

Energy Efficiency of the Polish Economy

By Rafał Kasperowicz*

Introduction

The energy transformation in Poland has been in progress since the beginning of the 1990s. It was triggered by the restructuring of the Polish economy as a result of liberalization. As Poland entered an era in which resource depletion and environmental protection became major socio-economic issues, the structure of the power industry has changed radically. The traditional, rigid approach – according to which, only the existence of a strong monopoly could guarantee the proper operation of the energy industry – had failed, and the market was increasingly liberalized. Energy efficiency has become one of the key factors determining the country's economic development. This issue is present in all aspects of business life, from sectoral approaches to households.

In Poland, there is still a high potential for energy saving, which may be achieved through the application of significantly lower resources as was the case in more developed countries. We must not let pass this opportunity and we have to undertake relevant and effective action in the sphere of energy-saving policy.

The aim of this article is to show the changes in energy efficiency of the Polish economy and to answer the question whether Polish economic growth has been energy efficient.

Energy Consumption and Polish Growth

The problem that was formulated in the introduction may be addressed from two perspectives:

- Firstly, is the need to study changes in energy consumption by industry over time and compare them to changes in GDP – This will allow us to establish the energy-intensiveness of economic growth in Poland;
- Secondly, the above results may be compared with other, more developed economies – in order to identify the potential for further development of energy efficiency in the Polish economy.

In order to accomplish the above, selected economic variables obtained from the Eurostat database for the period from 1995 to 2010 were analyzed. The gross domestic product, published in millions of euro, was put in constant terms using the Eurostat price index (based on 2005=100). The energy variables included were primary energy consumption in TOE (PEC) and electrical energy consumption in TOE (EEC). All data were rebased to 1995=100.

Table 1 and Figure 1 present this data along with a calculation of the energy efficiency index.

From the table and figures we conclude that:

- Over the 16 year period, Poland's real GDP increase about 91%.
- During this period Poland's consumption of primary energy first declined, then stabilized and finally rose so that in the end it was essentially unchanged.

Year	GDP	Growth Rates		Energy Efficiency Index	
		PEC	EEC	PEC/GDP	
1995	100.00	100.00	100.00	0.91	
1996	106.27	103.65	103.00	0.88	
1997	113.84	102.20	102.73	0.81	
1998	119.48	95.60	102.73	0.72	
1999	124.87	93.34	102.25	0.68	
2000	130.21	88.76	104.45	0.62	
2001	131.72	89.93	104.76	0.62	
2002	133.67	88.98	103.69	0.60	
2003	138.87	90.88	109.09	0.59	
2004	146.24	90.87	110.90	0.56	
2005	151.53	91.94	112.90	0.55	
2006	160.96	96.39	116.36	0.54	
2007	171.94	95.90	114.63	0.50	
2008	180.72	97.64	111.73	0.49	
2009	183.61	94.21	109.15	0.46	
2010	190.70	100.67	113.42	0.48	

Table 1. Estimated Selected Variables for the Polish economy.

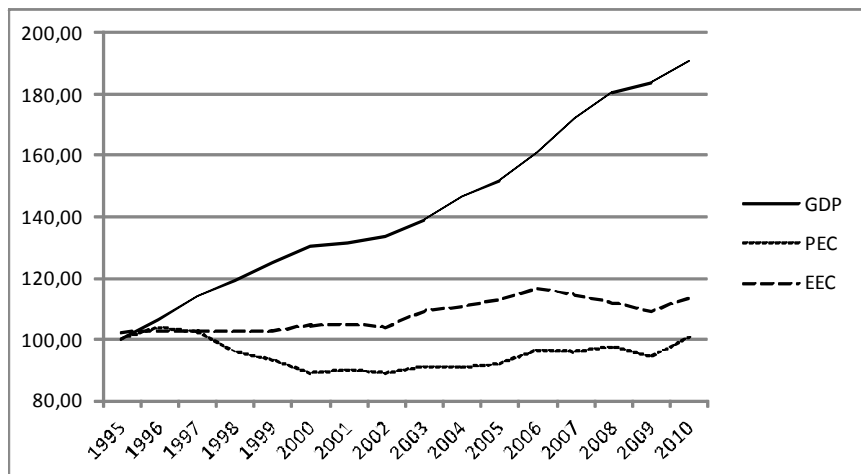


Figure 1. Growth of Selected Variables of the Polish Economy

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- The trend of electricity consumption was basically upward for the period under study; in the end, showing growth of almost 13.5% for the period.

The facts presented above indicate that economic growth in Poland has been energy efficient. In general, Poland’s GDP doubled without an increase in the amount of energy used. This is confirmed by the energy efficiency index which fell from 0.91 to 0.48 in the period under study. Thus, the consumption of electricity in the production of a unit of GDP fell over the sixteen years, resulting in half as much energy being needed at the end as was required at the beginning.

	Growth Rates						Energy Efficiency Index		
	GDP U15	GDP U27	PEC U15	PEC U27	EEC U15	EEC U27	Poland	U15	U27
1995	100.00	100.00	100.00	100.00	100.00	100.00	0.91	0.19	0.22
1996	101.74	101.85	104.01	103.77	103.75	103.69	0.88	0.19	0.23
1997	104.51	104.66	102.86	102.39	104.48	104.14	0.81	0.19	0.22
1998	107.55	107.76	104.77	103.10	107.13	106.49	0.72	0.19	0.21
1999	110.72	111.00	105.02	102.44	108.90	107.61	0.68	0.18	0.20
2000	115.00	115.34	106.17	103.15	111.85	110.65	0.62	0.18	0.20
2001	117.41	117.78	108.80	105.78	114.78	113.63	0.62	0.18	0.20
2002	118.79	119.35	108.31	105.46	115.71	114.55	0.60	0.17	0.20
2003	120.33	121.14	110.78	107.99	118.88	117.77	0.59	0.18	0.20
2004	123.18	124.18	112.36	109.20	121.59	120.27	0.56	0.17	0.19
2005	125.49	126.72	112.32	109.30	122.33	121.09	0.55	0.17	0.19
2006	129.37	130.91	112.03	109.51	123.84	122.71	0.54	0.16	0.19
2007	133.34	135.15	110.46	108.13	124.27	123.17	0.50	0.16	0.18
2008	133.39	135.61	110.18	107.96	124.54	123.31	0.49	0.16	0.18
2009	127.55	129.74	104.71	102.36	118.47	117.38	0.46	0.16	0.17
2010	130.15	132.48	107.82	105.61	123.70	122.37	0.48	0.16	0.18

Table 2. Selected Variables for EU Economies

efficiency of the Polish economy in a slightly different light. Study of the table diagram shows:

- Poland has enjoyed much stronger GDP growth than either of the two EU groupings—near 91% vs percents in the low thirties
- At the same time Poland’s primary energy consumption has been significantly less—not growing all vs six to eight percent for the EU as a whole.
- However, energy efficiency is still behind that of the Union—48% compared with 16 to 18%.

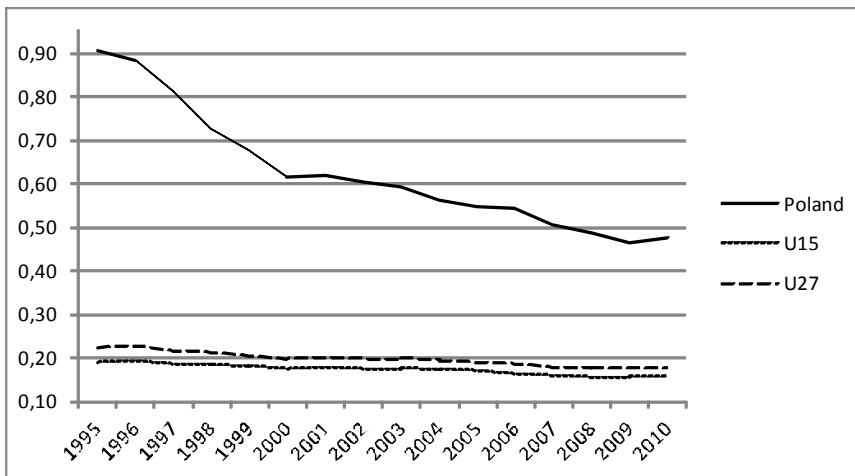


Figure 2. Energy Efficiency (PCT/GDP)

connected with the increase of effective energy use. The actions aimed at increasing energy efficiency should be undertaken in all sectors and spheres of activity. They should include not only the increase of energy efficiency in the area of production, but also the use of energy in other fields (e.g., the household sector or city transport).

As far as electricity is concerned, despite the increasing use of energy-saving technologies in industrial enterprises and households, the demand for electricity is steadily growing. Therefore, it is appropriate to say that more and more primary energy is being used for electricity purposes. Electricity consumption has a long-term upward tendency, but the growth rate is significantly lower than the growth rate of GDP. This is the result of the use of more and more energy efficient appliances in industrial enterprises and households.

Table 2 along with Figure 2 provide data to compare Poland’s energy performance with that of the 15 original EU countries (U15) as well as the current 27 countries (U27).

The table and figure show the energy

efficiency of the Polish economy in a slightly different light. Study of the table diagram shows:

Conclusions

The analysis shows that economic growth in Poland is energy efficient. However, the energy efficiency of Poland’s economy compared with the EU developed economies is at a relatively low level. What is a positive phenomenon is that the production of a unit of GDP requires less and less energy, which shows the right direction for future development. The relatively lagging level of energy efficiency indicates that in Poland there is a high potential for speeding up economic growth by implementing action