

## EL-EFF REGION

### WP 2: Regional summary report

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#### Overview Table

Region of: POMERANIA (POLAND)		Year	Remark/Explanation
Electricity consumption <u>Households</u> (domestic sector)	1495 GWh	2005	
Electricity consumption <u>Service Sector*</u> (commerce & trade & public sector)	No separate data available	2005	
Electricity consumption <u>industry**</u>	2 195 GWh	2005	
Electricity consumption <u>energy sector</u>	1 194 GWh	2005	
Electricity consumption <u>other sectors***</u>	1 419 GWh	2005	
Electricity consumption <u>transportation</u>	529 GWh	2005	
Electricity consumption <u>agriculture</u>	60 GWh	2005	
<b>Total Electricity consumption in the region</b>	6 892 GWh	2005	
Total Energy Consumption in the region	46 000 GWh	2005	
Share of electricity in total energy consumption	15 %		
<b>Data on the region</b>			
Number of inhabitants	2 202 463	2006	
Number of households (most recent data)	755 192	2002	Available data from National Census of 2002
Number of 1-person householders (most recent data)	181 586	2002	Available data from National Census of 2002
Number of 2-person householders (most recent data)	183 809	2002	Available data from National Census of 2002
Number of 3-person householders (most recent data)	163 753	2002	Available data from National Census of 2002
Number of 4 or more-person householders (most recent data)	226 045	2002	Available data from National Census of 2002
Number of households (predicted for 2010)	790 000	2010	No statistical data available-estimate number based on the number of flats built per year (taking into account the current

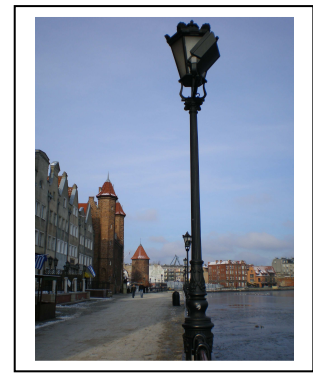
			boom)
GDP	13 405,5 mln Euro	2004	
GDP/inhabitant	6 114,5 Euro	2004	

\* use of electricity in commerce & trade & public sector is included in the category "other " in Polish statistics

\*\* without the consumption of the electricity sector

\*\*\* includes commerce & trade and public sector

## Introduction



## Short description of the region

Pomeranian Province

Photo: The Old Town of Gdańsk

The Pomeranian Province (Województwo Pomorskie) is situated in the North of Poland, on the southern coast of the Baltic Sea and borders on the East with the Russian Federation. The area of the province is 18 293 km<sup>2</sup>, and accounts for 5.9% of area of Poland, while its population of 2,202,463 people represents 5.7% of Poland's total population. With the population density of 119 inhabitants per square kilometre and 68.1 % of population inhabiting towns, Pomerania is the fourth most urbanised region in Poland. Pomerania ranks among the top provinces in terms of industrialisation (ca 70%) as it is ranked seventh in terms of GNP, it also has fifth position for nominal product value and GNP per capita.

The region's economy is strongly related with the sea as its major sectors are: tourism, shipbuilding and ship renovation, sea navigation, fishery, fish processing, and the service sector relating to these activities.

Source: Information brochure about the Province "The Province of Pomerania" posted on the website of Office of the Marshal of Pomorskie Voivodeship ([http://www.woj-pomorskie.pl/downloads/ekonomia\\_en.pdf](http://www.woj-pomorskie.pl/downloads/ekonomia_en.pdf))

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

Pomeranian Province has defined some general objectives for its development relating to energy in Pomorskie Voivodeship Development Strategy, prepared by Office of the Marshal of the Pomorskie (Department of Regional and Spatial Development) where the Strategic Objective nr 2 (Priority III: ACCESSIBILITY) is defined as the improvement of technical and tele-informatic infrastructure including the improvement of energy infrastructure and supply systems, the availability of different sources of energy and increase of energy efficiency and the improvement of levels of energy supply security and achievement of the better use of the region's energy potential through, among other actions, supporting the usage of renewable energy and launching a local market for fuel and energy (the strategic objective nr 7). The objectives as to energy policy are set in Regional Strategy for Energy Sector for the period 2006 - 2025 adopted by Regional Parliament. The principal objective of energy strategy in the region is defined as the reduction of energy intensity and energy consumption in all sectors of economy and the increased share of energy generated from RES in the total energy balance. The courses of action adopted for the realization of this objective are (among others) the promotion of cogeneration of heat and electricity and modernization of electricity network.

The quantifiers (targets) for the realization of the general objectives are as follows:

- The reduction of energy carriers and primary fuels consumption by c.a. 50 %;
- The increase of RES use in the total energy balance by 19 %

These general objectives are incorporated into the Regional Operational Programme 2007-2013 under which public funding will be made available for investment projects increasing the efficiency of existing installations for energy production and distribution, as well as projects promoting co-generation and a new structure of fuels and projects of electricity grid modernization.

**However there are no specific objectives and targets relating to electricity in particular.**

**The partner organisation:**

**BALTIC ENERGY CONSERVATION AGENCY's** activities are aimed at the implementation of EU Directives on energy conservation and dissemination of state-of-the-art, ecologically friendly technologies in the energy sector. The agency's activities include consultancy and expertise services as well as educational and training services in the area of rationalization of energy use and of renewable energy sources utilization.

The agency helps organizations and individuals tackle legal, financial and environmental challenges created by the changing energy market in Poland and is directly involved in efforts taken by local companies and authorities to implement efficient energy technologies at acceptable cost with benefit to the environment. It assesses experiences in the field of energy production, renders advisory and consultative services in industry, housing sector and public sector (energy audits, financial engineering). BAPE explains energy issues and solutions to local authorities, increases public awareness on environmental and energy issues. It also provides local authorities with support for energy management and planning.

The agency also participates in realisation of numerous European projects concerning energy conservation under "Intelligent Energy - Europe Programme" of European Commission.

## Electricity consumption in households

The national electric energy consumption in 2004 amounted to 130.5 TWh, out of which households accounted for 22,8 TWh, i.e. 17,5% (Figure1). Over the period 2001-2004 the electricity consumption in Poland grew by 4,7% and in households by 6,7% (Figure.2). According to National Census of 2002 there are 13 337 thousand households and the average electricity consumption per household in Poland is 1624 kWh/a.

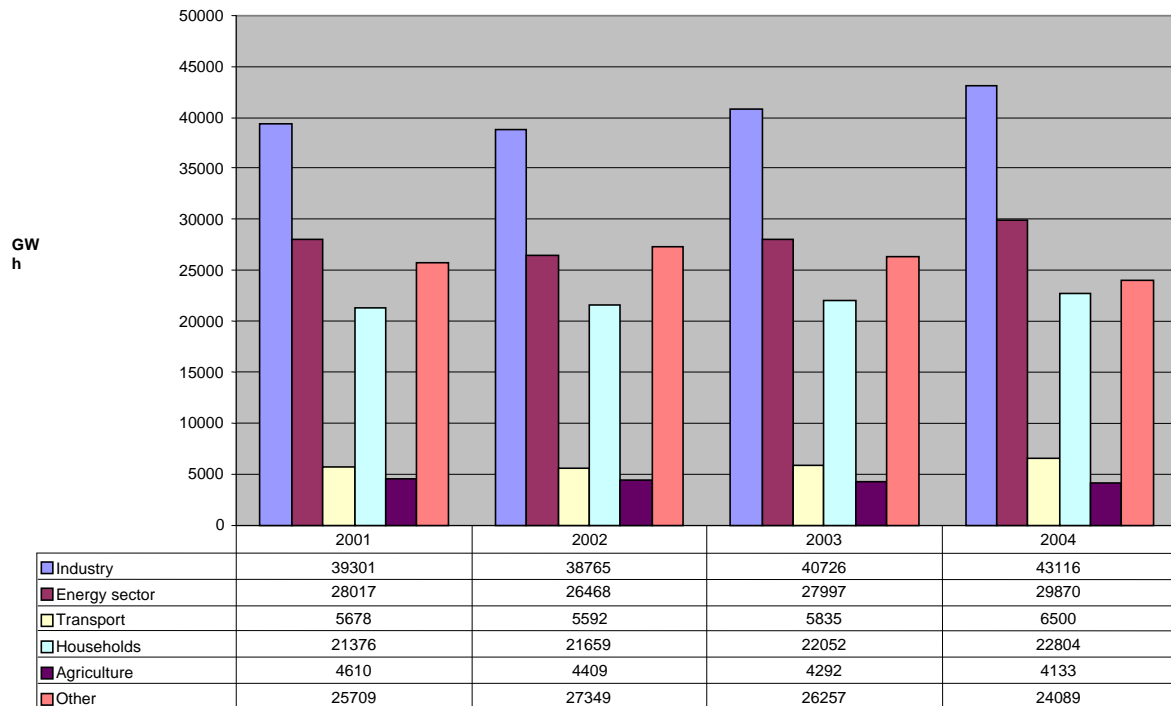


Fig.1. Electricity consumption [GWh] in Poland from 2001 to 2004

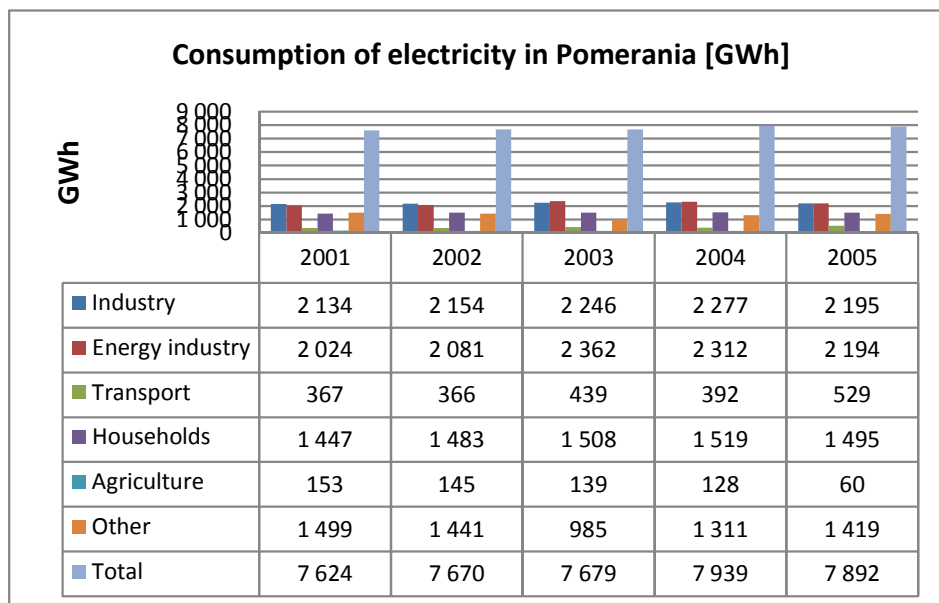


Fig.2. Electricity consumption [GWh] in Pomeranian Province from 2001 to 2005

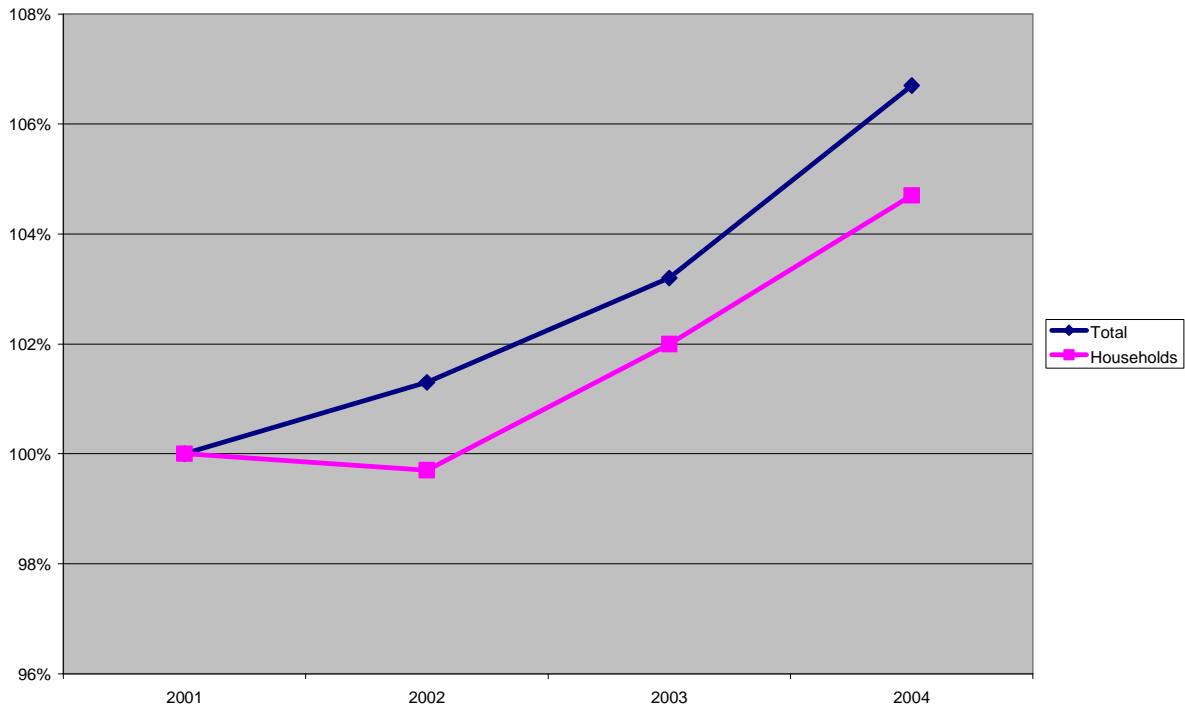


Fig.3. Dynamics of total electricity consumption and electricity consumption in households in Poland (consumption in 2001 =100%) in the period 2001-2004

		Towns	Rural area	Higher consumption per one household in rural areas
		Per one household	Per one household	
		kWh	kWh	%
Pomeranian Province	2003	1 979	2 294	15,92
	2004	1 957	2 293	17,17
Total Poland	2003	1 858	2 083	12,11
	2004	1 868	2 087	11,72

Tab.1. Electricity consumption in households (Source: Agency of Energy Market, Statistics of Electric Energy Sector for 2003 and 2004)

The ratio of electricity consumption in households indicates a distinct relation to the affluence of people. There is a significant regional diversity and a considerable difference of electricity consumption ratio for households in towns and in the rural area. The consumption in the urban area is much higher than in the countryside. However the consumption of electricity per one household is higher for rural areas than for urban areas (17% for Pomerania and 12% for Poland).

The electricity consumption in the Pomeranian Province is above the national average.

The ratio of electric energy consumption in households has stayed at the same stable level and the recorded consumption tendency over a longer period of time is a growing one. This tendency is a result of overlapping and counterbalancing of two trends:

- growth tendency resulting from improved living standards and from the higher level of saturation of households with electric appliances,

- improved quality of used appliances and replacement of the old appliances with the energysaving new ones.

The recorded increase in the total consumption by households (Fig.3) is mainly caused by the increase in the number of households.

Due to the considerable share of electricity costs in the total maintenance costs of households electricity consumers began to pay more attention to the problem of rational electricity consumption. However the access to knowledge on this issue is not easy. Basic information is dispersed in the Internet and can be read on energy labels. Promotional activities and campaigns are sparse and organized quite seldom. They focus on products introduction of which results in quick and considerable economic benefits for consumer (eg. energysaving bulbs) . Consumer organizations are not active in promoting energysaving household appliances. Over the past few years ( 2- 3 years) energy traders have been more active in educating consumer about energysaving issues. The main communication channels are web sites and free brochures for customers.

Few measures are undertaken by manufacturers of energysaving appliances to promote their products by using arguments of energy saving. The replacement of old equipment with the new one which is more efficient is hampered because of disadvantageous relation between the high price of new appliances and a relatively low price of electricity.

There is only slight activity of central government and local selfgovernment in the area of effective use of electricity. So far no measures addressed to the sector of households have been taken, apart from general statements about promoting energysaving behaviour and the significance of energy efficiency. The only functioning system is energy labels for new household appliances on sale. There are no plans for the nearest future to introduce any measures resulting in the increase of energy efficiency in Pomeranian Province achieved by more rational use of electricity by householders.

### **Electricity consumption in the public sector**

The consumption of energy in the public sector has not been examined to a large extent. The technical condition of buildings falling into this category is varied. There are many new buildings where technical solutions meeting modern technical standards are used altogether with old facilities in poor technical condition with outdated installations.

No statistical data on the consumption of electricity in this sector is published and no research work on a larger scale has been conducted.

Information about energy consumption in this sector gathered in energy audits performed for public facilities (such as schools, hospitals and museums) shows that in numerous buildings electricity is not used in a rational way. The reasons for higher energy consumption are as follows:

- Inadequate care and energy awareness of technical maintenance staff
- Outdated lighting technology and inadequate observance of operation and maintenance procedures for lighting equipment
- Uncommon use of control and management systems of energy consumption

Some improvement in this area has been noted over the past few years. The availability of new technologies (especially for lighting and control systems) and their dropping prices makes it possible to install high-tech apparatus in newly built and refurbished buildings. Metering of buildings is much more advanced, which increases the awareness of end-users of the rational energy use and facilitates the development of rational energy use programs.

The local authorities are becoming more and more aware of the importance of efficiency of energy use and consequently implement energysaving measures in the entities they govern. The decisive factor is the economic one - local selfgovernment bodies attempt to reduce maintenance costs of their buildings. The measures undertaken so far are much more advanced for the rational use of heat than for the rational use of electricity. Single implementations of comprehensive solutions of electricity efficiency in buildings do occur (the example of hospital presented by BAPE in the Project Newsletter) but there are no system solutions and programs in place for the implementation of standard measures or for the establishment of regional targets. They are not planned for the nearest future either.

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

The service sector is a growing one. The structure of energy consumers of this sector has changed. The number of buildings of large floor space ( shopping malls and high-rise multi-story office buildings in business) is on the increase. The change of types of buildings brings about the change of electricity end-users structure: small buildings were supplied with low voltage electricity while the arising new buildings use electricity of medium voltage. The basic division of electricity end-users into tariff groups is made with regard to the voltage of electric power supply. As a result the statistical data can not be easily analyzed because the growth of electricity consumption is recorded for different tariff groups and it is hard to interpret it.

The fact that old-type shops and offices scattered over a large area are replaced by new buildings of vast floor space which are designed and used with proper caring with regard to energy costs results in the trend of decreasing consumption in the sector. The identification of the sector in the statistics is difficult as it is included in various statistical categories ( Figure 1 – the category “other use”). On the basis of the statistics it can be only noted that the total increase in the demand for electricity in this sector is of little significance. A more detailed identification of existing trends requires further research, which is not feasible on the basis of the available statistics.

### **Electricity consumption in industry**

The 90's were the period of dynamic economic transformation of Poland which entailed major changes in the structure of Polish industry. Many branches of heavy industry characterized by high energy intensity collapsed, which resulted in the overall decrease of industry energy intensity and the decrease of the energy

consumption. Since 2000 the intensity of industrial production has been growing . Consequently there is a growth tendency in the consumption of electricity (Fig. 1). The rapid economic growth of the recent years makes this tendency more noticeable. Industry is the sector of the highest growth tendency (Fig. 3).

This growth tendency shows that the simple potential of rationalization has been exploited to a large extent and that the period of rapid changes in the industry structure has finished. The rate of demand growth for electricity in this sector is expected to be related to the pace of economic growth.

At the same time there is a vast room for rationalization of energy use in Polish industry. Some of technologies currently used are outdated and the use of energysaving equipment and monitoring systems is not sufficient. In order to make use of this potential it is necessary to spread the technologies of energy management, benchmarking and to carry out a successful policy in this field.

The provisions of energy policy are yet general and declarative and the actions taken so far insufficient. Some energysaving measures are financed by Funds for Energy Conservation and only single actions for improvement of energy efficiency implemented with the support of foreign funds are effective.

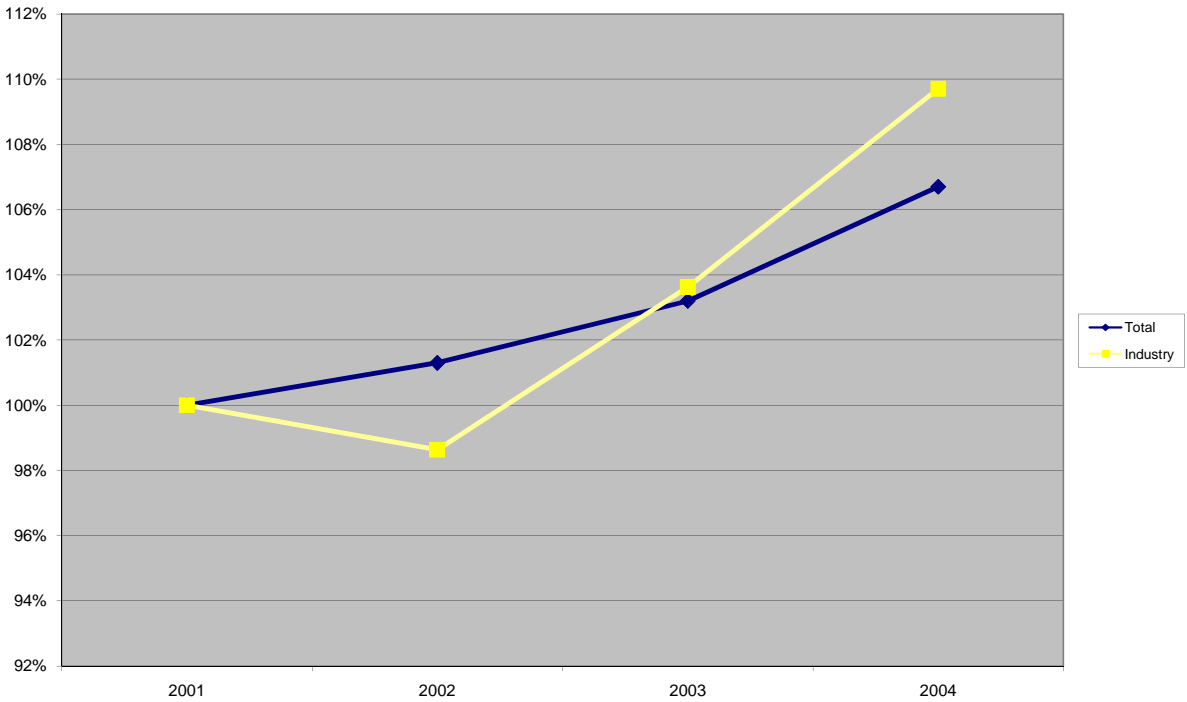


Fig.4. Dynamics of total electricity consumption and electricity consumption in industry (consumption in 2001=100%) in the period 2001-2004

**There is not much attention paid to topic of the rationalization of electricity use in the general policy of the region and clear strategy in this field. has not been defined yet.**

## Electricity prices & market liberalisation

How did the prices for electricity develop over the last years in the sectors of private households, services and industry (please use table below) and also describe the development in a few sentences. Did the price development affect consumption levels or have any other noticeable effect?

How far is the opening of the electricity market in your country/region - opening only for industry, or also for smaller consumers including private households)? If the market has been opened for households - is there a visible price difference between the different traders and how much are smaller consumer making use of the choice of electricity suppliers?

	Price 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.)	2006/2007 0,098859/0,103894  (0,1041)	<b>2006/2007</b>	Most common tariff for households (G11) in Pomerania region (1 Euro = 3,78 zloty) <i>Average electricity price for households in Poland (2006 – included all taxes and payments)</i>
This price consists of:			
Energy costs	0,035503/0,03955		
Grid charges	0,045529/0,045608		
Charges/levies for green electricity/CHP etc	0		No special charges for green electricity/CHP. Costs of green/CHP electricity is included in energy costs
VAT	0,017827/0,018735		Vat tax = 22%
Other taxes (CO2 etc.)	0		
Others :.....	0		Excise tax is included in energy costs. In Poland Excise tax is paid by producers of energy (20 zł/MWh = 5,29 Euro/MWh)
Typical electricity price household	0,094405	<b>2005</b>	Most common tariff for households

			(G11) in Pomerania region (1 Euro = 3,78 zloty)
Typical electricity price household	0,0932	<b>2004</b>	Most common tariff for households (G11) in Pomerania region (1 Euro = 3,78 zloty)
Typical electricity price household	0,091587	<b>2003</b>	Most common tariff for households (G11) in Pomerania region (1 Euro = 3,78 zloty)
Typical electricity price <u>service sector</u> (price range for commerce & public sector), including all taxes	0,07-0,12	<b>2006</b>	Estimated average price (included all taxes and payments e.g. capacity price per kW)
Typical electricity price <u>industry</u> (price range), including all taxes	0,0567	<b>2006</b>	Average price for industry in Poland in the middle of 2006
Relevant special tariffs (e.g. heat pumps, electric heating) - please specify:....	-	<b>2006</b>	No special tariffs for heat pumps, hot water or electric heating.

Tab. 2. Electricity prices (Source: Electricity tariffs of Electricity Trading Company "Koncern Energetyczny Energa SA")

The extent to which the energy market is open is quite large. All energy consumers, except for householders, are free to choose any energy supplier they want. However, only few end-users take advantage of this opportunity due to the organizational limitations, insufficient awareness of consumers, shortage of attractive offers from energy traders and little cost-effectiveness emerging from changing the energy supplier. The primary reason of lacking attractive offers is the uncompetitive mechanism of energy wholesale market in Poland.

The market for householders will be liberalized since July 2007. The organization of this process is under preparation and will be probably completed on time but the ultimate results for end-users and full liberalization of the market will depend on the competitiveness of energy traders.

Over the decade the increase in the price of electricity for householders has remained stable as it is controlled by Energy Regulatory Office but analysts predict that it will grow due to the vast investments that have to be made in the energy infrastructure.

## Stakeholders

In Pomeranian Province there is one leading electricity trader:

### **Electricity Trader Koncern Energetyczny Energa SA**

The corporation deals with the distribution, transmission and sales of electricity. Energa distributes electricity in northern and central Poland (an area of 75,000 square kilometers) and it serves around 2.7 million customers (17 % of the total number of energy end-users in Poland); It provides its customers with the information on rational use of electricity (source: ENERGA S, data as of 2004)

**Polish Power Grid Operator Company** (Polskie Sieci Elektroenergetyczne Operator SA) is the transmission system operator supplying the region (the electricity trader Energa S.A.) with electricity generated in other regions of Poland over the high voltage 400 kV and 200 kV electricity grid.

**Combined Heat and Power Station EC Wybrzeże in Gdansk** (total installed capacity 353 MW) is the main supplier of heat for municipal district heating systems of TriCity conglomeration (Gdansk, Sopot and Gdynia) ( 50 % of the total demand for heat), heat in steam sold to the nearby industrial plants , and electricity from combined heat and power generation sold to the electricity trader Koncern Energetyczny SA.

**Energy Regulatory Office** (Urząd Regulacji Energetyki) is a governmental regulator of energy sector whose main tasks are as follows:

- \* issuing licences to the energy enterprises whose business is generation, transmission and trade of energy,
- \* approval and control of energy tariffs,
- \* control of consumer's service quality standards.

**Regional Parliament of Pomeranian Province (Voivodeship)**-the regional level of self-government - creates the regional economic policy, coordinating it as well as creating the foundations for regional development. It develops and implements a strategy to create conditions conducive to the region's economic growth, which is defined in such documents as Pomorskie Voivodeship Development Strategy, Regional Strategy for Energy Sector for the period 2006 – 2025, Regional Operational Programme 2007-2013.

**Commune Councils** – local level of self-government create the local policy for the growth of the communes, among others they prepare long term **Heat, electricity and gaseous fuels supply plans** which determine the development of energy infrastructure in the communes.

**Local radio stations** eg. “Radio Gdańsk” broadcast interviews with speakers and participants of events organized to promote ecological issues.

## **Selection of the "second sector"**

Agriculture is an important economic sector of Pomerania and its current situation results from the historic background – in the past most of the agricultural land was state-owned. After liquidation some part of this land is no longer used but at the same time some of the best arable soils in the estuary of the Vistula river are cultivated by specialist farms, many of them are Danish and Dutch companies. Pomeranian agriculture is very varied because of the quality of the soil in Żuławy area, in the Vistula River delta, where there are some of the best arable soils in Poland. In the central part of the region, where the soil is of lower quality, potatoes or strawberries are grown.

- **Selection of the second sector**

There is virtually no detailed statistics on the use of electricity in agriculture and it is believed that this subject requires more attention, which can be done, to some extent only, within the frame of the project.

Moreover, the education level of people living in rural areas is much lower than in urban areas (in Poland the education of 56% of population in rural areas is above the primary level, while for inhabitants of towns it is 73%) due to more difficult access to the educational system. Therefore farmers' awareness on the rational use of electricity needs to be raised since no measures in this matter have been taken so far. Thus the inhabitants of rural areas and agricultural holdings should be targeted by the educational activities planned in the project.

Furthermore, the agricultural sector has been chosen to be addressed in this project on boosting electricity efficiency since the population of rural areas in Pomerania forms a significant proportion of the total population of the region.

- **Population of rural areas**

According to National Census of 2002, population of rural areas accounts for 31,9 % of total population of Pomerania ( for Poland in total - 38,2 % of population inhabits rural areas). Rural areas are defined as areas outside administrative borders of towns, both rural communes and communes of mixed type: municipal and rural).

The forecast for the number of population in rural areas (including individual agricultural holdings) shows a slightly growing trend and therefore agriculture is considered to be worth targeting in the project.

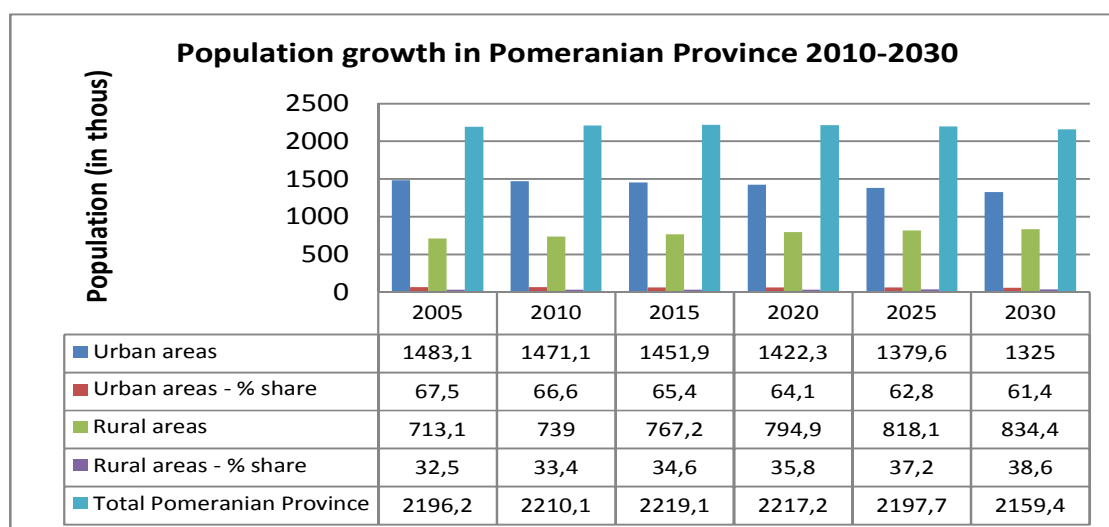


Fig. 5 Forecast of the population growth in Pomeranian Province (Source: Regional Statistical Office).

- Type of agricultural production

The structure of gross agricultural output shows that crop output (65 %) prevails over animal output (35 %). In the cultivation structure, corn dominates at 70%, potatoes about 7%, rape about 6.5% and sugar beet about 2.5%. The headcount of farming animals per 100 ha decreases, while the dominating role of crops in the sector of agriculture dominates.

- Use of agricultural land

Most of the land belongs to (or is leased by) private agricultural holdings, either private farmers or agricultural companies (often with foreign capital).

Private farms or companies are the majority of businesses in agriculture, about 80 % of agricultural land is owned (or used) by individual farmers and only about 7 % is public (owned or leased by communes and state treasury entities). The area of agricultural land is steadily going down, due to the urban and industrial growth, but the share of agricultural land used by private sector grows in contrast to the decreasing use of agricultural land by the public sector.

		2000	2004	2005
1	Agricultural land - public sector [ha]	70 305	50 527	46 259
2	Agricultural land - private sector [ha] including:	797 433	753 077	727 356
2.1	private agricultural holdings (private farms) [ha]	685 570	644 650	621 231
2.2	other agricultural holdings [businesses]	111 863	108 427	106 125
3	Total agricultural land [ha]	867 738	803 604	773 615
4	Total area of Pomerania [ha]	1 829 288	1 829 288	1 829 288
5	Share of agricultural land in total area [%]	47,44	43,93	42,29
6	Share of agricultural land owned or leased by private farms in total agricultural land [%]	79,01	80,22	80,30
7	Share of agricultural land owned or leased by other private agricultural holdings (businesses in total agricultural land [%]	12,89	13,49	13,72

Tab 3. Structure of agricultural land use in Pomerania (Source.:Regional Statistical Office).

- Size of agricultural holdings (individual farms and companies)  
Majority of agricultural holdings are individual farms , 60 % of them are farms with the area agricultural land not exceeding 5 ha, while over 50% of agricultural businesses (companies) are holdings of agricultural land over 100 ha.

Type of agricultural holding - size	Number of individual agricultural holdings (farms)	Number of other agricultural holdings (companies)	Total number of agricultural holdings
agricultural land -up to 1 ha	22 477	13	22 490
agricultural land -from 2 to under 5 ha	23 027	23	23 050
agricultural land - from 5 to under 10 ha	10 587	25	10 612
agricultural land - from 10 to under 20 ha	11 933	31	11 964
agricultural land -from 20 to under 50 ha	5 778	35	5 813
agricultural land -from 50 to under 100 ha	1 084	22	1 106
agricultural land -from 100 ha	496	162	658
Total	75 382	311	75 693

Tab 4. Types of agricultural holdings with regard to size (area of agricultural land)

(Source: National Statistics Office on the basis of National Agricultural Census of 2002)

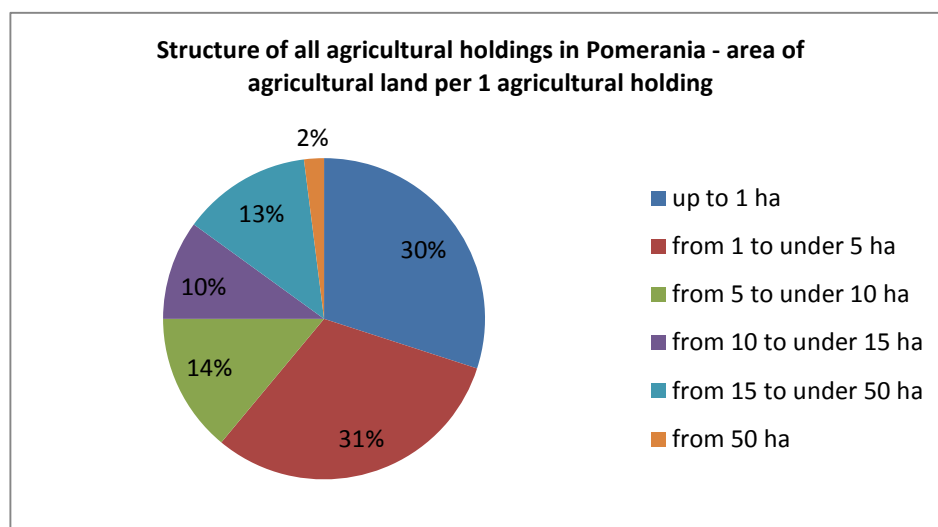


Fig.6 Share of agricultural holdings (with regard to size) in the total number of agricultural holdings.(Source: National Statistics Office on the basis of National Agricultural Census of 2002)

Comparative studies of National Agricultural Census of 2002 and National Agricultural Census of 1996 show that there is an increase in the number of small agricultural holdings (from 1 to under 5 ha) in the communes with poor soils and the opposite trend in the communes with good soils. The number of middle agricultural holdings (from 10 to 15 ha) is going down, while the number of large holdings (over 50 ha) is going up and their area is increasing. (Source: Report on State of Spatial Management of Pomeranian Province)

- Electricity consumption in agriculture

Only general statistical data on the consumption of electricity in Polish agriculture is available.

	2001	2002	2003	2004	2005
Poland - el. consumption in agriculture [GWh]	4 610	4 409	4 292	4 133	2 002
Pomerania - el. consumption in agriculture [GWh]	153	145	139	128	60
Poland - total el. consumption [GWh]	124 691	124 242	127 159	130 512	128 557
Pomerania - total el. consumption [GWh]	7 624	7 670	7 679	7 939	7 892
Share of el. consumption in agriculture of Pomerania in total consumption in Pomerania [%]	2,01	1,89	1,81	1,61	0,76
Share of el. consumption in agriculture of Poland in total el. consumption in Poland [%]	3,70	3,55	3,38	3,17	1,56
Share of el. consumption in agriculture of Pomerania in el. consumption in agriculture of Poland [%]	3,32	3,29	3,24	3,10	3,00

*Tab. 5 Electricity consumption in agriculture in Pomerania vs Poland [GWh]*

(Source: National Statistics Yearbook for 2005)

Generally, the share of electricity consumption in agriculture both in Poland and in Pomerania is very small and a minor decrease is noticeable (in absolute numbers).

Specification	2000	2004 <sup>1)</sup>	2000=100
End-consumers of electricity in thous.	696,3	734,9	105,5
in towns	540,1	565	104,6
in rural areas	156,2	169,9	108,8
Electricity consumption [GWh]	1 416,9	1 508,1	106,4
in towns	1 082,0	1 118,3	103,4
in rural areas	334,9	389,8	116,4
Electricity consumption in households per 1 inhabitant in Pomerania [GWh]	671,1	689,9	102,8
in towns	728,6	753,4	103,4
in rural areas	548,2	556,6	101,5
Electricity consumption in households per 1 inhabitant in Poland [GWh]	no data available	577,3	-
in towns	no data available	692,7	-
in rural areas	no data available	392,0	-
Consumption of electricity in Pomerania - position in Poland	6	6	-
Consumption of electricity per 1 inhabitant in Pomerania - position in Poland	1	1	-

*Tab.6 Electricity consumption in towns and rural areas* (Source: Report on State of Spatial Management of Pomeranian Province)

The figures in the above table show that the electricity consumption in rural areas (including agricultural holdings) calculated per 1 inhabitant shows a trend of minor growth.

According to the research conducted by Prof. Małgorzata Trojanowska from Agricultural Academy in Cracow the number of individual agricultural holdings is essentially the same and the number of farming equipment does not grow significantly but the number of household appliances increases due to the technical progress and increasing affluence of farmers and thus the electricity consumption by these households is likely to go up.

Electric household appliance	Number of appliances/ 100 farms	
	1990	2004
TV-set	61	98
VHR	29	88
Freezer	57	87
Washing machine	30	60
Kettle		54
Mircorwave oven		25
Computer set		18

*Tab 7. Average number of household appliances in farms. (Source: Małgorzata Trojanowska, Agricultural Acedemy of Cracow; Selected issues of electricity use in Polish rural area)s*

#### • Prices of electricity

Prices of electricity are defined in terms of tariffs based on the network voltage. Most agricultural holdings whose products are not sold but used by themselves belong to the tariff group G 11 like all households, described in “Electricity prices and market liberalisation” on page 11.

Agricultural holdings which run business activity and sell their products on the market use the tariff for low voltage of network **C 11** – with one time zone and C 12 with two time zones.

The maximum contracted energy load for this tariff is 40KWh.

Large agricultural holdings, for example specialist farms, buy electricity at **G 22 b** tariff, which is available for end-users with the contracted energy load of over 40 KWh.

<b>Tariff C11</b>	Net price [EUR]
energy cost per 1KWh	0,0388
grid charges per 1KWh	0,0475
fixed monthly fee per 1 kW	0,8571
monthly subscription fee per 1 month	1,1111
average net price of 1 kWh	0,0863
<b>Tariff G22</b>	
active load energy cost per 1KWh - day zone	0,0412
active load energy cost per 1KWh - night zone	0,0297
reactive load energy cost per 1KWh - day zone	0,0545
reactive load energy cost per 1KWh - night zone	0,0286
fixed grid charges per 1KWh of contracted power	3,1455
grid charges for transmission per 1KWh - daytime	0,0389
grid charges for transmission per 1KWh - nighttime	0,0260

monthly subscription fee	8,4656
average net price of 1 kWh	0,1032
VAT tax	22%

*Tab.8 Price of electricity for end-users in agriculture (Source: Electricity tariff of Electricity Trading Company Energa SA)*

From the table above it can be concluded that the price level of electricity is not diversified for end-users in the agricultural sector.

- **Stakeholders:**

In addition to general stakeholders listed on page 12:

- Agricultural Market Agency (AMA) *Agencja Rynku Rolnego***

Agricultural Market Agency, which was established in 1991 for stabilization of the agricultural market and protection of incomes from the agricultural production, has become the Paying Agency on 1 May 2004 responsible for administration of 50 mechanisms of the Common Agricultural Policy on 20 markets in agricultural products. AMA is responsible for 3 basic functions: implementation of the Community law, paying and information. The CAP mechanisms that AMA administers are directed mostly to the traders, storage enterprises, processing and production plants and producer groups as well as to the farmers.

- Agency for Restructuring and Modernisation of Agriculture (ARMA) *Agencja Restrukturyzacji i Modernizacji Rolnictwa***

is a state agency which supports Polish farmers, processors and rural residents mostly through subsidies to investment and working credit interest and co-financing of rural infrastructure construction, undertakings related to trainings and education of young and adult rural residents and since 2004 has been the Paying Agency for the Common Agricultural Policy mechanisms and structural policy for agriculture and rural areas.

- Pomorski Agricultural Advisory Centre *Pomorski Ośrodek Doradztwa Rolniczego***- provides gratuitous advisory services, including training sessions for farmers on modern operation of holding, agricultural accountancy, using the Common Agricultural Policy instruments and structural policy for improvement of production quality, distribution of information on scientific developments and raising increasing of professional qualifications of the farmers and other rural residents.

*Source; Publication of Ministry of Agriculture and Rural Development –Agriculture and Food Economy in Poland, 2006*

- Institute of Power Engineering, Gdańsk Division, *Instytut Energetyki***, provides scientific research analyses, expert opinions, devices and software from the field of power engineering.

- Faculty of Electrical Engineering and Automatics, Department of Electrical and Control Engineering at Technical University of Gdańsk, *Wydział Elektrotechniki i Automatyki, Katedra Elektroenergetyki, Politechnika Gdańska***

conducts a wide spectrum of scientific research within the following areas: electrical engineering, control engineering and robotics. The research in electrical engineering is primarily involved with physical phenomena in electrical equipment and apparatus, as well as those in power systems. Considerable research effort is also directed towards computer-aided design (CAD) of electrical equipment, power systems, and industrial plants.

## **Summary/conclusions**

The area of efficiency of electricity use in households and agriculture has not been widely analyzed and no measures on a large scale have been taken to promote the rational use of electricity in these sectors. Broad public should be made aware of the necessity to save energy, electricity in particular, and educated on methods to use electricity in a rational way.

The main information channel used by public bodies for energy efficiency questions is mass media, but the information is insufficient and no national information campaign has been conducted so far.