Europeanisation of energy policy and area-based partnerships: Regional diversity of interest in renewable energy sources in local development strategies in Poland

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Abstract. Cross-sectoral partnerships, known as Local Action Groups (LAGs), are a key pillar of the European Union’s Community-Led Local Development approach in member states. LAGs prepare bottom-up territorial strategies, having a relatively high degree of freedom to set their own development goals and the scope of the activities for which they receive EU funding. In this sense, there is clear potential for LAGs to implement local scale initiatives around renewable energies (RE). To understand the scope and extent of such bottom-up initiatives in Poland, we analyse the regional diversity of operations in RE in the local development strategies of 324 LAGs prepared for the EU Programming Period 2014–2020. Specifically, we analysed whether local communities planned to undertake educational actions or investments related to RE in their strategies. Content analysis shows a relatively low interest in this subject by the communities analysed at the time their strategies were prepared. Across the country, educational activities related to RE were planned in 13% of strategies and investments related to RE in only 9% of them. Possible reasons for the generally low local interest in RE may relate to the levels of education and income of local communities. However, the regional disparities could be the result of the individual policy of regional authorities. We discuss the possible causes of this apparent lack of interest in RE among local communities in the context of EU-wide efforts for a low-carbon economy. Alternative policy instruments, or more precise targeting of rural development funding to sustainable energy may be needed to accelerate the transition to low-carbon energy sources in Poland.

1. Introduction

Under rapid climate change, the costs of adapting the economy and settlement networks to new conditions could be enormous [1, 2]. Awareness of this fact is currently the main driving force behind efforts to reduce greenhouse gas emissions in energy and transport. To achieve this, global climate change mitigation efforts look to significantly increase the share of renewable energies (RE) and reduce the burning of fossil fuels [3]; these activities are key elements of the European Union’s (EU) climate policy. To this end, the Europe 2020 strategy includes targets for reducing greenhouse gas emissions, increasing the share of renewable energy and increasing efficiency in energy use [4]. The EU’s insistence on policy coherence for socio-economic development – with special attention to be
given to environmental and renewable energy issues – is often referred to as a process of “Europeanisation” [5]. Many governments support large-scale investment in renewable energy through various financial mechanisms [6]. However, in many countries, the distributed micro-sources of renewable energy are also supported, including energy from so-called prosumers (individuals or organisations who generate their own energy, consume what they need, and sell the surplus). Modern, energy-saving solutions in construction, such as passive houses with recuperators or more efficient ground heat pumps, are also developed and supported.

Beyond energy policy, the European Union also supports various types of activities of local communities related to the concept of territorial governance and neo-endogenous development [7]. In this type of development, public authorities support local initiatives based on the needs of communities. An example of such programmes is Community-Led Local Development (CLLD), under which cross-sectoral, area-based partnerships called Local Action Groups (LAGs) are established in territorially compact areas [8]. In Poland, LAGs currently take the legal form of associations (stowarzyszenie – Lokalna Grupa Działania). They prepare local development strategies and obtain funds for their implementation, under which various types of local initiatives are supported, from small investments to cultural events. The promotion of resource efficiency and the shift towards a low-carbon, climate-resilient economy are also considered as important components of local actions in EU CLLD programme rules [9, 10]. However, local stakeholders have great freedom in formulating local development objectives. Therefore, the question arises as to whether in such grassroots organizations, local stakeholders express the need to pursue goals related to renewable energy and the elimination of fossil energy sources (e.g. local coal heating installations). If they have the option of spending the funds freely, are they interested in the issue of small scale and local RE development to support European aims?

In this paper, we try to answer these questions by analysing the regional diversity of interest in RE, expressed in LAGs local development strategies prepared by local stakeholders for the programming period 2014-2020 in Poland. We focus on rural areas because only 8 out of 324 LAGs are located in urban areas. In the first section, we present the general policy of the European Union on this topic, with particular emphasis on distributed renewable energy. Then, we briefly present Poland's experiences in this area. In the subsequent sections, we discuss the results of our analyses and the possible reasons for the apparent low level of interest in RE.

2. Distributed RE and local communities
The decisive step that led to a renewable energy policy at the European Union level was made in 1997 with the publication of the “White Paper for a Community Strategy and Action Plan” [11]. Since then, member states have faced long-term targets in this area [6]. A further crucial advance came with the establishment of the “2020 climate & energy package”, which adopted measures to increase the share of renewable energy to 20% of total EU energy consumption, 20% cut in greenhouse gas emissions (from 1990 levels) and 20% improvement in energy efficiency (Directive 2009/28/EU). In the EU RE currently include: hydro, wind, solar, geothermal, wave and tidal energy; biomass, biodegradable waste and energy transferred by heat pumps with specific technical parameters.

One of the important components of the transformation of the energy market in Europe is “distributed (energy) generation” DEG (DG) [12, 13]. These terms refer to electrical generation and storage performed by a variety of small, network-connected or distribution system connected devices. Alanne & Saari [12] (p. 539) note that in this system: “...energy conversion units are situated close to energy consumers, and large units are substituted by smaller ones. A distributed energy system is an efficient, reliable and environmentally friendly alternative to the traditional energy system.” It has been argued that DEG (DG) has good potential to help meet the EU’s energy policy aims [13]. Recently, the EU has moved from a position of ambivalence towards citizen participation in the energy transformation to one of explicit support [14].
Local communities can successfully use small-scale and local renewable energy sources for households, farms, enterprises and local public buildings. These types of energy sources may include, among others:

- installations for the production of renewable electricity for the private use of farms and non-energy enterprises (i.e. the production of electricity for production processes) and the transfer of its excess to the network under the so-called prosumer energy model,
- installations generating or storing heat (e.g. heating of water or residential and utility buildings, use of heat in production processes, retaining and obtaining heat in greenhouses).

Such installations can be particularly important in sparsely populated and peripheral rural areas, and might, therefore, be expected to feature prominently in local strategies. Local governments have much better legal and economic capabilities than individual farms and households to invest in RE, create and participate in energy cooperatives. This potential has been further reinforced in Poland since 2016 by the establishment of so-called “Energy clusters”. Energy clusters constitute a separate subsystem of energy producers and recipients, connected by a formal network. In Poland, they can gather five neighbouring municipalities (gminy) or one county (powiat). Thus, an energy cluster is a much stronger and more competitive marketplace than householder or farm level RE, or local citizens’ associations [15].

Issues related to the development of RE in its local dimension explicitly refer to the idea of cooperation based on local social resources. Efforts to create local energy markets on a larger scale, which are characterized by decentralization, often require reliance on information and communication technology (i.e. blockchain technologies, the Internet of Things) [16]. In view of the phenomenon of 'digital divide' observed in Poland, including the digital exclusion of farmers [17], the introduction of distributed RE requires special support also in the field of information technologies or even the broadband Internet, especially in remote rural areas. The need for cross-sectoral cooperation is also important because a lack of technical or commercial skills and information is an important barrier to implementing RE [18]. Therefore, it is important to take action not only at the state or regional level, but also at the local level. This is indicated by, among others, the Dutch experience, where local communities, entrepreneurs and NGOs are involved in creating the foundations for the generation and consumption of RE. As indicated by Boon and Dieperink [19] the creation of local RE organizations is important in stimulating the transition towards decentralized production and consumption of RE. Small-scale and local organisations of many different kinds are involved in promoting, generating, and managing RE within the community throughout Europe [20, 21].

In the case of Poland, the challenges associated with the development of RE are greater than elsewhere in Europe, since the country’s dependency on fossil fuel energy is among the highest in the EU, mainly thanks to the coal from indigenous sources [22]. Energy generation is also highly centralised [13, 21]. While Polish support for RE has broadly followed EU policy guidelines, EU targets do not appear to have been met. According to Directive 2009/28/EU, Poland was to reach a 15% share of RE in gross final energy consumption by 2020. The forecasts available at the time of writing this paper indicate, however, that this goal will not be achieved on time (near 11% share of renewable energy in 2018) [23]. According to Chodkowska-Miszczuk et al. [24] in the 2007-2013 programming period, EU funds were an important driver of Polish investments in RE. Among them, over 60% was allocated to large wind power plants (up to 10 MW), and about 20% to smaller RE projects (mainly biomass and biogas power plants – average 1 MW). Also, analysis by Hewitt et al. [21] indicates that in Poland larger-scale investments have hitherto been preferred, for example, in the adaptation of coal plants to also use biomass. Polish central government has preferred to invest in coal energy plants, based on domestic coal deposits, so far. The development of onshore wind farms has been limited after 2015 as a result of deliberate location restrictions and tax changes by central government [25]. Relatively low support, tax and legal problems related to RE [26], compared to
many EU countries, could have an impact on the low involvement in cooperatives, citizen-driven and community initiatives in RE [27].

Further in the paper, we analyse whether these types of adverse trends were visible in the goals and activities of the strategies prepared by local stakeholders operating in area-based partnerships.

3. Materials and methods
The subject of the analysis is local strategies prepared by Local Action Groups in Poland, operating under the Community-Led Local Development approach. Regional research covered all 324 LAGs in Poland that were qualified to receive European Union funds, according to data from the Ministry of Agriculture and Rural Development of 23 December 2019. The borders of LAGs and their sources of EU funding are shown in Figure 1.

![Figure 1. Local Action Groups in Polish voivodeships (provinces) and the main source of financing for local strategies. Acronyms: EAFRD – European Agricultural Fund for Rural Development; EMFF – European Maritime and Fisheries Fund; ESF – European Social Fund; ERDF – European Regional Development Fund; Source: Ministry of Agriculture and Rural Development 23.12.2019, Warsaw, Poland]

Most of the LAGs (316 out of 324) are organizations operating in rural areas (including in small towns). They cover an area from 2 to 25 cooperating rural or urban-rural communes (municipalities), with a population from 30,000 to 149,000 inhabitants. The programme rules enabled the financing of relatively small, local investments of residents, farmers and small enterprises that are consistent with the objectives of the local development strategy prepared by LAG members. They may also include
RE projects. Only eight LAGs in the Kuyavia-Pomerania (kujawsko-pomorskie) voivodeship were organized in urban municipalities. They are financed exclusively from the European Social Fund and they focused on social activities, which limited the possibility of investment in RE.

In our analysis, data were aggregated by voivodeships (Polish self-governing provinces), according to the location of the LAGs’ headquarters, in order to analyse the spatial diversity of LAGs’ goals. The basic research method used is content analysis [28] of the LAG strategy documents. Content analysis is often used in social sciences for the analysis of policies of central and regional authorities [29, 30] or the objectives of inter-municipal organizations and area-based partnerships [31]. We obtained current local development strategies from the official LAG websites. These were created for the European Union programming period 2014-2020 and are usually related to the period up to around 2022 or 2023. Most of them were prepared in 2015, and only slightly modified thereafter. Based on these strategies, LAGs received EU funds to support own projects and activities that are selected in local grant competitions by the so-called LAG decision councils composed of representatives of public authorities, entrepreneurs, local NGOs and ordinary residents [32]. All selected activities had to comply with the objectives and tasks set out in the strategy; hence these documents are of great importance for the selection of activities that will receive financial support from public funds.

As part of the analysis of the content of strategy documents, we checked whether the strategy envisaged support or implementation of the following issues:

- Educational activities directed at local communities regarding the possibilities of using renewable energy sources in households, agricultural and small enterprises.
- Operations concerning investments in distributed local RE.

In addition, we analysed if there were specific financial resources planned for the implementation of these types of activities and what specific descriptions and comments regarding the RE were included in the analysed documents. The analysis does not include actual activities undertaken by LAGs or co-financed by LAGs in 2016–2020 because they are not yet finished. Finally, implemented activities may differ from those originally planned in the strategies, due to the relatively high degree of freedom of local organizations and residents to determine the scope of tasks in the projects. The quantitative and qualitative data collected in this way are presented in the next section.

Figure 2. The share of LAGs strategies planning actions related to RE (educational actions or investment - logical sum) in voivodeships (provinces) of Poland
4. Results
Among the 324 LAG strategies analysed in Poland, only about 13% planned actions to educate local communities in the subject of RE. Specific investments in these types of installations were planned only in about 9% of LAGs. In total, approximately 18% of LAGs planned some activities related to RE. They were most frequently planned in the LAG strategies of Podlasie (podlaskie, in almost 70% of documents), Warmia-Masuria (warmińsko-mazurskie, 33%) and Łódź (łódzkie, 28%) voivodeships. Activities of this type had the least interest in Kuyavia-Pomerania (kujawsko-pomorskie), West Pomerania (zachodniopomorskie) and Świętokrzyskie (świętokrzyskie) voivodeships (Figure 2).

Educational actions were most commonly planned in Podlasie (podlaskie, 38% of strategies), Mazovian (mazowieckie) and Lower Silesian (dolnośląskie) voivodeships (24% each) (Figure 3A). Activities of this type were not included in the strategies of the West Pomeranian (zachodniopomorskie) and Świętokrzyskie (świętokrzyskie) voivodeships. Educational activities in the field of RE planned most often in strategies included, for example:
- Training, workshops and study trips for residents, farmers and small entrepreneurs from the partnership area, most often in the field of RE, energy-saving and passive houses;
- Rural events during which RE and other environmental issues were to be promoted (distribution of materials, educational competitions and other);
- Exhibitions and boards promoting renewable energy in public buildings (schools, rural common rooms, offices, etc.).

Educational activities on RE were often planned only as a small element of larger projects related to the issues of eco-development, environmental protection or climate change, so it is difficult to determine exactly what amounts were to be allocated for the promotion of RE.

We found the highest number of strategies anticipating investments in RE in the Podlasie (podlaskie, 62%), Lower Silesia (dolnośląskie, 18%) and Warmia-Masuria (warmińsko-mazurskie, 17%) (Figure 3B). No investments were planned in the strategies of the Kuyavia-Pomerania (kujawsko-pomorskie), Lubusz (lubuskie) and Opole (opolskie) voivodeships. The most frequently planned investment activities in RE were:

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**Figure 3.** The share of LAG strategies planning RE educational actions (A - left map) and investment (B - right map) in voivodeships (provinces) of Poland.
- Equipping RE installations of public buildings and their surroundings (rural community centres, schools, lighting points for streets and squares). Most often the investments concerned the use of solar energy;
- Support for the use of RE by local micro-entrepreneurs and farmers, mainly through the use of preferential consideration of projects for entrepreneurs and farmers in grant competitions, if they envisage investing in renewable energy in their activities. Descriptions most often mentioned the desire to use solar energy. The use of wind energy, the use of heat pumps as well as biomass and biogas was much less frequently reported.
- In a minority of cases, support for RE installations in private households, most often using solar energy to produce heat or electricity.

Due to incomplete information in the strategies, a methodical and accurate comparison of the number of financial resources planned for educational activities and investments could not be made. These are often only a non-separate component of larger enterprises, including activities not related to RE. On average, the largest share of funds for the RE-related objectives analysed was planned in Podlasie (podlaskie, 5% of the total value of the strategy's budgets) and Silesia (śląskie, 1%), compared with < 0.7% in all other regions. The most frequently planned RE-related tasks concerned training and educational activities with budgets of 50,000-100,000 PLN (near 11,000-23,000 EUR). Only 12 LAGs in Poland have planned support for renewable energy investments with budgets above 500,000 PLN (near 116,000 EUR).

5. Conclusions
Our results indicate that if local stakeholders had a lot of freedom in planning partnership budgets, then the development of RE was not an important task for them. Local communities were most often interested in the use of solar energy because the development of wind farms caused strong social conflicts in Poland [25] and was restricted after 2015 by the central government. LAGs allocated higher levels of funding to other, much more traditional activities, such as preserving cultural heritage, small social infrastructure or tourism development, a finding supported by other studies both in Poland and beyond [10, 33, 34]. Climate change mitigation measures are not popular in LAGs in many European countries [35]. This is interesting because EU programmes recommended that national, regional and local actions in the Member States should be aligned with the objectives set out in the EU 2020 Strategy. Of course, the main goal of LAGs is to increase social participation in planning and implementing local actions [36], not investments in hard infrastructure, but the low level of interest in the targets of the low-carbon economy is clearly visible. At the local level, in Polish area-based partnerships, climate or low carbon energy-related goals of this type were poorly represented in actions planned in 2014-15. This indicates differences between the priorities of local communities and the pan-European goals set by EU policy makers responsible for development programmes. This mismatch is likely to hinder the achievement of supralocal goals [10].

The analysis confirms the difficulties of “Europeanisation processes” in the field of low-carbon economy, which have faced significant social and economic barriers in Poland [37]. The use of RE in households and farms was considered in LAG strategies as a little-known innovation, needing educational actions. Some studies have suggested that the lower levels of education found in rural communities, compared with urban and suburban areas [38], hinder the diffusion of new technologies in households and farms [39]. Yet it is also true that farming communities can be well-known social innovators; Hewitt et al. [21] found many small, farmer-led RE enterprises, especially in biomass or biogas, e.g. in France and Sweden. However, it may be that where small-scale RE are associated with what rural dwellers consider to be “urban values”, rather than being seen simply as a business opportunity, uptake may be lower. In support of this theory, Meyer [40] found that for European countries, the level of education is closely related to the pro-environmental behaviour. Social research in Lower Silesia voivodeships in Poland has shown that the RE is mainly supported by people with secondary and higher (tertiary) technical education and people with higher incomes [41]. The same study found the most important supporters of RE to be farmers and private firm owners. Yet these groups have.
relatively low representation in LAG decision bodies, dominated by local NGOs preferring social issues and local government focusing on communal infrastructure, tourism and business development [32, 42].

A second key factor, the average lower income of households in rural areas than in urban and suburban areas, probably also has a significant impact on RE development. The relatively high cost of RE installations is a significant barrier to their development in rural households and farms in Poland [37]. In addition, it is difficult to use, for example, modern heating technologies in old buildings, typical in rural areas that do not meet modern energy efficiency standards. As a result, in Poland, residents have hitherto preferred much cheaper, old heating technologies based on burning solid fuels (mainly coal) and connecting to the power grid only as a consumer. Administrative and technical difficulties in connecting small RE installations (including prosomers) to the national power grid in Poland are also described in the literature [26].

We did not find any direct relationship between the regional socio-economic characteristics of the voivodeships and RE strategies. The deliberate actions of the voivodeship authorities, which dealt with the promotion and supervision of activities financed under the CLLD approach, were probably of high importance. This can be seen in the funding differences for LAGs, e.g. only two voivodeships supported LAGs from ERDF funds, and only one decided to support urban LAGs. These were clearly differences related to the policy of the autonomous regional authorities, which in some voivodeships pushed LAGs to target RE objectives, but in others, clearly did not.

It should be recalled that this analysis only concerned the records of the strategy's objectives and not actual actions. Entities applying for small grants in LAGs can prepare applications covering RE in their projects (e.g. when a small company wants to reduce operating costs). So even where the investment in the RE is not specified as a separate topic or goal, it does not mean that it is not possible to implement such activities. Since then, interest in RE may have increased after 2015 [43, 44]. For this reason, it would be interesting to compare the completed actions with the originally-defined goals.

Research confirms the need for special support for investments in RE, i.e. the preparation and promotion of top-down programs supporting only small investments related to the production and storage of RE in farms and households (including thermo-modernization of buildings, heating with heat pumps, recuperators, etc.). Financial support is particularly important due to the relatively low income of households and farms located in rural areas, which makes the development of modern but expensive energy-saving technologies and RE difficult. The relatively low level of interest in RE in the local strategies studied may suggest that greater efforts are needed also to educate local communities about the low-carbon economy and climate change mitigation. However, carefully designed local support schemes, where rural communities see a clear and direct benefit from installing RE, are probably more important than educational programmes.

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