Poland
Energy efficiency report

Objectives:
- 67.2 TWh of energy savings by 2016
- 2.9 TWh of energy savings in industry by 2016

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<th>Overview</th>
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<th>2000-2010 (%/year)</th>
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<tr>
<td>Primary intensity (EU=100)</td>
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++ Among best countries  + Better than the EU average
- Below the EU average
-- Among countries with the lowest performances

Latest update: January 2012

¹ The European Union, as the best performing region, is used as the benchmark.
1. Overview

1.1. Policies: 5.8 Mtoe of energy savings in 2016 (or 11%)

In compliance with the 2006 European Directive on Energy Efficiency, Poland adopted its National Energy Efficiency Action Plan (NEEAP), which lays down a final energy savings target of at least 9 percent between 2008 and 2016, ie 4.6 Mtoe (53.5 TWh). The draft of the second NEEAP (late 2011) raised the energy savings target to 11 percent by 2016 (5.8 Mtoe or 67.2 TWh), 38 percent of which should be achieved through the white certificate system, 19 percent through existing informational campaigns, 24 percent in the transport sector, 12 percent in the residential sector (Thermo-Modernization Program), 4 percent in industry and 3 percent in the public sector.

The Energy Efficiency Act was adopted in April 2011, defining the purposes of energy savings and establishing support mechanisms. The key measure is the introduction of white certificates, imposed on companies that sell electricity, gas or heat. White certificates will be provided for energy consumption reduction by end users (about 80 percent), by generators (10 percent) and by electricity network operators (10 percent). Poland’s energy efficiency policy also relies on the European eco-design and labeling directives for electrical appliances. The Energy Policy until 2030 (adopted in 2009) aims to achieve “zero-energy” economic growth by 2030 (ie raising the GDP without increasing energy consumption) and to reduce Poland’s energy intensity to the EU-15 average. In 1999, the Thermo-Modernization Program launched financial premiums for end-use improvements in residential and tertiary buildings, fuel substitutions (renewables) and energy loss reduction in heat distribution networks.

1.2. Energy consumption trends: cut in industry’s share

Poland’s primary energy consumption per capita is 23 percent lower than the EU average, at 2.6 toe in 2010. Total energy consumption increased by 0.6 percent/year between 1990 and 1996 and fell by 3.1 percent/year between 1996 and 2002. The upward trend seen since then (+1.6 percent/year over the 2002-2010 period) was interrupted in 2009 (-3.7 percent) as a result of the global economic slowdown.

The share of the power sector in total energy consumption has remained stable at around 18 percent (2010) over the last few years. The share of industry (including non-energy uses) fell from 29 percent to 21 percent following industrial closures.

Over the period 1990-2010 the share of coal and lignite in final energy consumption dropped from 31 percent to 18 percent, to the benefit of oil (34 percent of total consumption in 2010 compared with 17 percent in 1990) and natural gas (15 percent compared with 12 percent in 1990).
Poland’s electricity consumption per capita reached 3,360 kWh in 2010, which is about 40 percent below the EU average. The share of electricity in energy consumption is increasing slowly; in 2010 it stood at about 15 percent (13 percent in 1990). Electricity consumption was stable until 2000 and grew by 2 percent/year until 2008. In 2009, it declined by 3 percent as a result of the global economic slowdown, but in 2010 was on the rise again.

1.3. Energy efficiency trends: rapid improvements over the 1990-2010 period

Primary energy intensity (total energy consumption per unit of GDP) fell very rapidly in Poland, and much faster than the EU average: it dropped by 3.8 percent/year between 1990 and 2010 (and by 5.1 percent over the period 1990-2000). More than 35 percent of the energy intensity decrease was due to a decrease in the energy intensity of the industrial sector (-1.4 percent/year on average) and to a lesser extent to a decrease in the energy intensity of the power generation sector (limited improvement in the efficiency of power plants over the 1990-2010 period).
2. Power generation

2.1. Policies: white certificates and promotion of CHP

In 2011 a white certificate system was implemented for energy companies selling energy to end consumers in Poland. Those companies are obligated to receive and present white certificates to the regulation office (ERU) for redemption, and to pay fees accordingly to the number of missing white certificates. The certificates are awarded through yearly tenders, for projects achieving energy savings of at least 10 toe/year.

Poland aims to double power generation through highly efficient cogeneration technology between 2006 and 2020. The Energy Law of 1997 was amended in 2005 to introduce certificates of origin for CHP as well as a purchase obligation for energy distributors. Facilities included in this scheme are CHP installations fuelled by gas or with capacities under 1 MW (“yellow certificates”) and other CHP installations (“red certificates”).

Since 2009, the National Fund for Environmental Protection and Water Management (NFOSiGW) has made up to 1.5 billion zlotys (100 zlotys = 32 dollars) in special funding available to support renewable and high-efficiency CHP projects.

2.2. Efficiency of the power sector: strong improvements during the 90s

The efficiency of the electricity sector improved dramatically between 1990 and 2000, rising from 24 percent to 33 percent (stable around 34 percent until 2010). Maintenance investments were kept at a minimum during the 1970s and 1980s, leading to a very low efficiency level in 1990. The introduction of gas-fired capacity was limited, reaching 770 MW in 2010; combined cycle gas turbine (CCGT) plants account for just 3 percent of the thermal capacity.
The rate of T&D losses in Poland is 9.3 percent (2010). It increased rapidly and reached 15 percent in 1995, but has dropped by 3.1 percent/year since then. Nevertheless, Poland’s T&D losses are still among the highest in Europe (40 percent higher than the European average).

![Figure 6: Electric T&D losses](image)

Source: Enerdata

### 3. Industry

#### 3.1. Policies: energy audits and co-financing of energy-efficiency investments

The second NEEAP (2011) aims to achieve 2.9 TWh of energy savings in the industrial sector and in SMEs by 2016. The NFOSiGW has designed two main measures to reach this target: grants for drawing up energy audits in companies with an annual consumption over 50 GWh and co-financing of investments in energy efficiency projects. The funding program for energy audits will be implemented until the end of the year 2014 with a budget of 40 million zlotys (9.6 million euros); it will cover processes, buildings and energy consumption audits. The funding of investments for energy management systems and the modernization of industrial processes will be implemented until the end of the year 2015, with a budget of 780 million zlotys (186 million euros).

Voluntary agreements (coupled with the white certificate system) are under consideration.

Two other energy efficiency measures were already in place in industry, namely the Polish Energy Efficient Motor Program (PEMP) and the activities of the Energy Conservation Technology Centre (ECTC). The PEMP, a five-year program (2004-2009), was focused on energy-efficient motors in the manufacturing industry, the heating sector, water supply and mining. The ECTC is a joint project with the Japanese Government to promote energy conservation technologies in the Polish industrial sector.

#### 3.2. Energy consumption trends: sharp drop since 1996

Industrial energy consumption decreased by 37 percent between 1990 and 2010, reducing its share in final energy consumption from 40 percent to 23 percent in 2010. Industrial energy consumption recovered to its 2008 level after a 9.9 percent fall in 2009.
Electricity consumption remained relatively stable between 1990 and 2010, but its share in the energy consumption of the industrial sector rose from 14 percent in 1990 to 22 percent in 2010. Industrial coal consumption has been falling since 1996 (its share dropped from 58 percent to 31 percent). Gas consumption has been rising since 1992, and its share in industrial consumption grew from 10 percent in 1990 to 20 percent in 2010. Oil consumption doubled between 1990 and 2000 and has been falling since 1998 (8 percent of industrial consumption in 2010).

The share of energy-intensive industries has remained stable since 2000, at around 2/3 of industrial final energy consumption. The declining share of steel in Poland’s total industrial production and the sharp drop in the energy consumption of the steel industry (by 66 percent between 1990 and 2010) contributed to the decrease in the role played by this sector in industrial consumption. The energy consumption of the non-metallic minerals industry, namely cement, fell during the period 1990-2002 (by 3.7 percent/year) but has risen by 4 percent/year since then. The energy consumption of the chemical branch remained relatively stable over the 1990-2009 period; its share in industrial energy consumption rose from an average of 14 percent between 1990 and 2006 to 26 percent in 2009. In 2010 the paper industry accounted for 8 percent of industrial energy consumption (4 percent in 1990).
3.3. Energy intensity trends: rapid improvement in industry

The decrease in industrial energy intensity (consumption per unit of industrial value added) was much more rapid in Poland than in the EU between 1990 and 2010 (7 percent/year compared with 2.2 percent/year).

The largest improvements took place in the chemical sector (-5 percent/year on average between 1990 and 2009), in the paper sector (-4.1 percent/year) and in the cement sector (-3.5 percent/year). Energy consumption per ton of steel decreased by 2.8 percent/year between 1990 and 2009, with a more rapid improvement since 2000 (-4.6 percent/year).

Figure 10: Trends in the energy intensity of industrial branches

![Figure 10](image)

Source: Enerdata, Odyssee

Combined heat and power generation (CHP) is well established in Poland, but its share has been decreasing since 2002. Since 2009, the share of industrial CHP is lower than the EU average (17 percent and 19 percent, respectively).

Figure 11: Share of industrial CHP in industrial consumption

![Figure 11](image)

Source: Enerdata
The energy intensity of the manufacturing sector (ie excluding construction and mining) decreased at the same rhythm as energy intensity in industry: 6.5 percent/year for the period 2000-2009. This decrease is linked both to energy efficiency gains (more than 80 percent of the improvement) as well as changes in the structure of activities.

**Figure 12: Trends in the energy intensity of manufacturing and structural effect**

![Chart showing trends in energy intensity with significant decrease from 2000 to 2009.](chart)

Source: Enerdata