

Upper Austria

Regional RES-e Map: Electricity from renewable energy sources (RES-e)



The region	Upper Austria
Number of inhabitants	1.38 Mio
Size (in km ²)	12,000 km ²
Capital	Linz

Short description:

Upper Austria is located in the Northern part of Austria bordering Bavaria and Czech Republic. It is a highly industrialised region and a leading technology and export region in Austria. The main economic sectors include metal and chemical industries, the tertiary sector and tourism with around 6.5 Mio overnight stays annually. A number of RES companies cooperate in the network of green energy businesses (Ökoenergie-Cluster).

Share of RES (total primary energy): 33 %

Share of RES-e (total electricity): 70 %

Target RES-e (Austria): 78.1 % (2010), 4 % (excl. hydro) until 2008, 9 % small hydro power (2008)

Target RES-e (Upper Austria): 6% (2007), 8% (2010)

The partner organisation: O.Ö. Energiesparverband, the energy agency of Upper Austria, promotes EE, RES & innovative technologies and implements numerous programmes & projects on behalf of the regional government and the European Commission.

	num- ber of plants	Total in- stalled capacity (MW)	Typical installa- tion size	Main present funding mechanism	Short-term perspective (2007)	Mid/long- term per- spective (2015)	Main barriers**
Wind	17 (+6*)	14.4 (+12)	3x660 kW (2 MW)	feed-in tariff***	medium	low	limited wind potential, land use (urban sprawl)
Wood biomass	6 (+11*)	60 (+40)	> 2 MW	feed-in tariff***	medium (small-scale), high (large- scale)	high	lack of mature small-scale tech- nology, lack of interest through other prominent RES
Biogas	35 (+40*)	2.75 (+10)	250 kW	feed-in tariff***, investment sub- sidy	high	medium	pioneer phase is just over, insuf- ficient number of market actors
PV	980	5.8	5 kW	investment sub- sidy	medium	medium	high investment costs, limitations by funding scheme
Hydro <10 MW	533	110	< 1000 kW	feed-in tariff***, invest. subsidy	high	medium	renovation only
Other: geother- mal	1	1	only 1 installation	feed-in tariff***	low	medium	limited sites, very high invest- ment costs

* under construction

** main barriers except feed-in tariff, see background funding scheme

***see background funding scheme

Background funding scheme:

In Austria the main support scheme for RES-e was so far a nation-wide feed in tariff and a regional programme introduced in 2003. The feed-in tariffs in combination with the regional support programme for RES-e caused a boom in new RES-e installations. Unfortunately the tariffs were only given for new installations that received all necessary permits before 31 December 2004. At present the negotiations for a new regulation fixing the feed in tariffs are on-going, meaning that at the moment there are no feed in tariffs for new RES-e plants granted. For the following analysis and the short & mid term perspectives it is assumed, that feed in tariffs will be fixed within the next few months.

Wind

The past:

Since the early 90ies, a continuous market development took place, on average every second year a new wind park was opened. A significant percentage of the investment is typically raised by community shares (bought by the general public, often from the neighbourhood).

The present:

Presently 17 wind parks are in operation. The recent trend is towards larger installations (1 - 2 MW each).

The main barriers & strategies to overcome them:

The wind power potential in Upper Austria is comparatively low and national feed-in tariffs will mainly be used in other regions with higher wind speeds. Nevertheless, there is a political commitment to continue the market development in Upper Austria as well and a regional support programme added in the past a surplus to the national feed-in tariff.

Short-term perspectives (until 2007):

For the future, due to the limited wind potential in the region, the perspective is medium.

Mid/long-term perspectives (until 2015):

In case of significant technical development and stable feed-in tariffs, the mid & long term prospects could be better than short term.



Wood biomass

The past:

Electricity generation from biomass is a relatively new technology in the region and mainly large CHP plants in industry were established so far.

The present:

Presently about 6 large industry companies are operating wood biomass plants (CHP). The installations are on average > 2 MW, the total capacity amounts to 60 MW (including biomass waste incineration). 11 biomass CHP plants are under development.

The main barriers & strategies to overcome them:

For small scale electricity generation from biomass the technology is not yet mature. For medium and large scale installations pilot projects are presently under construction in the region and it is hoped that with the experiences gained thereby, technology development can be speed up.

Short-term perspectives (until 2007):

As it will take another few years to develop mature technology, short term prospects are medium, an estimated potential of 5 new plants annually is seen as realistic.

Mid/long-term perspectives (until 2015):

As soon as technical problems have been solved, the perspective for biomass electricity plants (small scale and medium scale) is expected high.



Biogas

The past:

The biogas market development took quite a time to emerge. Some years ago only few plants, often in bad quality, were established.

The present:

Presently, 35 biogas plants are in operation and 40 are under construction. Whereas the first installations were small, single plants (< 50 kW), the recent trend is towards larger plants (on average 250 kW) operated by farmers co-operatives. The positive development was triggered by a guaranteed feed-in tariff (until 2004) and an investment subsidy.



The main barriers & strategies to overcome them:

The market introduction of biogas plants was accompanied by many low quality plants and bad/no concepts for utilising the produced heat. Additionally in the past plants were very often too small to be profitable. Due to a training course for potential biogas plant operators and quality criteria required for the investment subsidy and the increased feed-in tariff, the situation is now improving quickly. Information events helped to raise know-how and by establishing farmers co-operatives larger, more economic, plants are implemented.

Short-term perspectives (until 2007):

Presently the market development is very promising and significant growth in the next few years is expected, about 10 new plants annually could be installed.

Mid/long-term perspectives (until 2015):

In the long term, due to limited capacity, steady growth is expected.

PV

The past:

In the early 90ies the market development was started by a nation wide impulse subsidy programme. At that time mainly pilot plants (established by energy utilities) were in operation.

The present:

In the last years a continuous market development took place. Presently 980 installations (5.8 MW) are in operation, the typical size is ~ 5 kWp (due to a recent funding situation). The main funding mechanism now is an investment subsidy granted for plants up to 3 kW.



The main barriers & strategies to overcome them:

Whereas at the beginning of the market development lack of awareness and know how presented the biggest barriers, it is now mainly the high investment costs that hamper quicker implementation. That is why in the recent years the market development was triggered by a regional support programme. Additionally large installations & facade integrated plants helped to make PV more attractive and widely known. Presently the main remaining obstacle is the unclear legal & financial situation due to the new nation wide law and the limitation of 3 kW for the investment subsidy .

Short-term perspectives (until 2007):

Depending very much on the RES electricity legislation in Austria, the prospects are medium to high, e.g. in 2002 891 kWp new PV-plants were installed, the potential for 1 additional MW annually is there.

Mid/long-term perspectives (until 2015):

As PV is a very attractive and popular RES, for the long term, medium perspectives are expected.

Small hydro (< 10 MW)

The past:

The potential for new plants is limited, existing plants are very often old, therefore the potential for retrofitting is very high but did in general not take place in the past.

The present:

533 small hydro power plants are in operation with a total capacity of more than 100 MW and a production of 540 GWh (2004). Most of the plants are small (35 % of the capacity is below 1000 kW).

The main funding mechanism was a guaranteed feed-in tariff and recently also an investment subsidy.

The main barriers & strategies to overcome them:

Because of the negative environmental impact of a few large hydro power plants, the climate for hydro power in general was not very good in the last 10-20 years. Due to information & awareness raising activities the situation has improved and the distinction between large and small plants become general knowledge. Although quite a number of plants could raise their output by renovation, that did not happen very much in the past. However, an Upper Austrian support programme, carried out recently, gave a boost to renovation. Presently about 70 renovation projects are under preparation.

Short-term perspectives (until 2007):

During the programme about 340 operators asked for advice with the aim of renovating their plants, triggering so far more than 70 investment projects. That is why high potential is seen for the renovation of existing plants, about 20 plants renovated annually seems realistic.

Mid/long-term perspectives (until 2015):

Medium, due to the limited potential for new installations.



OTHER RES-e: Geothermal energy

The past:

5 geothermal district heating plants (50 MW_{th}) in operation in the region but no electricity generation.

The present:

The geothermal plant (12.4 MW) of the small town Altheim in Upper Austria is one of the first plants in Europe to generate electricity (ORC turbine of 1 MW_{el}) from geothermal water (100°C).

The plant was financed by feed-in tariff and R&D investment subsidy (EU, regional).

The main barriers & strategies to overcome them:

Whereas so far the technology for generating electricity from a geothermal resource (with an average water temperature of below 100 °C) presented the main barrier, the Upper Austrian geothermal plant now demonstrates that it can function well. The remaining obstacle is the high investment costs. Cost reduction may be expected in the next years if more such plants will be built.

Short-term perspectives (until 2007):

Due to the limited potential and the high investment costs, low perspectives are expected, in total only 5 geothermal plants are installed, limiting the electricity production to these 5 plants.

Mid/long-term perspectives (until 2015):

In the long term, technology prices may decrease, plants thus becoming easier to be financed. Therefore medium long term perspectives are estimated.



Main market actors:

The main market actors are companies active in the field of technology production, planners and consultants. Presently 142 "green energy businesses" are partner of the "Ökoenergie-Cluster", the Upper Austrian network of companies active in the field of energy efficiency and renewable energy sources, which is managed by O.Ö. Energiesparverband. Presently these companies achieve an annual turn-over of around 364 M€ and employ more than 2,500 persons, their export share is above 50%.

Besides businesses, NGO's and other institutions play an important role. Important market actors for the promotion of RES-e are active citizens. As a driving force in "their" municipality, they can trigger significant developments. Very often teachers play an important role. Additionally O.Ö. Energiesparverband as the regional energy agency is a central point for information and awareness raising activities. Especially the network of green energy businesses, which is managed by O.Ö. Energiesparverband, comprises the main companies and stakeholders active in RES.

The most important actors are:

Most important companies:

- Hexcel Composites (production of high tech materials for wind turbine rotor blades)
- Energiewerkstatt GmbH (consultant for the planning of wind farms)
- Scharoplan GmbH (planning, consulting, TPF of RES plants)
- SW Umwelttechnik (planning & installation of biogas plants)
- Wolf Systembau GmbH (planning & installation of biogas plants)
- Fronius International (a leading European producer of solar inverters)
- eTECH (consulting, installation of PV plants)
- GUGLER Hydro Energy (consulting, installation, production of plants)
- VA Tech ELIN EBG (hydro power division of the company, consulting, installation of plants)
- Drack Elektrotechnik (electronic control devices, automatic operation of plants)
- VA Tech ELIN AG (division eco energy)
- KE Kelit (plastics, pipes for district heating networks)

NGO's & other institutions:

- active citizens (usually teachers), home owners
- O.Ö. Energiesparverband & Ökoenergie-Cluster
- administrative authorities
- the electricity authority
- research project leaders
- civil engineers
- farmers, farmers association
- research institutes (ASiC, QSEL, LIOS etc.)
- Small hydro power association
- Municipalities, spas

Conclusions:

In Upper Austria, there are 533 small hydro power plants in operation. A special funding scheme recently offered attractive conditions for the retrofitting of these plants. In order to motivate plants owners to become active and to renovate their plants, O.Ö. Energiesparverband started an energy advice service for plant owners. So far more than 300 small hydro power plant operators were consulted and informed about renovation possibilities and about 70 investment project were triggered with a total investment of 6.3 million € achieving now on average 15% more electricity output. Small hydro power will therefore be an important technology during the project implementation. The main challenge will be to monitor progress and motivate plant owners to invest in modernisation of plants. Continuous information activities will be implemented to increase the number of renovation projects, including among others personal advice, information folders and events.

The second key technology on which ESV will focus is biogas. Presently 35 biogas plants are in operation, the typical size is 250 kW. Whereas the first installations were small, single plants (< 50 kW), the recent trend is towards larger plants (average of 250 kW) operated by farmers co-operatives. The market introduction of biogas plants was accompanied by many low quality plants and bad/no concepts for utilising the produced heat. Additionally in the past plants were very often too small to be profitable. Due to a training course for potential biogas plant operators and quality criteria required for the investment subsidy and the increased feed-in tariff, the situation is now improving quickly. Information events will help to raise know-how and by establishing farmers co-operatives larger, more economic, plants could be implemented. Presently the market development is very promising and significant growth in the next few years is expected, about 30 new plants annually could be installed. Aim of the project is therefore to support this development by providing well-target information and awareness raising activities.

Depending on the final decision of the national programmes, the focus will be put on one of these 2 technologies.