply companies (ARGE Kompost & Biogas 2010; www.biogasnetzein-speisung.at 2010). This shows a positive attitude at least from the side of certain gas suppliers, however the large majority does not show any activity in this domain at all. To date, there are no practical experiences with the transmission of biogas over longer distances and the conclusion of the respective contracts with the different grid operators. It is thus rather difficult to assess, whether this would work smoothly or not (ÖGUT 2010).

In addition to the unfavourable situation created by the existence of a feed-in tariff for electricity from biogas and the absence of an equivalent financial incentive for the injection of biogas into the natural gas grid, several barriers exist due to a legal framework (Gas industry act - Gaswirtschaftsgesetz, Order on the calculation of charges for use of the gas grid - Gassystemnutzungstarifverordnung) not taking into account the special characteristics of biogas. The biogas industry would thus welcome the introduction of clear provisions creating a favourable environment for the injection of biogas into the natural gas grid on a larger scale (ARGE Kompost & Biogas 2010).

9.2 Description of barriers & solutions

9.2.1 Detailed description of the barriers and solutions

Barrier 9.1 – Problems related to the upgrading process:

- The gas quality requirements already have to be fulfilled at the feed-in point. This makes a much more complex and expensive upgrading process necessary than if a certain gas quality was prescribed at the feed-out point of the gas consumer, as it is for example the case in Switzerland or Sweden (Hornbachner 2005).

- Clear provisions on the requirements for biogas injection are missing. Grid operators thus may ask for additional requirements apart from the gas quality, such as the kind or frequency of measurement, the quality of the measuring device, the control of bacteria etc. (ARGE Kompost & Biogas 2010).

Possible options: The biogas industry favours the introduction of a cost-sharing mechanism for biogas upgrading. It argues that if the costs were shared between the grid operator and the biogas plant operator, the former would refrain from imposing exaggerated requirements for biogas injection (HEI 2010).

Barrier 9.2 – Lack of information:

- Grid operators do not publish any information on grid conditions. It might be helpful if they designated grid sections for preferential injection of biogas (ARGE Kompost & Biogas 2010).

Barrier 9.3 – Inefficient authorisation procedures:

- Current provisions oblige the plant operator to bear the full costs related to grid access.

  Possible options: The ARGE Kompost & Biogas suggests introducing clear rules on cost sharing and bearing, where parts of the costs are carried by the plant operator and parts by the grid operator who may then pass them on to the consumers (ARGE Kompost & Biogas 2010).

Barrier 9.4 – Insufficient cooperation of grid operators:

- All four projects currently up and running have been completed with gas suppliers as shareholders and thus also in close cooperation with the grid operators. On the one hand this shows a certain positive attitude of the gas suppliers and grid operators towards biogas injection, on the other hand the lack of autonomous projects suggests that the existing framework conditions are not very favourable for independent producers of biogas. Grid operators only give their permission to projects where they (or their gas supplying companies) are shareholders. In other cases they make excessive estimates of the costs for grid connection, rendering the project unattractive from an economic point of view.

  Possible options: The biogas industry association suggests introducing an obligation for grid operators to receive certain amounts of biogas the whole year long (expressed in percent of the natural gas consumption) (ARGE Kompost & Biogas 2010).

Barrier 9.5 – Other barriers:

- The main obstacle for biogas injection into the grid is a cost barrier. While electricity produced from biogas is eligible for a feed-in tariff, no equivalent support mechanism for biogas injection into the gas grid exists (ÖGUT 2010). Even though the tariff is considered not to be cost-covering by the Austrian biomass association (Österreichischer Biomasse-Verband 2010), it still presents at least a certain incentive compared to non-existent incentives for biogas injection into the gas grid.

  Possible options: The introduction of a feed-in law for gas, similar to the provisions in the electricity sector, with a feed-in tariff for each m³ gas injected, is considered to stir development in this domain (ÖGUT 2010).

- Another barrier for biogas lies in high charges for the gas transport and distribution laid out in the Order on the calculation of charges for use of the gas grid (Gassystemnutzungstarifverordnung) which are calculated in the same way as for natural gas. This means that even for short distances, suppliers must pay the full tariff

(ARGE Kompost & Biogas 2010; Hornbachner 2005; www.biogas-netzeinspeisung.at 2010).
Possible options: A new tariff system, which takes into account distances actually used by biogas, should be created (Hornbachner 2005).

- Biogas plant operators currently have to proof every hour or up to four times an hour that they feed certain amounts of gas into the grid. According to the biogas industry, this detailed schedule only makes sense in case of the injection of more than 100 m³. Instead, they suggest committing to a certain amount of biogas to be fed in in the course of a whole year (ARGE Kompost & Biogas 2010).

- There are no clear provisions on the responsibility in case problems arise at the final consumption unit. Biogas plant operators may thus be liable for damage. This causes important insecurities that should be removed (ARGE Kompost & Biogas 2010).

- Biogas plants are not always situated near existing gas grids and the injection of biogas into the natural gas grid may thus be impossible in certain cases.
  Possible options: The biogas industry favours the creation of an alternative infrastructure of biogas micro grids in regions with a high potential of biogas production in cooperation with the grid operators. The introduction of funding measures for the use of biogas in off-grid regions might be a suitable means (HEI 2010).

9.2.2 Best practice elements and indicators

No.	Benchmark	Result
9.1	If green certificates and/or subsidies for biogas are in place, do they de facto make unattractive to feed green gas into the grid due to the high level of subsidy for biogas used for electricity generation?	Yes
9.2	Are the costs of grid connection for producers of gas from renewable energy sources objective, transparent and non-discriminatory?	Negative
9.3	Do transmission and distribution tariffs discriminate against gas from renewable energy sources?	No
9.4	Average time needed for grid connection approval (from application for grid connection to formal approval) in months (#).	N/A

9.3 Literature

ARGE Kompost & Biogas (2010): ARGE Kompost & Biogas Österreich; Franz Kirchmeyr. Interview in Vienna on 10.03.2010

HEI (2010): HEI Eco Technology GmbH; Vitaliy Kryvoruchko. E-mail from 04.05.2010

Hornbachner, Dieter / Gernot Hutter / Dieter Moor (2005): Biogas-Netzeinspeisung. Rechtliche, wirtschaftliche und technische Voraussetzungen in Österreich. Kurzfassung,

in: Bundesministerium für Verkehr, Innovation und Technologie (Ed). Berichte aus Energie- und Umweltforschung 19a/2005. Wien.

ÖGUT (2010): Österreichische Gesellschaft für Umwelt und Technik; Michael Cerveny. Telephone interview on 10.04.2010

Österreichischer Biomasse-Verband (2010): Österreichischer Biomasse-Verband; Christoph Pfemeter. E-mail from 26.04.2010

Websites:
www.biogas-netzeinspeisung.at

10 Issue 10 District Heating

10.1 Introduction

District heating is relatively wide spread in Austria. In 2007, one-fifth of the dwellings were connected to district heating networks with a total length of around 4,000 km. Mainly the urban agglomerations heavily rely on district heating: Linz (60%), Vienna (36%) and Klagenfurt (30%) (Beirat für Wirtschafts- und Sozialfragen 2009). At the countryside, extensive housing sprawl is a serious barrier for district heating development though. This trend is already declining in the mountainous regions due to the limited space available. In other federal states such as Lower Austria, Upper Austria and the Burgenland, housing sprawl still continues (Landwirtschaftskammer Steiermark 2010; ÖGUT 2010).

District heating based on renewable energy sources has quite a positive image in Austria, translating in a rather high share of RES of 41%. While policies and support schemes for the initiation and expansion of DH systems largely based on RES are considered as relatively efficient, larger difficulties are encountered for the increase of the share of renewables in existing DH systems. The large amounts of waste heat produced render the additional injection of heat from renewable energy sources unnecessary in some parts of Austria. This cannot be considered a real barrier though (Cycleenergy 2010; ÖGUT 2010; proPellets Austria 2010). Mainly **biomass** district heating has a long tradition and is already quite common with more than 1,000 projects all over the country (Landwirtschaftskammer Steiermark 2010; ÖGUT 2010; proPellets Austria 2010). According to some representatives of the biomass industry, the potential for biomass district heating is already almost exhausted, as the resources are decreasing and possible new locations are already very scarce (Cycleenergy 2010). This point of view is not shared by the Austrian biomass association though which argues that only 60% of the biomass potential is used today (Österreichischer Biomasse-Verband 2010). The integration of **solar thermal** systems still has larger potentials and needs more efforts (Austria Solar 2010). In the field of **deep geothermal energy**, six district heating projects exist in Upper Austria and two in Styria. All of them are entirely based on geothermal energy and have been constructed either in collaboration with or with the approval of energy utilities. No important barriers have been identified (TU Graz 2010).

The Austrian Energy Strategy puts a high emphasis on the further development of district heating based on renewable energy sources in addition to the use of industrial waste heat. It mentions the intention to develop an energy spatial planning concept, where district heating areas shall be defined, taking into account the regional special characteristics. Depending on the settlement structure, the heat demand shall either be provided by

district heating or by small renewable heating units (BMWFJ / BMLFUW 2010). It is not yet clear though, how and when the expressed intention will be put into practice.

10.2 Description of barriers & solutions

10.2.1 Detailed description of the barriers and solutions

Barrier 10.1 – Lack of positive conditions for the increase of the share of renewables in existing DH systems:

- Several Austrian cities such as Vienna and Salzburg mainly rely on industrial waste heat for their district heating systems. It is thus difficult to increase the share of RES, as the waste heat is there anyhow and has to be dissipated in some way. This does not mean that in those cities there is no potential for DH systems largely based on RES at all. The largest Austrian biomass plant is e.g. situated in Vienna and injects heat into the district heating system. Policies here could focus mainly on the establishment of new small DH systems based on RES though. But this makes only sense when the existing waste heat potential has been exhausted, which is not the case yet e.g. in Vienna. In other cities such as Graz waste heat is not available in large quantities and the increase of the share of renewables in existing DH systems makes more sense. Certain efforts have already been made for the integration of solar thermal systems in Graz and further policies going into this direction, also in other cities in a similar position, could be encouraged (Austria Solar 2010; FGW 2010; ÖGUT 2010).

Barrier 10.2 –Lack of positive conditions for the initiation and expansion of DH systems largely based on renewables:

- Several problems for district heating development stem from inefficient spatial planning:
  - Almost non-existent spatial planning in the past decades, resulting in unplanned settlement in the open country, today poses serious problems for district heating development. The mayors as the first responsible entity for building matters in general do not act according to a comprehensive concept and tend to be easily influenced by different interest groups. As a consequence, a lot of existing residential areas are not suitable for district heating due to large distances between the consumers (ÖGUT 2010).
  - In addition, the striving towards energy efficient buildings leads to challenges for existing DH systems, as it is getting more and more difficult to operate them in a cost-effective way. Where the provision of new residential areas from district heat is concerned, many mayors show a very favourable attitude and take decisions making district heating from biomass obligatory. While these decisions can in principle be regarded as positive, they are often not compatible with reality, as the provision of new residential areas with low energy houses economically does not make sense (Landwirtschaftskammer Steiermark 2010; ÖGUT 2010).

    Possible options: Spatial planning should better take into account the necessary framework conditions for district heating. This could for example be realised through putting a special focus on spatially concentrated housing combined with district heating systems (Landwirtschaftskammer Steiermark 2010). First

declarations of intent on better coordinated spatial planning in the domain of energy provision from the part of the Austrian government can be found in the recently published Austrian Energy Strategy. Whether this translates into concrete and efficient measures has yet to be seen (BMWFJ / BMLFUW 2010).

- Today, more than 1,000 biomass district heating systems exist in Austria. The Austrian solar thermal industry association criticises that most of them are either combined with oil boilers or work in a very inefficient way in summer, as the biomass boilers can only be operated in part load, which leads to capacity losses and bad efficiency levels. As the owners of the district heating systems often are forestry cooperatives delivering the biomass, they do not have any incentives to decrease the amount of biomass needed (Austria Solar 2010). The biomass industry on the other hand admits that inefficiency was an important problem in the past but has now been smoothed out with the introduction of a well-working quality control system (proPellets Austria 2010).
  Possible options: Austria Solar and the Biomass industry association have developed a proposal that foresees financial support for new biomass district heating systems or the expansion of existing ones only when combined with 300 m² solar thermal systems per MW boiler capacity (Austria Solar 2010).

Barrier 10.3 – Other barriers:

- Representatives of the **biomass** industry state that the political roadmaps for the development of biomass district heating in Austria are far too ambitious. They estimate that only a maximum of 100 further small plants may still be built. This assessment is based on the observation that the Austrian wood industry is shrinking and thus also producing less waste-products that could be used as raw materials. In addition, the possible locations for biomass district heating are to a large extent already exploited (Cycleenergy 2010). This point of view is not shared by the Austrian biomass association though which argues that only 60% of the biomass potential is used today (Österreichischer Biomasse-Verband 2010).

10.2.2 Best practice elements and indicators

No.	Benchmark	Result
10.1	Are there policies to promote the increase of the RES share in existing DH networks?	Yes
10.2	Are there policies to promote the initiation / expansion of DH networks?	Yes
10.3	Percentage present renewable share	41%
10.4	Percentage CHP share	75%

10.3 Literature

Austria Solar (2010): Austria Solar - Verein zur Förderung der thermischen Solarenergie; Roger Hackstock. Interview in Vienna on 25.02.2010

Beirat für Wirtschafts- und Sozialfragen (2009): Herausforderungen in der Energiepolitik. Weißbuch der österreichischen Sozialpartner (www.arbeiterkammer.at/bilder/d102/WeissbuchEnergiepolitik.pdf)

BMWFJ / BMLFUW (2010): Bundesministerium für Wirtschaft, Familie und Jugend / Bundesministerium für Land- und Forstwirtschaft, Umwelt und Wasserwirtschaft; Eckpunkte der Energiestrategie Österreich (www.energiestrategie.at/images/stories/pdf/PKPapier/eckpunkte_energiestrategie_100311.pdf)

Cycleenergy (2010): Cycleenergy Beteiligungs- und Management AG; Stephan Schuster. Telephone interview on 14.04.2010

FGW (2010): Fachverband der Gas- und Wärmeversorgungsunternehmungen; Rainer Anzböck. E-mail from 05.05.2010
Landwirtschaftskammer Steiermark (2010): Landwirtschaftskammer Steiermark; Horst Jauschnegg. Telephone interview on 09.03.2010

ÖGUT (2010): Österreichische Gesellschaft für Umwelt und Technik; Michael Cerveny. Telephone interview on 10.04.2010

Österreichischer Biomasse-Verband (2010): Österreichischer Biomasse-Verband; Christoph Pfemeter. E-mail from 26.04.2010

proPellets Austria (2010): proPellets Austria - Netzwerk zur Förderung der Verbreitung von Pelletsheizungen; Christian Rakos. E-mail questionnaire from 28.02.2010 & interview in Vienna on 09.04.2010

TU Graz (2010): Technische Universität Graz, Institut für angewandte Geowissenschaften; Johann Goldbrunner. Telephone interview on 16.04.2010