

## EL-EFF REGION

### WP 2: Regional summary report

prepared by: **ESV**

#### Introduction

##### Short description of the region

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 as well as the tertiary sector and tourism with around 6.5 Mio overnight stays annually.



##### Existing regional energy policy targets (especially energy efficiency):

The region of Upper Austria has set itself ambitious energy efficiency targets. As one of the first European regions, Upper Austria passed an Energy Efficiency Strategy in 2004 with the aim to increase energy efficiency by 1% and 1.5% in the public sector until 2010. A number of measures for the different target groups were developed and are now being implemented.

The Energy Efficiency Strategy is also part of the overall energy strategy and action plan "Energy 2010" which includes clear targets and a mix of measures to achieve them. The first implementation phase (1994-1999) was very successful and for example led to an increase in the share of renewable energy sources from 25 to 30% and to a reduction of energy consumption in housing (private sector) of 30%.

##### The partner organisation:

O.Ö. Energiesparverband is the energy agency of Upper Austria, founded by the regional government with the aim of promoting energy efficiency, renewable energy sources and innovative energy technologies. It is the central institution for energy information in Upper Austria and one of Europe's largest energy advice and information providers.

## Overview Table

| Region of: Upper Austria  |             | Year        | Remark/Explanation  |
|---|-------------|-------------|---|
| Electricity consumption <u>Households</u> (domestic sector)                       | 2.490 GWh   | 2005        | Private households  |
| Electricity consumption <u>Service Sector*</u> (commerce & trade & public sector) | 1.828 GWh   | 2005        | public & private services   |
| Electricity consumption <u>Industry**</u>   | 7.718 GWh   | 2005        | Including manufacturing sector  |
| Electricity consumption of the <u>Electricity Sector</u>                          | (1.968 GWh) | 2005        | Not included in total regional final electricity consumption (electricity sector is not final energy) |
| Electricity consumption <u>other sectors***</u>                                   | 797 GWh     | 2005        | railway, other land transport, agriculture  |
| <b>Total Electricity consumption in the region</b>                                | 12.833 GWh  | <b>2005</b> | Total final electricity consumption (excluding electricity sector)                                    |
| Total Energy Consumption in the region  | 83.611 GWh  | 2005        |   |
| Share of electricity in total energy consumption                                  | 15,35 %     | 2005        |   |

| Data on the region   |                 |      |
|--|-----------------|------|
| Number of inhabitants                                      | 1.399.226       | 2005 |
| Number of households (most recent data)                    | 543.034         | 2001 |
| Number of 1-person householders (most recent data)         | 164.783         | 2001 |
| Number of 2-person householders (most recent data)         | 151.976         | 2001 |
| Number of 3-person householders (most recent data)         | 89.832          | 2001 |
| Number of 4 or more-person householders (most recent data) | 136.443         | 2001 |
| Number of households (predicted for 2010)                  | 587.799         | 2010 |
| GDP  | 36.178 Mio Euro | 2003 |
| GDP/inhabitant   | 26.100 Euro     | 2003 |

\* should your regional/national statistics have a very different split between sectors, then the table can be slightly adapted, however, it would be nice for the overall picture, if you manage to use the same categories

\*\* without the consumption of the electricity sector

\*\*\* please specify what this sector includes (e.g. incl. transport)

## Electricity consumption in households

In Upper Austria, there are about 543,034 households, of which:

- 30% are 1-person households, this equals 164,783 households and 164,783 persons living in such households
- 28% are 2-person households, this equals 151,976 households 303,952 persons living in such households
- 17% are 3-person households, this equals 89,832 households 269,496 persons living in such households
- 25% are 4 or more person households, this equals 136,443 households more than 545,772 persons living in such households.

The increase predicted for 2010 is 8%, which would mean 587,800 households in 2010. It is anticipated that the major increase will be in the sector of 1-person households.

The total electricity consumption in households in 2005 was 2,490 GWh, which is 19.4% of the total Upper Austrian electricity consumption. This figure includes the electricity used for electrical heating, which is about 300 GWh and for hot water provision (about 400 GWh). The electricity consumption in households for electric appliances (excluding hot water provision and electrical heating) amounts to about 1,790 GWh, or 14% of the total electricity consumption.

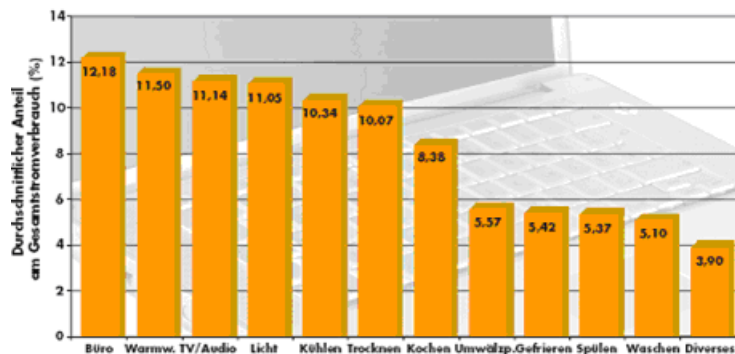
There was a continuous increase of electricity consumption in this sector (GWh):

| 2000     | 2001     | 2002     | 2003     | 2004     | 2005     |
|----------|----------|----------|----------|----------|----------|
| 2,157.07 | 2,223.67 | 2,290.26 | 2,356.85 | 2,423.44 | 2,490.04 |

Experts assume that the increase of about 15% since 2000 is mainly due to the increase in the number of heat pumps in the last 2-3 years, because of additional appliances and because of the increased number of households. In the last years, many new one family homes were equipped with heat pumps (24,000 installations) mainly because people considered it an ecological friendly heating system and due to attractive electricity tariffs offered by the electricity suppliers.

In addition, the number of electrical appliances per household is continuously increasing as well as their use. Especially the field of "home office" and electronic entertainment are a new additional area of electricity consumption. For example, the home office sector has already a share of about 12% on the total household electricity consumption and the electricity consumption only for PCs increased from 1989 to 2003 by about 1900%.

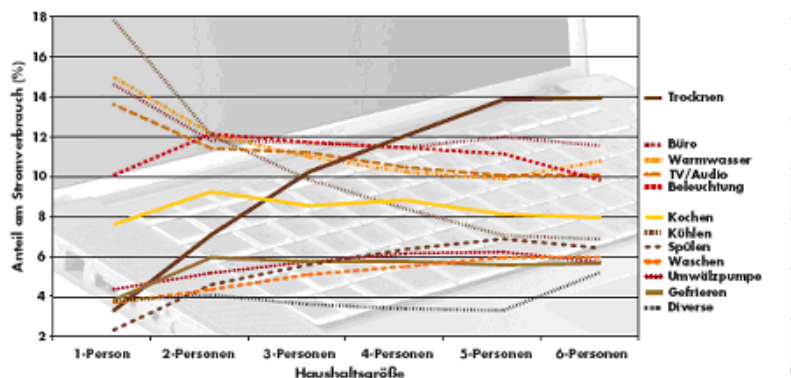
**Prozentuale Anteile der 12 Stromverbrauchsbereiche  
gemittelt über alle Haushaltsgrößen**



Source: Energieagentur NRW 3/2006

The graph shows the distribution of the different electricity appliance sectors for average households (home office (12.18%), followed by hot water provision, TV/Audio, lighting, cooling, cooking,...). However, this distribution is different depending on the size of the household.

**Schwankungen der Anteile der 12 Stromverbrauchsbereiche  
zwischen den verschiedenen Haushaltsgrößen**



Source: Energieagentur NRW 3/2006

Of course the share of electricity consumption for “home office” is a higher percentage in 1-person households.

Concerning the electrical appliances used in households, there was, besides home office a sharp increase in the number of dryers (258% increase in consumption between 1989 and 2003) and dish washers (140% increase in consumption between 1989 and 2003).

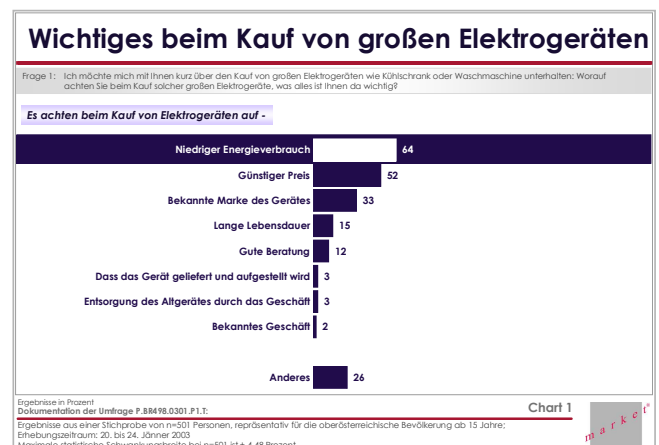
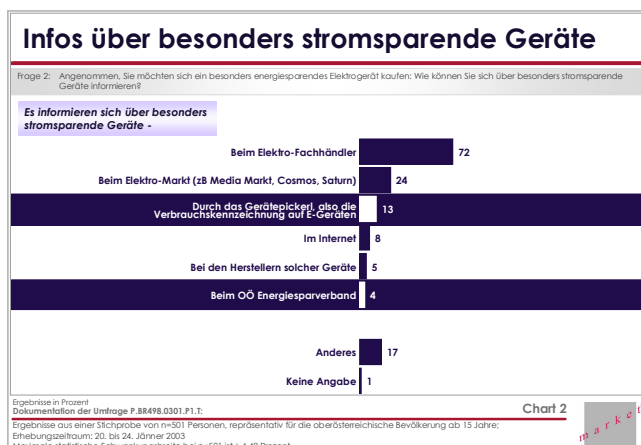
The increase in consumption is furthermore due to the increase in households. Whereas the number of inhabitants was more or less constant over the last years, the number of households, especially 1-person households, is increasing.

The average electricity consumption per household is about 3,000 kWh.

For the future development on the one hand a decrease of electricity consumption is predicted due of fewer electrical heating installations (they are no longer allowed in new buildings), but on the other hand electricity consumption will increase because of additional electricity consumption for cooling and ventilation and possibly also the continuation of the other trends (more appliances, smaller households).

More and more, new one and multi-family homes are equipped with ventilation systems (with heat recovery) which on average have an electricity consumption of 300 kWh per appliance (one family home). Additionally, more and more cooling installations are used due to increasing temperatures in summer and also due to new architecture (more glass facade).

However, awareness concerning electricity consumption and savings potentials is quite high. According to a survey carried out by ESV in the last years, when buying new electrical household appliances, people mainly look at the electricity consumption (64%), followed by the price (52%) and the branding (33%).



The main information channels used for efficient household appliances are above all the retailer (72%), followed by chain of stores (e.g. Media Markt, large retailer of consumer electronics). Only 13% use the “label” as decision factor when buying new appliances.

In the last years a number of awareness raising measures have been implemented to trigger electricity saving measures for households, for example:

- EU project “Energy labels” with information packages for households (brochures, postcard, etc.), informing about the energy label and benefits of electricity efficient household appliances
- Database on the website informing about electricity efficient household appliances, which should be a guide when buying new appliances
- “pump-test”: on online tool to check the electricity consumption of household pumps including a suggestion of improvement measures
- brochure “saving electricity in households”.

The most important policy measures in this field are the prohibition of electrical heating for new homes and the requirement of energy efficiency criteria (coefficient of performance) for heat pumps in order to receive financial support.

For the recent activities, a focus is put on efficient lighting - a promotion campaign will support efficient lighting technologies.

For future development of electricity consumption in households by 2020, the following scenarios were developed:

Scenario 1 is an ambitious one which foresees a total reduction of electrical heating in all households and in addition a reduction of 300 kWh stand-by consumption per household (presently the stand-by consumption per household is estimated to about 430 kWh/a).

Scenario 2 is less ambitious, only half of the electrical heating can be removed and only 150 kWh stand-by consumption per household can be saved.

| <b>GWh</b>                      | <b>scenario 1</b> | <b>scenario 2</b> | <b>explanation</b>   |
|---------------------------------|-------------------|-------------------|--|
| electricity consumption 2005    | 2,490             | 2,490             |  |
| reduction of electrical heating | - 300             | - 150             | presently about 3.7% of the households (20,000 households) have electrical heating               |
| reduction of stand-by losses    | - 180             | - 90              | 300 (150) kWh less stand-by consumption in 600,000 households                                    |
| sub-total                       | 2,010             | 2,250             |  |
| increase in households          | + 201             | + 225             | 10% increase in the number of households by 2020   |
| more ventilation                | + 10              | + 15              | average consumption of a ventilation system: 300 kWh/a, 2,000 (3,000) new installations annually |
| more home office equipment      | + 60              | + 120             | 100 (200) kWh more electricity consumption per household for home office equipment               |
| total                           | 2,281             | 2,610             | total electricity consumption households by 2020   |

An increase in electricity consumption due to increasing number of households, more ventilation systems (2,000 – 3,000 new systems per year) and more home office equipment (100 – 200 kWh more consumption annually per household) was predicted. It was assumed that the number of households would increase by 10% to 600,000 by 2020.

## Electricity consumption in the public sector

Statistics in Upper Austria only show electricity consumption in the “public and private service sector” as one figure, therefore it is difficult to analyse the public and tertiary sector individually.

However, electricity consumption in this field increased sharply in the last years. From 2000 to 2005, there was an increase in electricity consumption of 80% (public and private service sector). It is estimated that the vast majority of this increase was in the service/tertiary sector.

For the public buildings owned by the regional administration, energy accounting is in place since 1994, allowing benchmarking and monitoring.

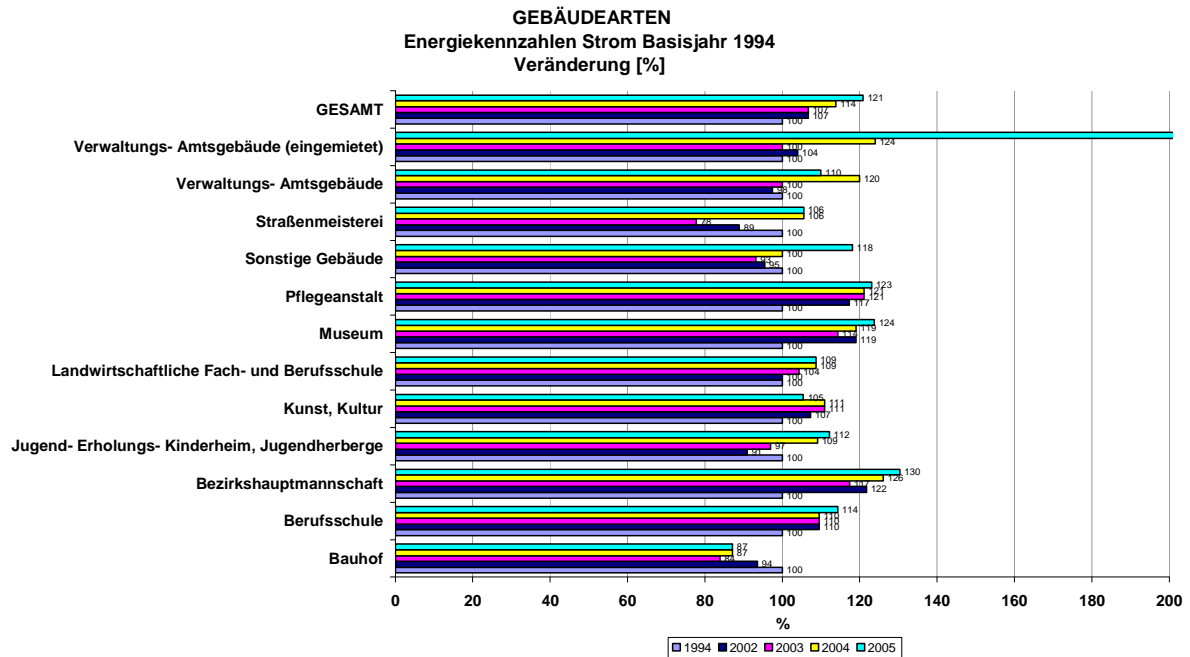
### Gebäudearten

Energiekennzahlen Strom [kWh/m<sup>2</sup>a]

|   | 1994      | 1995      | 1996      | 1997      | 1998      | 1999      | 2000      | 2001      | 2002      | 2003      | 2004      | 2005      |
|---|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Bauhof  | 31        | 31        | 30        | 30        | 30        | 31        | 30        | 28        | 29        | 26        | 27        | 27        |
| Berufsschule  | 21        | 20        | 21        | 20        | 22        | 23        | 23        | 23        | 23        | 23        | 23        | 24        |
| Bezirkshauptmannschaft                              | 23        | 26        | 26        | 27        | 29        | 31        | 29        | 29        | 28        | 27        | 29        | 30        |
| Jugend- Erholungs-<br>Kinderheim,<br>Jugendherberge | 33        | 33        | 30        | 28        | 25        | 29        | 29        | 30        | 30        | 32        | 36        | 37        |
| Kunst, Kultur                                       | 55        | 47        | 46        | 51        | 49        | 54        | 53        | 55        | 59        | 61        | 61        | 58        |
| Landwirtschaftliche Fach-<br>und Berufsschule       | 23        | 22        | 23        | 23        | 23        | 23        | 22        | 23        | 23        | 24        | 25        | 25        |
| Museum  | 21        | 21        | 25        | 21        | 25        | 23        | 26        | 25        | 25        | 24        | 25        | 26        |
| Pflegeanstalt                                       | 52        | 55        | 69        | 75        | 71        | 77        | 79        | 70        | 61        | 63        | 63        | 64        |
| Sonstige Gebäude                                    | 44        | 41        | 41        | 42        | 38        | 39        | 37        | 46        | 42        | 41        | 44        | 52        |
| Straßenmeisterei                                    | 18        | 19        | 19        | 18        | 18        | 18        | 19        | 18        | 16        | 14        | 19        | 19        |
| Verwaltungs-<br>Amtsgebäude                         | 40        | 39        | 39        | 41        | 41        | 38        | 38        | 37        | 39        | 40        | 48        | 44        |
| Verwaltungs-<br>Amtsgebäude<br>(eingemietet)        | 25        | 25        | 29        | 51        | 41        | 40        | 38        | 39        | 26        | 25        | 31        | 56        |
| <b>GESAMT</b>                                       | <b>28</b> | <b>27</b> | <b>28</b> | <b>29</b> | <b>29</b> | <b>30</b> | <b>30</b> | <b>30</b> | <b>30</b> | <b>30</b> | <b>32</b> | <b>34</b> |

The table shows the electricity consumption (kWh/m<sup>2</sup>,a) of different public buildings.

The overall energy benchmark for electricity consumption in all public buildings (owned by the regional administration), increased from 30 to 34 kWh/m<sup>2</sup>a (in 2005). However, it was possible to achieve a stable electricity consumption over the last years in the “IT-sector”, despite increase in PCs and other electrical office appliances.



*electricity consumption – changes compared to 1994*

For the future, electricity consumption will probably increase mainly because of additional electricity consumption for cooling and ventilation.

Most new office buildings are equipped with ventilation systems and additionally more and more cooling installations are used due to increasing temperatures in summer and also new architecture (more glass façades).

In the next years, the implementation of the EPBD will draw more attention towards electricity consumption in public buildings, as the energy performance certificate will include data on the electricity consumption and for such buildings with more than 1,000 m<sup>2</sup> the certificate has to be displaced publicly.

The main policy measures in this field are:

- obligatory energy accounting
- monitoring and benchmarking in public buildings of the regional administration since 1994
- local energy strategies: for example at present a support programme for municipalities is being implemented in many Upper Austrian municipalities ("E-GEM – Energiespargemeinde", energy saving municipality) which encourages municipalities to carry out local energy strategies including targets and an action plan to achieve them
- municipalities can get (free) energy advice and support from ESV

Future promotional activities will focus on public procurement. Presently activities in this field are under preparation (also linked to the "Energy Services Directive") which will support public authorities in their procurement activities and draw the attention towards energy efficient procurement.

Furthermore campaigns for efficient street lighting and efficient office lighting are under preparation which will start in the course of 2007 with the aim to save electricity in these fields. Another field of action in the next two years will be efficient cooling. As the number of cooling appliances is continuously increasing, there is an urgent need for action. The activities already started last year with the dissemination of an information brochure and the development and implementation of training courses for "energy advisers for cooling".

An important financial measure for implementing energy efficiency projects is Third Party Financing, which is already well established in Upper Austrian municipalities. More the 60 projects have been implemented with 15 M€ investment and were supported by the Upper Austrian support programme "ECP" ("Energie-Contracting-Programm"). The average reduction in energy consumption achieved within this projects is 25-30%.

In addition, services to support in public authorities in the procurement process are for example information on energy efficient criteria for different appliances and systems, which are carried out following the implementation of the "Energy Services Directive".

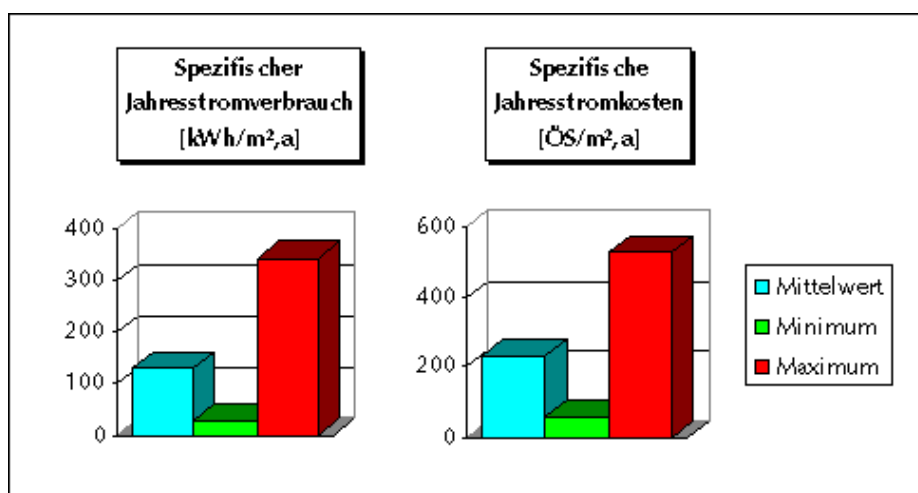
## Electricity consumption in the service/tertiary sector/SMEs

As mentioned before, statistics in Upper Austria only show electricity consumption in the “public and private service sector” as one figure, therefore it is difficult to analyse the public and tertiary sector individually.

However, electricity consumption in this field increased sharply in the last years. From 2000 to 2005, there was an increase in electricity consumption of 80% (public and private service sector). It is estimated that the vast majority of this increase was in the service/tertiary sector (offices, shops, etc.).

The increase is mainly due to an increase in the number of buildings. The annual increase in economic activities (increasing GDP) results in a continuous increase in new services.

Example 1: office buildings



*Benchmarks for electricity consumption and costs (excl. VAT) per m<sup>2</sup> floor area*

In many cases, electricity costs can be reduced by simple rate restructuring, which requires no investments. In one case study, for example, such measures were able to produce an annual savings of more than 9,000 € for a company. In general, "large" electricity consumers can negotiate better tariffs than smaller ones. In addition, electricity-efficient office machines (computers, printers, fax machines, etc.) and systems (ventilation and air-conditioning, lighting, lifts, etc.) can help reduce electricity consumption.

Example 2: examples for hotels & restaurants from the energy advice programme run by O.Ö. Energiesparverband

|  |                    | restaurants |         |        | hotels incl. restaurants |           |         |
|--|--------------------|-------------|---------|--------|--------------------------|-----------|---------|
|  |                    | Ø           | max.    | min.   | Ø                        | max.      | min.    |
| energy consumption per m <sup>2</sup>      | kWh/m <sup>2</sup> | 452         | 795     | 134    | 393                      | 1753      | 567     |
| electricity consumption per m <sup>2</sup> | kWh/m <sup>2</sup> | 163         | 253     | 99     | 83                       | 133       | 14      |
| total electricity consumption              | kWh/a              | 63,847      | 109,530 | 32,690 | 158,362                  | 340,632   | 33,317  |
| total energy consumption                   | kWh/a              | 233,195     | 524,135 | 63,060 | 729,517                  | 1,540,632 | 400,000 |

*benchmarks for hotels & restaurants*

The electricity consumption amounts to 22 - 27% of the total energy consumption.

For the future, electricity consumption will probably increase mainly due to additional consumption for cooling, ventilation and more IT.

Most office buildings are equipped with ventilation systems and additionally more and more cooling installations are used due to increasing temperatures in summer and also due to architecture (more glass facade).

In the next years, the implementation of the EPBD will draw more attention towards electricity consumption in tertiary sector buildings, as on the energy performance certificate for such buildings, the electricity consumption has to be mentioned.

Promotional measures for electricity saving in this sector in the last years, where among others:

- online tool to check the electricity consumption of office buildings allowing a first benchmarking
- online database for efficient office appliances (IT, [www.topten.ch](http://www.topten.ch))

An important financial measure for implementing energy efficiency projects, is third party financing, which is already well established in Upper Austrian municipalities but which is more and more also used in SMEs. More the 60 projects have been implemented with 15 mio € investment and were supported by the Upper Austrian support programme "ECP" ("Energie-Contracting-Programm"). The average reduction in energy consumption achieved within this projects is 25-30%.

Future awareness raising activities will focus on lighting and cooling. Presently a "lighting campaign" to promote electricity efficient lighting in businesses is going on and in 2008 efficient cooling will be a focus point of activities.

## Electricity consumption in industry

Upper Austria is a highly industrialised region with strong industry, especially energy intensive metal, chemical and pulp and paper industries. This explains, why the electricity consumption in industry amounts to 7,717.9 GWh (2005), which is 60% of the total Upper Austrian electricity consumption.

Typical for the sector is the high relevance of “single measures” in one industry company. If for example a new paper production machinery is installed in one of the 3 major pulp and paper industry companies, this means a significant increase in the overall Upper Austrian energy consumption.

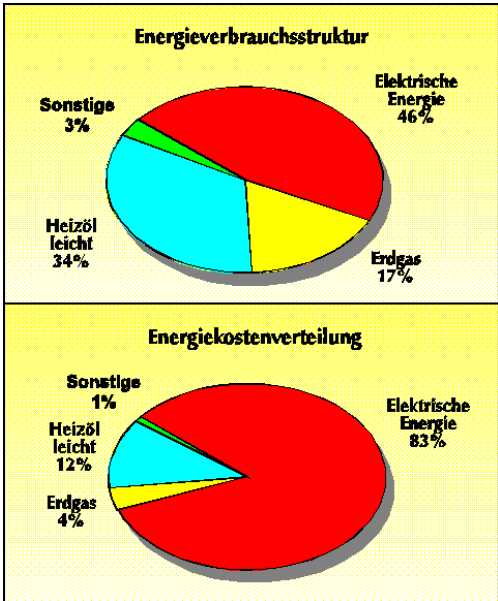
Although in the last years, industries benefited from lower electricity prices, presently a trend to own electricity production in big companies can be noticed. Recently some major businesses build new CHP plants, some of them fired by biomass.

A number of best practice industry buildings were implemented recently which serve as model for other businesses.

### Example 1: Metal industry

| Sector                | consumption [ % ] |               |
|-----------------------|-------------------|---------------|
|                       | mean value        | range         |
| <b>electricity</b>    |                   |               |
| office, lighting      | 6                 | (3.0 – 23.0)  |
| mechanical production | 43                | (20.0 – 54.0) |
| thermal production    | 26                | (7.0 – 50.0)  |
| surface treatment     | 12                | (5.0 – 30.0)  |
| compressor, heating   | 13                | (7.0 – 17.0)  |
| <b>total</b>          | <b>100</b>        |               |

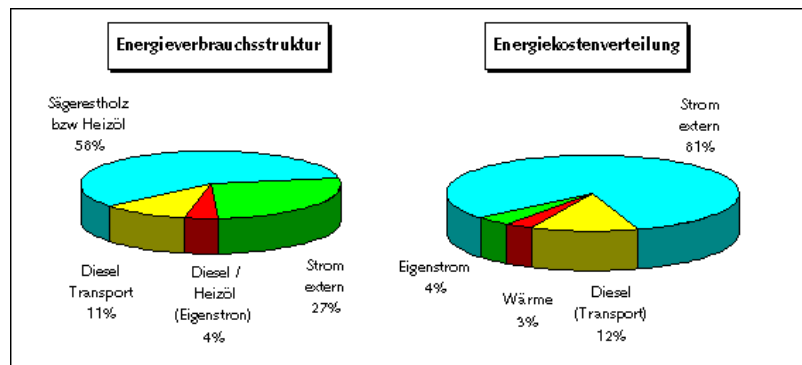
*share of electricity consumption in different sectors*



*Energy consumption and energy costs*

Besides electricity, industries use natural gas and heating oil. Although the share of electricity on the total energy consumption is only 46%, electricity accounts for 83% of the energy costs.

## Example 2: timber industries



*Energy consumption and energy costs*

Electricity accounts for more than 80% of the total energy costs. However, the businesses of this sector are characterised by a great variety different energy consumption figures ranging from 255,000 kWh/a to more than 15 mio kWh/a. The difference is mainly due to own electricity production (hydro power).

The main policy measures for industry included in the Upper Austrian energy strategy are:

- energy advice: businesses can get up to 2 days on spot advice and have only to pay 25% of the costs (about 200 €)
- Third Party Financing: besides energy performance contracting projects, in the last 2 years, a number of biomass plants were established and financed via third party financing
- R&D: regional R&D programme supports businesses in their R&D activities

In the next years, the implementation of the EPBD will draw more attention towards electricity consumption in industry buildings, as on the energy performance certificate for such buildings, the electricity consumption has to be mentioned.

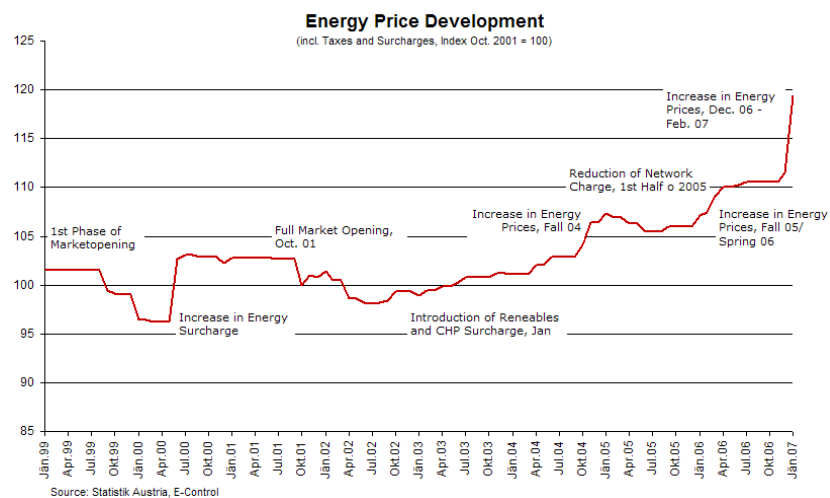
## Electricity prices & market liberalisation

|  | Price<br>per kWh in Euro                                       | Year          | Remark  |
|--|--|---------------|---|
| Typical electricity price household including all taxes ( <u>not</u> "special" tariffs for domestic hot water/heat pumps/electric heating etc.)                                      | 0,16 – 0,19  | <b>3/2007</b> | 3,500 kWh/a<br>(see graph 1)  |
| This price consists of:  |  | <b>3/2007</b> | see graph 4,<br>example 3,500<br>kWh/a, cheapest<br>supplier        |
| Energy costs   | 34.31 %  |               | including 2.5-3.5%<br>for green electricity                         |
| Grid charges   | 33.26%   |               |   |
| VAT  | 20%  |               |   |
| Other taxes: electricity tax   | 1.5 Cent/kWh   |               |   |
| stranded costs   | 0-0.0922<br>Cent/kWh   |               | from 1 July 07 0<br>Cent  |
| metering point charge  | 15 € per metering<br>point /a                                  |               | voltage level 7   |
| tax for public properties  | 0-0.5 Cent/kWh   |               |   |
| Typical electricity price household  | 0,147 – 0,153  | <b>2005</b>   | see graph 2, 3;<br>lowest prices; valid<br>only for a few<br>months |
| Typical electricity price household  | 0,16 – 0,165   | <b>2004</b>   | see graph 2, 3  |
| Typical electricity price household  | 0,153 – 0,165  | <b>2003</b>   | see graph 2, 3  |
| Typical electricity price <u>service sector</u> (price range for commerce & public sector, only energy price, taxes, network charges not included, see graph 5), including all taxes | 0.0465 – 0.0464  | <b>2006</b>   | full load hours <<br>4,500/a  |
| Typical electricity price <u>industry</u> (price range, only energy price, taxes, network charges not included, see graph 6), including all taxes                                    | 0.0441 – 0.0433  | <b>2006</b>   | full load hours ><br>4,500/a  |
| Relevant special tariffs (e.g. heat pumps, electric heating) - please specify:....   | 0.126 – 0.128<br>(day) and 0.1018<br>– 0.109 (night<br>tariff) | <b>2007</b>   | the electricity supply<br>can be disconnected<br>for 1 hour per day |

The Electricity Directive 96/92/EC was first transposed into Austrian law by the Electricity Act (EIWOG) in 1998, which opened the Austrian electricity market for only a part of the customers. The amendment to the Electricity Act in 2000 completed the hundred percent market opening effective as of 1 October 2001.

However, the Electricity Act in many cases only provides a framework which has to be transposed into regional law by the 9 Austrian regions. The most recent Upper Austrian legislation in this field is the "Oö. EIWOG 2006", which for example includes regulation of the unbundling of the grid operators, legal basis for the Austrian Power Grid AG as grid operator.

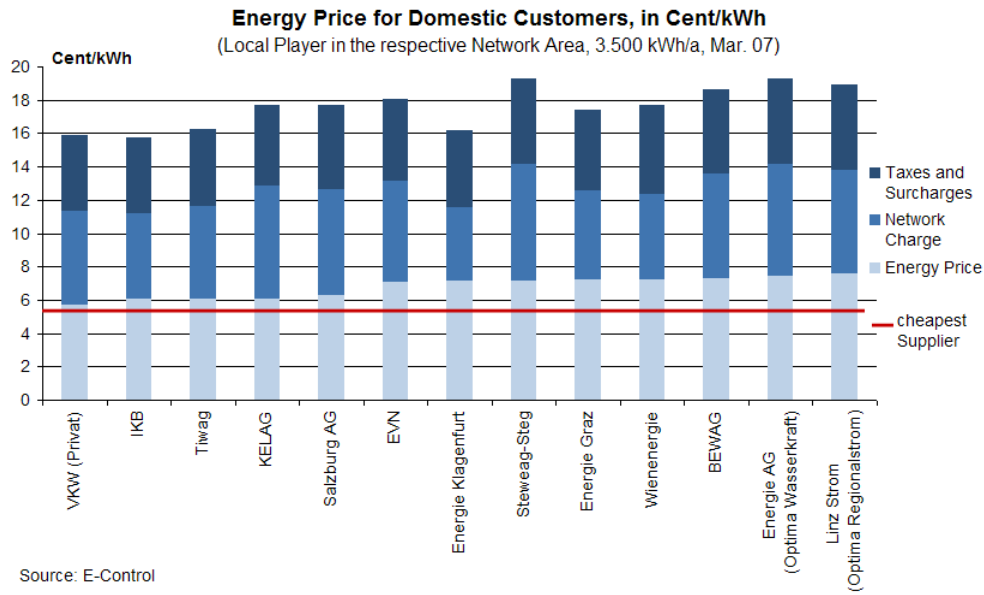
The electricity price development over the last years is shown by the following graph, being 1 October 2001 as the date of full liberalisation the basis (100%):



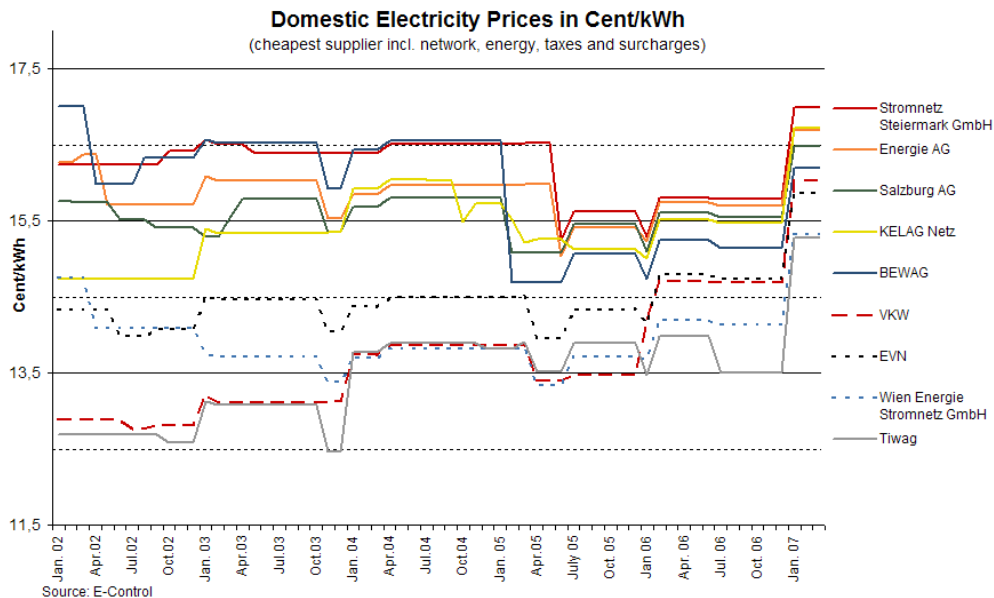
Since 1 October 2001, except a small reduction in 2002, the electricity price has been continuously increasing. Presently it is about 120% of the value in October 2001.

Although there is a significant price difference between different traders, so far only a small percentage of households changed their supplier.

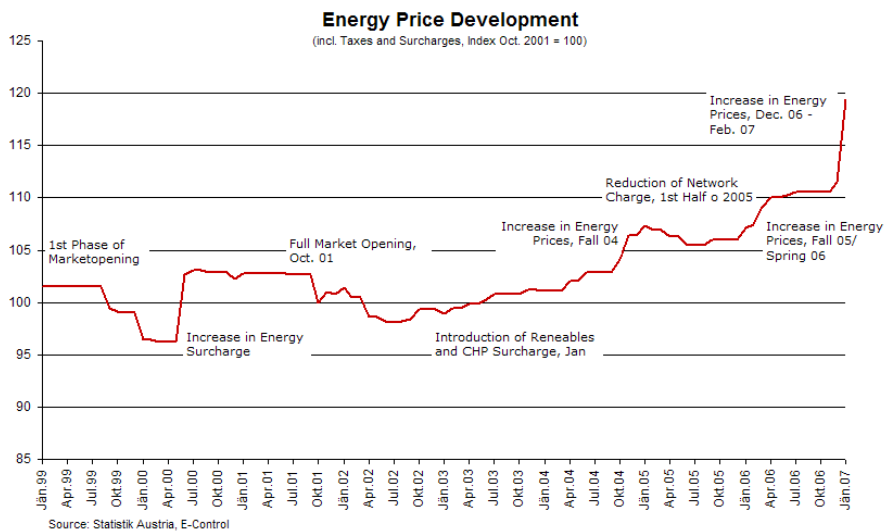
Please find below relevant graphs explaining the situation.



Graph 1

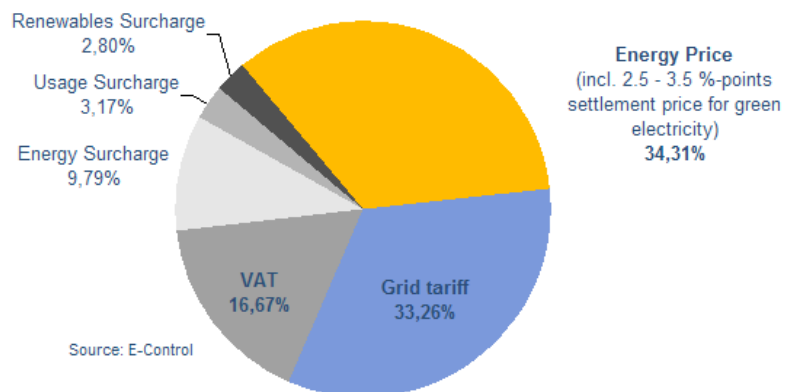


Graph 2



Graph 3

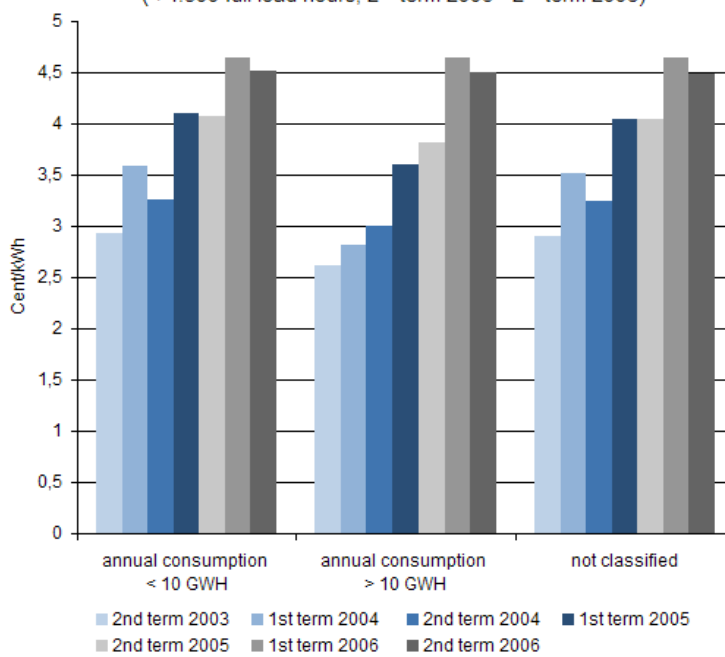
**Electricity Price Composition**  
 (Grid area Vienna, residential customer,  
 3.500 kWh/a, cheapest supplier, March 07)



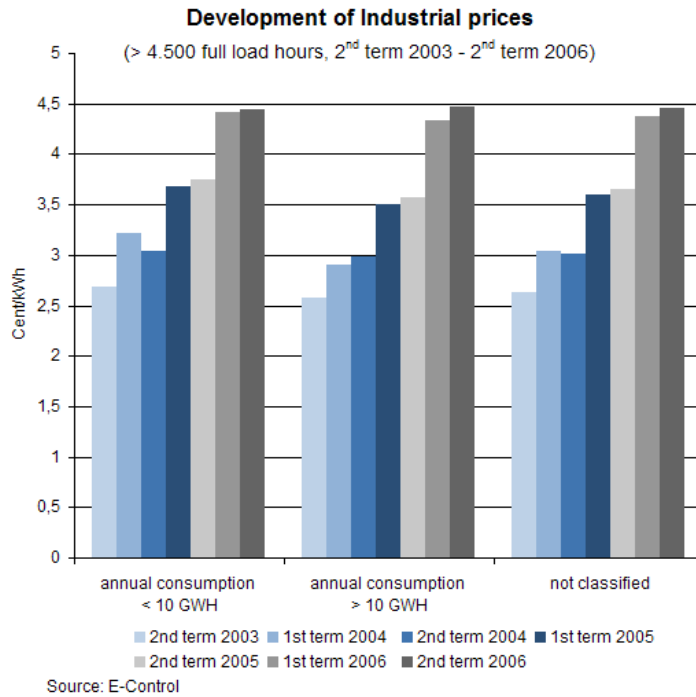
Graph 4

**Development of Industrial prices**

(< 4.500 full load hours, 2<sup>nd</sup> term 2003 - 2<sup>nd</sup> term 2006)



Graph 5



*Graph 6*

## Stakeholders

The main stakeholders in the electricity field are:

- Energy utilities
- Grid owners and operators
- Regional authorities (administrative authorities, the electricity authority)
- National electricity regulator
- Technology producers (e.g. for green electricity, the OEC)
- Civil engineers & consultants
- Regional energy agency ESV & OEC (network of green energy businesses)
- Large industries (metal, chemical and paper industries)
- Media
- Consumer organisations, farmers association (biogas) and small hydro power association
- Retailers of household appliances

### Some "key" stakeholders in the region

The main electricity suppliers are:

- **Linz AG**  
The Linz AG is a management holding with four strategic subsidiaries and one internal service provider for the branches of the corporation. Among themselves the divisions cover the areas energy generation and telecommunications, supply of gas, district and immediate heating and installation services, public transport and water supply and disposal.
- **Energie AG**  
Energie AG is the number one infrastructure group in the core business segments energy, water and waste disposal in Upper Austria. The markets of the enterprise are not restricted to Upper Austria but also include southern Germany, the Czech Republic, Hungary and Slovakia.
- **E-Werk Wels**  
The E-Werk Wels is an Upper Austrian energy provider with more than 100 years of experience. Besides its core services electricity, gas and water supply and district heating, it is also active in a variety of other areas like telecommunications, metal-structure and electrical engineering, technical facility and event management, sustainable energies and consulting and contracting.

## **O.Ö. Energiesparverband & Oekoenergie-Cluster (OEC)**

The O.Ö. Energiesparverband, the Energy Agency of Upper Austria, was founded by the regional government with the aim of promoting energy efficiency, renewable energy sources and innovative energy technologies. It is the central institution for energy information in Upper Austria and one of Europe's largest energy advice and information providers. O.Ö. Energiesparverband is also responsible for the management of the "Oekoenergie-Cluster", which is the network of Upper Austrian companies active in the area of green energy. Aim of the cluster is to foster innovation and competitiveness of green-energy-related businesses operating in the region.

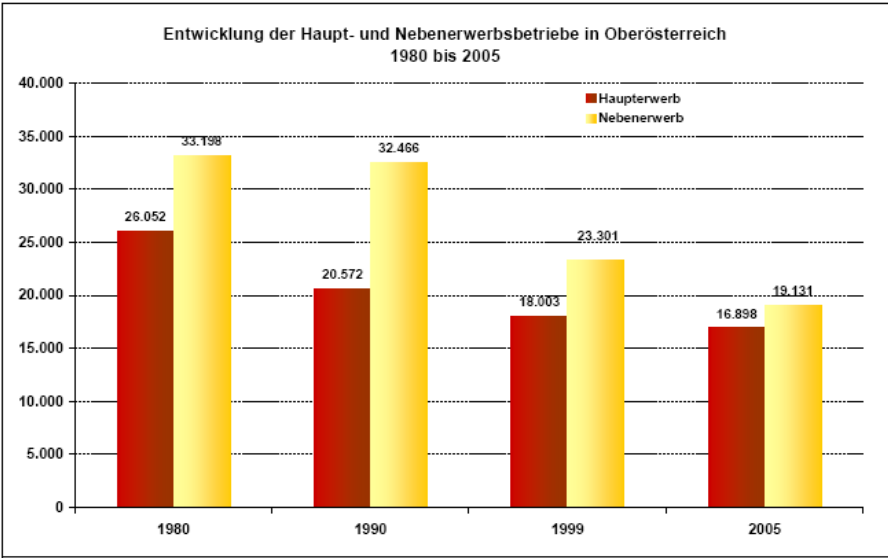
### **Regional administration**

The regional administration plays an important role in this field, being on the one hand permission authority for electricity plants and on the other hand a large electricity consumer in own buildings. For the buildings owned and operated by the regional administration, energy accounting is in place since 1994 which allow monitoring and benchmarking of electricity consumption.

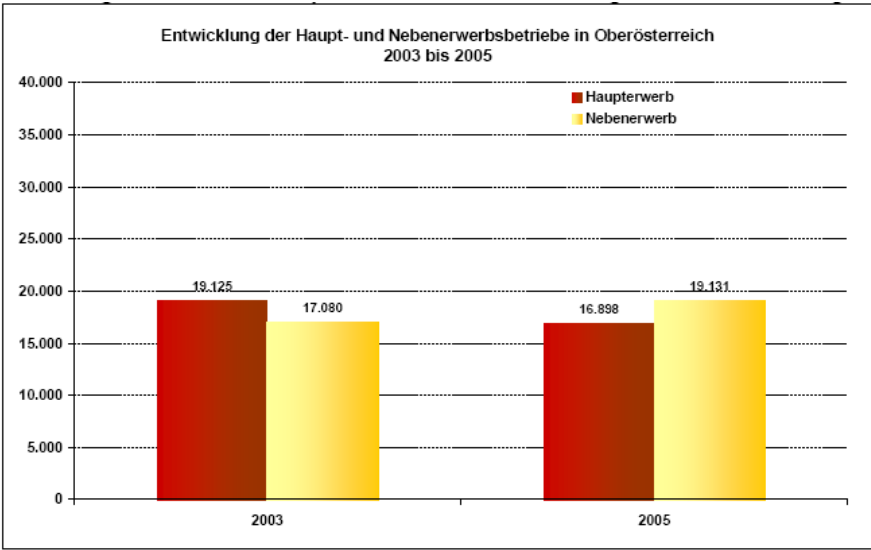
## Selection of the "second sector"

As “second sector” agriculture was chosen. So far, almost no statistical data on the electricity consumption of the sector are available. Contrary to other sectors, no “sector strategy” outlines key data of the consumption structure, technologies and possible measures, is available. Additionally, no activities have been carried out to increase (electricity) efficiency on farms.

In 2005, there were 36,543 farms operated in the region, which means a reduction of 0.5% compared to 2003. More than half of them are only partly living from the income of the farms (19,131 farms), they have another source of income for their living. The number of farms with full-time farmers is continuously decreasing.



*Decreasing number of farms in Upper Austria from 1980 to 2005*



*Increasing number of part time farmers, decreasing number of "fully employed" farmers*

In total 108,249 persons are working in the agricultural sector, the majority of that are family members (86%). The production value of the agricultural sector amounted in 2005 in Upper Austria to 1.3 billion Euro, about 63% of this comes from animals breeding or feeding and 31% from arable farming.

The electricity consumption of the agricultural sector in 2005 in Upper Austria was 272,146 MWh (1,400 GWh Austrian-wide), which is about 2% of the total Upper Austrian electricity consumption.

Agriculture accounts for about 3% of the total energy consumption Austrian-wide. About 1/6 of the total energy consumption is electricity (1/6 heating fuels, 2/3 oil products).

Although the number of farms continuously decreased over the last years, the total consumption of the sector was more or less stable of the last years (and did not decrease).

The main stakeholders in the agricultural sector are:

- farmers as electricity consumers
- farmers associations as first contact point for farmers in most issues
- agricultural schools - teachers & students: multiplier, awareness raising
- agricultural store chains ("Lagerhäuser"): most every day products needed on farms are bought there, very good local connections
- energy utilities: special electricity tariffs for "large" farms
- technology producers

In order to get more information on the sector especially on the electricity consumption structure, in cooperation with the agricultural schools of Upper Austria, a pilot project was started. A questionnaire was developed and disseminated to teachers and pupils, with the aim to get an overview of electricity consumption on farms per farm category and to be able to develop benchmarks. The questionnaire includes also a listing of the main electric appliances used on farms.

For future development, it is estimated that the number of farms will decrease further and the number and capacity of electric appliances per farm will increase.

## Summary/conclusions

As part of the overall energy consumption balance, the electricity sector has a high relevance mainly due to the high share of exergy (can be transformed) and being a rather expensive energy source (costs per kWh). Additionally in the last years the increase in electricity consumption was very high (Austrian-wide increase for example in 2003, +4.2%, for some Upper Austrian electricity suppliers up to 7%).

For future development, as part of the strategy process "Energy future 2030", 4 scenarios were developed which outline development of consumption, trends and potentials and which show that the share of RES-e can vary from 44% up to 130%. This depends on the development of the electricity consumption by 2030 (high – 3% increase, medium – 2% increase, stable - +/- 0%, turning point scenario - -0.5%) and on the utilisation of RES-e potentials.

However, 130% share of RES-e (turning point scenario) will only be possible, if Upper Austria succeeds in increasing electricity efficiency (minus 0.5% electricity consumption per year). Electricity efficiency will therefore also have a high political priority over the next years.

