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ASSESSMENT OF EU STRUCTURAL FUNDS CONTRIBUTION TO ECO-INNOVATION IMPLEMENTATION IN ŚLASKIE VOIVODSHIP

Key words

EU structural funds in Poland, eco-innovation, Śląskie voivodship, ROP for Śląskie Voivodship, OP Innovative Economy.

Abstract

The objective of the paper is the assessment of an eco-innovation implementation scale in companies in Śląskie voivodship within EU structural fund measures. The assessment concerns the national-level measures undertaken within Operational Program Innovative Economy as well as regional-level measures included in Regional Operational Program for the Śląskie Voivodship. The research is based on the classification of projects realised by companies within these frameworks on eco-innovation and non-eco-innovation projects. The assessment is based on a comparison of the eco-innovation shares in the total number of projects realised in Upper Silesia and in Poland. This paper also proposes a methodology for the complex assessment of the impact on eco-innovation development of EU funded programs.

Introduction

Eco-innovation is one of the instruments to give sustainability implementation a new pace and sources of technological breakthroughs [1]. The concept of eco-innovation is based on several issues underpinned to sustainability including eco-efficiency, research and technological development for better matching of societal needs. Eco-innovation is one of the instruments that could generate multiple and diversified benefits for the sustainability implementation process and its benefactors. Support for projects based on eco-innovation implementation is realised within numerous programs financed by EU structural funds. Poland and its regions are highly committed to the implementation of EU financed programs, including the field of eco-innovation.

The paper is focused on the impact assessment of projects supported by EU funds on the development of eco-innovation in the business sector. The goal of the paper is twofold: to present the methodology developed for eco-innovation assessment that is appropriate for EU funded projects and to compare the scale of eco-innovation development in the Slaskie voivodship and in Poland through implementation of selected programs.

1. Eco-innovation and its characteristics

The definitions of eco-innovation differ significantly in publications. Only one definition is presented here. It comes from the most recent EU initiative called *Innovation for a sustainable Future – The Eco-innovation Action Plan*. The definition states, “eco-innovation is any form of innovation resulting in or aiming at significant and demonstrable progress towards the goal of sustainable development, through reducing impacts on the environment, enhancing resilience to environmental pressures, or achieving a more efficient and responsible use of natural resources” [2, p. 2].

The role of eco-innovation in making an economy more sustainable should not be underestimated. Eco-innovation should join the ecological effect with the build-up of competitive advantage and efficiency gain [3]. Through the synergy effect, eco-innovation could bring out the unexpected effects of pursuing sustainability strategies [4]. Eco-innovation lies at the very heart of eco-efficiency based sustainability strategy, and its role is to deliver the best possible solutions for the optimisation of the functioning of companies [5]. The range of eco-innovation implementation is multidimensional from the perspective of a company and should spread out on such areas of its functioning as market, technology, finances, organisation, culture, and certainly environmental issues [3]. Finally, eco-innovation is considered the milestone of any sustainability strategy if it is used in a systemic integrated approach and is focused on constant improvement of company operations, products, and services [6].

As some authors complain, including Miedzinski [7] and Kalinowska [8], there is no consistent system for defining, classifying or measuring eco-innovation globally nor in the EU itself. Miedzinski indicates that eco-innovation is quite often limited to certain sectors or branches of the economy, while its core and potential effects could be achieved in any type of economic activity [7].

2. Eco-innovation implementation within EU funded programs in Poland

Developing eco-innovation is one of the key element of EU policy of laying a foundation of new sources of economic competitiveness. Support for eco-innovation based projects is widely covered in nation-wide and regional programs in Poland. Their evaluation is mostly made on a very general level and focuses on economy as a whole or its sectors (i.e. [9]); however, it does not specifically address the issue of reaching sustainability through eco-innovation implementation. On the other hand, the research projects performed in Poland often focus on single issues such as the driving forces to undertake eco-innovation projects [10] or their expected results [11].

The key program to support the competitiveness of the economy in Poland within structural funds is the Operational Program Innovative Economy 2007–2013 (OPIE). Its main objective is formulated as “Development of the Polish economy on the basis of innovative enterprises” [12, p. 58]. OPIE refers to its sustainability objectives by defining desirable characteristics of innovations and the results of their implementation.

The key program to support Slaskie voivodship is the Regional Operational Program for Slaskie Voivodship 2007–2013 (RPOWSL). Its main objective is to “stimulate dynamic growth, with strengthening social, economic and spatial cohesion of the region” [13, p. 60]. Therefore, through its main objective RPOWSL refers to the sustainable development concept. Detailed objectives point towards innovation, R&D result implementation and knowledge based economy development as key areas of support dedicated to the business sector.

3. Project classification and assessment methodology

The study includes the assessment of on-going projects financed within the framework of the priority axis of OPIE named *Investments in innovative undertakings* and priority axis of RPOWSL, titled *Research and development (R&D), innovation and entrepreneurship*. The assessment is made on the their potential results with regard to eco-innovation development in the business sector.

The following project types has been supported within OPIE measures:

4.1. Implementation of results of R&D works,

- 4.2. Stimulation of R&D activity and support in the scope of industrial design,
- 4.3. Technological credit,
- 4.4. Investments of high innovative potential, and
- 4.5. Investments of high importance to the economy.

All of these measures are directed to companies, and one measure limits them to SMEs only. For all measures, financing has a form of non-returnable aid.

Only one measure of RPOWSL, dedicated to the direct support of Micro-companies and SMEs, was included in the assessment. There is no differentiation made between sub-measures, since all of them enabled the support of innovation [15]. The range of assessment excluded the types of projects aimed at consulting services purchase and participation in trade fairs and trade missions.

The assessment is based on the classification of projects in three categories, according to their eco-innovation content. The primary data on these projects (list of projects, short description with their expected results, types of innovation and budget) was classified accordingly to the assumptions explained below. In total, the classification and assessment included 1146 OPIE projects and 1361 RPOWSL projects.

The classification divided the projects into the following categories:

1. Direct eco-innovation projects include projects that are directly aimed at developing and implementing eco-innovation.
2. Eco-innovation supporting projects include projects that are oriented on general innovation but include developing and implementing eco-innovation as a minor or supporting objective of the project.
3. Non-ecologically oriented innovation include projects that are not aimed at eco-innovation and does not produce any ecologically positive effects.

To be classified as eco-innovation, the project should assume at least one of the following effects: reducing impacts on the environment, enhancing resilience to environmental pressures, and achieving a more efficient and responsible use of natural resources. Additionally, in order to be classified as direct eco-innovation, these effects should be indicated as the main objectives of the project. If these effects could be observed or at least expected, but not as a main objective of the project, it would lead to classifying it as indirect eco-innovation [16]. Projects are classified based on declarations made by companies and were sanctioned by the financing agreement signed between them and the financing institution.

In order to assess eco-innovation's overall impact on a regional economy and its competitiveness, traditional evaluation criteria should be redefined. The list of criteria with their required characteristics is presented below:

- *relevance* – assessment of the extent to which eco-innovation support satisfies the needs of companies;

- *efficiency* – relationship between financial inputs and obtained financial, material and environmental effects;
- *effectiveness* – assessment of the extent to which economic and environmental objectives of OPIE and RPOWSL have been reached;
- *utility* – assessment of the appropriateness of measures used from a point of view of companies;
- *impact* – assessment of the influence on overall competitiveness and environmental pressures in the business sector on the regional and national level;
- *sustainability* – assessment of the durability of the effects on the companies' strategic and financial engagement, and “snowball” and synergy effects.

The assessment methodology should combine all the mentioned criteria and different time frames. Fig. 1 presents an overview of assessment methodology. In general, the assessment should be made in a three-step process: (1) ongoing assessment, (2) immediate ex-post assessment, and (3) 3 or 5 years² postponed ex-post assessment. Since most of the projects are ongoing, it is only possible to perform the first step of assessment.

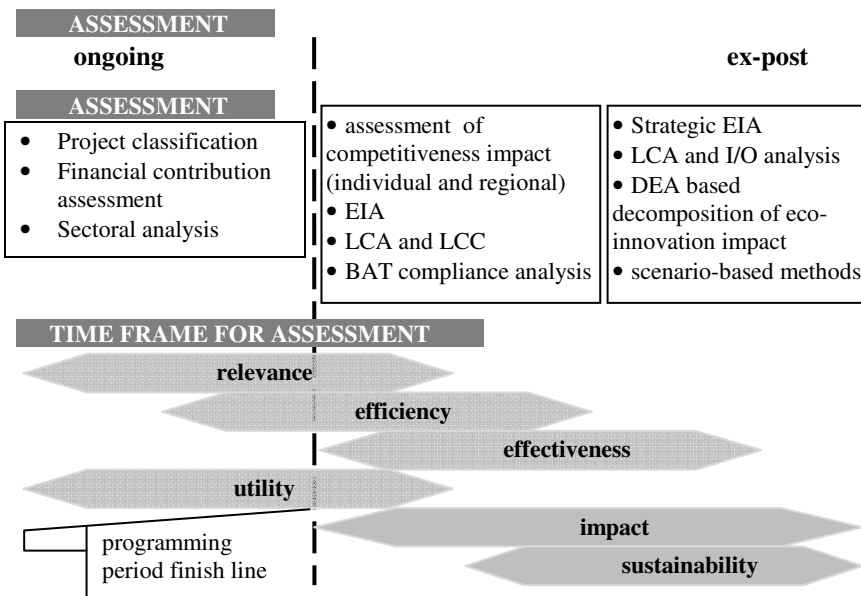


Fig. 1. Simplified scheme for the assessment of eco-innovation impact

² OPIE and RPOWSL measures have different requirements on durability of the results.

As shown at Fig. 1, different stages of evaluation have different methods proposed. The first stage should be mostly based on the analysis structure and financial commitments of projects. The second stage should include the life-cycle approach (LCA and LCC methods), technology assessment, environmental impact assessment, and impact on competitiveness assessment. The final stage should complement the life cycle based assessment with input/output analysis and an enlarge EIA to include whole programs, and it should also enable decomposition of eco-innovation impacts by Data Envelopment Analysis or scenario-based methods. The evaluation criteria should be used throughout the evaluation procedure, but their appropriateness to certain evaluation stages is also shown in Fig. 1.

4. Comparative assessment of eco-innovation implementation scale

As presented in details elsewhere [16], the average level of EU contribution for all projects within OPIE measures is barely 33%. For the RPOWSL measure, the average contribution of EU funds is similar and amounts to 34.5%. The total budget of the RPOWSL measure is significantly lower than most of OPIE measures (except technological credit).

R&D result implementation measures have the biggest share of projects oriented to direct eco-innovation and projects supporting them (the share of 13% and 8% respectively). The number of eco-innovation projects and their share significantly exceeds their number and shares in all the other measures. Concerning the RPOWSL SMEs support measure, the share of direct and indirect eco-innovation is relatively low (altogether 6%, approximately). It is important to notice that measure 1.2 supports innovation based projects and different types of projects leading to the improved competitiveness of companies. Bearing that in mind, leads to the conclusion that 6% share of eco-innovation should not be underestimated and surely is comparable to the shares of eco-innovation in OPIE measures, even to R&D results implementation measure.

Fig. 2 presents the share of three different types of projects in the total budget of analysed OPIE measures. Almost one quarter of the total budget of the R&D results implementation measure is dedicated to projects directly implementing eco-innovation. Additionally, 10.7% are spent on indirect eco-innovation projects.

In the case of the RPOWSL SMEs support measure, the share of eco-innovation in the total budget is slightly higher than the share in the overall number of projects and amounts to 2.8% for direct and 4.2% indirect eco-innovation, respectively.

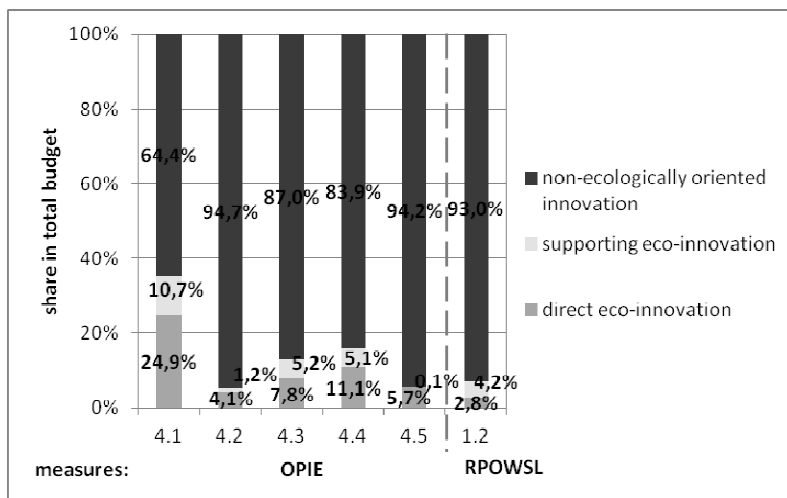


Fig. 2. Share of project types in the total budget of analysed measures

The comparison of the average budget of projects and the EU contribution with respect to types of innovation implemented within measures 4.1, 4.2 and 4.4 of OPIE 4th priority and 1.2 of RPOWSL is presented in Tab. 1. Limiting the comparison to these measures is due to their closest similarity (support of investments). As shown in Table 1 only for measure 4.2, the average budget for projects concerning eco-innovation is lower than those that do not concern them at all or not directly. For all the remaining measures, the average budget for projects concerning eco-innovation is higher than for other projects. Moreover, within all analysed measures, the contribution of EU funds for eco-innovation oriented projects is, on average, higher than for other types of projects.

Table 1. Average total budget and EU contribution to projects for selected measures

Measures	4.1		4.2		4.4		1.2	
types of projects	average project budget and EU contribution [mlns of zł]							
direct eco-innovation	14.5	5.5	7.9	3.5	37.9	15.4	0.90	0.33
supporting eco-inn.	10.8	4.5	2.9	1.2	33.6	12.5	0.95	0.31
non-eco- innovation	6.3	2.0	9.4	3.4	35.1	12.3	0.81	0.28

The observations made above confirm that meeting horizontal environmental criteria of the project qualification procedure increases the budgets of the projects on average. On the other hand, it could also lead to the increase of the contribution of EU funds in financing them. Environmental criteria are always present in the qualification of investment projects for EU funding, and it is the case for all analysed measures.

Findings and conclusions

The analysis presented in this paper shows that direct support of companies within EU funded programs generates eco-innovation. The scale of eco-innovation implementation development in the Slaskie voivodship business sector is similar to its implementation on a national level while structural funds are concerned. Orientation toward smaller projects and the lack of requirements on project innovativeness, which is the case in RPOWSL, reduces the quantitative share of eco-innovation for all projects. On the other hand, their share in total budgets of analysed measures, the average budget of projects or the average contribution of EU funds reflect the nation-wide tendencies observed in OPIE measures concerning direct support for innovation in companies.

The time horizon of the presented research is crucial for the obtained results. All the projects analysed have recently finished or are ongoing. Therefore, there is no possibility to assess their long-term effects or impacts on the environment, economy, or society at this time. To obtain the whole picture of these impacts and effects, the assessment should be made 3-5 years after all the projects are finished, as it is presented in the methodology of the paper.

The overall assessment of the role of EU structural funds in eco-innovation development in the Slaskie voivodship is rather positive. A 7% share of eco-innovation reflects a countrywide average of 6–8% [11]. Moreover, the 1.2 measure of RPOWSL supported innovation implementation and the actual share of eco-innovation in innovation projects could have been doubled or tripled. Perhaps, the scale of their implementation should be larger due to the use of environmental criteria in the project qualification and innovation potential of Slaskie voivodship, but it generally is satisfactory. Recommendations for programming EU funded support in the next period is to include stand-alone measures for eco-innovation, both on the national and regional level, in order to give them a real development boost.

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Reviewer:

Wojciech PIĄTKIEWICZ

Ocena udziału funduszy strukturalnych UE we wdrażaniu ekoinnowacji w przedsiębiorstwach w województwie śląskim

Słowa kluczowe

Fundusze strukturalne UE w Polsce, ekoinnowacje, województwo śląskie, RPO Województwa Śląskiego, PO Innowacyjna Gospodarka.

Streszczenie

Celem artykułu jest ocena skali udziału funduszy strukturalnych UE we wdrażaniu ekoinnowacji w przedsiębiorstwach w województwie śląskim. Ocena dotyczy porównania działań podejmowanych w ramach Programu Operacyjnego Innowacyjna Gospodarka wdrażanego na poziomie krajowym oraz działań Regionalnego Programu Operacyjnego Województwa Śląskiego, który obejmuje tylko projekty regionalne. W trakcie przeprowadzonych badań dokonano klasyfikacji projektów przedsiębiorstw realizowanych w ramach ww. działań na projekty uwzględniające i nieuwzględniające ekoinnowacje. Następnie dokonano oceny skali realizacji projektów bezpośrednio lub pośrednio wdrażających ekoinnowacje w województwie śląskim i odniesiono je do skali ich realizacji na poziomie całego kraju. Na tej podstawie oceniono rolę funduszy strukturalnych we wdrażaniu ekoinnowacji oraz oceniono zakres i skalę ich wdrażania w województwie śląskim.