

Chapter 5

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RENEWABLE ENERGY SOURCES IN POLAND

Abstract: In the paper characteristic of the renewable energy sources in Poland was presented. The sustainable development concept which makes the renewable energy sources necessary and these sources were defined. Polish legislation one a given problem was presented. The basic statistics of the production and consumption of energy from renewable sources in Poland and in the world were shown.

Key words: environment protection, sustainable development, renewable energy sources

5.1. Introduction

For many years in Poland the research on the optimal use and investing in the development of renewable energy sources (RES) has been carried out. The use of these energy sources is associated with the obligation to act in accordance with the sustainable development concept. In Poland, this rule is provided in Art. 5 of the Constitution of the Polish Republic.

The sustainable development of the Earth is “a development that meets the basic needs of all human beings and which conserve, protect and restore the health and integrity of the Earth's ecosystem, without compromising the ability of future generations to meet their own needs and without going over the limits of long term capacity of the earth's ecosystem” (World commission on environment and development. "our common future, Chapter 2: towards sustainable development". Un-

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documents.net. Retrieved 2011-09-28). This concept can be generally represented in graphic way (Figure 5.1).

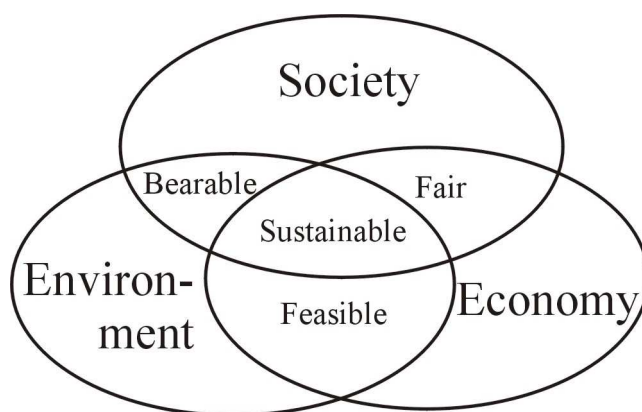


Fig. 5.1. Graphical interpretation of the sustainable development concept.

Source: http://www.argox.com.pl/budownictwo_zrownowazone.php (4.02.2013)

According to the Act “Prawo energetyczne”, by renewable energy sources (RES) is understood – source which uses in the processing the wind energy, sunlight energy, geothermal energy, wave energy, energy from tidal and fall river, from biomass, landfill biogas, and biogas produced in the process of extraction or purification treatment or decomposition of plant and animal remains.

The Act “Prawo energetyczne” gives the definition of the renewable energy sources but only “Implementing Regulation” shows what type of energy is considered as the renewable energy source, for which the assistance in the form of a certificate of origin, ie. green certificates is entitled. According to the regulation, regardless of the power source of the energy produced, the energy from renewable sources should be classified as an electricity or heat from (Rozporządzenie Ministra Gospodarki z dnia 14 sierpnia 2008 roku OJ 2008, No. 156 item. 969):

- from hydro power and wind power.
- from biomass and biogas,

- from solar photovoltaic cells and solar collectors for heat production,
- from geothermal sources,
- part of the energy recovered from the municipal waste treatment.

In the case of energy produced per unit of production, in which biomass or biogas are burned, together with other fuels, as electricity produced from renewable energy sources it can be classified part of the electricity or heat corresponding to the share of the chemical energy of biomass or biogas in chemical energy of fuel used for power generation, calculated on the basis of the actual calorific respective value of the fuels.

The energy produced by the entity from renewable energy sources can be used for internal purposes of the entity or introduced into the national power network (for electricity) and to a heating network (for heat) and sold to appropriate power company involved in the trade and/or sale of electricity to end users. The electricity market and the heat market from the RES are controlled in slightly different way.

5.2. Characteristics of renewable energy sources in Poland

The wind, geothermal, sun, biomass energy, and energy from other renewable sources increase its percentage in the total consumption structure through introducing better and newer technology in the world and in Poland. This led to create the Polish Council for the Development of the Use of Renewable Energy Sources. The Council aims to facilitate the process of creation of favorable conditions for the development of the so-called green energy, this term is understood as inexhaustible and eco pollution-free all renewable energy sources (REDCLIFT M.R. 2009, INGALDI M., SIERKA E. 2012, PAKIET INFORMACYJNY (OZE) 2010).

In the twentieth century, the electricity was produced mostly in central power plants and delivered to users via high-voltage transmission lines and distribution networks of medium and low voltage. In recent years, many changes were introduced. Trends in the development of the

energy networks have become a challenge for the development of new technologies in electricity generation (GABRYŚ H.L. 2012).

European countries promote mainly wind, sun, and then so called small hydro power as renewable energy sources. The energy consumption in the world in 2010 is presented in Figure 5.2.

In Poland, primarily the energy from biomass, geothermal, hydro, wind and solar (in order of percentage) is used (Fig. 5.3).

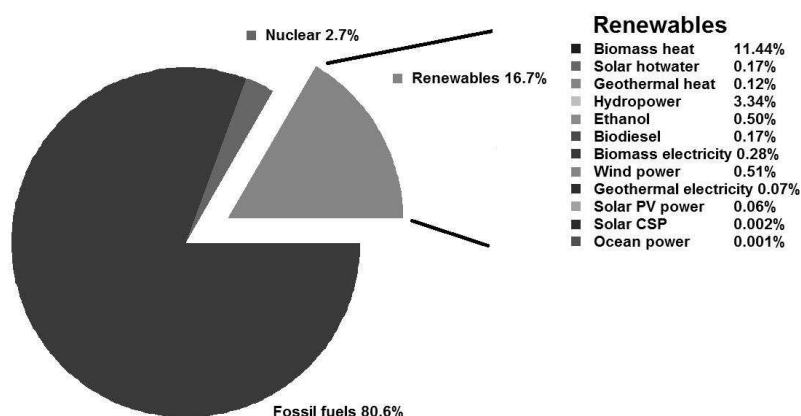


Fig. 5.2. Total world energy consumption by source in 2010.

Source: Total world energy consumption by source 2010, from REN21 Renewables 2012 Global Status Report

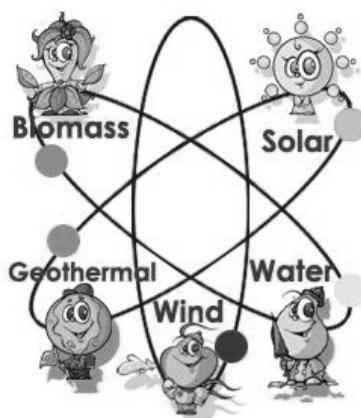


Fig. 5.3. Types of the most used renewable energy sources in Poland.

Source: <http://greentechtown.com> 24.08.13

In recent years, in Poland the share of RES in energy production and consumption has been improving (Tab. 5.1).

Tab. 5.1. Comparison of total energy production and energy from renewable sources in Poland

Year	Total energy production	Total energy consumption	Energy production from RES	Percentage of RES	
	thousands toe - ton of oil equivalent used in energy balances, the international unit of measurement 1 toe = 41,868 GJ		The unit used in energy balances, the international unit of measurement 1 toe = 41,868 GJ	In total energy production	In total energy consumption
2000	80070	91898	3624	4,53	4,14
2005	78447	94832	4433	5,65	4,67
2009	67285	95032	6051	8,99	6,37
2010	67451	104773	6439	9,55	6,56
2011	69420	107643	7768	11,19	7,22

Source: KONSTANCIAK A., BROŽOVÁ S., PUSTĚJOVSKÁ P. 2013

5.3. Polish legislation on the renewable energy sources

The renewable energy sources sector in Poland does not currently have a separate law. Regulations on the energy, land use planning and other administrative procedures are spread over several legislative and executive acts.

Due to the Directive 2001/77/WE in force since 23 April 2009 many regulatory issues (including support systems) in the Polish legislation are devoted to the particular sector of the green electricity. Bearing in mind the provisions of the new Directive 2009/28/WE on the promotion of the energy from the renewable sources, based on a more complex, more than over sector approach to the promotion of the renewable energy sources, it will be necessary to conduct further legislative changes, reaching far beyond the fairly extensive amendment of the Act “Prawo energetyczne”, adopted by the Parliament on 8 January 2010, concerning the connection of the renewable energy (and other sources) to the power supply and support the production and use of the biogas. The government has adopted on 7 December 2010 the strategic document “Krajowy Plan Działania w zakresie energii ze źródeł odnawialnych”, promising the implementation of EU legislation in the field of the renewable energy through the adoption of a new separate law on the renewable energy sources.

According to the announced need to transpose the Directive 2009/28/WE many provisions of the renewable energy market will soon change. Regulations concerning the renewable energy in Poland are governed primarily by two pieces of primary legislation: the Act “Prawo energetyczne” and the Act “Ustawa o biokomponentach i biopaliwach ciekłych”.

The Act “Prawo energetyczne” on 10 April 1997 sets out the rules of the state energy policy, terms and conditions for supply and use of fuel and energy, including heat and energy companies, as well as determines the body in charge of the fuel and energy policy. The purpose of the Act is to create conditions for sustainable development of the country, ensuring energy security, economical and rational use of fuels and

energy, the development of competition, counteract of the negative effects of natural monopolies, consideration of the environmental requirements, obligations under international agreements and the balance of the interests of energy companies and consumers of the fuels and energy. The Implementing Regulation sets out the requirements for classification of the energy as energy generated from renewable sources in support of the so-called green certificates and the extent of the obligations on entities selling electricity to final consumers.

The Act has been completed with the Implementing Regulation of the Minister of Economy on 14 August 2008 on the specifies responsibilities to obtain and submit to the redemption of certificates of origin, the substitute fee, purchase of electricity and heat from the renewable energy sources and obligation to confirm the data on the amount of electricity produced from the renewable energy sources. The Regulation sets out the scope of the use of the renewable energy sources and therefore in relation to the established system of support indicates duties on persons selling electricity to end users.

The Act „Ustawa o biokomponentach i biopaliwach ciekłych” on 25 August 2006 defines, among others, the rules for the implementation of economic activities in the production of bio-components in the liquid biofuels for their own use by farmers and the marketing of bio-components and liquid biofuels.

The Act has been completed with the Implementing Regulation of the Ministry on 15 June 2007 on the national indicative targets for years 2008 to 2013. The national indicative targets includes minimum percentage share of biofuels and other renewable fuels in the total volume of liquid fuels and liquid biofuels used in the transport in the calendar year, calculated according to the calorific value. The minimum percentage share of the biofuels and other renewable fuels in the total amount of the fuels consumed in the transport sector in a given year, which is as follows: 6,2% (2011); 6,65% (2012); 7,10% (2013). The entities, which are obliged to implement the national indicative targets according to the Act, are entrepreneurs running business activities in the area of

manufacturing, import or intra-Community acquisition of the liquid fuels or biofuels that sell or dispose them in a different form on Polish territory or consume for own use.

5.4. Subsidies and funding system

In 2007-2013, there were many possibilities for financing energy projects in the field of the renewable energy. For investment in the renewable energy resources more than EUR 2 billion have been allocated. The final date of eligibility of expenditure is 31 December 2015.

Support at the national level is available within the Operational Programme: Infrastructure and Environment (POIiŚ) in action 9.4: Production of energy from renewable sources, where the investments in the construction of electricity units which uses wind, water in small hydro power plants up to 10 MW, biomass or biogas and heat with use of geothermal or solar energy are financed. In this action the company may also endeavor to support investment in energy production from the renewable sources in cogeneration and in the systems which do not meet the criterion of high-efficiency cogeneration. The possibility of co-financing technology for fossil fuels and biomass, biogas and the construction or reconstruction of power facilities burning municipal waste is excluded.

The nature of support is regulated by the Regulation of the Minister of Economy on 3 February 2009 on granting state aid for investments in the construction or expansion of units producing electricity and heat from the renewable energy sources. According to the regional map of the intensity, the support depends on the location of investment and enterprise size (from 30 to 70% of the expenditure eligible for support). The minimum value for projects that may receive funding according to the Act were specified: for investments in the electricity production from biomass or biogas and the construction or expansion of small hydropower min. value is 10 mln PLN, and for other types of projects 20 mln PLN.

Another important action that supports the renewable energy sources is construction and modernization of networks for connecting of electricity units of electricity from the renewable sources to the National Power System. It is possible within the action 9.6: Networks facilitating reception of energy from the renewable sources. Only projects with a value over 20 mln PLN, fully dedicated to the connection of new units of energy generation from renewable sources are subjected to funding.

The action 9.5: Production of biofuels from renewable sources and 10.3: Industrial development of renewable energy sources allow to apply for funding only entrepreneurs planning the investment with a value over 20 mln PLN.

In the case of 9.5 only projects of construction of plants and facilities for the production of biofuels are possible. In case of 10.3 construction of the modern technological lines producing equipment used to electricity and heat generation from renewable sources and biofuels are possible (<http://www.zrodlaodnawialne.pl>).

5.5. Summary

Many nations count on coal, oil and natural gas to supply most of their energy needs, but reliance on fossil fuels presents a big problem. Fossil fuels are a finite resource. Eventually, the world will run out of fossil fuels, or it will become too expensive to retrieve those that remain. Fossil fuels also causes air, water and soil pollution, and produce greenhouse gases that contribute to global warming.

Renewable energy resources, such as wind, solar and hydropower, offer clean alternatives to fossil fuels. They produce little or no pollution or greenhouse gases, and they will never run out. Since the green energy resource is easily and freely accessible so people need not to worry about the setup cost. The price of set up is easily recovered in just a couple of years, and the benefits which we get from green renewable energy make this price even more negligible. Also a free supply of renewable energy that is always available in the daytime is the sun. For example the

improvement in technology has now made it possible to utilize the sun's energy even if the day is cloudy.

Nearly all governments support the production of green renewable energy and have subsidies and tax reliefs for the utilization of such energy within your own home. Due to the increase in demand along with the advancement in technology the various units used to produce green energy have reduced in cost. Nowadays, people can find many houses in our country which make use of green energy to sustain their energy utilization.

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