

# Financing renewable energy projects through regional operational programmes

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**Abstract:** Regional operational programmes provide support granted from EU funds for different projects implemented in individual voivodeships in Poland. The aim of the programmes is to improve the competitiveness of regions and to promote the sustainable development. The priorities of the regional programmes include inter alia transport, environmental protection and sustainable energy production. The aim of the article is to analyze the amount and the results of the support provided from regional operational programmes for projects in renewable energy in Poland. The projects aimed at increasing the amount of electricity or heat produced from renewable resources and included for example modernisation of hydroelectric power plants or the installation of solar thermal collectors. The article also discusses difficulties in renewable energy project implementation. The problems resulted from the uncertainty about regulations affecting the energy sector and about price of green certificates which renewable energy producers sell to electricity suppliers. The analysis includes experience from the 2007-2013 funding period. It is based on regional programme documents and data from National Information System for the monitoring of the use of EU funds in Poland.

*Keywords:* renewable energy, regional operational programmes, the 2007-2013 programming period

**JEL:** O13, Q28, Q42

## 1. Introduction

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One of the mechanisms used to stimulate the construction of renewable energy power plants is a public support through grants or loans. In Poland public support for renewable energy comes from national and European sources. In the 2007-2013 period investments in renewable energy installations co-financed from the EU funds were implemented via operational programmes managed at national and regional level. Larger projects (worth over PLN 20 million) were implemented at a central level under the Operational Programme Infrastructure and Environment. The smaller scale projects were supported from regional operational programmes. One could assume that the funding provided at the regional level helps to solve challenges and needs identified in the programme.

The aim of the article is to analyze the amount and the results of the support provided from regional operational programmes for projects in renewable energy in Poland. The article also discusses difficulties in renewable energy project implementation.

The analysis includes experience from the 2007-2013 funding period. The analysis of the amount of the support provided is based on the data from National Information System for the monitoring of the use of EU funds in Poland. Using this data, it was also possible to specify the types of projects and recipients of the support.

Regional operational programmes and reports on their implementation include indicators which measure the effects of the support. The indicators related to energy production from renewable sources show the number of projects supported by EU funds, additional installed capacity and additional energy production. Using those indicators, it was possible, to a certain extent, to compare the expected and achieved results.

## **2. Regional operational programmes in Poland**

In Poland there are 16 regional operational programmes at the regional level. Regional operational programmes provide support granted from EU funds for different projects implemented in individual voivodeships in Poland (Kornberger-Sokołowska et al. 2012: 141). The main beneficiaries of the support are companies and local self-government units.

According to article 15 paragraph 4 of Act of December 6, 2006 on the principles of development policy regional operational programmes are established to achieve goals and

objectives of development strategies (Journal of Laws of 2006 No. 227, item 1658, as amended). Generally speaking, activities funded within these programmes were focused on:

- increasing the competitiveness of the regions,
- promoting sustainable development,
- improving the quality of life (Szcubiała 2009: 78).

The programmes are designed to meet needs identified at local level. Regional programmes are established in accordance with principle of subsidiarity granting some autonomy to voivodeships.

Regional operational programmes included priorities (areas covered by the funding programme ) which related to competitiveness, education, health, transport, environment, etc. There are also measures within each priority which indicate the activities supported.

### **3. Renewable energy projects financed through regional programmes**

Support from regional operational programmes for renewables was provided mainly through the priorities on environment and (or) energy. The aims (or expected results) of the support were (Specifications of the regional operational programmes for 2007-2013):

- increasing the share of energy from renewable sources (and other targets set by the European Union's climate and energy package such as improving energy efficiency or reducing greenhouse gas emissions),
- improving air quality or reducing air pollution in the region,
- ensuring energy security,
- diversification of energy sources,
- environmental quality enhancement.

The projects encompassed a range of renewable energy technologies such as solar, wind, biomass, biogas, geothermal and micro-hydro. Some kinds of renewable energy have been also used to improve the energy efficiency of buildings. Additionally, there were projects which focused on education or raising awareness about energy conservation (Table 1).

Table 1 shows that some projects on renewable energy sources were funded within priorities on entrepreneurship, innovation or competitiveness of enterprises. The projects aimed at

developing new services, products and production processes or improving research infrastructure. It can be assumed that R&D investments contribute to the development of renewable sources (including the storage of energy from renewable sources) and to more efficient energy production (Fundeko Korbel, Krok-Baściuk Sp. J., nd.).

Table 1. Examples of renewable energy projects financed through regional operational programmes

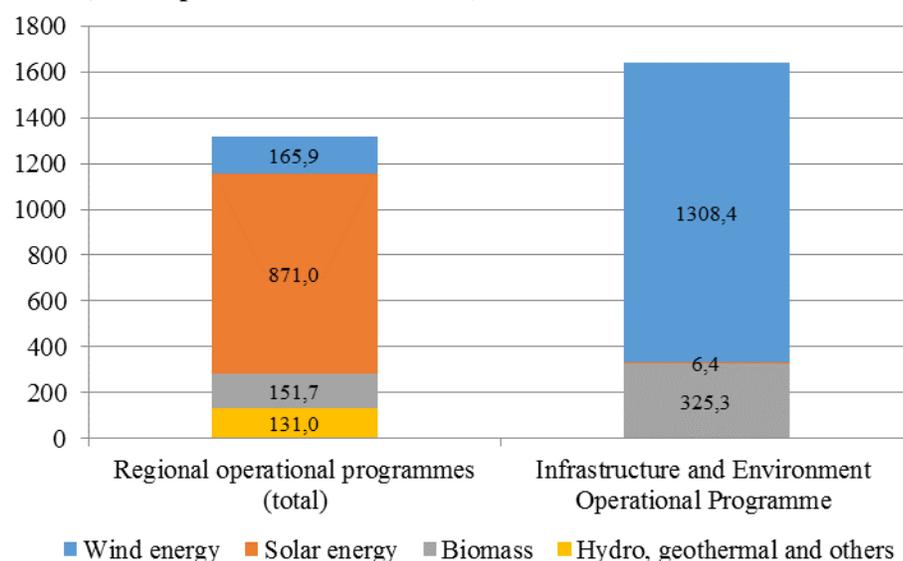
Priority axis/measure	Projects
Renewable energy sources, environmental protection, environmental infrastructure, air protection	<ul style="list-style-type: none"> <li>• Construction (modernization) of small hydropower, biogas plants, biomass-fired boilers, heat pumps, wind farms, solar or geothermal energy systems</li> <li>• Thermomodernization using renewable energy sources</li> <li>• Project documentation for renewable energy systems</li> <li>• Information campaign on renewable energy</li> </ul>
Entrepreneurship, innovation, competitiveness of enterprises	<ul style="list-style-type: none"> <li>• Construction of the information platform for technology transfer in the area of renewable energy sources</li> <li>• The use of renewable energy sources in technological park's buildings</li> <li>• Exhibition at renewable energy fair</li> <li>• Implementation of an innovative production process of systems powered by solar or wind energy</li> <li>• Launching the production of yachts powered by renewable energy</li> <li>• Modernisation of the R&amp;D department in order to develop innovative concept of a renewable energy device</li> <li>• The extension of the company services to renewable energy sources</li> </ul>
Education, knowledge-based society	<ul style="list-style-type: none"> <li>• Educational and research equipment for laboratory on renewable energy</li> <li>• Using renewable energy sources for educational purposes in a school building</li> </ul>
Regional economy	<ul style="list-style-type: none"> <li>• Commercialization of R&amp;D in the field of biofuels</li> <li>• Equipment for laboratory on renewable energy</li> </ul>

Source: National Information System SIMIK 2014.

It should be noted that project proposals that involved the use of renewables were sometimes rated higher than others. Renewable energy sources were used in projects implemented within various priorities or actions (eg. related to transport, development of entrepreneurship, wastewater management, cogeneration or energy efficiency of buildings) (Przewodnik po kryteriach wyboru operacji finansowanych w ramach Regionalnego Programu Operacyjnego dla Województwa Dolnośląskiego na lata 2007-2013 2014; Zarząd Województwa Mazowieckiego 2015; Zarząd Województwa Lubuskiego 2014).

The value of contracts for renewable energy projects co-financed from regional operational programmes is PLN 1319.6 million. This amount is equivalent to 1.9% of the total value of contracts awarded under regional operational programmes at the end of April 2015 and to 80% of the support provided by the Infrastructure and Environment Operational Programme (Figure 1).

Figure 1. The value of contracts on renewable energy projects awarded under regional operational programmes and Infrastructure and Environment Operational Programme for 2007-2013 (30th April 2015, PLN million)



Source: National Information System SIMIK 2014.

Table 2 shows the structure of contracts for co-financing from regional operational programmes by the beneficiaries and the types of energy sources. As one can see most of the wind power projects were carried out by entrepreneurs. In the case of solar energy projects more than half of projects has been carried out by self government units.

Table 2. Contracts for co-financing from regional operational programmes by the beneficiaries and the types of energy sources

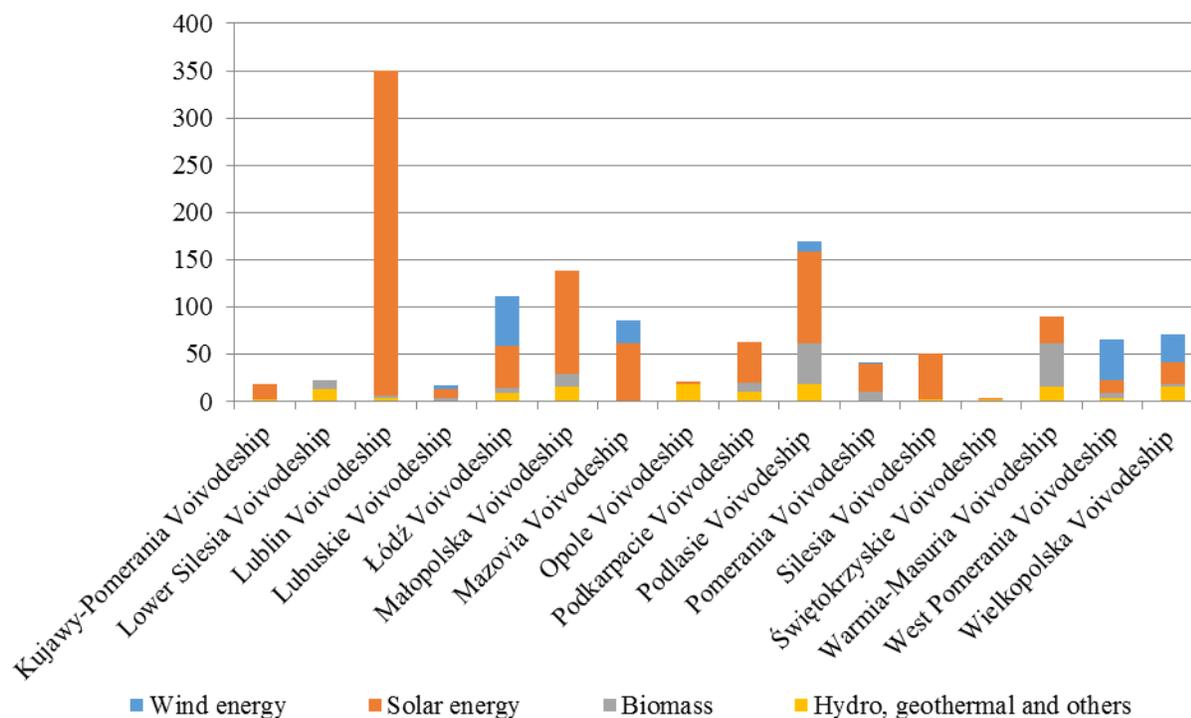
Beneficiaries	Wind	Solar	Biomass	Hydro, geothermal and others	Total
Self-government units <sup>a)</sup>	1	287	18	46	352
Companies	34	134	27	33	228
Sole proprietorships	8	30	4	24	66
Public health maintenance organisations	–	25	3	4	32
Others <sup>b)</sup>	–	47	11	19	77

Total	43	523	63	126	755
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a) Municipalities, districts or voivodeships.  
 b) Voluntary associations, community partnerships, Catholic Church and others.  
 Source: National Information System SIMIK 2014.

As shown in Figure 1 two-thirds of the support for renewable energy investments provided by the regional programmes relate to the solar energy development. Nearly 40% of this support came from regional programme for Lublin voivodeship (Figure 2). Criteria for selecting the operations financed under the programme were designed to promote renewable energy technologies, for which the Lublin region has great natural advantages, that is solar energy and biomass (Kryteria wyboru projektów dla Osi Priorytetowych III-VIII... 2010; Zarząd Województwa Lubelskiego 2014). The majority of the grants (80 out of 128) for solar energy were awarded to municipalities (National Information System SIMIK 2014). The support was used to install solar hot water panels on the roofs in private houses. The roofs were temporarily leased by municipalities (*Lubelskie: ponad 34 tys...*). One grant was also awarded to the community partnership designed to build a 1.4 MW solar power plant (*Projekt*).

Figure 2. The structure of the support for renewable energy sources provided by regional operational programmes for 2007-2013 (30th April 2015, PLN million)



Source: National Information System SIMIK 2014. See also: Wiśniewski 2011: 21.

Figure 1 shows that wind farms were mainly co-financed from Infrastructure and Environment programme<sup>2</sup>. It should be noted that in some voivodeships wind turbines were not eligible to receive grants from regional programmes. For example, in the case of Warmia-Masuria voivodeship (having diverse and valuable environmental assets) the reason for this were the concerns regarding the potential adverse impact of wind farms on animals or landscape (Zarząd Województwa Warmińsko-Mazurskiego 2007). In Lower Silesia voivodeship it was recognised that the region does not have good wind power-generating resources (Urząd Marszałkowski Województwa Dolnośląskiego 2014). Furthermore, wind farms were seen as expensive investments which do not generate sufficient benefits to justify the support (PSDB 2014). This decision has been criticised in the ex-post evaluation report on the Lower Silesia regional operational programme as there were many applicants interested in wind energy projects (PSDB 2014).

Grants for installing biomass renewable energy systems accounted for 11.5% of total support for renewable energy projects. It can be assumed that the aim of the support was a need to promote the regional agricultural sector or to use significant quantities of natural unused biomass (Zarząd Województwa Lubelskiego 2013; Urząd Marszałkowski Województwa Podlaskiego 2013). In Warmia-Masuria voivodeship the structure of the support was designed to use the natural and climatic conditions of the region.

Table 3. Output and results indicators related to renewable energy sources in the regional operational programmes for 2007-2013

Outputs	Results
<ul style="list-style-type: none"> <li>• Number of projects on renewable energy</li> <li>• Additional installed capacity of renewable energy sources (MW)</li> <li>• Number of systems generating heat and electricity from renewable sources</li> </ul>	<ul style="list-style-type: none"> <li>• Additional installed capacity of renewable energy sources (MW)</li> <li>• Primary energy savings (GJ per annum)</li> <li>• Additional energy production from renewable sources (MWh per annum)</li> </ul>

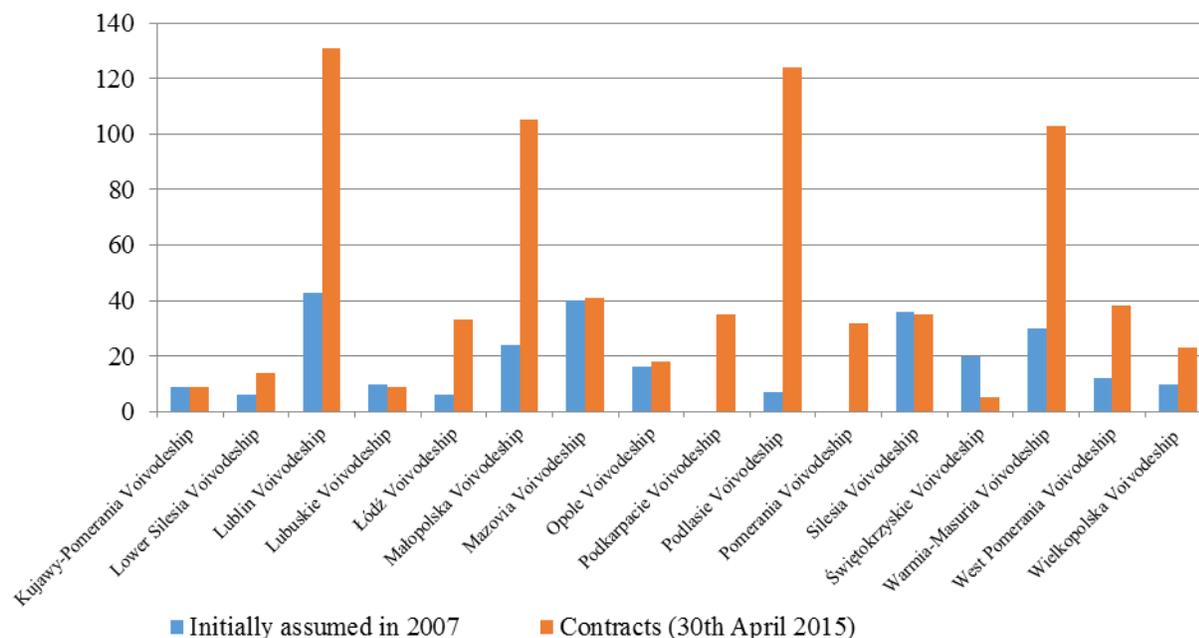
Source: specifications of the regional operational programmes for 2007-2013.

<sup>2</sup> The largest investments in renewable energy in 2007-2013 in Poland consisted in the construction of wind parks (worth about 10-40 million euro) (Wiśniewski 2011: 21).

In order to measure the effects of the intervention of the operational programmes the output and result indicators can be used<sup>3</sup>. The most common indicators related to renewables are number of projects on renewable energy and additional installed capacity of renewable energy sources. There are also other indicators used in a number of the regional programmes (Table 3).

Figure 3 shows that the total target value of the indicator “number of projects on renewable energy” has been underestimated. In 2007 it was assumed that the number of projects that will be funded through 16 regional operational programmes will be 269. Currently, one can expect that the total number of projects will be at least 755. In Podlasie voivodeship the expected value is 17 times higher than it was initially assumed.

Figure 3. Number of projects on renewable energy supported through regional operational programmes



Source: specifications of the regional operational programmes for 2007-2013; Reports on implementation of the regional operational programmes for 2007-2013.

In some of the regions there were many applicants interested in renewable energy projects and additional calls for proposals were necessary (Sprawozdanie roczne z realizacji Małopolskiego Regionalnego Programu Operacyjnego). However, it should be noted that in some

<sup>3</sup> Output indicators “relate to activities that have taken place” and result indicators “relate to the direct and immediate effect on the beneficiaries” and “provide information on changes to, for example, the behaviour, capacity or performance of beneficiaries” (Sweco Eurofutures 2007; European Commission).

voivodeships potential investors were not willing to take up the projects. The reason was the uncertainty about the cost-effectiveness and growing uncertainty about regulations affecting the energy sector. The long anticipated law on renewable energy sources mobilization has not been promulgated before May of 2015. Furthermore, the primary support scheme for renewables in Poland (based on green certificates) has collapsed. Hence, potential investors did not want to invest in projects that could not pay off.

There were also other barriers inhibiting investments in renewables. These include for example (PSDB 2014):

- Legal requirements in relation to environmental impact assessment. Some investors could not obtain required permits to build hydroelectric power stations.
- Mistrust and suspicion amongst local communities to renewable energy projects and to foreign investors. For example the residents of a small town were showing their some kind of NIMBY attitude about building a biomass boiler by the investor from another part of the country. The problem was that investor was involved in many small business enterprises to manage different renewable energy projects.

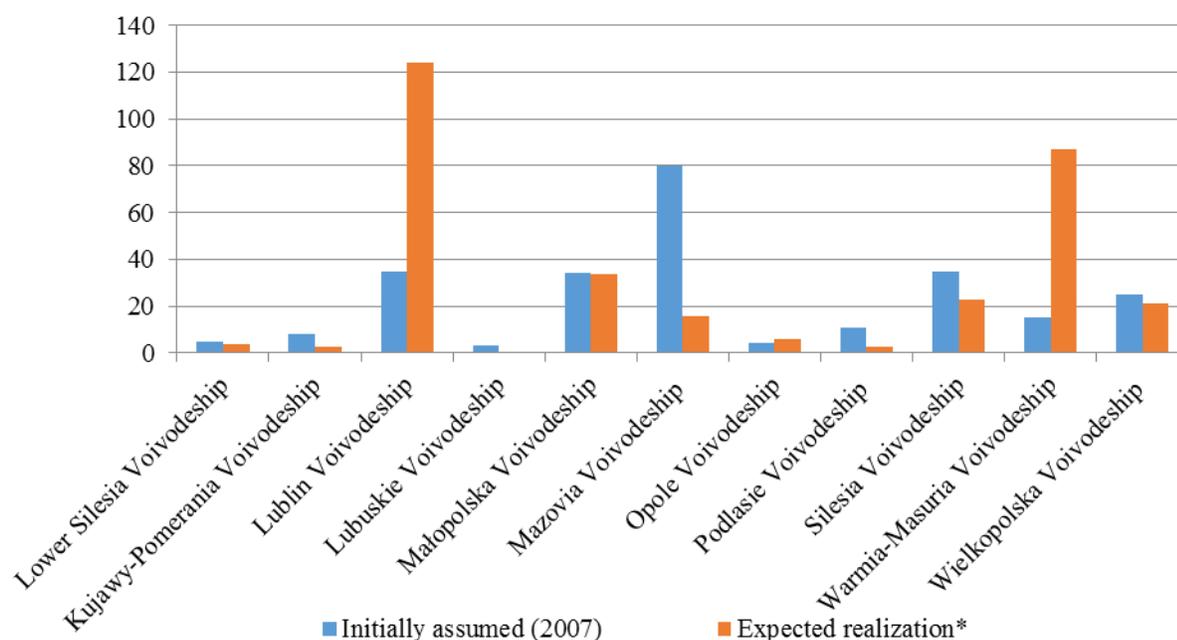
Support provided through regional operational programmes has increased installed capacity of renewable energy sources by at least 338 MW (Reports on implementation of the regional operational programmes for 2007-2013). This amount is equal to 5.5% of the total capacity of renewable energy sources in Poland (31st March 2015) (*Moc zainstalowana*). As one can see in many voivodeships the originally assumed capacity which could be achieved within financial allocation was revalued (Figure 4).

There are 3 regional programmes where the indicators related to energy production from renewable sources are reported (Table 4). Hence, it is possible to estimate CO<sub>2</sub> emission savings. As one can see in Warmia-Masuria voivodeship initiatives resulted in avoided emissions of about 6.3 percent. This should be interpreted with caution as the Warmia-Masuria region is dependent on external energy supplies (Zarząd Województwa Warmińsko-Mazurskiego 2007).

According to some evaluation studies of the regional operational programmes the impact of the support on increasing the production of energy from renewable sources is important (Fundeko Korbel, Krok-Baściuk Sp. J., nd.). However it is sometimes assumed that climate and energy package targets are only of secondary importance. The most important objective of the support is to reduce so called “low emission” that is particulate emissions from burning low

quality coal in local boilers and in individual households. The use of renewable energy sources in buildings for heating and for domestic hot water generation and thermomodernisation has the highest positive impact on air quality improvement, in particular in urban areas (Fundeko Korbel, Krok-Baściuk Sp. J., nd.).

Figure 4. Additional installed capacity of renewable energy sources co-financed from regional operational programmes



Source: specifications of the regional operational programmes for 2007-2013; reports on implementation of the regional operational programmes for 2007-2013.

Table 4. Additional energy production from renewable sources (MWh per annum)

Voivodeship	Expected production from installations supported (GWh per annum)	Estimated CO <sub>2</sub> emission savings (thousand tonnes)	% of total annual CO <sub>2</sub> emissions in a voivodeship
Lower Silesia	33.7	27.4	0.2
Warmia-Masuria	123.1	100.0	6.3
West Pomerania	256.3	20.1	2.2

Source: specifications of the regional operational programmes for 2007-2013; reports on implementation of the regional operational programmes for 2007-2013; Bank Danych Lokalnych nd.

#### 4. Support for renewables offered under the JESSICA initiative

A JESSICA initiative (Joint European Support for Sustainable Investment in City Areas) is developed by the European Commission (nd.) in co-operation with the European Investment Bank and the Council of Europe Development Bank. It supports sustainable urban development projects through financial engineering instruments which are delivered via urban development funds and, if required, holding funds. Financial engineering instruments may take the form of equity, loans and/or guarantees. Provision of repayable assistance fills the gap between assistance provided through grants and commercial credits. Projects that receive JESSICA financing may include management and promotion of heritage or cultural sites, redevelopment of brownfield sites and energy efficiency improvements (*Cyprus joins forces with the EIB for sustainable city development; JESSICA: Joint European Support for Sustainable Investment...; What is JESSICA?*). The projects should generate returns and be included in integrated plans for sustainable urban development that is operational or strategic documents such as urban areas' revitalization programmes, sustainable energy action plans or energy supply plans.

In Poland a JESSICA initiative was implemented at the regional level within regional operational programmes. There were only five Marshall Offices which decided to join the scheme<sup>4</sup>. The conditions of the loans were as follows:

- Loans could be provided even for 100% of the total eligible project cost.
- Loan repayment period was 20 years.
- Loan interest rate was the National Bank of Poland's reference rate<sup>5</sup>. The interest rate could be reduced if a project has a positive social impact (*O JESSICA*).

Projects that could be supported included inter alia renewable energy, energy efficiency of buildings, transmission of electricity and heat (Zarząd Województwa Pomorskiego 2015; Zarząd Województwa Mazowieckiego 2015; Sprawozdanie okresowe z realizacji Regionalnego ... 2014). Considering the names of the projects supported and available data one can assume that renewable energy sources were only a part of larger projects which aimed at revitalization or reducing the energy consumption of the buildings (Sprawozdanie roczne za 2013 rok ... 2014; Sprawozdanie okresowe z realizacji Regionalnego ... 2014; Sprawozdanie okresowe za I półrocze 2014 ... 2014).

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<sup>4</sup> Mazovia, Pomerania, Silesia, West Pomerania and Wielkopolska Voivodeships.

<sup>5</sup> As of 5th March of 2015 the reference rate is 1.5%.

There were some difficulties with the implementation of JESSICA initiative within regional operational programmes. These include the lack of documents which could be considered integrated plans for sustainable urban development (Dubiński, nd).

## **5. Concluding remarks**

The analysis shows that the share of support for renewable in total funding provided by regional operational programmes (about 1.9%) is not significant. It can be assumed that there are many other areas where development is needed. The level of support for renewable energy projects from different programmes is very diverse and ranges from PLN 3.7 million (Swietokrzyskie voivodeship) to over PLN 350 million (Lublin voivodeship). Two thirds of the financial support were used to foster the development of solar energy facilities. Support from regional programmes complemented the funding from the Operational Programme Infrastructure and Environment which was focused on wind energy.

The financial support for renewables provided from regional operational programmes was adjusted to economic or social needs and to natural conditions of the voivodeships. The projects contributed to the increase in installed capacity of renewable energy, more sustainable energy production and to decrease in greenhouse gas emissions. It can be assumed that expected results of the support (at least 338 MW of installed capacity coming from renewable sources) are quite substantial. There are large differences in the results of the support from different programmes ranging from 0.6 MW to 124 MW. A full comparison of results is hindered by the absence of common indicators which would measure the level of energy production from renewable source. There are only 3 regional programmes where the indicators related to additional annual energy production are reported.

One of the most important effects of the support is the reduction of local air pollutants. In the longer term the additional effects of the support can be expected thanks to educational and innovative renewable energy projects. It should be noted that some of the projects had demonstrative character and could contribute to popularise the renewable energy sources, in particular small and microinstallations (see Fundeko Korbel, Krok-Baściuk Sp. J., nd.).

The experience of the 2007-2013 programming period indicates some difficulties in renewable energy project implementation. The problems resulted from the uncertainty about regulations affecting the energy sector and about price of green certificates which renewable energy producers sell to electricity suppliers. One can assume that in the current programming period (2014-2020) there will be less uncertainty about the government's energy policy. As of May 2015 the renewable energy sector in Poland is regulated by special Act on renewable energy sources. It can encourage applicants to apply for support from operational programmes. It can be also assumed that experience gained in 2007-2013, knowledge of the investment needs of firms and local government units will also allow managing authorities for more effective and efficient implementation of strategic goals of the regions. Experience in offering loans under the JESSICA initiative can also contribute to effective management of EU funds in 2014-2020 programming period.

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### ***Finansowanie energetyki odnawialnej w ramach regionalnych programów operacyjnych***

#### ***Streszczenie:***

Regionalne programy operacyjne można uznać za programy finansowania przedsięwzięć realizowanych w poszczególnych województwach ze środków Unii Europejskiej. Celem tych programów jest poprawa konkurencyjności regionów i promowanie zrównoważonego rozwoju. W ramach programów wspiera się finansowo

inwestycje z różnych dziedzin, takich jak transport, ochrona środowiska czy zrównoważona energetyka. Celem artykułu jest analiza poziomu wsparcia udzielanego z regionalnych programów operacyjnych na projekty z zakresu odnawialnych źródeł energii w Polsce, a także ocena rezultatów osiągniętych dzięki tej pomocy. Projekty zakładające zwiększenie produkcji energii elektrycznej lub ciepła ze źródeł odnawialnych polegały np. na modernizacji elektrowni wodnych czy instalowaniu kolektorów słonecznych. W artykule omówiono także trudności z jakimi spotkali się beneficjenci w trakcie realizacji projektów. Trudności te wynikiem niepewności co do przepisów regulujących odnawialną energetykę w Polsce oraz niepewności co do cen zielonych certyfikatów sprzedawanych przez producentów energii odnawialnej. Zakres czasowy analizy obejmuje perspektywę finansową 2007-2013. W artykule wykorzystano regionalne dokumenty programowe i dane pochodzące z Krajowego Systemu Informatycznego służącego monitorowaniu projektów finansowanych ze środków funduszy europejskich.

**Słowa kluczowe:** energia odnawialna, regionalne programy operacyjne, okres programowania 2007-2013  
JEL: O13, Q28, Q42