

Polish Energy Efficiency Report

Prepared by FEWE – Polish Foundation for Energy Efficiency

1. Summary

Through market-based mechanisms Poland has brought significant energy efficiency improvement to the economy. Energy intensity of GDP fell by 42% between 1991-2002, an average of 3.8% per year, including an average of 4.7% per year between 1997–2002.

Through market conditions and energy price growth the non-energy industrial sector has seen large improvements in energy efficiency through structural changes and management and technology improvements.

However, there still exists a large cost-effective potential for further energy saving in energy and non-energy industries, residential and the commercial sectors, estimated to be 20 – 30% in industry and 25 – 40% in residential and commercial sectors. Realising this potential will bring a large number of positive benefits including: improved energy security; better air quality; reduction in industry and households bills; and job creation. However, even for these ‘win-win’ projects policy driven mechanisms need to be implemented.

Poland must design and implement a long-term energy efficiency programme integrated with other national energy programmes under transparent and stable conditions of support. Assistance from the EU through the structural funds programmes is essential for rapid and successful implementation.

2. Trends in energy consumption

2.1. Primary energy consumption

Primary energy consumption decreased by an average of 2.2% per year between 1997 – 2002, compared with an average gross domestic product (GDP) growth of 3.2% per year (Figure 1). This resulted in a decrease in the energy intensity of the Polish economy by an average of 4.7% per year in years 1997 – 2002.

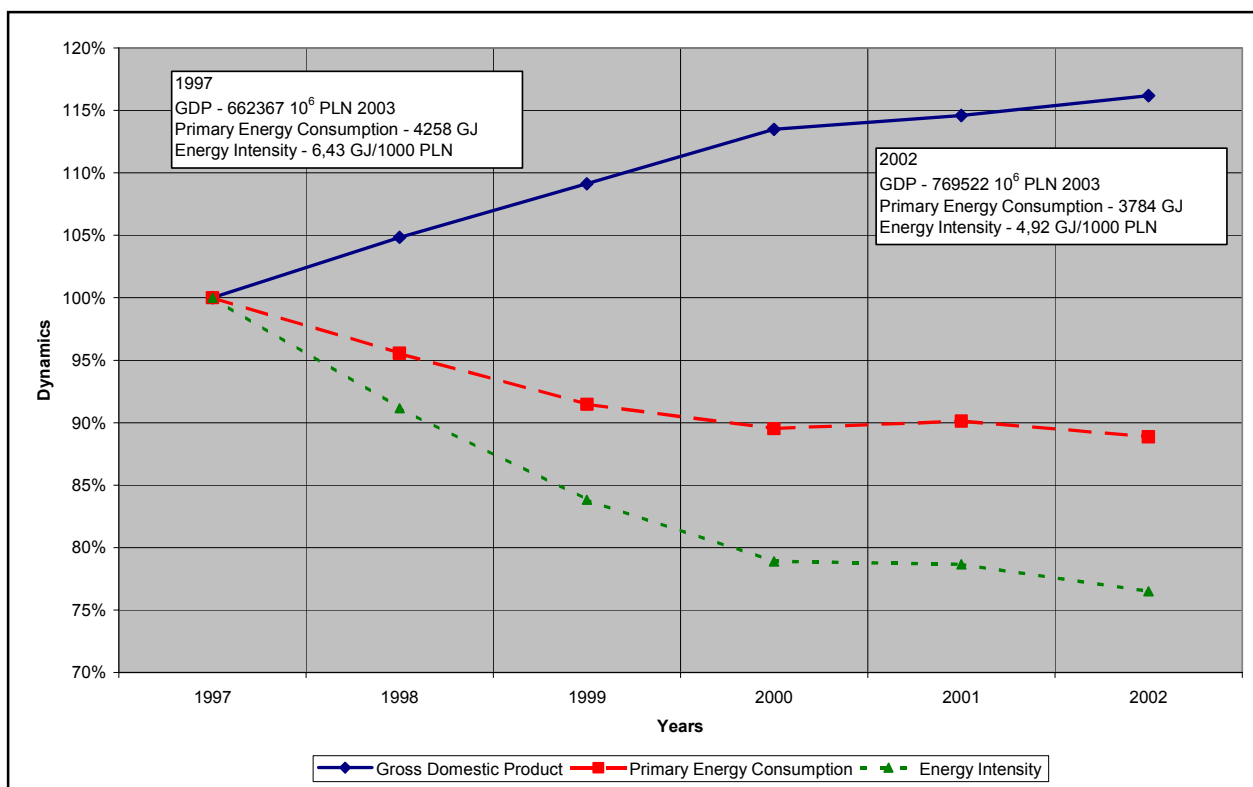


Figure 1. Dynamics of Gross Domestic Product, Primary Energy Consumption and Energy Intensity in Poland in 1997 - 2002 (1997 = 100%)

Over the last five years the structure of final energy consumption by sectors has changed significantly with a decrease in the share by the non-energy industries and an increase in the transport and household sectors (Table 1).

Table 1. Shares of final energy consumption by sectors

	1997		2002	
	TJ	%	TJ	%
Energy industry (mining & quarrying + electricity, gas & water supply)	273816	8.1	231421	8.3%
Non energy industry (manufacturing & construction)	1286171	38.1	945278	33.9
Transport	424499	12.6	398379	14.3
Household, agriculture and others	1389121	41.2	1212741	43.5

The decline in industry's share of consumption is a result of structural changes in the beginning of transition period, i.e. in years 1990 – 1995, and also energy efficiency improvements over the last few years (1997 – 2002). The fastest growth in demand was for transport, which increased its share from 12.6% to 14.3% over the period of 1997 – 2002.

As a result the overall fuel mix in Poland changed, with a decrease in relative use of Coal, and in increase in the importance of oil and natural gas (Table 2).

Table 2. Shares energy sources in primary energy demand

Energy carriers	1997	2002
Coal & lignite	71.8%	63.7%
Crude oil	14.9%	20.1%
Natural gas	9.3%	11.2%
Others	4.1%	5.0%

Share of coal and lignite were significant decreased because of increased shares of hydrocarbons (crude oil and natural gas).

2.2. Electricity consumption

Electricity consumption decreased by an average of 0.5% per year between 1997 – 2002 compared with an average GDP growth of 3.2% per year (Figure 2). Consequently there was a decrease in the electricity intensity of Polish economy by an average of 3.2% per year in years 1997 – 2002 and therefore, practically a zero-electricity growth of Polish economy.

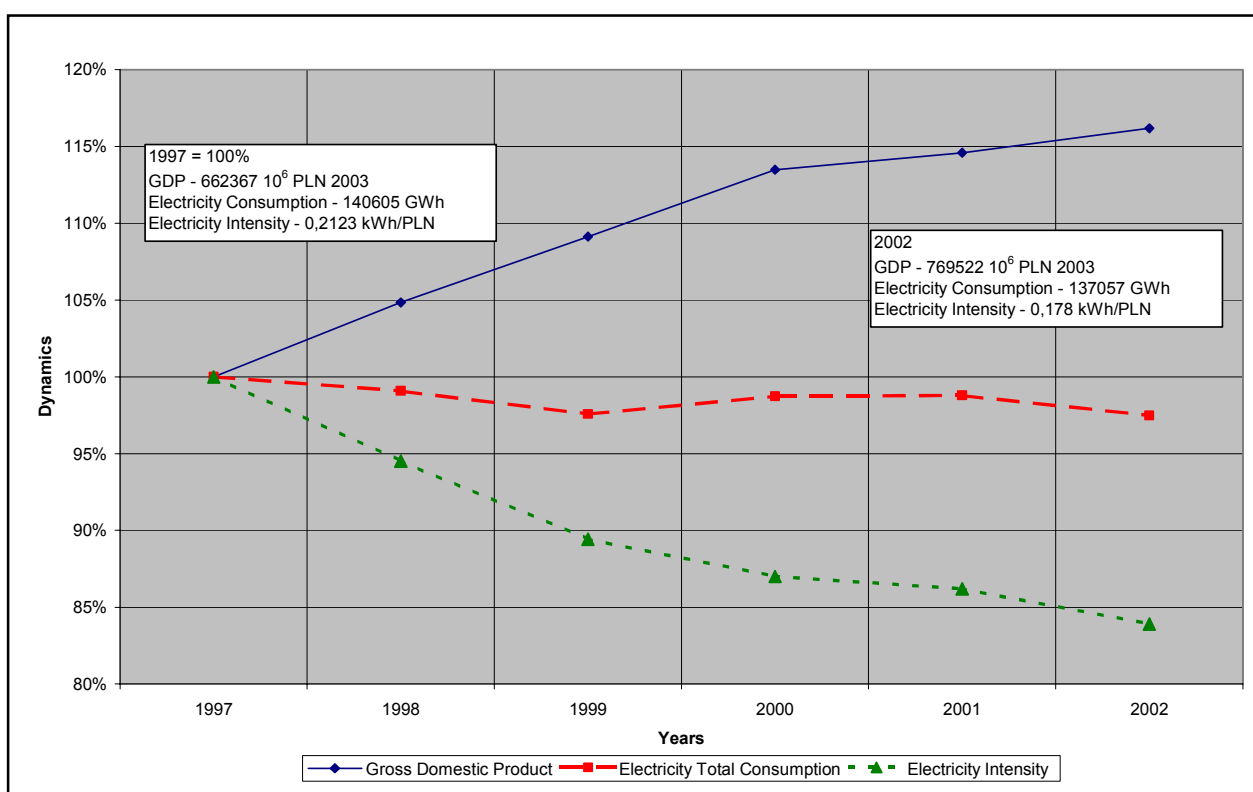


Figure 2. Dynamics of Gross Domestic Product, Electricity Total Consumption and Electricity Intensity in Poland in 1997 - 2002 (1997 = 100%)

Electricity consumption decreased from 140 TWh in 1997 to 137 TWh in 2002 and GDP (fixed price 2003) increased from 662.4×10^9 PLN to 769.5×10^9 PLN in this period (Figure 3).

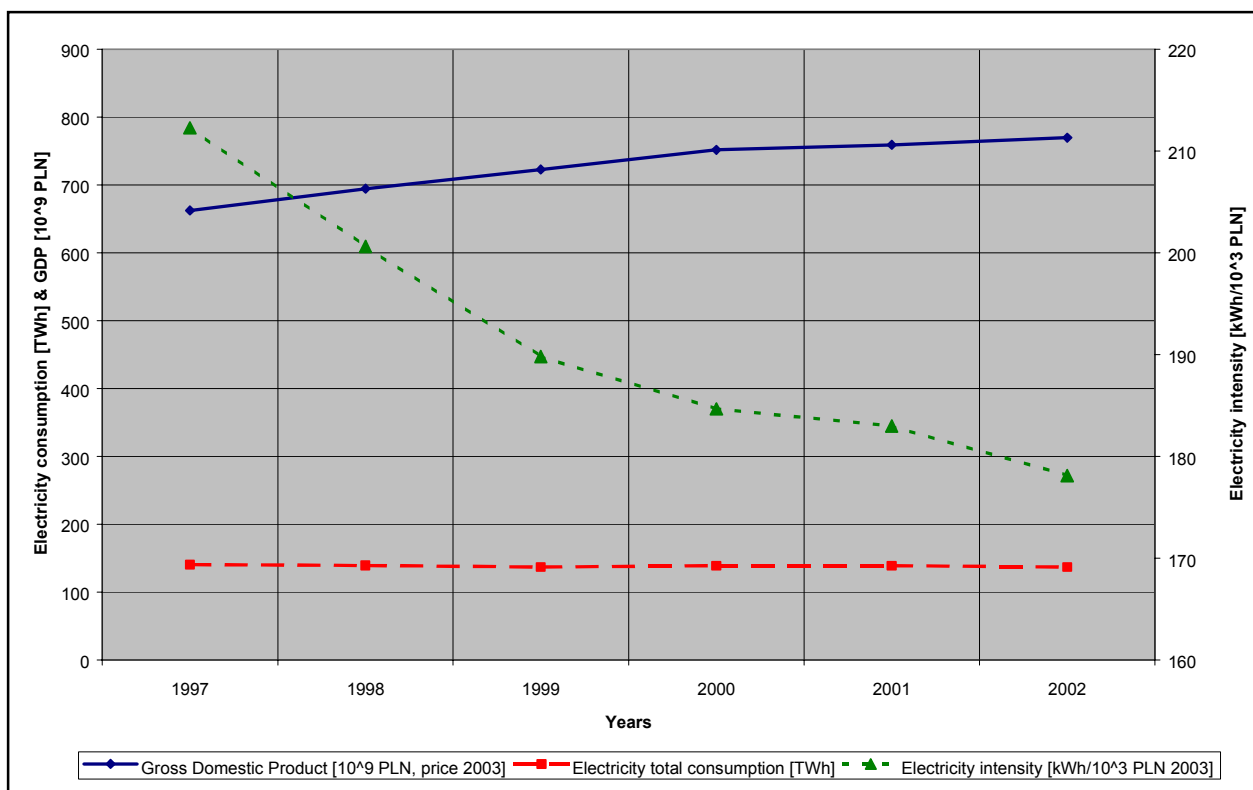


Figure 3. Gross Domestic Product, Electricity Total Consumption and Electricity Intensity in Poland in 1997 - 2002

2.3. Heat consumption

District heating (heat produced by public power & heat plants, public and non-public heat plants, autoproducing power & heat plants) consumption decreased from 467.5 PJ in 1997 to 372.8 PJ in 2002, an average decrease of 4% per year. This decline was largely resulted from a change in policy in the following areas.

- Delayed reaction of heat users to the increase in heat price due to withdraw of state subsidies at the beginning of 1990s.
- Restructuring of energy intensive industries for reason of market forces.
- Increased supporting for energy efficiency investments of buildings, resulting in low heat losses.

2.4. Fuels consumption by transport

Consumption of motor gasoline and diesel oil in transport was in 1997, 7,65 Mtoe and 6,96 Mtoe in 2002 – a average decline of 2% per year.

3. Potential for demand reductions

A gap remains between the energy intensity of the Polish and the EU 15 economy, with the Polish economy is 1.5 – 2.5 more energy intensive. There are two main reasons firstly, the more energy intensive structure of Polish economy and the inefficient use of energy at production of goods and services.

Government studies assessing the energy efficiency potential have been undertaken. These include:

- “*Strategies of the GHG Emission Reduction and Adaptation of the Polish Economy to the Changed Climate*” from 1996 undertaken under an agreement between the US Government and Polish Government.
- *Preliminary Assessment of GHG’s Emission Reduction on Polish Economy*” from 2000 and financed by US EPA.
- “*Polish Energy Efficient Motors Programme (PEMP)*” from 2002 financed by GEF.

These studies point to the following potential reductions in energy demand:

- the economic potential for the industrial sector is 30-33%,
- the technical potential of the residential and commercial building sectors are estimated to be 35 – 45% and the economic potential 20 – 35%. The economic potential will increase if energy efficiency measures are combined with renovation of existing buildings,
- the technical potential in electric motor are estimated to be 10 – 12% of electricity consumption and the economic potential 6 – 8%.

In 2001 the total emission of CO₂ were 318 x10⁶ Mg. The result of the proposed efficiency improvements would be a reduction in emissions of 92 x10⁶ Mg/year in 2010 or 29% reduction in CO₂ total emission in 2001.

4. Trends in policies

The latest Polish Energy Law came in force in 1997 and required energy efficiency objectives under its sustainable development objectives. Unfortunately there were no in depth legal requirements to develop and implement energy efficiency policies. Consequently, there are no comprehensive policies or laws on energy efficiency in Poland, rather a series of scattered initiatives to promote energy efficiency like standardisation of energy efficiency standards in new buildings or appliances, and the promotion of cogeneration.

Some financial incentives are offered by ecological found such as: the National and Voivodships Funds for Environmental Protection and Water Management; Ecofund; Thermomodernisation Funds on Existing Buildings and Small and Medium Heat Supply Systems. These funds raised 4x10⁹ PLN in 2002 (881x10⁶ Euro) in which measures of air and climate protection is 23%.

The guidelines in the national energy policy create some energy demand scenarios but domestic targets for energy demand reductions have not been explicitly set and there are no comprehensive mechanism to support energy efficiency. Consequently energy demand scenarios reflects more business as usual targets rather than an energy efficiency target.

Furthermore, there are no integrated economy, environmental and energy policies to harness the full benefits of energy efficiency. The most promising areas in which the social and economic benefits are being captured are:

- renovation of residential and commercial buildings including thermomodernization improvements,
- technology and management improvements in industry oriented for cost reduction and energy efficiency measures,
- energy efficient and environment friendly heat sources replacement and energy savings measures in multi and one family houses.

These projects have resulted in an improvement security of supply, lower energy demand, reduced industry and household energy bills, reduced health effects from bad air quality caused by pollutant emission from so called low – stacks sources, and job creation. A study undertaken by FEWE

showed that improvement in the thermal efficiency in buildings could result in 1.5 - 3 new jobs/GWh saving energy/year.

5. Adequacy of policies towards potentials

The main barriers for realising the full energy saving potential are:

- lack of awareness and information,
- lack of financing mechanism and sources,
- lack of project development capacity,
- lack of focused energy efficiency policy,
- lack of strong interest groups/advocacy of energy efficient investment,
- no consideration of additional benefits of energy efficient measures in business and financial decision-making,

Furthermore the national, regional and local decision makers are only introducing short term measures, rather than taking a longer term view.

6. Key recommendations

Some actions are needed to push the business as usual energy efficiency track towards policy driven energy efficiency improvements. The key actions for the Poland should be:

- Assess and implement an integrated energy efficiency program taking into account energy, environmental and other socio-economic needs. The diagnosis of past and current initiatives including recognising the existing and future barriers is the priority.
- Legal requirements and financial incentives should be created under transparent and stable conditions to support long term programmes for investors. The EU's Cohesion and Structural Funds and domestic funds must develop joint procedures and criteria for these programmes.
- Monitoring and assessment of the impacts of publicly funded projects must be undertaken and the results disseminated.
- Eligible areas for improvements in energy efficiency such as the thermomodernization of buildings, energy efficiency improvements in small and medium enterprises (SME), reduction of air pollutant emissions from so called low stacks must all be incorporated into national programmes.
- Innovative forms of financing should be developed to meet specific needs including the promotion of energy audits, information and advisory services, energy management services, third party financing, public – private partnership etc.

Reference

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