Energy Efficiency Policies and Measures in Poland

ODYSSEE- MURE 2010

Monitoring of EU and national energy efficiency targets

Central Statistical Office

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1 Executive Summary

Increasing the energy efficiency of generation, transmission and use of energy is the pillar of conducting a sustainable energy policy. It finds its expression in legislation and actions taken up by national institutions. Poland, as a member of the European Union, actively participates in creating a common energy policy and legislation on energy efficiency, as well as its implementation in national circumstances, taking into account protecting the interests of consumers, available energy resources and the technological conditions of generating and transmitting energy. Poland pursues the indicative target set by Directive 2006/32/EC of the European Parliament and Council from the 5th of April 2006 *on effective end use of energy and energy services, repealing Directive 93/76/EWG of the council*, which is achieving 9% of energy savings compared to 2001-2005 average use of final energy. Up to 2009 Poland achieved important progress in this regard. Barriers of continuous progress in the field of energy efficiency improvement were identified in the second National Energy Efficiency Plan and actions are determined i.e. white certificates system established.

An effect of a GDP increasing faster than the increase of energy consumption is an observed decrease of primary and final energy intensity of GDP, with the exception of year 2010. In the first half of the decade energy intensity decreased by 2% annually, and between 2007 and 2009 the rate amounted to 5% for primary energy intensity of GDP and almost 4% in the case of final energy intensity of GDP. However in 2010 the energy intensity of the Polish economy increased for the first time since 1993. The fastest rate of improving energy efficiency was noted in the industry sector, while the slowest in the services sector.

2 Key messages

During last 20 years Poland has achieved one of the greatest progress in scope of efficient energy use. It was industry sector that contributed most, due to improvements at branches level and structural changes. Improvements were mainly autonomous decisions based on economical calculation. Modernizations were also conducted after privatization of state-owned enterprises. Activities towards energy efficiency improvements have been undertaken continuously in households, services and transport sectors.

The main difficulties in further exploitation of potential for improving energy efficiency and realizing the first National Energy Efficiency Action Plan (2007) are:

- to little interest on energy saving solutions by energy companies,
- lack of encouragement in the form of tariffs favouring users who use energy sustainably,
- to little support for actions increasing energy savings taken up by the society,
- financial barriers (e.g. lack of a defined budget, limited support resources),
- weak effect of energy saving action taken up by households,
- little knowledge and low awareness of the energy user (e.g. no familiarity with sources of information on energy efficiency).

Until now Poland did not have regulations which would ensure the implementation of programmes and actions improving essentially energy efficiency to achieving the required energy savings. No strong encouragement market mechanisms for implementing energy efficiency actions were in place. New regulation accepted on the 15th of April 2011, Law on energy efficiency (Law Gazette No. 94, pos. 551), is meant to cause developments of mechanisms stimulating energy efficiency improvements. The Law introduces the obligation to acquire an appropriate number of energy efficiency certificates, called White Certificates, by energy companies selling electricity, heat or natural gas to end users connected to the network on the territory of the Republic of Poland.
The Law introduces also obligations for the public sector to play the exemplary role in energy saving. Government and local authorities are obliged to, while realizing their roles, utilise at least 2 measures of energy efficiency improving, from the list in the Law. Additionally the regulation outlines the rules for conducting energy efficiency audits.

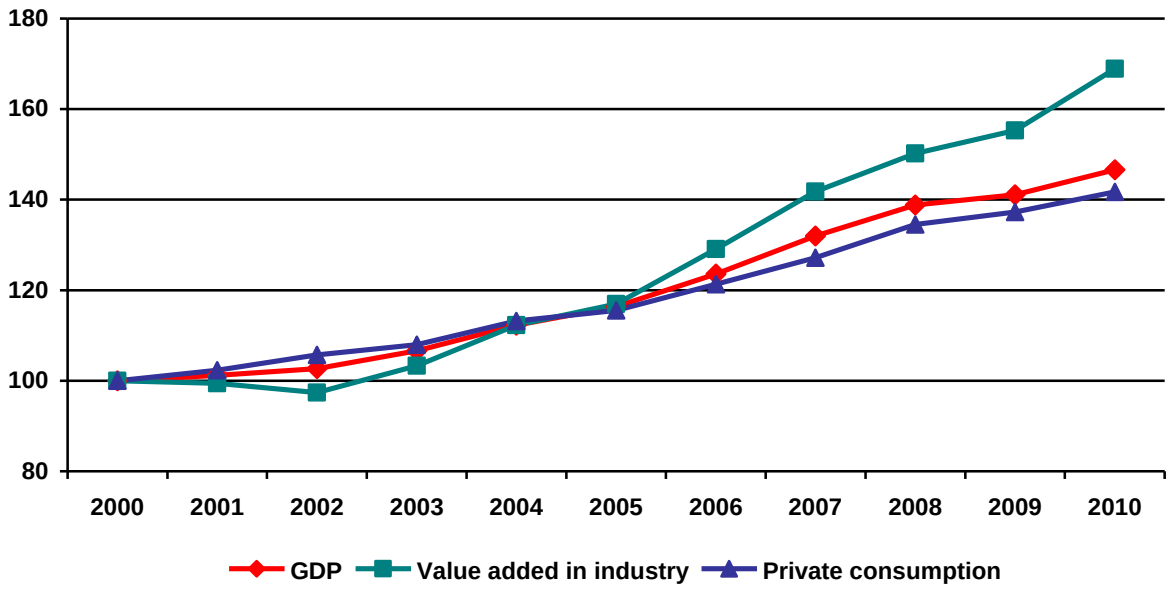
After conducting analysis of existing programmes and resources of improving energy efficiency as well as those planed as part of national policies, additional priority and further actions for improving energy efficiency for 2011-2016 as part of a second National Action Plan, which will allow reaching the national sustainable energy management target.

3 The Background to Energy Efficiency

3.1 Overall economic context

Economic situation of Poland in terms of GDP was constantly improving in the period 2000-2010. The growth of GDP was achieved each year and its value in 2010 was higher by more than 46% than at the beginning of decade. The fastest rate of growth of value added at constant prices was achieved in the given period in industry sector. Rate of growth[1] of private consumption was little smaller than rate of GDP growth.

Figure 1. Dynamics of basic macro-economic indicators (2000=100)



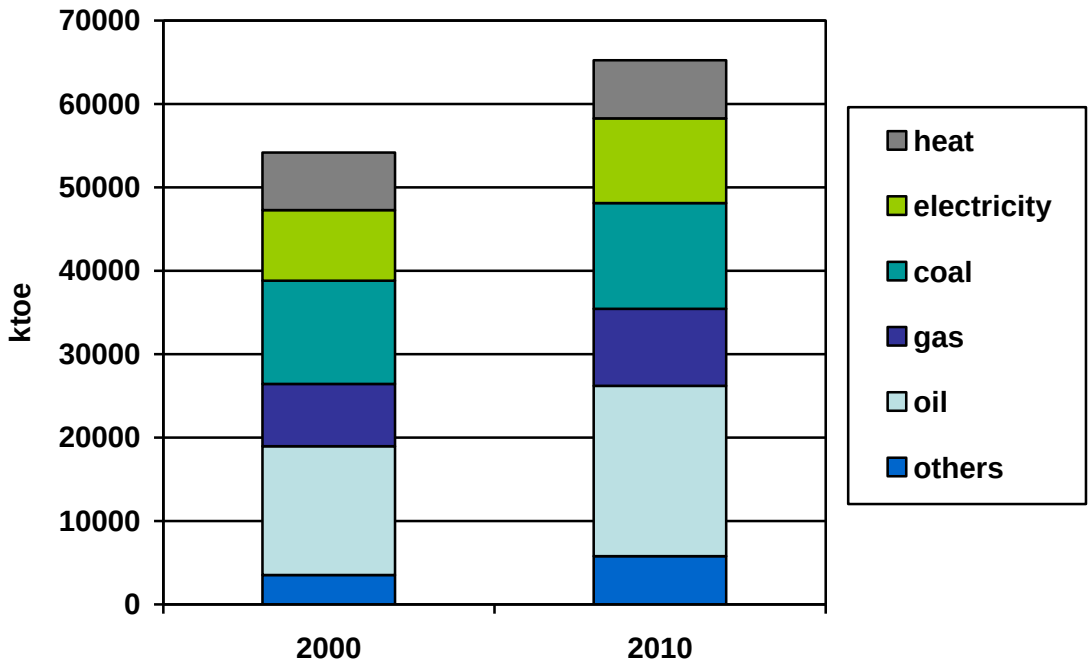
3.2 Energy consumption trends : by fuel and by sector

The level of final energy consumption in Poland tended to increase in years 2000-2010. The average annual growth of consumption amounted to 1.9%.The highest consumption level was reached in 2010 (65.3 Mtoe) and the lowest in 2002 (53.3 Mtoe). The structure of used energy carriers changed more visible. The share of coal fell from 23% in 2000 to 19% in 2010, while the share of liquid fuels increased from 29 to 31%. A

[1] Calculated as geometric mean

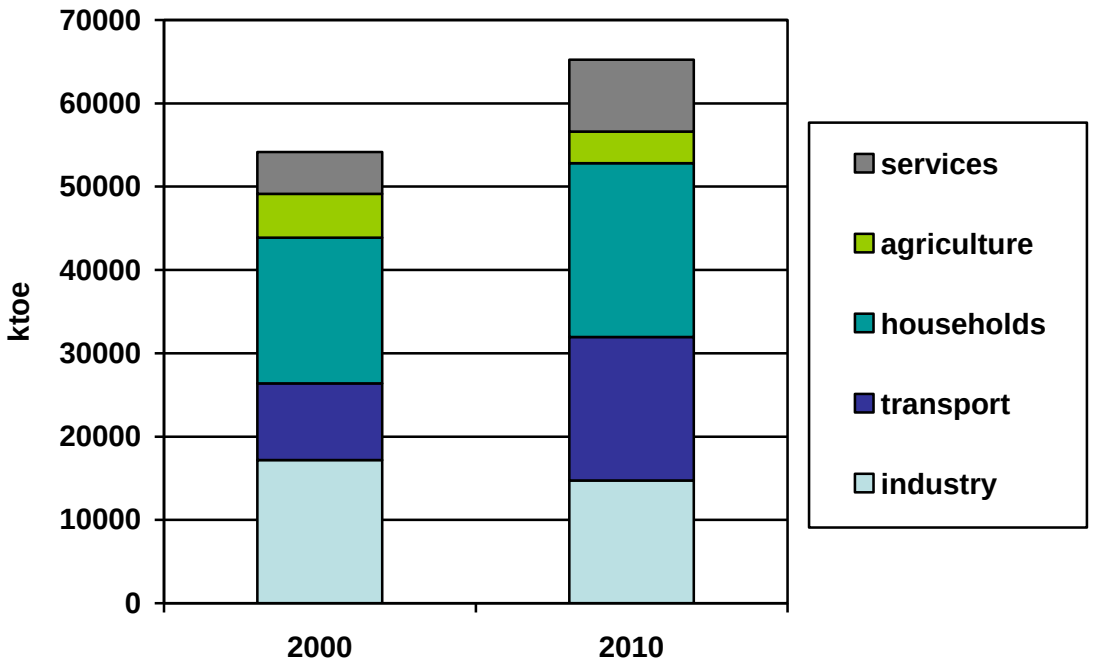
slight increase in comparison with year 2000 occurred in the consumption of other energy carriers, which accounted for 9% of energy consumption in 2010. The share of electricity (16%) and natural gas (14%) has not changed, while decrease of the heat was observed.

Figure 2. Final energy consumption by energy carrier



The major change in sectorial structure consisted in shift from industry to transport. The share of industry fell from 32% in 2000 to 23% in 2010, while the share of transport increased from 17% to 26% during that period. In addition, the agriculture sector recorded a decline and service sector growth of the share. Households remained the biggest consumer with market share of 32%. These changes reflect the development trends of the economy (eg increased trade with foreign countries resulting in higher energy consumption in transport), and the activities undertaken in the industrial sector (growth of efficiency associated with rising energy prices) and the results of actions taken by public authorities (eg pro-efficiency programs targeted to households).

Figure 3. Final energy consumption by sector



3.3 The policy background to energy efficiency

The issue of energy efficiency is prioritised in Poland's energy policy, and advances in this area are recognised as the key to realize all the aims of this policy.

The main aims of energy efficiency in the energy policy are:

- Pursuing a „zero-energy" economic growth, economic growth without an increase of demand for primary energy;
- Consequentially, decreasing the energy intensity of the Polish economy to UE-15 levels.

Particular aims in the field of energy efficiency are:

- Increasing the efficiency of electricity generation, through construction of high efficiency units;
- Doubling electric energy production in high efficiency cogeneration technologies until 2020, compared to production in 2006;

- Decreasing loss ratios in transmission and distribution by modernising current and building new networks, replacing low efficiency transformers and developing distributed generation;
- Increasing efficiency of energy end-use;
- Increasing the relation between annual electricity demand and maximal load-peak electricity demand, this allows decreasing the total costs of supplying the electricity demand.

The actions for improving energy efficiency outlined in the Poland Energy Policy until 2020 cover:

- Establishing a national target for energy efficiency increase;
- Introducing a systematic support mechanism for actions used to achieve the national energy efficiency increase target;
- Stimulating developments of cogeneration, including cogeneration from sources below 1 MW, through support mechanisms, and adequate regional policies;
- Using mandatory energy performance certificates for buildings and apartments introduced to the market or rented;
- Labelling the energy consuming appliances and products and introducing minimal standards for energy-using products;
- Obliging the public sector to play an exemplary role in sustainable energy management;
- Supporting energy saving investments through preferential loans and grants from national and European funds, as part of legislation on supporting thermo modernizations and renovations, Infrastructure and Environment Operational Program, regional operational programmes, and funds of the National Fund for Environmental Protection and Water Management;
- Supporting scientific work in developing new solutions and technologies decreasing energy use in all areas of its transformation and use;
- Implementing Demand Side Management, stimulated through, among other, different daily distribution rates and energy prices based upon reference prices resulting from a day-by-day market as well as passing the price signal to the consumer through remote, two way communication with electronic meters;
- Information and educational campaigns, promoting rational energy use.

Poland realizes the indicative target resulting from the 2006/32/EC Directive of the European Parliament from the 5th of April 2006, on energy end-use efficiency of and repealing directive 93/76/EWG which is achieving energy savings of 9% in relation to average final energy consumption from 2001 to 2005 (53,452 GWh), defined in the first National energy Efficiency Action Plan of Poland.

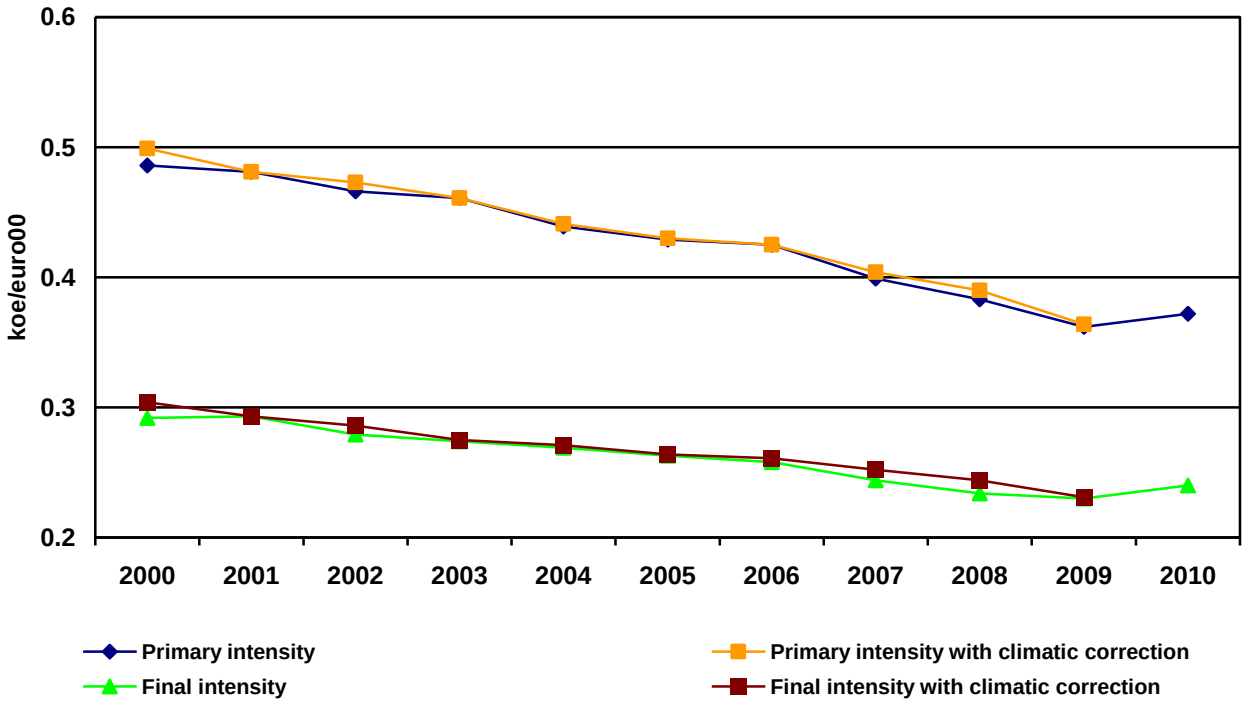
The 2006/32/EC Directive imposed a duty on Poland, of taking up actions leading to decreasing final energy consumption by end users in the next nine years of its validity, beginning from the 1st of January 2007. Carrying out article 14, act 2 of the Directive the Ministry of Economy developed the first National Energy Efficiency Action Plan in 2007. The document defined the indicative target in energy saving until 2016. A national intermediate target of 2% energy savings by 2010 was also defined, creating a path for achieving the 2016 target as well as evaluating the realization of the target. Additionally the document presented an outline of resources and the resulting actions, realized or planned on a national level, used to achieve the national indicated target in the expected period.

4 Overall Assessment of Energy Efficiency Trends

4.1 Overall trends in energy intensity

Growth of GDP faster than the growth in energy consumption resulted in observed decreasing, with the exception of year 2010, primary and final energy intensity of GDP (Figure 4, Table. 1). In the first half of the decade, energy intensity decreased by over 2% per year, in years 2006-2009 the rate of improvement exceeded 5% in case of primary intensity, and amounted to nearly 4% in final energy intensity. In 2010 the energy intensity of Polish intensity grew for the first time since 1993.

Figure 4. Energy intensity of GDP



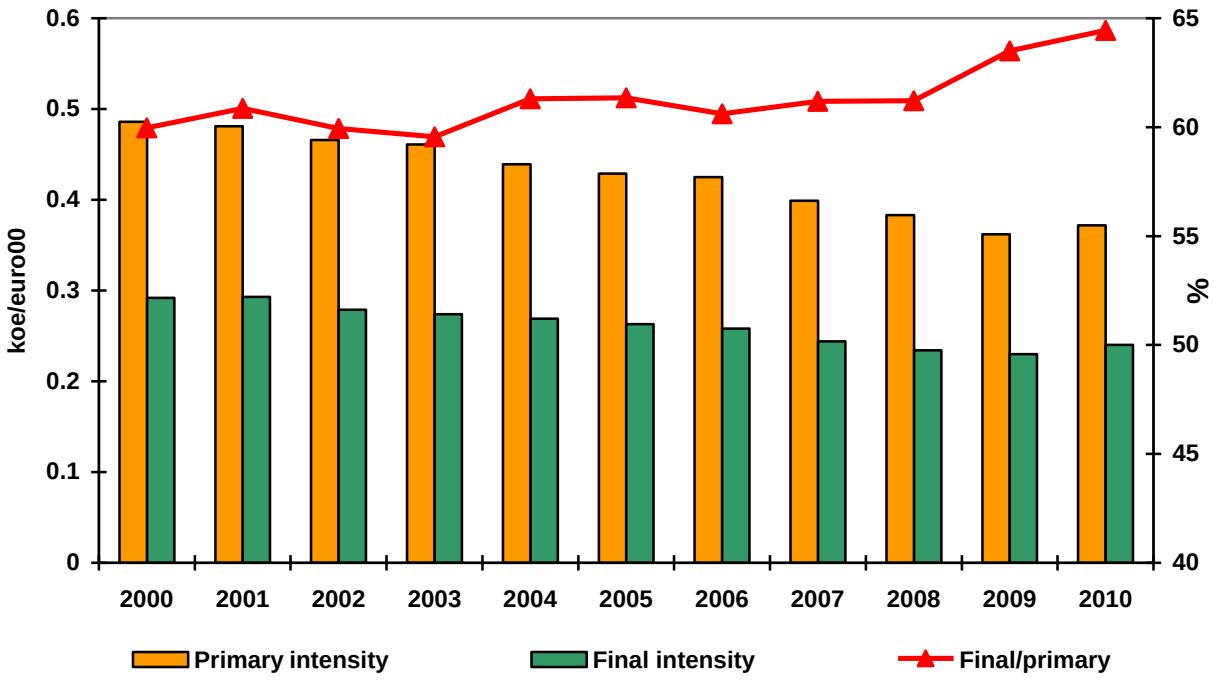
Trends for intensity with climatic correction were similar (data for 2010 from Eurostat are temporarily unavailable).

Table 1. Annual rate of changes in GDP energy intensity indicators (%/year)

Growth rate	2000-2006	2006-2009	2009-2010	2000-2010
Primary intensity of GDP……..	-2.21	-5.21	2.76	-2.64
Primary intensity of GDP with climatic correction…….	-2.64	-5.03	.	.
Final intensity of GDP……..	-2.04	-3.76	4.35	-1.94
Final intensity of GDP with climatic correction……..	-2.51	-3.99	.	.

Ratio of final energy consumption in relation to primary energy consumption has remained at a similar level to 2006, when it began a fairly significant increase. In 2010 this indicator reached the highest value in this decade and amounted to 64.4%. Its level is mainly affected by the energy transformation efficiency (the higher the efficiency the greater the value of the indicator) and the rate of growth of electricity consumption (the higher consumption the lower value of the indicator).

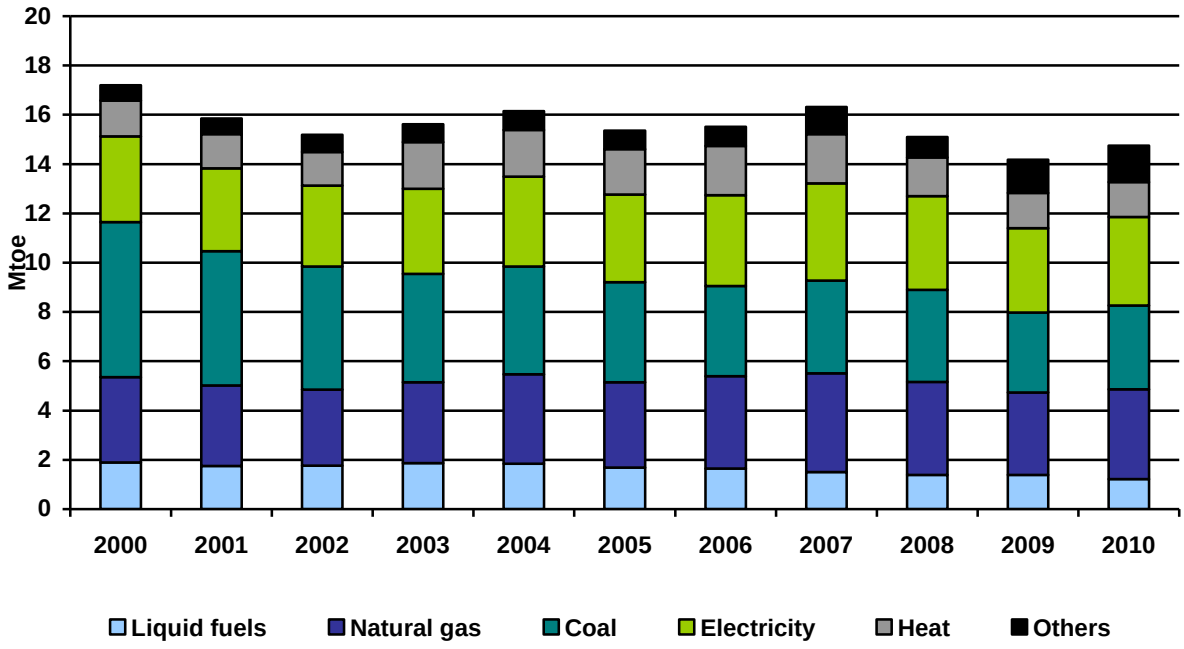
Figure 5. Ratio of final to primary intensity



4.2 Industry :

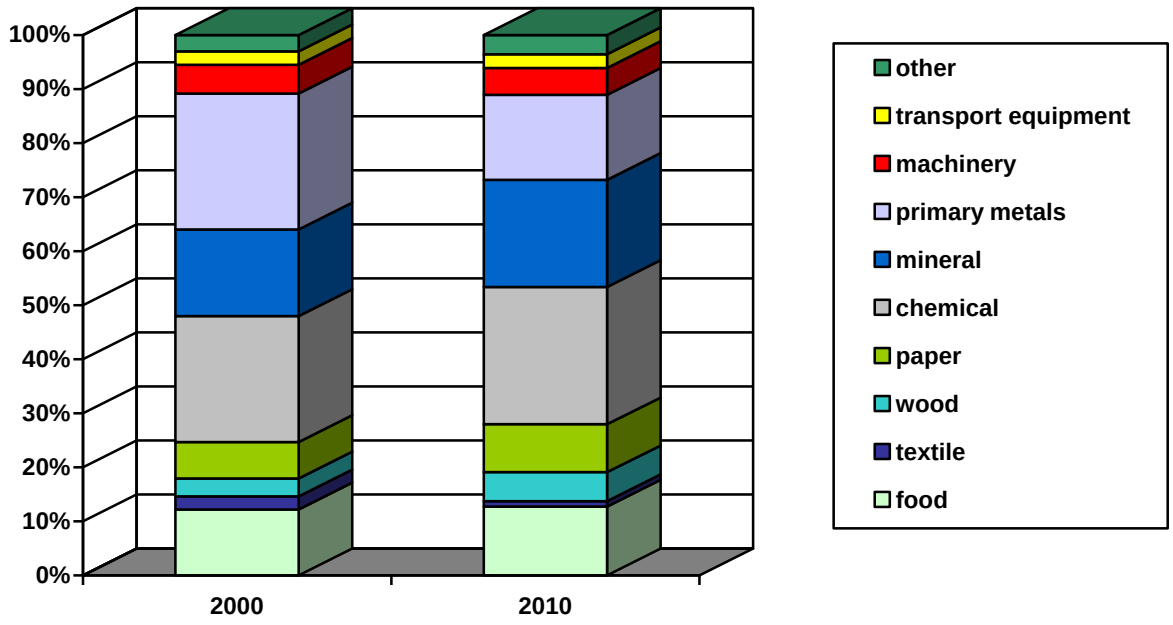
Final energy consumption in industry in the period 2000-2010, was subject to irregular fluctuations with a tendency to decrease. As far as energy carriers go, the consumption of coal and liquid fuels decreased while consumption of natural gas, electricity and other carriers increased. Heat consumption remained at the same level.

Figure 6. Final energy consumption in industry by energy carrier



Changes in shares of individual industries in total energy consumption in the manufacturing industry is shown in Figure 7. Approximately 60% of energy is consumed by energy-intensive industries: primary metals, chemical and mineral. The largest decline in comparison to 2000 which amounted to almost 10 percentage points noted primary metals. The textile and engineering industries have seen a reduction of their share in the energy consumption. Increased share in the consumption of food, wood, paper, chemical, mineral, transport equipment and other industry was recorded. However, structural changes were small and did not exceed a few percentage points.

Figure 7. Energy consumption in manufacturing by branch



Figures 8 and 9 present energy intensity (final energy consumption/value added) of selected industrial branches in years 2000-2010. The most dynamic energy efficiency improvements were observed in machinery, as well as food, textile and transport equipment industry. Slowest improvement occurred in the paper industry, wood and others.

Figure 8. Energy intensity of energy intensive industry branches

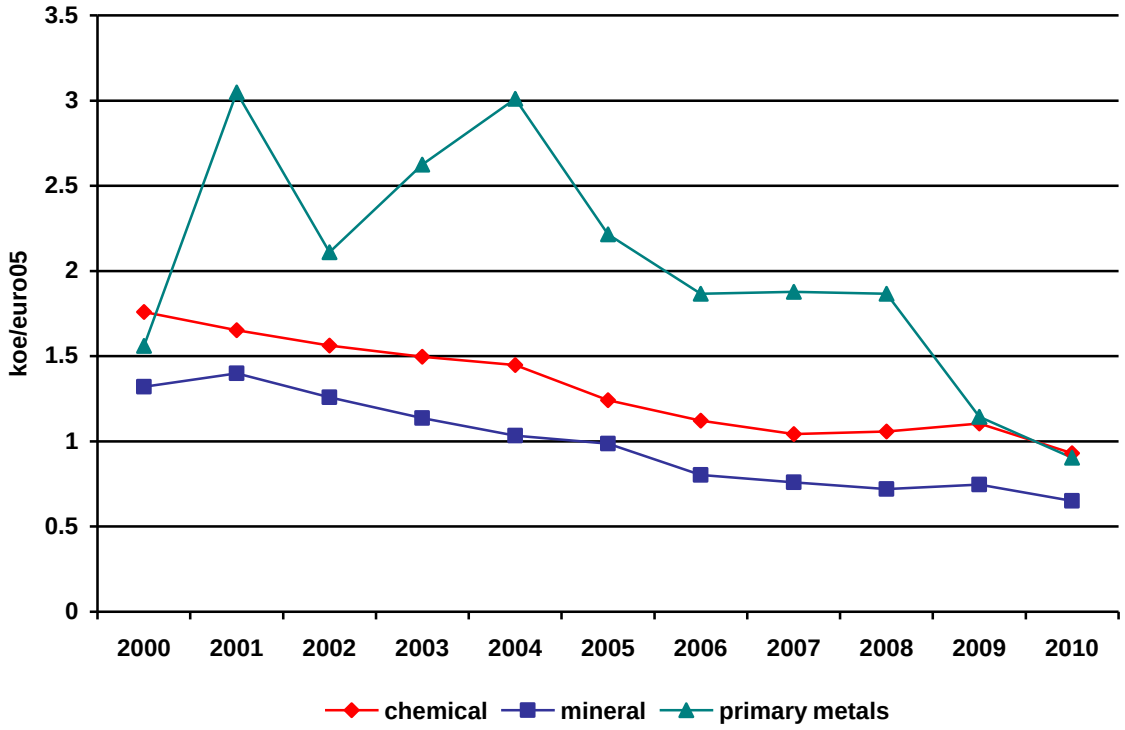
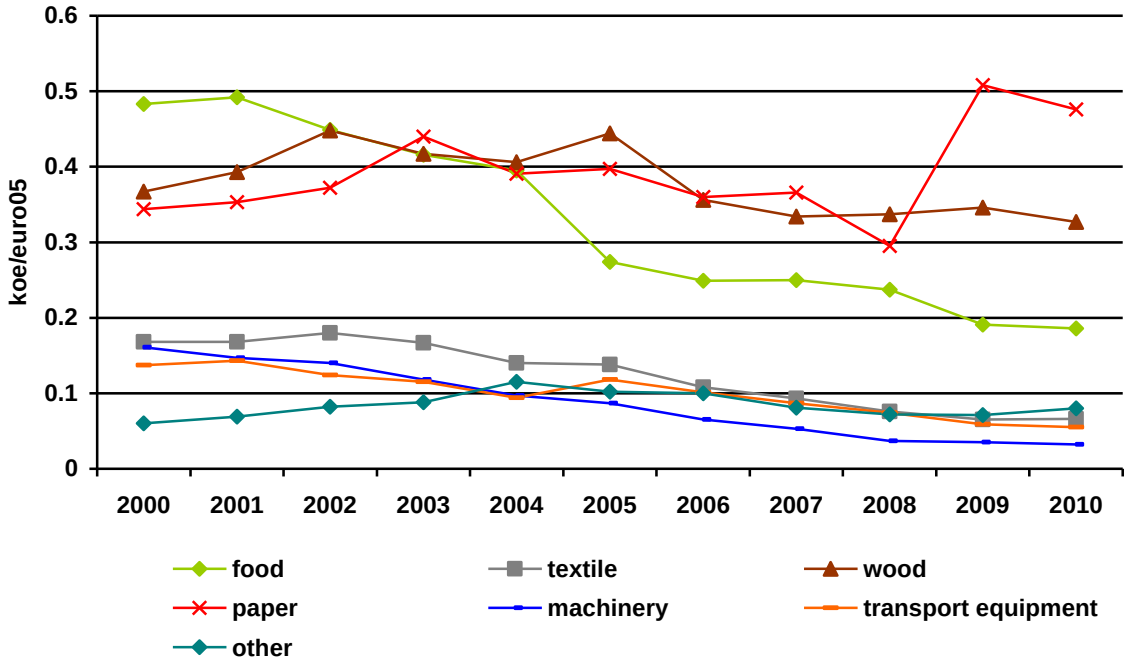


Figure 9. Energy intensity of low energy intensive industry branches



Changing shares of individual sectors of manufacturing in the final consumption of energy and value added in the section, that is the changing structure have affected the level of energy consumption in manufacturing.

The rate of improvement of energy intensity of manufacturing industry was high in years 2000-2008 and averaged to 7.7%/year. Impact of structural change was positive – it contributed to the decline in energy intensity by 3.3%/year. The situation changed in 2010 - energy intensity at constant structure decreased by over 11%, while structural changes have affected the growth of manufacturing energy intensity by more than 3%. Actual intensity decreased by over 8%.

Figure 10. Energy intensity of manufacturing - role of structural changes

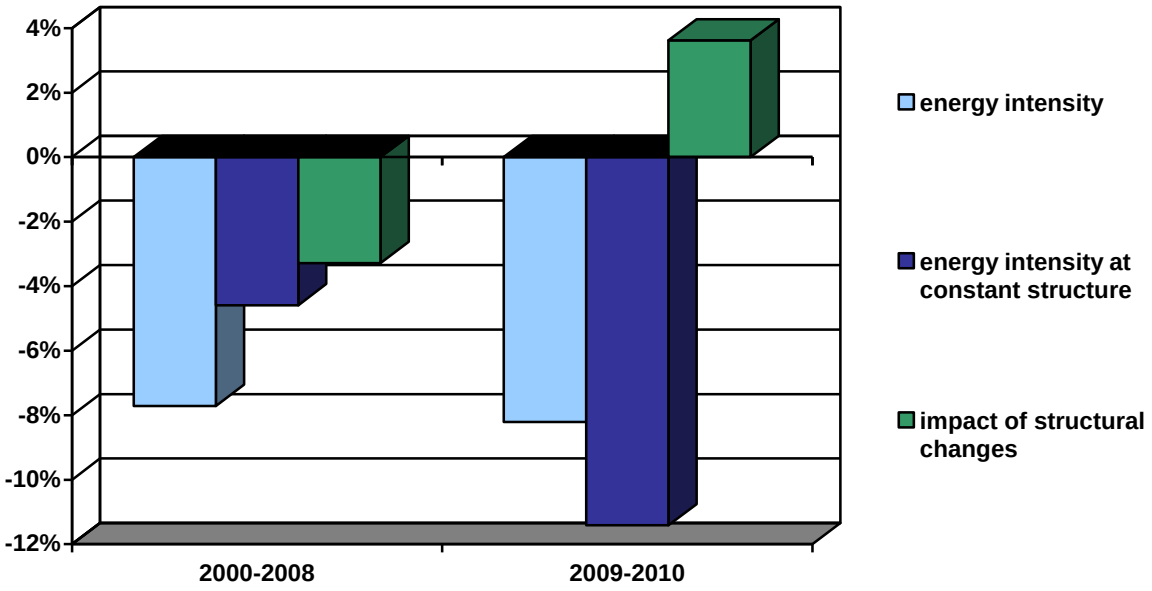


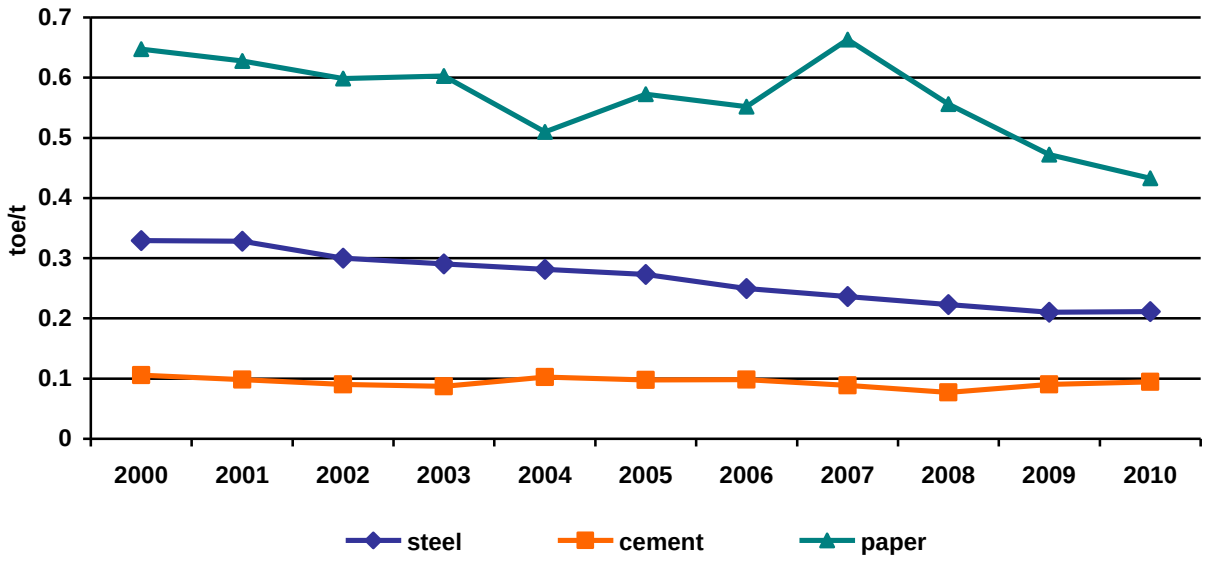
Table 2. Dynamics of energy intensity and impact of structural changes (%/year)

Specification	2000-2008	2009-2010
Energy intensity.....	-7.71	-8.21
Energy intensity at constant structure....	-4.59	-11.41
Impact of structural changes.....	-3.28	3.62

Figure 11 presents energy intensity of steel[2], cement[3] and paper[4] production in years 2000-2010. Energy used to produce these three products amounted to 31% of energy consumption in manufacturing in 2010.

The energy intensity of cement production remained in this decade at a similar level of 0.1 toe/t. This value is close to the European average. In the case of steel production energy intensity decreased steadily until 2010, when there was a slight increase. Energy consumption of paper industry showed a downward trend in 2000-2010, but between 2004 and 2007 increased from 0.51 to 0.66 toe/t Since then, energy intensity decreased to reach a level of 0.43 toe/t in 2010. In the period 2000-2010, the energy consumption of crude steel production fell by 35.9% (4.3%/year), paper by 33.2% (3.9%/year) and cement by 10.3% (1.1%/year).

Figure 11. Unit consumption of selected industrial products



[2] Calculated as final energy consumption in steel industry (since 2009 in groups 24.1, 24.2, 24.3 and classes 24.51 and 24.52 according to NACE Rev. 2) divided by steel production

[3] Calculated as final energy consumption in cement industry (since 2009 in group 23.5 according to NACE Rev. 2) divided by cement production

[4] Calculated as final energy consumption in paper industry (since 2009 in division 17 according to NACE Rev. 2) divided by paper production

4.3 Households:

The share of energy consumption in households in final energy consumption amounted to 32% in 2010. The structure of consumption by end-use, resulting from surveys carried out by the CSO in 1993, in 2002 and 2009 are shown in Figure 12 and Table 3.

The share of energy consumption for heating was steadily decreasing; this was associated with replacing low efficient coal stoves by more efficient gas and electric appliances, the influence of thermal modernization and more stringent construction standards is also noticeable. The increase in electricity consumption is associated with richer home furnishings in electrical equipment and changes in user behavior (eg, changes in the intensity of use of appliances - washing machines, dishwashers, TV, computers).

Figure 12. Structure of energy consumption in households by end use

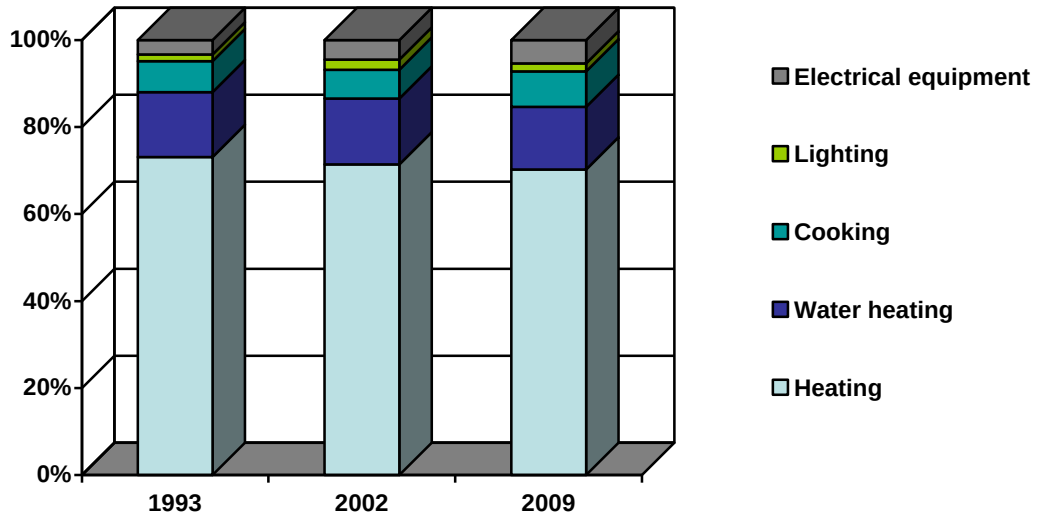


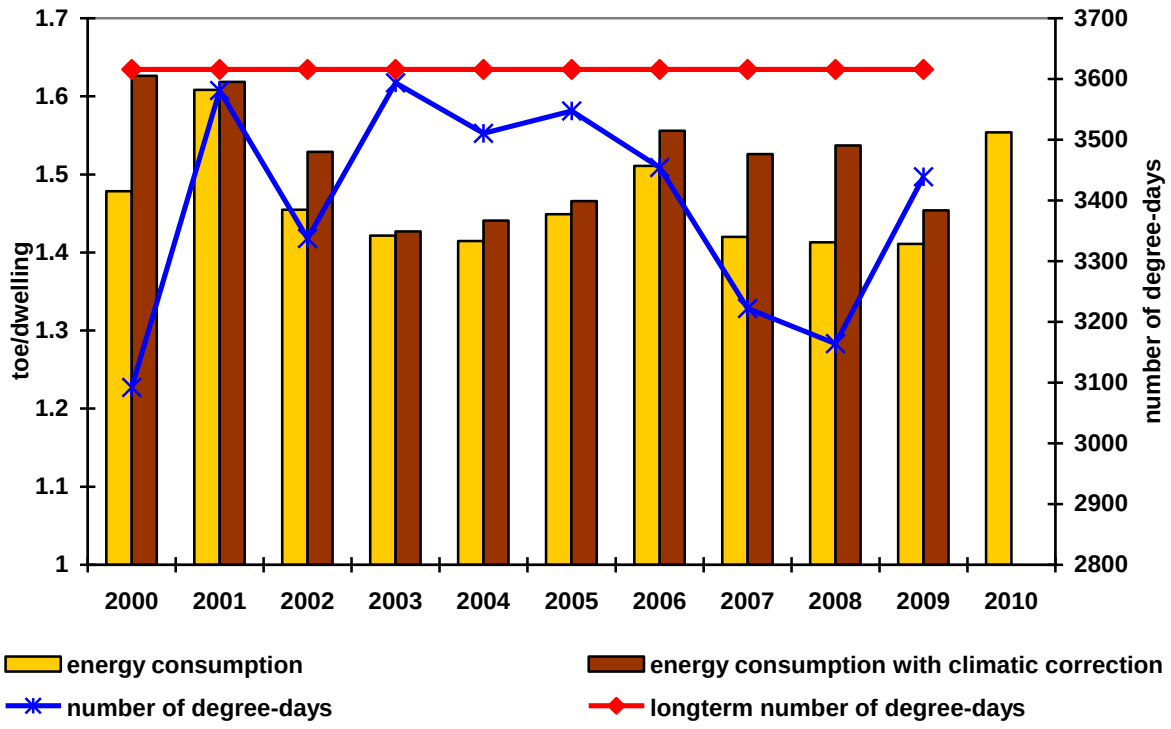
Table 3. Structure of energy consumption in households by end use (%)

Items	1993	2002	2009
Total.....	100.0	100.0	100.0
Heating	73.1	71.3	70.2
Water heating	14.9	15.0	14.4
Cooking	7.1	7.1	8.2
Lighting	1.6	2.3	1.8
Electrical equipment.....	3.3	4.3	5.4

Figure 13 shows the changes of energy consumption per dwelling. The indicator with climatic correction declined between 2000 and 2009 with the average annual rate of 1,2%. In the second half of the period consumption has increased.

Energy consumption per house without taking into account climatic adjustment increased by 0.5% per year.

Figure 13. Energy consumption in households per dwelling



source: Eurostat and Joint Research Center, GUS

Trend of energy consumption per m^2 is similar, although the growth rate of improvement is higher by about 1 percentage point, reflecting the gradual increase in the average size of the dwelling. Figure 14 shows the energy consumption in households per m^2.

Electricity consumption in households showed an increasing trend in years 2000-2010. The growth of electricity consumption in 2003 is due to methodological changes - electricity consumption in households whose main source of income was the income from the use of an individual farm was added.

Figure 14. Energy consumption in households per m^2

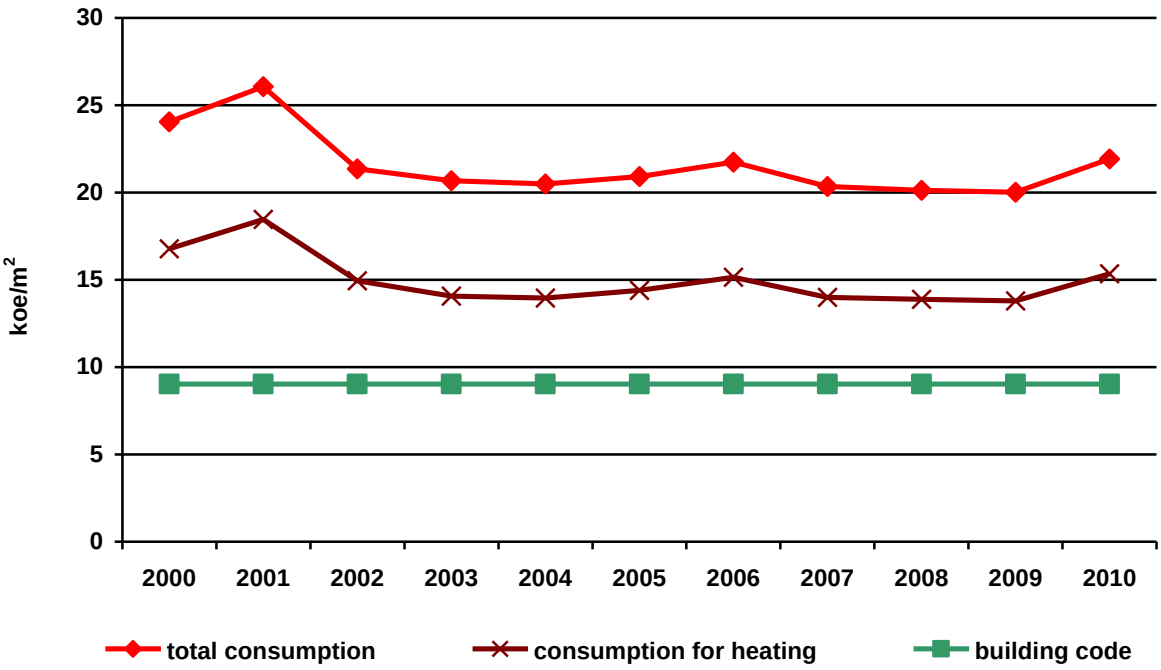
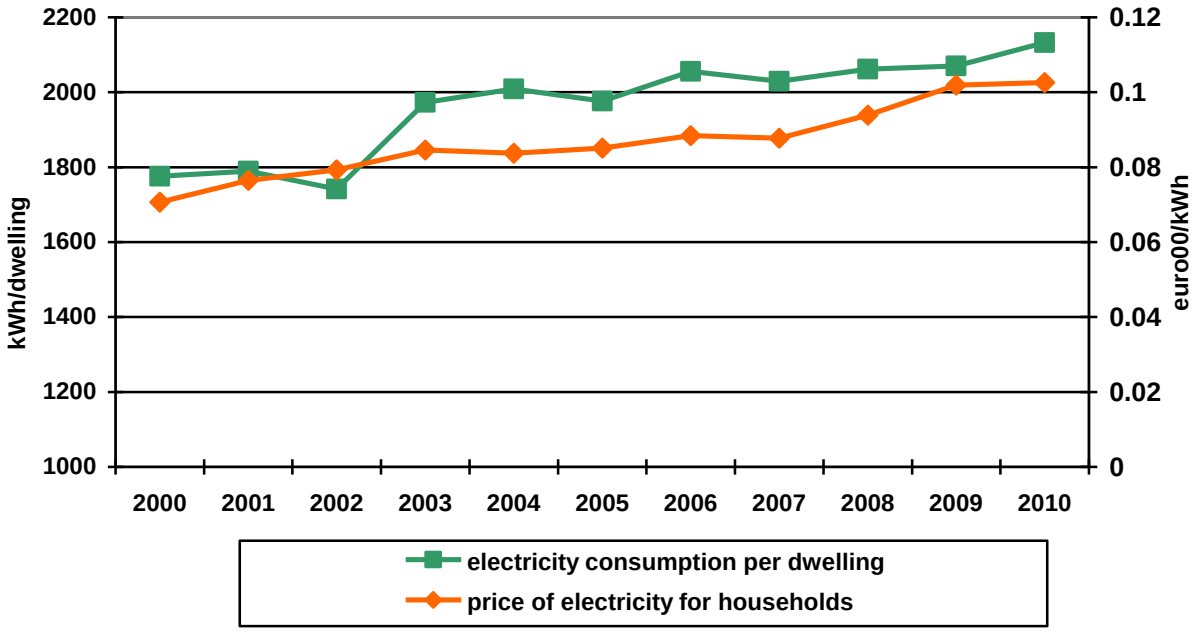


Figure 15. Electricity consumption and price in households per dwelling

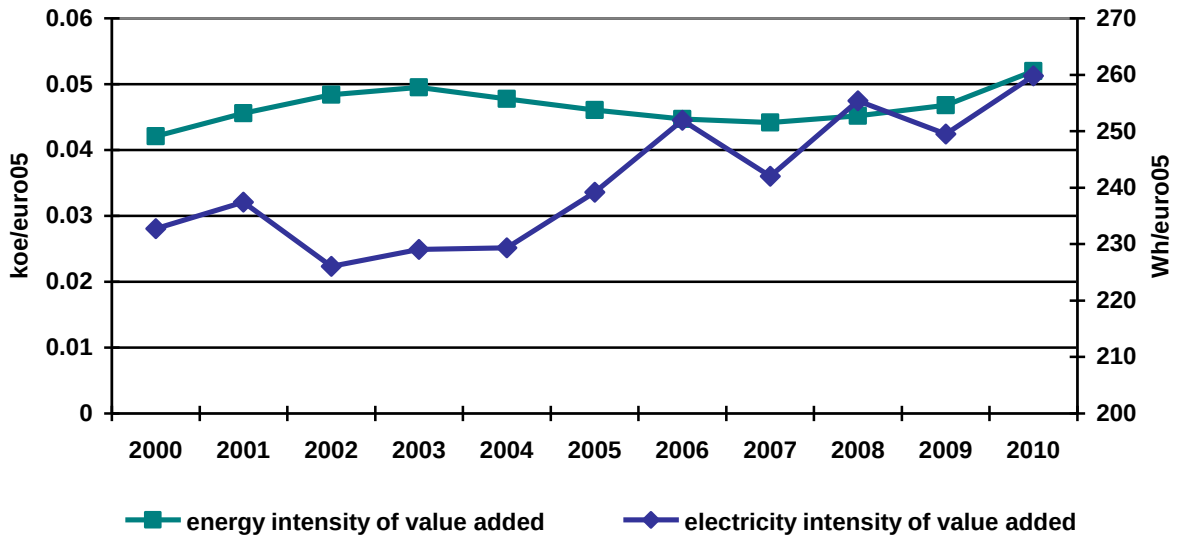


4.4 Services:

Energy intensity of value added[5] in the services sector was showing slight fluctuations and in 2010 it amounted to over 0.05 kgoe/euro05. Energy intensity of service sector was growing by 2.1%/year. At the same time it is the most efficient in terms of energy sector of national product creation. Electricity intensity of value added was increasing in years 2000-2010 by an average of 1.1% per year.

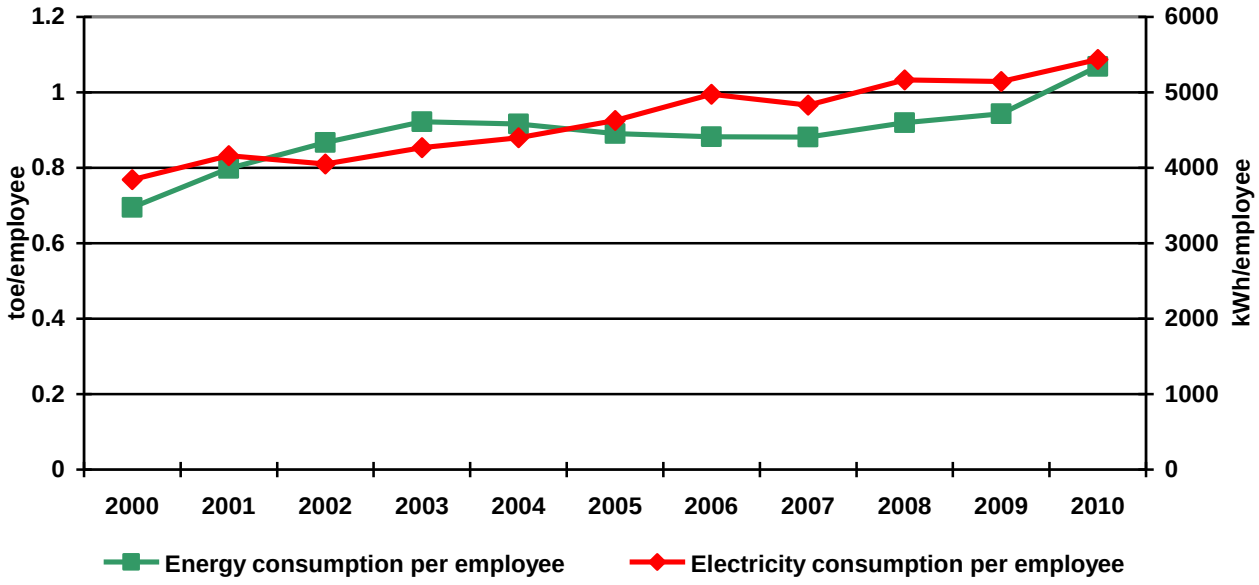
[5] Calculation of this indicator excludes energy consumption of transport but includes value addend of transport. The same procedure concerns electricity intensity indicator.

Figure 16. Energy intensity and electricity intensity in service sector



In the case of energy and electricity consumption per employee an irregular trend can be seen in the period 2000-2010 (Figure 17). Energy consumption has increased in the early years of the period, then came to a stabilization of consumption. In 2010 strong growth of consumption occurred. The average growth rate of this indicator amounted to 4.4% per year. In case of electricity consumption per employee the growth was more regular and amounted to 3.5% per year.

Figure 17. Energy consumption and electricity consumption per employee of the service sector



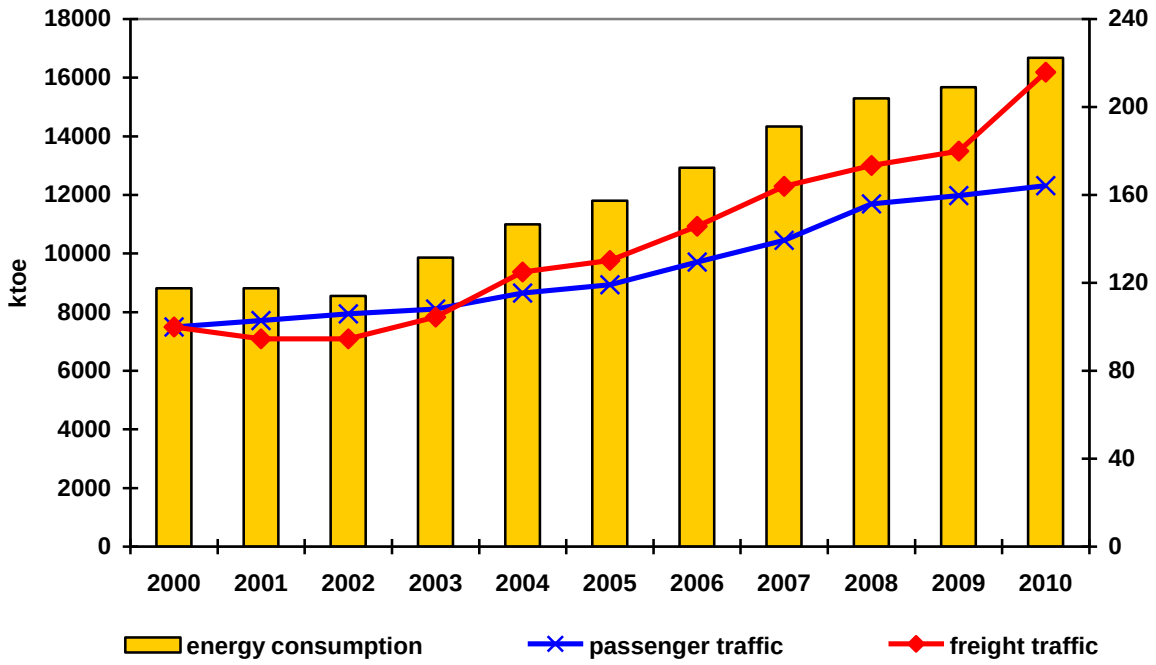
4.5 Transport:

In Poland, nearly 95% of the energy consumed in transport sector is consumed by road transport, and more than 2% in rail transport. In addition, more than 3% of energy consumed is by air transport and small amounts by the inland and coastal water transport.

In the period 2000-2010 average annual growth rate of fuel consumption in road transport amounted to 7%, while energy consumption in rail transport significantly (28%) decreased. Total average annual growth rate of fuel consumption in transport (excluding air transport) amounted to 6.6% in years 2000-2010.

Freight and passenger traffic increased in this period regularly, except for the drop in freight traffic in the early 2000's. In the case of freight traffic an average rate of growth amounted to 8.0%/year, while in the case of passenger transport to 5.1%/year.

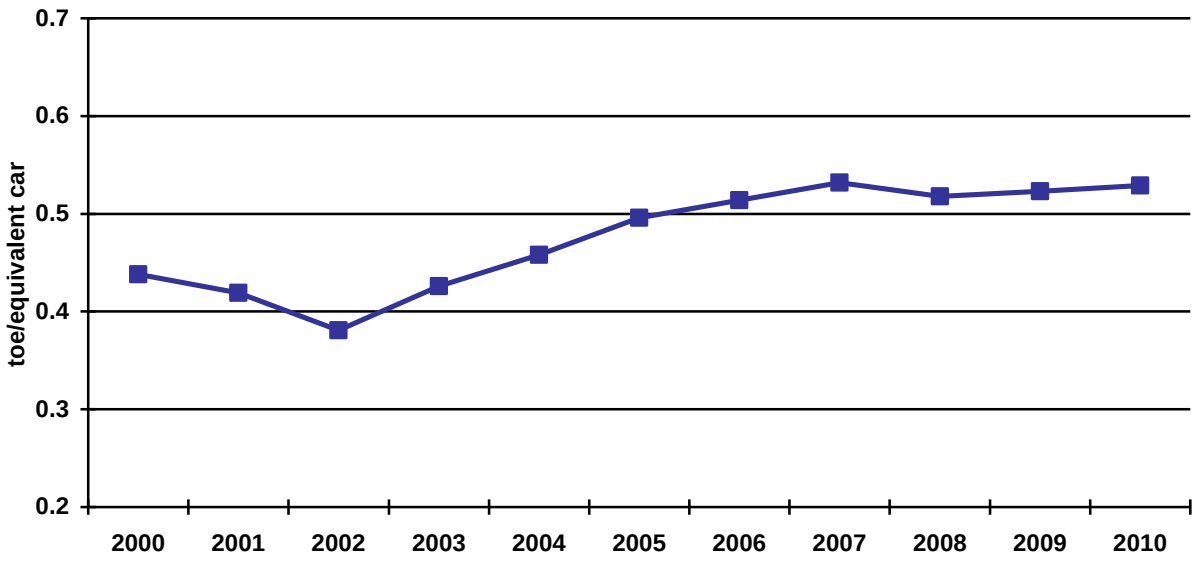
Figure 18. Passenger and freight traffic and energy consumption in transport*



** excluding air transport, source: DG TREN, GUS*

Figure 19 shows the evolution of specific fuel consumption per car equivalent. In years 2008-2010 the value of the indicator has stabilized after earlier growth period between 2003 and 2007. The value of this indicator is influenced mainly by the economic situation of the country, variation of fuel prices and the growing efficiency of new cars.

Figure 19. Fuel consumption per equivalent car



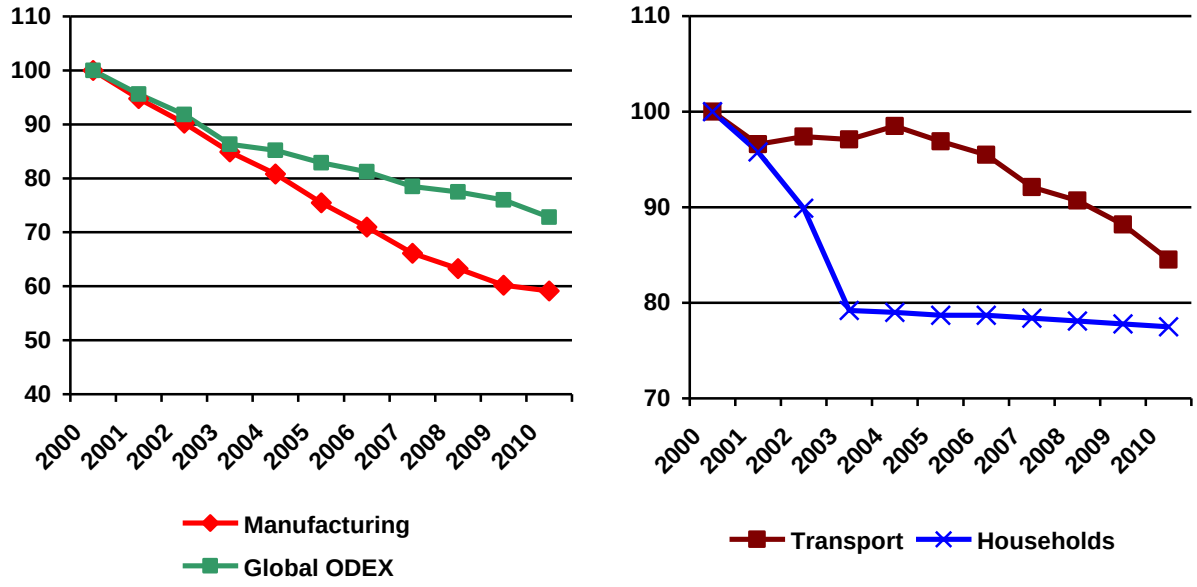
4.6 Assessment of energy efficiency/savings through ODEX: total and by sector

ODEX indicator declined in the years 2000-2010 from the level of 100.0 points. to 72.8. The average rate of improvement amounted to 3.1%/year. The fastest rate of improvement (5.1% per year) was achieved by manufacturing. In the household sector ODEX indicator[6] was dynamically falling to 2003, then the rate of improvement was little. The average improvement in years 2000-2010 in this sector amounted to 2.5% per year. In the transport sector value of indicator remained at a similar level to 2004 and then began to decline. Overall, in 2000-2010 the average rate of improvement amounted 1.7%/year[7].

[6] For household sector technical ODEX was calculated, that is basing on the technical parameters of buildings.

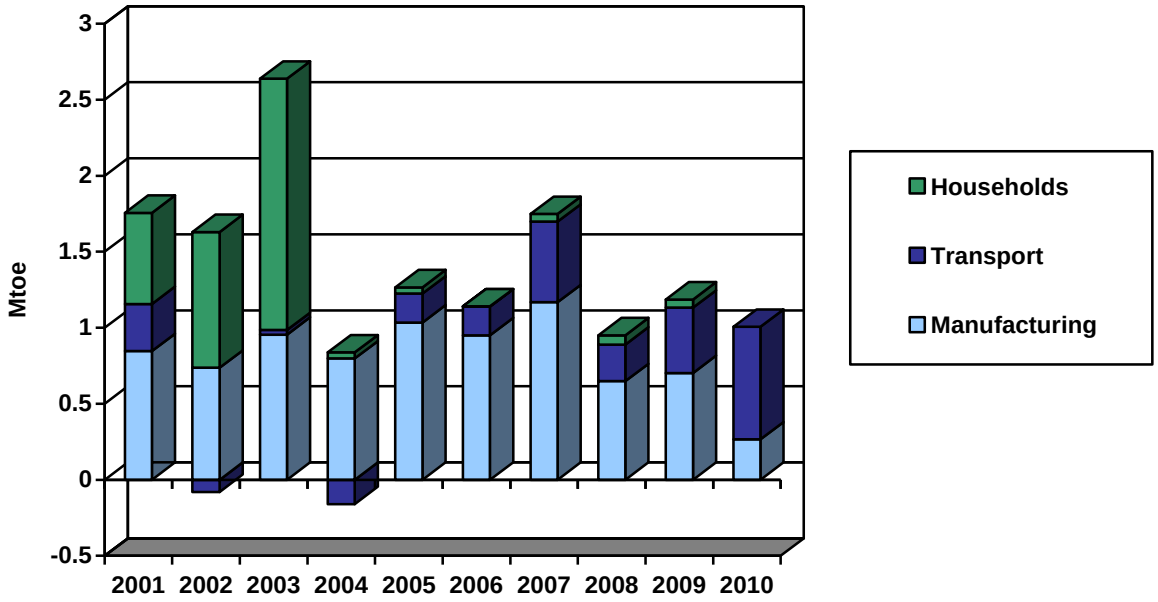
[7] Because of lack of official data on specific consumption of different types of transport, calculation of indicator for transport is based on estimated and constant parameters and therefore can be burdened with an error.

Figure 20. ODEX indicator



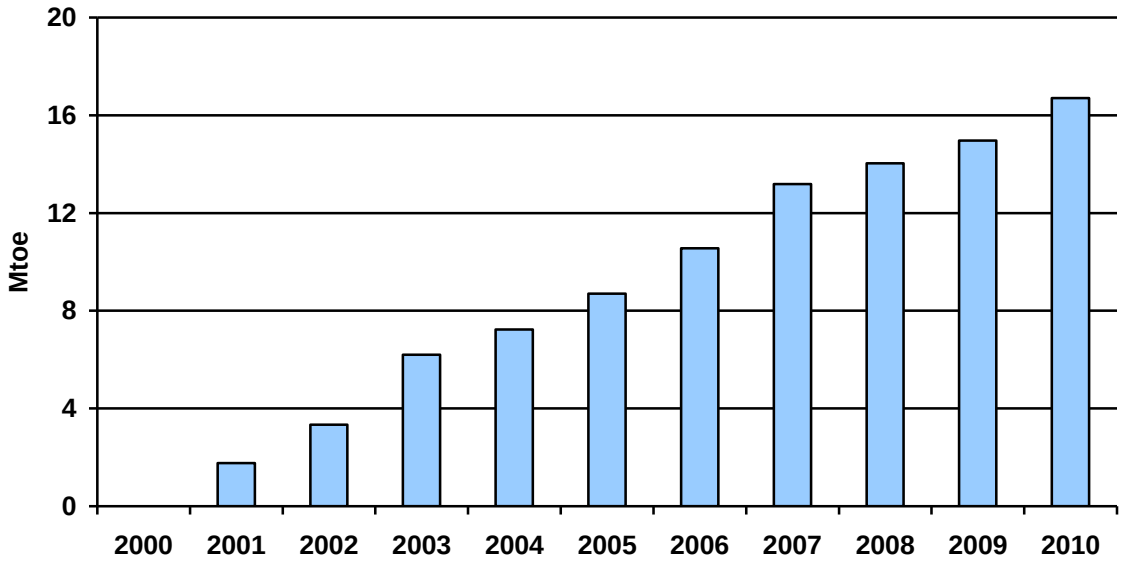
The chart below shows energy savings achieved in subsequent years in manufacturing, households and transport sector after 2000.

Figure 21. Annual energy savings



The cumulative energy savings since 2000, showing as far as energy consumption would be higher in a given year if improvements in scope of energy efficiency had not been introduced after 2000, amounted in 2010, 16.7 Mtoe. This result takes into account also the savings achieved by the sectors covered by the European Emissions Trading Scheme (ETS).

Figure 22. Energy savings since year 2000

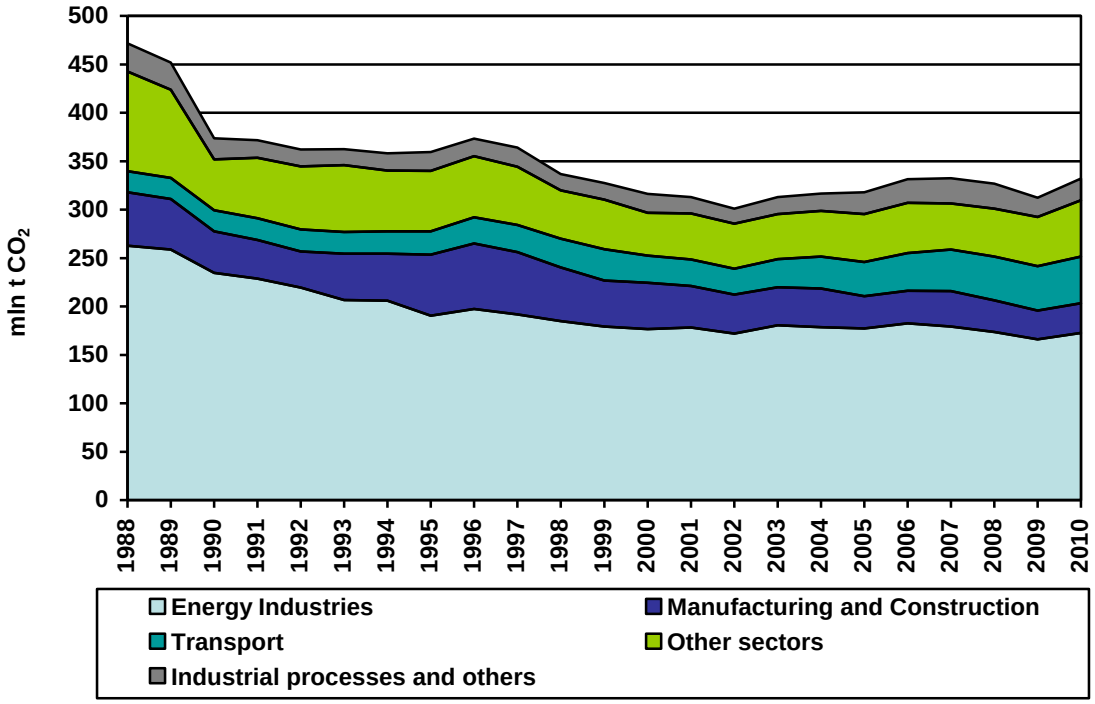


4.7 CO_2-emissions trends:

The emission of CO_2 in 1988 amounted to 471.7 Mio ton and dynamically dropped to reach level of 373.5 Mio ton in year 1990 (Figure 23). Later, level of emissions stabilized and started to decrease in 1997 and reached bottom of 300.9 Mio ton in 2002. Since then, emission of CO_2 slightly increases, except for years 2008 and 2009.

93% of emissions come from fuels combustion and 7% from industrial processes and others. Share of energy sector in total emissions amounted to 52.0% in 2010 which was the lowest value during presented period. The shares of other sectors amounted in 2010 to 9.2% (manufacturing and construction), 14.5% (transport), 17.6% (other sectors).

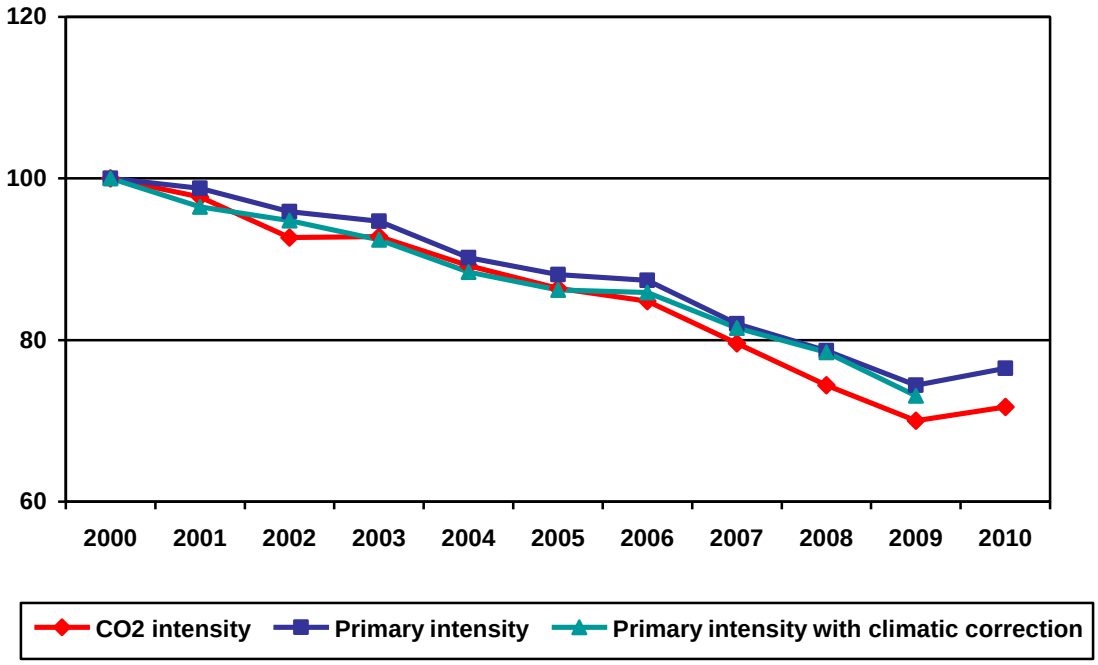
Figure 23. CO_2 emissions



source: National Inventory Report 2012

The CO_2 intensity of the economy has decreased by almost 30% between 2000 and 2010 (3.3%/year) (Figure 24). Primary energy intensity decreased by 23% (2.6%/year) during that period. The majority of improvement in scope of CO_2 intensity came therefore from improvement of energy efficiency. The impact of other factors (among them change of fuel mix) can be evaluated at 0.7% per year.

Figure 24. CO_2 and energy intensity (2000=100)

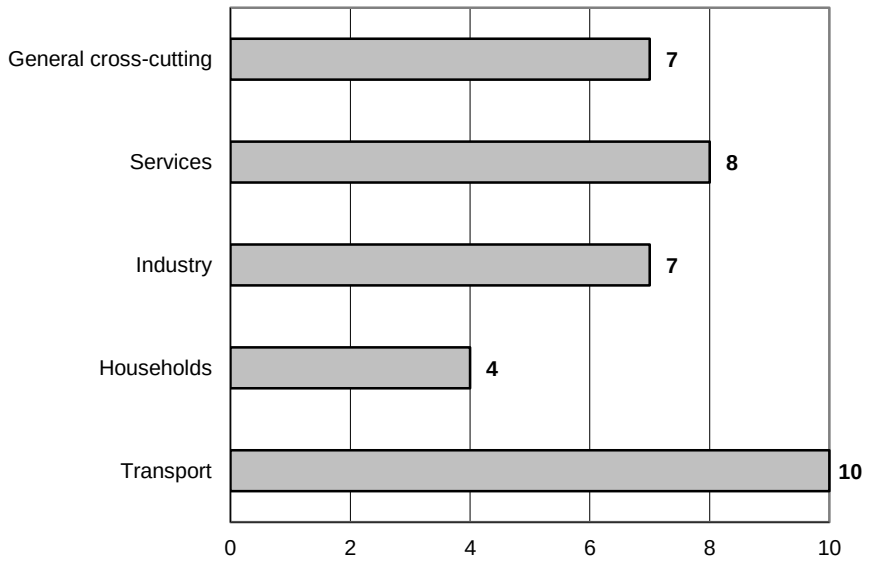


5 Energy efficiency measures

5.1 Recent Energy Efficiency Measures

Numbers of energy efficiency improving measures implemented or planned in Poland described in the MURE database are presented in the Figure below.

Figure 25. Number of measures in the MURE database



The measures improving energy efficiency, presented in the MURE database are in detailed described, including their quantitative and ecological effect depending on the data availability.

Residential Sector

Energy efficiency measures in residential sector, presented in MURE database, are listed below.

No.	Type	Title of the measure
1.	Legislative/Normative	Requirements for new and modernised buildings
2.	Financial	Thermal Modernisation Fund - for investments in energy efficient building renovation, including heating systems and replacement of conventional sources by renewable energies

3.	Legislative/Informative Legislative/Normative	EU-related: Energy Performance of Buildings (Directive 2002/91/EC) - Certificates of energy performance for buildings
4.	Financial	Promotion of solar collectors in households sector

In general, the energy consumption in the residential sector in Poland is still excessive, reaching higher level than in Western countries with a similar climate. The fact that the residential sector consumes about 40% of the primary energy consumption of the country, underlines the urgency to improve this situation.

The second NEEAP refers to one measure that is Thermal Modernisation Fund. The Act supporting thermo-modernisations has been functioning from 1999. In 2008 the amendment to the Act on Support for Thermo-Modernisation Investment in Buildings came into power (measure no. 2). The Act covers the rules of providing financial support to the investors (building owners or administrators) in the form of the premium which can cover up to 20% of credit loan taken out for realisation of the thermal modernisation investments.

Concerning the item 1 of the table above, the Ministry of Regional Development and Buildings has introduced new standards for buildings in 2008.

The Ministry of Regional Development and Buildings has introduced new standards for buildings, which are described in details in Ordinance of the Minister of Infrastructure *"Technical Requirements for Buildings and theirs Location"*. Scope of Ordinance of Infrastructure dated November 6, 2008 *"Technical Requirements for Buildings and theirs Location"* covers general requirements - how buildings have to be planned, designed, built and modernised as well as requirements for thermal renovation of all types of buildings.

Polish regulations make provision for two alternative ways of fulfilling energy requirements. The first method is prescriptive and consists of a list of detailed requirements for different building components (e.g. external walls, windows). The second method has a performance character and defines permissible values of specific non-renewable primary energy use EP, expressed in kWh/(m^2year). The second method offers more freedom for designers. For instance, lower quality thermal insulation can be compensated by better systems or utilization of a more environmentally friendly source of energy.

Both methods allow for lower quality energy performance of modernized buildings, in comparison to new buildings identical in form and use. In the first method, the average heat transfer coefficient for the whole building envelope can be 15 % higher than in the new building. In the second method, modernized buildings can also have a 15% higher primary energy use (EP).

Performance method

The regulations define an alternative way of fulfilling the requirements by allowing that the permissible values of specific non-renewable primary energy use EP, expressed in kWh/(m^2year), are not exceeded. The permissible values depend on the type of the building and the building shape coefficient:

For example in residential buildings the energy use for heating, ventilation and hot water supply (EP_{H+W}) is calculated for a whole year:

a) for $A/V_e \leq 0,2$ $EP_{H+W} = 73 + \Delta EP$ [kWh/($m^2 \cdot$ y)],
b) for $0,2 \leq A/V_e \leq 1,05$ $EP_{H+W} = 55 + 90 \cdot (A/V_e) + \Delta EP$ [kWh/($m^2 \cdot$ y)],
c) for $A/V_e \geq 1,05$; $EP_{H+W} = 149,5 + \Delta EP$ [kWh/($m^2 \cdot$ y)],

where:

$\Delta EP = \Delta EP_W$ – the addition to specific use of non-renewable primary energy for supply of hot water during the year,

$\Delta EP_W = 7800/(300 + 0,1 \cdot A_f)$; [kWh/($m^2 \cdot$ year)],

A – the sum of surface areas of all outer partitions which separate the building's heated parts from ambient air, ground or adjacent unheated spaces defined along outer boundaries,

V_e – the cubic capacity of the building's heated section defined along outer boundaries, diminished by the volume of balconies, loggias and galleries,

A_f – the useful heated area of the building (apartment).

Prescriptive method

The energy requirements for all the new buildings and for modernised buildings consists of i.e. maximum permissible U-value, 0,3 W/(m^{2}K) for external walls, 1,7-1,9 W/(m^{2}K) for windows.

The historical changes of U-value are presented in below.

Type of element	U_{max} [W/(m^{2}K)]						
-	PN-57	PN-64	PN-74	PN-82	PN-91	Before changing the regulation of November 2008	Now
External walls	1.16	1.16	1.16	0.75	0.55-0.7	0.30-0.50	0,3
Flat ventilated roof	0.87	0.87	0.7	0.45	0.3	0.3	0,25
Attic roof	1.05	1.16	0.93	0.4	0.3	0.3	≤ 0.22
Windows (in dependence on the climatic zone)	-	-	-	2.0-2.6	2.0-2.6	2.0-2.6	1,7- 1,8

Legal context

The implementation of the EPBD in Poland was executed by the Ministry of Infrastructure under the supervision of the Ministry of Economy.

The legal framework of implementation is based on the national act and accompanying ordinances. On the 19th of September 2007, the Polish Parliament accepted several changes to the Construction Act. The changes define rules for the creation of an energy assessment and certification system for buildings and the inspection of building systems' energy efficiency by:

- regulating the legal situations in which the obligation to possess a certificate of energy performance for buildings and apartments applies, by introducing new duties for investors, building managers and owners,
- defining the requirements and conditions for groups of experts mandated to prepare certificates of energy performance and,
- defining the conditions for inspection of boilers and air-conditioning systems, and a one-off inspection of heating installations with boilers older than 15 years.

As of January 1st 2009, according to a regulation in the Construction Act, the certificate of energy performance has been required for:

- new buildings licensed for operation,
- modernised or renovated buildings, if as a result a change of energy performance took place,
- buildings for sale or rental.

Similarly, from the 1st of January 2009, the obligation to possess a certificate of energy performance has been also required for apartments that are placed for sale.

Additionally, beginning on the 1st of January 2009, the following two obligations are introduced:

- periodical inspection of the energy efficiency of boilers and air-conditioning systems,
- one–off inspection of heating installations equipped with boilers of nominal capacity over 20 kW or older than 15 years.

The following regulations were prepared as secondary legislation defined in art. 5 paragraph 9 and art. 55a of the Construction Act:

1. An ordinance on the training and examination of experts allowed to prepare energy performance certificates for buildings, apartments and building parts that constitute separate technical/functional areas, signed on the 21st of January 2008 by the Minister of Infrastructure and published in the Official Journal, nr. 17 position 104, and including the list of required qualifications for those experts,
2. An ordinance on the methodology of energy performance calculations for whole buildings, separate apartments or building parts that constitute separate technical/functional areas, along with the scope of and a template for the energy performance certificates, signed on the 13th of November 2008 by the Minister of Infrastructure and published in the Official Journal nr. 201 position 1240,
3. An ordinance on amendments to an Ordinance of the Ministry of Infrastructure from the 12th of April 2002 on the technical criteria to be met by buildings and their location, signed on the 13th of November 2008 by the Minister of Infrastructure and published in the Official Journal nr. 201 position 1238,
4. An ordinance on amendments to an Ordinance of the Minister of Infrastructure from the 3rd of July 2003 on the detailed scope and form of buildings' designs, signed on the 13th of November 2008 by the Minister of Infrastructure and published in the Official Journal nr. 201 position 1239.

Ministry of Transport, Construction and Maritime Economy is responsible for implementation of Directive 2010/31/EC and the Ministry is preparing the set of relevant regulations aiming also to tide buildings codes.

Transport Sector

Transport policies of the Government are in general market oriented, both on the State government and territorial Self-Governments level. The essence of the policy is searching the balance between needs and possibilities for satisfying them on the base of reconciling technical, spatial, economic, social and ecological factors.

Key actions are directed at: (i) management of transport demand, leading to rationalisation of the use of transport, (ii) moving transport activities towards less polluting transport modes and (iii) using the best available technologies. Guiding premises of the Government's transport policy are: (i) for the rationalisation of freight carriage, market factors react most efficiently; (ii) for the rationalisation of individual passenger traffic: promotion of alternative transport modes and behaviour patterns as well as fiscal factors.

Energy efficiency measures in transport sector (described in MURE database)

No.	Type	Title of the measure and explanation
1.	Information/Education/Training	The Cities for bicycles project - promotion of cycling or walking
2.	Legislative/Normative	Speed limits – mandatory speed limits
3.	Legislative/Normative	Technical inspection of vehicles - periodic mandatory inspection of vehicles / pollution control
4.	Legislative/Normative	Promotion of biofuels in transport
5.	Infrastructure	Development of intelligent transportation system
6.	Information/Education/Training Infrastructure	Traffic management system and transport of goods optimisation • Information on public transport; • Modal shift toward public passenger transport; • Inter-urban traffic management and optimisation
7.	Fiscal	Fuel Tax - annual vehicle tax (if linked to effi-

		ciency improvement)
8.	Financial	Toll on highways
9.	Fiscal	Vehicle taxation - tax on the purchase of cars (if linked to efficiency improvement)
10.	Financial Informa-tion/Education/Training Infrastructure	Fleet replacement programme in public transport and the promotion of eco driving

The highest impact in terms of energy saved is predicted for two measures: Traffic management system and transport of goods optimisation (13,360 GWh) and fleet replacement programme in public transport and the promotion of eco-driving (2500 GWh).

Industrial Sector

The list of selected measures in industrial sector is as follows.

Energy efficiency measures in industrial sector (described in MURE database)

No.	Type	Title of the measure
1.	Informa-tion/Education/ Training	Information/Training for top-level management and energy managers by Energy Conservation Technology Centre (ECTC)
2.	Financial	2007 to 2013 Infrastructure and Environment Operations Programme and Regional Operations Programme (1)
3.	Financial	2007 to 2013 Infrastructure and Environment Operations Programme and Regional Operations Programme (2)
4.	Financial	Priority Programme “Efficient use of energy. Part I” - Grants for energy audits in industrial enterprises
5.	Financial	Priority Programme “Efficient use of energy. Part II” - Soft loans support for investments decreasing energy consump-tion
6.	Financial	Polish Sustainable Energy Financing Facility (PolSEFF)
7.	Financial	Priority Programme “Smart Grids”

The measures are mainly connected with financial support provided by National Fund for Environmental Protection and Water Management (high impact) and coming from Structural Funds. One measure of information type is briefly described below.

Information/Training for industry by Energy Conservation Technology Centre (ECTC)

The Poland-Japan Energy Conservation Technology Centre (ECTC) is a joint project between Polish and Japanese Governments with aims at contributing to further promotion of the energy conservation technology in the Polish industrial sector, making the best use of the Japan's knowledge and experience. It is so arranged that the Japanese Government through the Japan International Cooperation Agency (JICA) as part of its Official Development Assistance (ODA), extends its technical assistance in the forms of dispatching Japanese Experts on a long as well as short term basis, providing machinery and equipment worthy of US$ 1million and training Polish counterpart personnel in Japan. The project continues for a period of four (4) years starting from July 1, 2004.

The Polish Government, for its part, with The Polish National Energy Conservation Agency (KAPE S.A.) as the Government owned implementing agency, undertakes to render services of the Polish counterpart personnel both technical and administrative, to provide land, building and facilities and to bear the running expenses necessary for the total operation of the project so as to ensure that the self-reliant operation of the project can be sustained during and after the period of Japanese cooperation, through full and active involvement in it by all of the authorities concerned, beneficiary groups and institutions.

ECTC laboratory consists of the compressor, pump, fan, burner, boiler, and steam traps units.

ECTC offers services:

- training courses for management of factories,
- training courses for engineers responsible for energy management in factories,
- training courses for energy auditors,
- co-operation and assistance for factory audits prepared by professional auditors,
- consulting services for factories on marketing, investment and finance of energy efficiency projects,
- dissemination of information on energy efficiency and energy conservation

References: http://www.pjcee.pl; http://www.kape.gov.pl

Tertiary Sector

Energy efficiency measures in tertiary sector (described in MURE database).

No.	Type	Title of the measure and explanation
1.	Financial	Thermal Modernisation Fund
2.	Legislative/Normative	Technical Requirements for Buildings and theirs Location
3.	Co-operative Measures Information/Education/Training Legislative/Normative	Increasing the proportion of energy saving products available in the market
4.	Financial	Infrastructure and Environment Operations Programme and the Regional Operations Programme
5.	Financial	Green Investment Scheme. Part 1 - energy management in public buildings
6.	Financial	Green Investment Scheme. Part 5 – Energy Management in Buildings of Selected Public Sector Entities
7.	Information/Education/Training	Exemplary role of public sector
8.	Financial	Programme "Energy Savings and Renewable Energy Sources Promotion" (under the EEA Financial Mechanism and Norwegian Financial Mechanism)

The huge role in improving of energy efficiency in public services sector is playing National Fund for Environmental Protection and Water Management. The institution is constantly preparing programmes of high impact regarding thermal modernisation of public buildings as well preparing new programme utilising different national and external financial sources (i.e. EEA Financial Mechanism and Norwegian Financial Mechanism).

Cross-cutting measures

General cross-cutting energy efficiency measures (described in MURE database)

No.	Type	Title of the measure and explanation
1.	Financial Measures	The National Fund for Environmental Protection and Water Management (NFOŚiGW)
2.	Market-based Instruments	Green certificates for electricity production from renewable energy sources
3.	Legislative/Normative Measures	Quota system for the promotion of CHP
4.	Legislative/Normative Measures	Priority access of renewables to the electricity grid
5.	Legislative/Normative Measures	Quota system for the green electricity (concerns the green certificates)
6.	Non-classified Measures Types	Information campaigns, training and education
7.	Market-based Instruments	System of white certificates - Energy efficiency Act

In Poland the supporting mechanism for RES which can be classified as “green certificates” was established by Energy Law and last Decree from 2008, would be changed from 2013. Energy undertaking involved in generation of or trading in electricity and selling this energy to final consumers connected to the system within the boundaries of the Republic of Poland is obliged, to the extent specified in the secondary regulations issued, to:

1) acquire the certificate of origin and present it to the President of the Energy Regulatory Authority (URE) for cancellation, or
2) pay the compensation fee, calculated in accordance with the method presented below:

   The compensation fee *Oz* shall be calculated in accordance with the following formula: *Oz=Ozj x (Eo-Eu)*

where the symbols shall mean:

Oz – the compensation fee expressed in PLN,
Ozj – compensation fee unit,
Eo – the amount of electricity, expressed in MWh, stemming from the obligation to acquire certificates of origin and to present them for cancellation, in the particular year,
Eu – the amount of electricity, expressed in MWh, stemming from the certificates of origin, which the energy undertaking presented for cancellation in the particular year.

The compensation fee unit indicated by symbol *Ozj*, is subject to annual valorisation by the mean-annual consumer price index from the calendar year preceding the year for which the compensation fee is calculated, determined in the communication of the President of the Central Statistical Office and announced in the Official Journal of the Republic of Poland 'Monitor Polski'.

The President of URE announces the compensation fee unit after its valorisation in the Bulletin of the Energy Regulatory Authority not later than on 31 March of every year.

The compensation fee shall constitute the income of the National Fund for Environment Protection and Water Management, and shall be paid into a designated account of this fund until 31 March of each year, for the previous calendar year.

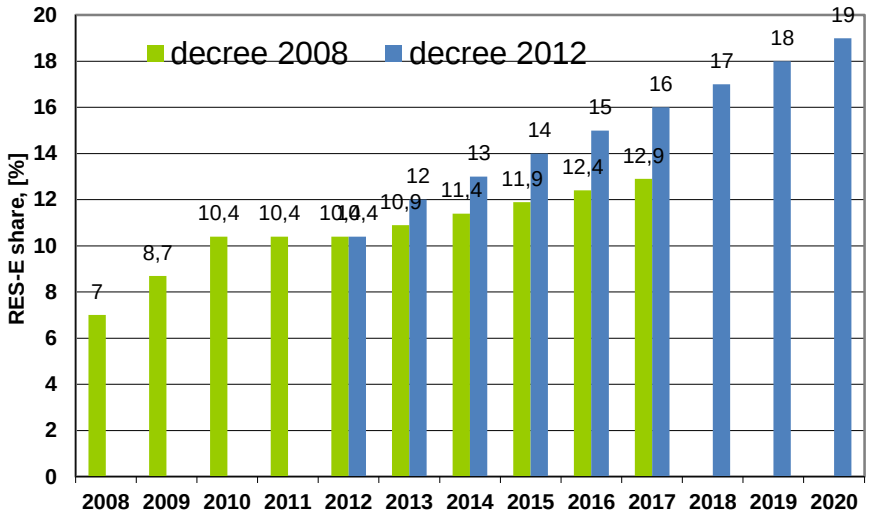
The supplier of last resort is obliged, insofar as specified in the regulations issued, to purchase electricity generated in renewable energy sources connected to networks located within the area of operation of the supplier of last resort, offered by energy undertakings which acquired licenses for its generation; such purchase shall be made at average electricity sales price for the previous calendar year.

Energy undertaking involved in trading of heat and selling this heat is obliged, insofar as specified in the regulations issued, to purchase offered heat generated in renewable energy sources connected to the network located on the territory of the Republic of Poland, in the amount not exceeding the demand of this undertaking's consumers connected to the network, to which the renewable energy sources are connected.

Energy undertaking involved in generation of or trading in electricity and selling this energy to final consumers, connected to the network on the territory of the Republic of Poland, is obliged, insofar as specified in the regulations issued, to purchase offered electricity co-generated with heat in energy sources connected to the network located on the territory of the Republic of Poland.

The Decree of the Minister of Economy from 2012 states minimal values eligible as levels of fulfilling the imposed obligation, in terms of particular years up to 2017 (decree from 2008) and 2020 (decree from 2012). The share of RES-E refers to the electricity sold by energy enterprises to final consumers.

Figure 26. Minimal values of RES-E share in electricity sold by energy enterprises to final consumers, accordingly the Decree on August 14th, 2008



5.2 Patterns and Dynamics of Energy Efficiency Measures

Generally the support measures have got mainly legislative/informative character. Concerning financial support, Government decided to introduce market mechanisms in form of different certificates (white, red, green, brown, yellow, etc.). Financial support directly from the state is being provided for thermal modernisation investments in households and services. The second source of soft loans or grants are available from

the environmental protection funds (state or regional levels). Patterns of measures in different sector are provided below.

Residential Sector

Energy efficiency measure patterns residential sector: development of measure by type over time

Coop: Co-operative Measures

Cros: Cross-cutting with sector-specific characteristics

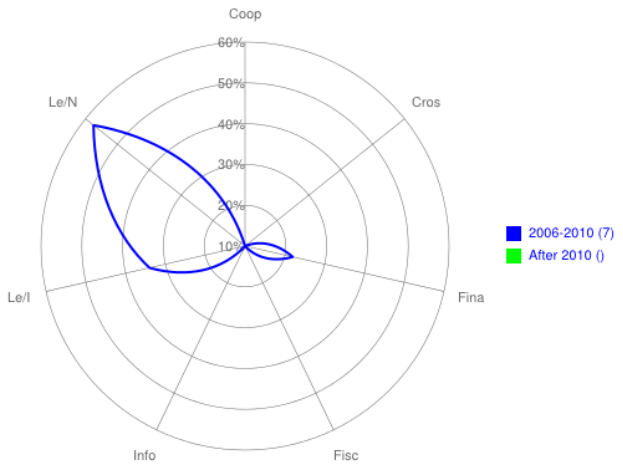
Fina: Financial

Fisc: Fiscal/Tariffs

Info: Information/Education

Le/I: Legislative/Informative

Le/N: Legislative/Normative



Transport Sector

Consumption in the transport sector has been being increased steadily since 2002. The sector should be more addressed by measures and issues improving its energy efficiency.

Coop: Co-operative Measures

Cros: Cross-cutting with sector-specific characteristics

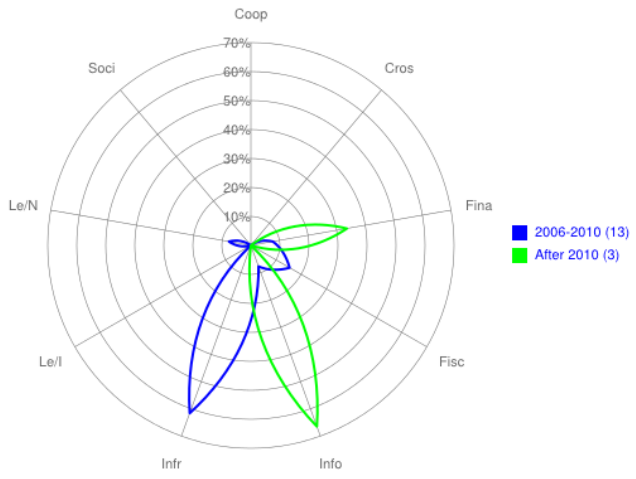
Fina: Financial

Fisc: Fiscal/Tariffs

Info: Information/Education

Le/I: Legislative/Informative

Le/N: Legislative/Normative



Industrial Sector

The Polish industrial sector has been subject of restructuring and privatisation since 1989. Structural changes have in particular taken place from heavy to consumer industries. While privatisation has been successful in particular in consumer industries, heavy industries like metallurgical, chemical and machine building industries, as well as the mining and energy sector enterprises, are still in process of privatisation.

Coop: Co-operative Measures

Cros: Cross-cutting with sector-specific characteristics

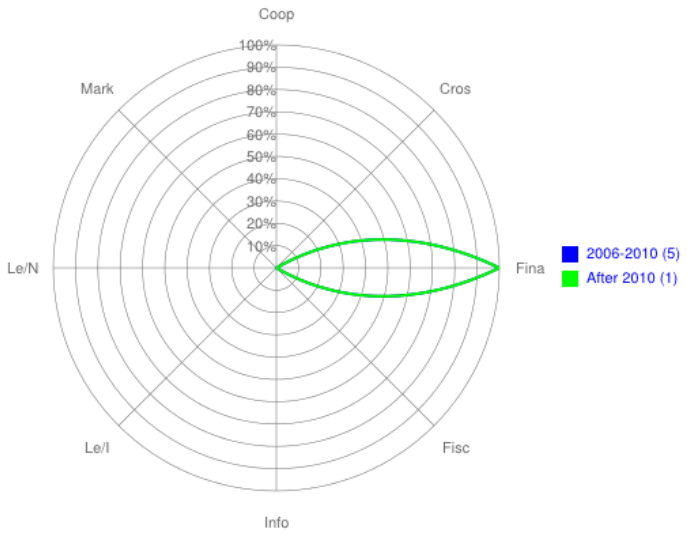
Fina: Financial

Fisc: Fiscal/Tariffs

Info: Information/Education

Le/I: Legislative/Informative

Le/N: Legislative/Normative



Tertiary Sector

In the tertiary sector heat for space heating and electricity are the predominant energy carriers. Problems in the tertiary sector and energy efficiency measures in some extent are similar to those in the residential sector.

Coop: Co-operative Measures

Cros: Cross-cutting with sector-specific characteristics

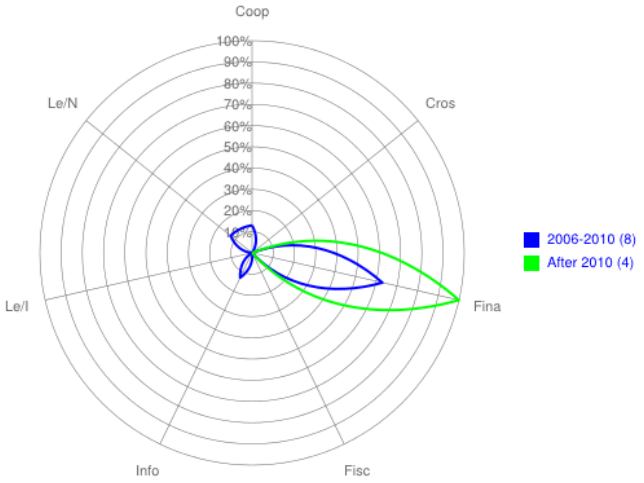
Fina: Financial

Fisc: Fiscal/Tariffs

Info: Information/Education

Le/I: Legislative/Informative

Le/N: Legislative/Normative



Cross-cutting measures

Dispersed generation of electricity and heat from renewables and electricity generated in CHP at is basically stimulated by purchase obligation and quota system accompanied by certificates systems.

It is expected, that these regulations, combined with market demonopolisation and privatisation in general, will result in favourable conditions for small scale, local energy sources. Factors quoted include:

- Decrease of load in transmission and distribution networks will improve operating conditions of these networks and reduce transmission and distribution costs;
- High efficiency of decentral CHP plants, short construction times and lower investment risks.

Coop: Co-operative Measures

Cros: Cross-cutting with sector-specific characteristics

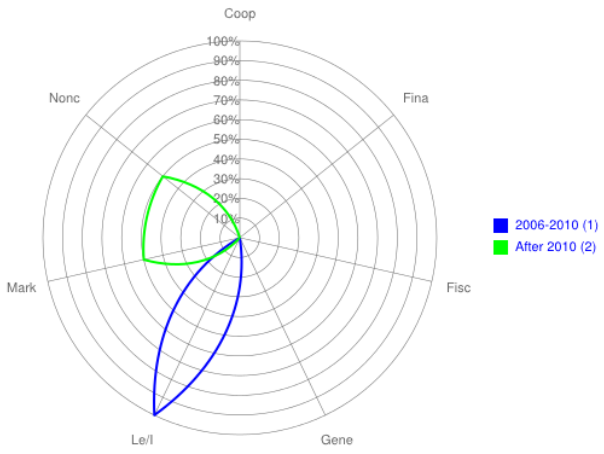
Fina: Financial

Fisc: Fiscal/Tariffs

Info: Information/Education

Le/I: Legislative/Informative

Le/N: Legislative/Normative



Environmental Funds

Besides the Thermo-modernisation Fund, which focuses on energy efficiency improvements in buildings of residential and tertiary sectors and heat distribution sector, two major environmental funds are operational in Poland:

- The National Fund for Environmental Protection and Water Management (NFOŚiGW)
- Voivodeship Funds for Environmental Protection and Water Management

International Co-operation

Poland is the member of several international organisations and institutions, like OECD, the World Bank, EBRD and the World Energy Council, and plays an active role in various international co-operation schemes, including AJI, bilateral and EU co-operation programmes.

It seems to very important the stimulation by Government of further wide participation of Polish institutions and enterprises in relevant programmes, like Intelligent Energy for Europe and 7th FP in order to strengthen the national capacities in the field of EE and research base.

5.3 Innovative Energy Efficiency Measures

Energy Efficiency Obligation

Poland implemented the White Certificate system, as a horizontal measure, established by Energy Efficiency Law in 2011. The system will work similarly to the existing green certificates for energy from renewable energy sources and red certificates for electricity generated by CHP. Certificates can be given to among others, companies who decreased their energy use by investing in new technologies. The issuing body will be the President of the Energy Regulatory Office (URE). Income from substitute fees, monetary penalties for failure to comply with the obligations of possessing white certificates and presentation them for redemption to the President of URE, failure to pay the substitute fees, as well as failure to carry out other responsibilities resulting from the energy efficiency law will be gathered, in a National Fund for Environmental Protection and Water Management (NFOŚiGW) bank account. They will be used as funding for programmes supporting improvements in energy efficiency, including high efficiency CHP, supporting development of renewable energy sources and building or improving networks used to connect to these sources.

Exemplary role of the public sector

Fulfilling a model role by the public administration is realized by the proper implementation of the energy efficiency law regulations, which defines the actions of the public sector in energy efficiency. In light of art. 10 section 1 and 2 of the law, a public sector entity realizes its tasks by implementing at least two of five listed measures for improving energy efficiency, and an energy audit according to the regulation of the law from the 21st of November 2008 on supporting thermo-modernizations and renovations. In the energy audit, it is advised to carry out action shown in the audit with regard for their economic feasibility. These actions can be financed from public funds available from the National Fund for Environmental Protection and Water Management.

According to art 13 of the directive 2010/31/EC of the European Parliament and Council from the 19th of May 2010 on energy performance of buildings, all government buildings with an area above 500 m^2 should, until 2013, have a clearly visible energy performance certificate. In 2015 this obligation will also include buildings with an area above 250 m^2.

Among main aims of ongoing action were shown:

- increasing the consideration of environmental aspects in public tenders,
- developing the market for environmentally friendly products and increasing the market for technologies of the environmental protection industry and environmental services,
- promoting sustainable standards of production and consumption.

The public administration is also realizing its exemplary role through implementing and promoting near-zero emission buildings. It is assumed that, financing from the EU for public buildings – e.g. schools, hospitals etc. will be given primarily (and after 2015 exclusively) to buildings of higher energy efficiency, and above all of near-zero energy use. Promotion of demonstrational and pilot projects on nearly zero energy public buildings is also planned. Additionally with regard to the pilot character of these actions, the funding for these projects should be higher than for conventional actions connected to building thermo-modernization. Development of example building projects of near-zero energy, which should be and inspiration for everyone realizing such projects is planned.

Access to information and advice

Information on measures improving energy efficiency and financing mechanisms is available to market participants, including final users.

The Polish National Energy Conservation Agency leads the National Contact Point as part of the Competitiveness and Innovation Framework Programme 2007-2013 (CIP) for beneficiaries of the Intelligent Energy – Europe Programme (IEE II). As part of the National Contact Point for the IEE Programme the following actions are ongoing:

- Providing potential beneficiaries information on the IEE Programme;
- organizing National Information Days with relation to proposal calls published by the European Commission;
- organizing trainings for institution interested in participating in the programme;
- participating in trainings, conferences and workshops organized by other institutions;
- translating work documents;
- preparing and distributing materials on the IEE programme;
- preparing and updating www.cip.gov.pl website (CIP - Competitiveness and Innovation Framework Programme);
- preparing reports on participation on polish entities in invitation to proposal submissions and realizing projects as part of the IEE programme;
- help with preparing proposal applications.

The Poland-Japan Energy Conservation Technology Centre (PJCEE) conducts actions aiming to improve energy management in industry, mainly through trainings of energy auditors and management staff in industry and conducting industrial energy audits.

Additionally other organizations, associations and institution as part of their service offer information and advice on promoting issues of energy conservation, such as: the National Agency for Energy Conservation (NAPE), Fund for Effective Energy Use

(FEWE), regional energy agencies (e.g. the Baltic Agency for Energy Conservation – BAPE, Regional Agency for Energy Conservation in Torun (RAPE), the Mazovian Energy Agency (MAE), Podkarpackie Energy Agency (PAE), the Institute for Eco Development and other industry organizations.

Due to actions on promoting energy efficiency buildings an appointment of advisory group is planned, whose members will consist of representatives of the public administration, local governing bodies, companies working in the construction industry and non-government organizations. As part of actions of the group, developing a diagnosis of the state of building energy efficiency with regard to the developer sector and thermo-modernization process is planned. The basis of the diagnosis will be information on the current energy standard for buildings. The aim of this report is the necessity to adapt existing support instruments to a changing economic situation.

Additionally creating a national ESCO contact point is planned. The work of this contact point will include, among others, helping entities in the public finance sector, including local territorial governing bodies, planning to save energy in the ESCO formula.

Market for energy services

Aiming to stimulate the market for companies providing energy services, such as ESCO type energy saving companies, the law from the 15th of April 2011 on energy efficiency includes regulation on joining tender by these entities as means to achieving energy efficiency certificates (white certificates). ESCO type energy saving companies will be the beneficiaries of the white certificates system, thanks to the possibility of aggregating energy savings and joining the tender representing other entities, which realized actions aimed at improving energy efficiency, achieving a total savings of 10 toe, which is included in the regulation.

Additionally, entities of the public sector which will be obliged to use measures of improving energy efficiency by the regulation will be able to sign contracts which will include realization and financing of investments of measures aimed at improving energy efficiency, with companies such as ESCO type energy saving companies. This will lead to an increase in the market for services of these entities, which offer various forms of out-of-budget financing, e.g. third party financing, or agreement on improving energy efficiency, upon which the investment is financed based on the energy saving specified in the agreement.

In 2012 other actions for developing the energy services market will also be taken up. These actions will concern, above all, facilitating agreements with companies working in the ESCO formula. The main facilitation in agreements on improving energy efficiency and out-of-budget financing by ESCO type companies would be causing the acquired financial resources to be treated as own resources when applying and realizing projects on energy efficiency, co-financed or credited from EU resources in a new

financial perspective from resources of the NFOŚiGW, WFOŚiGW and the Norwegian Mechanism. Appropriate changes to the proper regulations on acquiring these resources are being prepared by the Ministry of Regional Development and the Ministry of Environment with cooperation with other departments. Example Specifications of Important Order Conditions will be published on the Ministry of Economy website along with model agreements on different categories of services guaranteeing energy efficiency improvements.

5.4 Energy efficiency measure evaluations

5.4.1 Semi-quantitative Impact Estimates of Energy Efficiency Measures

In the first National Energy Efficiency Action Plan in 2007 indicative targets for energy efficiency for 2010 and 2016 were defined. For 2010 it is 2% of the average national final energy consumption, with the average taking into account years 2001-2005, and for 2016 9% of said energy consumption. These targets are maintained in the NEEAP2.

Calculation of energy savings (top-down method)

Energy savings for NEEAP2, presented below, are calculated by top-down method. The calculations were done for year 2009. The calculations were done accordingly to the methodology published by the European Commission *Recommendations on measurement and verification methods in the framework of directive 2006/32/EC on energy end-use efficiency and energy services*. Year 2007 was recommended by the European Commission as the base year.

The table below shows targets in energy savings realised as part of the 2006/32/EC directive, shown in NEEAP1, achieved and planned energy savings in 2009 and 2016 respectively. Due to availability of data the savings of final energy until 2009 were calculated.

Table 4. Targets in energy savings and achieved final energy savings

Year	Target		Energy saving achieved (2009) and predicted (2016)	
	GWh	%*)	GWh	%*)
2010……	11 878	2	35 320	5.9
2016……	53 452	9	67 211	11

*) with respect to average use 2001-2005

Table above shows that both realized and planned energy savings will exceed the targets set by directive 2006/32/EC and NEEAP1.

Table below shows the achieved final energy savings divided by sector in 2009, calculated by the top-down method presented below.

Table 5. Final energy savings divided into sectors (calculated using the top-down method for 2009 with respect to 2007)

Sector	Achieved energy savings GWh
Households…….……..……	13 816
Services…….……	-
Industry…….	11 851
Transport……...	9 653
Total……...	**35 320**

5.4.2 Lessons from Quantitative Energy Efficiency Measure Evaluations

The thermal modernisation fund is the example of measure where energy savings calculations are being done by ex-ante method. The background of the measure and explanation is provided below.

The residential sector in Poland, characterised by 40% of the primary energy consumption of the country (based on hard coal), should be more touched by activities towards energy efficiency improvement and renewable energy sources deployment. Focusing on these targets is essential from the point of view of sustainable building development. Poland has approximately 11.8 million housing units with the total usable area of about 700 million m^2. Although so far the measures to improve energy efficiency have focused in particular on the residential sector its energy consumption is excessive, reaching much higher levels than in Western countries with a similar climate. Before 1997, the Government provided assistance for cooperative housing in the form of financing projects mainly for buildings from the sixties and seventies.

Generally the Act of 18 December, 1998 on *"Support for Thermo-Modernisation Investment in Buildings"* (Journal of Laws 1998, No. 162, item 1121, amendment in 2008), assisted by relevant Decrees, and the Thermo-Modernisation Fund, created on the basis of provisions of the Act, covers the rules of providing to the investors (building owners or administrators) of the financial support, in the form of the premium which can cover up to 20% of credit loan taken out for realisation of the thermal modernisation investments. Premium is paid to the crediting bank directly from the premium fund as a repayment of the part of credit instalment just after all the modernisation work is completed. The replacement of a conventional heating system by another one using renewable energy sources is also included in the scope of investments described by the Law.

The scheme is available to all investors, as owners or administrators of buildings, local heat sources and local heat distribution networks. Projects eligible for support include end-use improvements in residential and tertiary buildings, reduction of energy losses in heat distribution networks and the substitution of conventional energy sources by non–conventional sources, including renewables.

The energy audit is required to prove technical and economic evaluation. Submission of the energy audit is obligatory as well as it is a basic condition to apply for a support (premium) from the Thermo modernisation Fund. The Act, through its ordinances precisely describes standard of the energy audit and delivers calculation methods (Journal of Laws 2002, No 12, item 114, Decree on „*Scope and form of energy audit"*).

In particular the energy audit report shall contain:

1) identifying data of a building, local heat source, local heat distribution network and its proprietor;

2) an appraisal of technical condition of a building, local heat source and local heat distribution network;

3) description of all possible options of thermal-modernisation project completion;

4) economic analysis of possible measures,

5) identification of an optimum option and scope of thermal-modernisation project;

6) detailed description of optimum option.

All the audits delivered to the commercial banks and then to Bank of National Economy (BGK) being a basis for applying for the premium granting, are verified by the independent institutions. The issue is determined by Decree on “Verification of energy audit” (Journal of Laws 2002, No. 12, item 115)

The National Economy Bank transfers the premium to the crediting bank as a repayment of the credit utilised by investor, if the modernisation:

- has been completed in accordance with the energy audit and with the technical design,
- has been completed by the deadline set out in the credit agreement.

On the base of energy audits the energy savings are being anticipated. The ex-ante methodology is only used for energy savings evaluation on the state level.

6 National Developments under the EU Energy Efficiency Directive and the 20% Energy Efficiency Target of the EU

The Second National Energy Efficiency Action Plan (April 2012_ - NEEAP2 was prepared to fulfil the obligation of submitting reports on the 2006/32/EC Directive (Journal of Law L 114 from 27 April 2006, page 64) as well as the directive on energy performance in buildings, 2010/31/EC (Journal of Law L 153 from 18 June 2010, page 13). The document was developed based on art. 6 section 1 from the 15th of April 2011 on energy efficiency (Journal of Law No. 94, pos. 551), implementing regulations of directive 2006/32/EC.

NEEAP2 contains descriptions of energy efficiency improving measures aimed at end energy use and calculations on current energy savings achieved in the period 2008-2009 and expectations until 2016 according to the requirements of the directive.

The document was prepared by the Ministry of Economy, with involvement from the Ministry of Transport, Construction and Marine Economy, Central Statistical Office (GUS) and the Polish National Energy Conservation Agency (KAPE S.A.).

The document contains detailed descriptions of planned measures for improving energy efficiency defining actions aimed at improving energy efficiency in the different areas of the economy, essential to achieving the national target for sustainable energy management for year 2016, which is to be achieved in nine years from 2008 according to art. 4 of the directive.

While developing NEEAP2 the following assumptions were taken into account:

- the proposed measures will be maximally based on market mechanisms and in minimally on the state budget.
- goals will be accomplished according to lowest cost rules with maximal use of existing mechanisms and organizational infrastructure,
- participation of all parties in exploitation of the total national energy efficiency potential.

The document also contains the report required by the 2010/31/EC directive on building energy performance in which the European Commission is presented with information needed by the directive, a list of current and planned measures and instruments including financial and supporting actions on energy saving in buildings (article 10 of directive 2010/31/EC).

Realized (2009) and projected (2016) final energy savings based on directive 2006/32/EC was considered in two ways. Based on data from statistical surveys and evaluation models, a total final energy saving for the entire national economy was defined with distinction for each sector of end use.

Additionally the final energy savings are defined for each measure by the bottom-up method. This method allows showing a direct relationship between these measures and the implementation of national energy policy. Measures monitored by a bottom-up method cover a large part of the total final energy savings, which is more than 30% of the total energy savings which, in accordance with Directive 2006/32/EC should be determined by the bottom-up method.

The NEEAP2 on energy efficiency defines the following measures of increasing efficiency:

1. Measures in residential housing (households)
    a. Fund for Modernization and Renovation (continued).
2. Measures in the public sector
    a. System of green investments (Part 1) – management of energy in public use buildings (new).
    b. System of green investments (Part 5) – management of energy in buildings of chosen public finance sector entities (new).
    c. Operational Program “Energy saving and promotion of renewable energy sources” for use of financial resources as part of the EOG Financial Mechanism and the Norwegian Financial Mechanism in 2012-2017 (new, under preparation).
    d. Operational Program Infrastructure and Environment (POIiŚ) – Action 9.3 Thermo-modernization of public buildings (continued).
3. Measures in industry and small and medium companies (SMEs)
    a. Effective energy use (Part 1) – Additional financing of energy and electricity audits (new).
    b. Effective energy use (Part 2) – Financing investments leading to energy savings or energy efficiency improvements in companies (new).
    c. Access to financial instruments for the SME sector (PolSEFF) (new).
    d. Priority Program Intelligent energy networks (new, from 2012).
    e. Operational Program Infrastructure and Environment (POIiŚ) – Action 9.2 Effective energy distribution (continued).
    f. Operational Program Infrastructure and Environment (POIiŚ) – Action 9.1 High efficiency energy generation (continued).

4. Measures in the transport sector
    a. Systems of traffic management and optimisation of freight transport (continued).
    b. Replacing the fleet in city transport departments and eco-driving promotion (new, from 2012).
5. Horizontal measures
    a. System of energy efficiency certificates – white certificates (new).
    b. Informational campaigns, workshops and education on improving energy efficiency (continued).

Energy savings accordingly to the second NEEAP. The Plan does not provides the predicted energy savings for other than measures as below.

	GWh	Mtoe
Target for 2016 accordingly the second NEEAP	67211	5.779
Economy sector		
Households		
Thermal Modernisation Fund	8121	0.698
Services - public		
System of green investments (1)	1950	0.168
Operational Programme Infrastructure and Environment (Activity 9.3)	320	0.028
Industry and SMEs		
Effective energy use (Part 2)	2900	0.249
Operational Programme Infrastructure and Environment (Activity 9.2 – Effective energy distribution)	498	0.043
Operational Programme Infrastructure and Environment (Activity 9.1- High efficient electricity generation)	3100	0.267
Transport		
Transport management system	13360	1.149
Fleet replacement	2500	0.215
General Cross-Cutting		
White certificates system	25586	2.200
National information campaign	12793	1.100
Total		6.116

The sum of effects of specific measures are even higher than assumed for 2016 target. It could be suggested to strength the role of bottom-up calculations in evaluations of specific measures results.

Annex 1

Energy Efficiency Measure Summary by Country

Provide summary tables of all the measures implemented in your country (mainly on going measures, classified by sector) (can be downloaded from the MURE web site)

All measures described in MURE database are listed in chapter 5.1 of this report, regarding each economy sector.

Annex 2

Country Profile

(Established in a standard manner by ENERDATA, can be downloaded from the Odyssee website to be included in this section