

## **Energy efficiency – case study Poland**

**Abstract.** *This paper describes selected aspects of energy efficiency in Poland. Analysis of energy efficiency in Poland is shown. Technical, economical and market potential of energy efficiency in Poland is defined. Analysis and assessment of energy efficiency in Poland in technical, economical and environmental aspects is made. Perspectives of energy efficiency increase in Poland up to 2020 in context of the implementation of the EU's "3 x 20%" climate package by Poland and national quantitative target for energy efficiency by year 2020 are described. Selected technical, economic and legal problems of energy efficiency increase in Poland are shown. Conclusions contain analysis of barriers and perspectives of development of energy efficiency increase in Poland in the future.*

**Keywords:** energy efficiency, energy policy, energy supply security, environmental safety

One of the strategic goals of the national energy policy is to improve the energy efficiency of the national economy. Energy efficiency is connected with energy use and consumption and is particularly important for ensuring energy supply security and environmental safety, increasing the competitiveness of Polish enterprises and for many other aspects [6]. Progress in this field is vital for reaching all the energy policy objectives and most of the environment and climate policy objectives [5]. The current principle energy efficiency objective is to reduce energy consumption by 20%, relative to the forecasts for 2020, as a result of energy efficiency improvement [3]. It is one of three main Polish national 2020 targets.

In this paper, selected aspects of energy efficiency are shown. Special attention is paid to energy supply security and environmental safety. National and the European Union legal regulations, such as Directive 2012/27/EU [1], which describe energy efficiency, are discussed. Special attention is paid to the Energy Efficiency Act [2]. Principles of realization of energy savings obligation and obligation to conduct energy audits of enterprises are shown. Tasks of the public sector entities in the field of energy efficiency are discussed. Programs and measures aimed at improving energy efficiency at the national, regional and local levels are shown. Fundamentally, they include five groups of measures: horizontal measures, measures in respect of energy efficiency in the buildings of public institutions, energy efficiency measures in industry, energy efficiency measures in transport and efficiency in energy generation and supplies [3]. Problem of national economy energy intensity are shown. The primary and the final energy intensity indicators and rate of their changes from 1990 are analysed. Directions of undertakings which let further reduction in energy intensity of national economy, are defined. An analysis of energy efficiency improving measures and solutions is performed. Special attention is paid to industry and households. Field connected with increase the degree of environmental aspects into account in public procurement in aspect of energy efficiency improvement is described.

### **Conclusions**

The increasing of the energy efficiency of the generation, transmission and use of energy constitutes a pillar for pursuing a sustainable energy policy, which is reflected in the domestic and EU regulations and the actions undertaken by various domestic and EU institutions.

Improvement in energy efficiency is of major importance for reaching all the energy policy goals and most of the environmental and climate policy goals and so it should be given a priority in the modernization of the national economy. This improvement can be achieved by, e.g., building high-performance generation units, reducing the index of grid losses in the transmission and distribution of energy and increasing the end utilization of energy.

The Energy Efficiency Act introduces systemic solutions which, besides the existing programmes and means dedicated to the improvement of efficiency at the national, regional and local level, make it possible to increase the efficiency of the generation and supply of fuels and energy and the utilization of energy by ultimate consumers.

Basically, the programmes and means of improving energy efficiency, existing in this country comprise five groups of means: means having a horizontal character, and means connected with respectively the energy efficiency of buildings and public institutions, energy efficiency in industry, energy efficiency in transport, and the efficiency of energy generation and supply. Particularly important are: the system of energy efficiency certificates (white certificates), the Infrastructure and Environment Operational Programme (Investment Priority) for the years 2014-2020 and the Thermal Upgrading and Renovations Fund.

Over the last 25 years the energy efficiency indicators of the national economy have improved considerably. Nonetheless, a significant gap in this regard between Poland and such countries as Germany, France and the UK still remains. Therefore, further relevant measures should be taken in order to bring about further notable environmental-energy efficiency effects.

Besides considerable economic benefits, the improvement in the energy consumption indicators of the national economy brings about notable environmental effects (a reduction in the consumption of natural resources and a reduction in the emission of pollutants), which the effects of any other solutions reducing the environmental nuisance of the power sector (a change of the energy carriers consumption structure, the building of protection systems and installations, etc.) cannot match.

## References

1. Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC (O.J.EC L 315 of 14.11.2012).
2. Act of 20 May 2016 – The Energy Efficiency Law (Journal of Laws of 2016 Item 831). /in polish/
3. *National Energy Efficiency Action Plan for Poland 2014*, Ministry of Economy, Warsaw 2014.
4. Energy end–use efficiency in years 2005-2015, information and statistical studies. Central Statistical Office of Poland, Warsaw, 2017. /in polish/
5. Dolega W., *Selected aspects of energy efficiency in Poland*, 9-th International Conference on Deregulated Electricity Market Issues in South-Eastern Europe DEMSEE 2014, Nicosia, Cyprus, 25-26 September 2014, Section Renewable energy sources and energy efficiency I, full paper 3, pp. 1-5.
6. Dolega W., *Selected aspects of energy efficiency*, *Polityka Energetyczna-Energy Policy Journal*, vol. 20, no 4, 2017, pp. 67-78. /in polish/

---

**Author:** dr hab. inż. Waldemar Dołęga, Wrocław University of Science and Technology, Wrocław, Wybrzeże Wyspiańskiego 27, 50-370 Wrocław, e-mail: [waldemar.dolega@pwr.edu.pl](mailto:waldemar.dolega@pwr.edu.pl).