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RENEWABLE ENERGY SOURCES AS AN OPPORTUNITY FOR THE DEVELOPMENT OF SMART VILLAGES[1]

Abstract

The article presents issues related to the location of renewable energy sources in rural areas. Spatial planning regulations are analysed, as well as other regulations enabling or impeding the development of green energy in rural areas. The legal possibilities of realising investments in renewable energy sources in rural areas through the prism of the Smart Village concept are also assessed. *De lege ferenda* proposals are presented to enable faster investment in renewable energy sources in rural areas. The article also points out the risks for farmers, whose current role has been reduced to renting agricultural property.

KEYWORDS

agricultural law, Smart Village, renewable energy, rural areas, agricultural innovation

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prawo rolne, Smart Village, odnawialne źródła energii, obszary wiejskie, innowacje w rolnictwie

INTRODUCTION

The new geo-political situation related to the war in Ukraine, as well as the development of the European Union's climate policy, known as the European Green Deal, is prompting the search for new energy sources. Renewable energy sources, mainly from the wind or the sun, are coming to the fore in this regard. They are today the future of economic development, but also of agriculture. They bring innovative solutions and, at the same time, contribute to climate protection. They do, however, have their own negative consequences, for example, in the form of violations of the principles of spatial planning or the location of renewable energy sources in environmentally valuable areas.

One of the main places where investment in renewable energy sources on a scale that enables them to be produced for more than just subsistence use is in rural areas. An increase in the location of photovoltaic farms or biogas plants can already be observed. However, investments in the construction of wind farms are much more difficult. The ongoing legal changes, in particular, following the enactment of the Act of 7 July 2023 amending the Act on spatial planning and development and certain other acts,[2] were supposed to accelerate the location of renewable energy sources and enable their development while replacing fossil fuels as an energy carrier.

For the most part, these investments are carried out by specialised corporations and energy companies that acquire agricultural land on their own or, more often, lease it from farmers. This raises quite significant concerns about creating a market of only a few players, where one of the main demands of cheap green energy may not be implemented. Bringing the farmer's interest in these investments down to just the collection of rent seems highly controversial.

A solution to these problems may be the idea of a Smart Village.[3] It is favoured for implementation in rural areas in the latest financial perspective of the European Union. It involves bottom-up initiatives to implement technical progress

[2] Journal of Laws of 2023, item 1688.

[3] L. Naldi, P. Nilsson, H. Westlund, S. Wixe, *What is smart rural development?,* Journal Rural Studies, 2015, No. 40, pp. 90-101.

in the countryside,[4] but also taking into account social or climatic aspects. The advantage of this idea is the emergence of bottom-up initiatives from farmers who will know best what kind of investment the region needs. Therefore, I believe that the Smart Village concept[5] is an opportunity for the development of renewable energy sources in rural areas. However, it requires refinement in terms of financial assistance, as well as the identification of precise opportunities for locating renewable energy sources in rural areas. Without such assistance, these opportunities, not only with the Smart Village concept,[6] but also for individual farmers, may prove to be quite illusory and will only result in the leasing of land for investment.

The aim of this article is to present selected issues in the development of renewable energy sources in rural areas, primarily through the prism of their location, as well as their compatibility with the Smart Village concept. *De lege ferenda* conclusions are also presented, which may prove helpful in the development of these investments.

THE COMMON AGRICULTURAL POLICY AND RENEWABLE ENERGY SOURCES IN RURAL AREAS

The Common Agricultural Policy after 2023 is the result of an evolution linked to the climate transformation of the entire European economy.[7] The European Green Deal[8] refers in large part to the sphere of agriculture and the requirements for the greening of agricultural production.[9] These requirements, such as the fallowing of part of the estate, encounter agricultural protests across Europe. At the same time, abandoning climate protection altogether in Europe will have irreversible consequences for the functioning of agriculture and the economy.

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[4] S. Renukappa, S. Suresh, W. Abdalla, N. Shetty, N. Yabbati, R. Hiremath, *Evaluation of smart village strategies and challenges*, "Smart and Sustainable Built Environment", 2022, https://doi.org/10.1108/SASBE-03-2022-0060.

[5] P. Gerli, J. Navio Marco, J. Whalley, *What makes a smart village smart? A review of the literature*, "Transforming Government: People, Process and Policy", 2022, Vol. 16 No. 3, pp. 292-304.

[6] R. Lankauskienė, Ž. Gedminaitė-Raudonė, *Toward Holistic Perceptions of 'Smart' Growth in Development Paradigms and Policy Agendas*, "Land", Vol. 12, No. 2.

[7] H. Guyomard, C. Détang-Dessendre, P. Dupraz, L. Delaby, C. Huyghe, J.-L. Peyraud, X. Reboud, C. Sirami, *How the Green Architecture of the 2023-2027 Common Agricultural Policy could have been greener*, "Ambio", 2023, Vol. 52 (8), pp. 1327 - 1338.

[8] https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_pl (accessed 10 December 2023).

[9] W. Ziętara, Z. Mirkowska, *Zielony ład – w kierunku rolnictwa ekologicznego czy ekologizacji rolnictwa?*, "Zagadnienia Ekonomiki Rolnej", 2021, Vol. 368 (3), pp. 29-54.

One of the determinants of the implementation of environmentally friendly solutions[10] are solutions aimed at the so-called zero-emission, involving the generation of energy from renewable sources. According to the declaration of the creators of the European Green Deal, in order to achieve the related goals, the EU is acting on various levels. Firstly, it is supporting the development and dissemination of cleaner energy sources, such as marine renewable energy and hydrogen; secondly, it is supporting the integration of energy systems across the EU; thirdly, it is developing interconnected energy infrastructures through EU energy corridors; and finally, fourthly, it is revising existing legislation on energy efficiency and renewable energy, including their 2030 targets.[11]

These general declarations must be translated into legal solutions, which are currently so scarce that their possible effectiveness cannot be assessed. Programme declarations on the European Green Deal must be followed by concrete solutions in the form of European regulations, which would make it possible to undertake investments in the long term.

The new Common Agricultural Policy[12] delegates the fine-tuning of individual solutions to Member States through strategic plans developed by them.[13] In Poland, such a plan has been adopted for the years 2023-2027.[14] It provides for a number of pro-environmental solutions to meet the ambitious EU climate goals. At the very outset of the considerations, it should be noted that this is, for the time

[10] G. Guarini, J.L. da Costa Oreiro, *Ecological transition and structural change: A new-developmentalist analysis*, "Socio-Economic Planning Sciences", 2023, Vol. 90, DOI: 10.1016/j.seps.2023.101727.

[11] https://www.consilium.europa.eu/pl/policies/green-deal/ (accessed 10 December 2023).

[12] A. Niewiadomska, *Prawne aspekty rozwoju obszarów wiejskich w nowej perspektywie finansowej Wspólnej Polityki Rolnej*, "Studia Iuridica", 2021, Vol. 89, pp. 257-268.

[13] Regulation (EU) 2021/2115 of the European Parliament and of the Council of 2 December 2021 laying down rules for support for strategic plans drawn up by Member States under the common agricultural policy (CAP strategic plans) and financed by the European Agricultural Guarantee Fund (EAGF) and the European Agricultural Fund for Rural Development (EAFRD) and repealing Regulations (EU) No. 1305/2013 and (EU) No. 1307/2013 (Official Journal of the EU 2021 L 435/1).

[14] Currently, according to the Ministry of Agriculture and Rural Development, "The document includes the version of Plan 3.1 approved by the European Commission on 30 August 2023 and the following amendments to the Plan referred to in Article 119(9) of Regulation (EU) 2021/2115 of the European Parliament and of the Council of 2 December 2021 laying down provisions on support for strategic plans drawn up by Member States under the common agricultural policy (CAP strategic plans) and financed by the European Agricultural Guarantee Fund (EAGF) and the European Agricultural Fund for Rural Development (EAFRD) and repealing Regulations (EU) No. 1305/2013 and (EU) No. 1307/2013: amendments which were notified by the Minister of Agriculture and Rural Development to the European Commission on 10 August 2023, and which apply from 15 August 2023; amendments which were notified by the Minister of Agriculture and Rural Development to the European Commission on 1 December 2023 and which apply from 15 December 2023". – https://www.gov.pl/web/wprpo2020/plan-strategiczny-dla-wspolnej-polityki-rolnej-na-lata-2023-2027-wersja-33 (accessed 10 December 2023).

being, a programme document which has been only marginally encapsulated by relevant national legal acts. Therefore, further considerations are based on programme assumptions and postulated legal provisions.

The Polish Strategic Plan indicates that "the use of renewable energy indirectly contributes to improving the profitability of farms while ensuring an equivalent use of resources. The Plan proposes an intervention for farms concerning the use of different sources of renewable energy. The aim of this intervention is primarily to reduce emissions and contribute to Objective 4 although indirectly, by reducing production costs, the economic effect of this intervention can also be indicated".[15] This means that investment in renewable energy sources is an indirect mechanism affecting farmers' profitability. The observable phenomena of investments in biogas plants or photovoltaic farms indicate the coexistence of agricultural activities and investments in RES (renewable energy sources). These only meet the farmers' own needs, and the energy obtained does not feed into the country's energy system but is used on site. This, of course, contributes to reducing the costs of agricultural production and, as highlighted, indirectly affects agricultural income.[16]

To meet the needs of farmers, the Strategic Plan introduced a specific intervention "On-farm investment in renewable energy and energy efficiency improvements". The declared aim of the intervention is to reduce the pressure of agricultural activity on the environment, through the use of energy from renewable sources, proper management of waste and by-products from agriculture and improvement of energy efficiency.[17] It should be pointed out, however, that this intervention in the Polish Strategic Plan is quite limited. It concerns new equipment for the production of energy from agricultural biogas (electricity or heat or gaseous fuel) up to 50 kW with the possibility of installing energy storage or installations producing energy from solar radiation up to 50 kW with energy storage and energy management systems or with a heat pump – as long as it is an integral part of the installation producing energy from solar radiation, the installation costs of the above mentioned energy production equipment (area A). It may also concern systems improving the energy efficiency of farm buildings used for agricultural production, such as the construction, reconstruction or purchase of

[15] Strategic Plan for the Common Agricultural Policy 2023-2027, p. 107.

[16] Especially since, as indicated in the Plan, "the total production of renewable energy sources from agriculture and forestry accounted for 81.6% of the total production of energy from renewable sources in Poland. In Poland, between 2012 and 2016, renewable energy production from agriculture increased by 55.9% [...] A characteristic feature of renewable energy production in Poland is the large share of solid biomass (firewood, residues from wood processing and forest and park maintenance) in total renewable energy production, which amounted to 71.1% in 2016. This is followed by wind energy, liquid biofuels, biogas and solar energy, whose share of total renewable energy production in the country in 2016 was respectively: 12,0%, 10,2%, 2,9% i 0,7%" – Strategic Plan for the Common Agricultural Policy 2023-2027, p. 141.

[17] Strategic Plan for the Common Agricultural Policy 2023-2027, p. 940 .

biomass boilers, heat recovery systems (e.g. from milk, livestock buildings, litter, slurry), roof glazing, LED lighting, as well as thermo-modernisation of farm buildings used for agricultural production (area B).[18]

The choice of investments favouring only agricultural biogas plants and, alternatively, only photovoltaics may not prove to be a very effective tool due to the rather complicated system of constructing biogas plants. In addition, there are no implementing regulations specifying the possible formal conditions for obtaining a subsidy to benefit from this intervention. Undoubtedly, however, the greatest drawback of the adopted solutions is the use of renewable energy sources only for the needs of agricultural activity. The energy generated on the farm still cannot be discharged effectively into the system, as there is no energy infrastructure capable of receiving the energy generated in such a way.

At the same time, the development of this intervention can be an opportunity for the development of a Smart Village[19] based on agricultural biogas. The establishment of several such biogas plants in one village can make it independent of external energy supplies. This will not only improve the climate but, above all, the profitability of agriculture and thus its competitiveness.[20] The development of well-functioning biogas plants, supported by other green energy devices, can be a stimulus for the development of other spheres of Smart Village formation, for example in terms of social or educational values.

RURAL ENERGY AS AN INSTRUMENT TO SUPPORT THE ENERGY TRANSITION

The mechanisms set out in the Common Agricultural Policy are not the only legal instruments enabling energy transformation towards the use of renewable energy sources. One example of support for Polish agriculture is the Energy for Rural Areas Programme[21] implemented by the National Fund for Environmen-

[18] *Ibid*, pp. 940-941.

[19] L.J. Cole, D. Kleijn, L.V. Dicks, J.C. Stout, S.G. Potts, M. Albrecht, J. Scheper, *A critical analysis of the potential for EU Common Agricultural Policy measures to support wild pollinators on farmland*, Journal of Applied Ecology, 2020, No. 57(4), pp. 681-694.

[20] P.W. Maja, J. Meyer, S. von Solms, *Smart Rural Village's Healthcare and Energy Indicators-Twin Enablers to Smart Rural Life*, Sustainability (Switzerland), 2022, Vol. 14, No. 19; V. Zavratnik, A. Kos, E.S. Duh, *Smart villages: Comprehensive review of initiatives and practices*, "Sustainability (Switzerland)", 2018, Vol. 10, No. 7.

[21] The objective of the Programme is reduction of CO2 emissions – the planned value of the indicator of target achievement is at least 260,000 Mg/year, including: for non-refundable and refundable forms of co-financing – at least 260,000 Mg/year 2). Amount of energy generated from renewable sources – the planned value of the indicator of target achievement is at least 450,000 MWh/year, including: for non-refundable and refundable forms of co-financing – at least

tal Protection and Water Management.[22] It provides subsidies for investments in the construction of: hydroelectric power plants, installations for the generation of energy from agricultural biogas in conditions of high-efficiency cogeneration, and energy storage facilities. In addition, preferential loans are granted for investments in the construction of: hydroelectric power plants, installations generating energy from agricultural biogas under conditions of high-efficiency cogeneration, wind installations and photovoltaic installations.

This comes as an addition to the missing solutions, for example in the field of wind energy generation or, on a larger scale, photovoltaics.[23] These investments can be made not only by individual farmers, but also by existing or emerging energy cooperatives. The latter refers to cooperatives within the meaning of the Act of 16 September 1982 – Co-operative Law (Journal of Laws of 2021, item 648, as amended) or farmers' co-operatives within the meaning of the Act of 4 October 2018 on farmers' co-operatives (Journal of Laws, item 2073), the object of whose activity is the production of electricity, biogas or heat in renewable energy source installations and balancing the demand for electricity or biogas or heat, exclusively for the own needs of the energy cooperative and its members, which intends to apply for inclusion of its data as an energy cooperative in the list referred to in Article 38f(2) of the Act of 20 February 2015 on renewable energy sources (Journal of Laws of 2022, item 1378, as amended).[24]

The emergence of these cooperatives and the potential for a much wider use of grants and loans to invest in renewable energy sources is an opportunity for the development of the Smart Village concept. Admittedly, it is still emphasised that the energy generated is to be used for the needs of the cooperative or its members, but this creates a much wider opportunity for co-operation in the siphoning of such green energy than in the case of individual farmers. Admittedly, the association of farmers into agricultural producer groups is currently in crisis, but energy cooperatives could be the impetus for a new kind of association of farmers who will seize the opportunity given to them.

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450 000 MWh/year 3). Additional capacity of energy generation from renewable sources - at least 90 MW, including for non-refundable and refundable forms of co-financing - at least 90 MW - https://www.gov.pl/web/nfosigw/energia-dla-village (accessed 10 December 2023).

[22] https://www.gov.pl/web/nfosigw/energia-dla-wsi (accessed 10 December 2023).

[23] In the case of investments made by a farmer indicated in section 7.4.3, the construction of one of the following renewable energy source installations with an electrical capacity of more than 50 kW and no more than 1 MW: a) photovoltaic installations (excluding investments on agricultural land constituting agricultural land of classes I-IV - within the meaning of the provisions issued pursuant to Article 26(1) of the Act of 17 May 1989. - Geodetic and Cartographic Law (i.e. Journal of Laws 2021, item 1990, as amended)) ; b) wind installations (excluding investments on agricultural land constituting agricultural land of classes I-IV - within the meaning of the provisions issued pursuant to Art. 26 (1) of the Act of 17 May 1989. - Geodetic and Cartographic Law (i.e. Journal of Laws 2021, item 1990, as amended)) - https://www.gov.pl/web/nfosigw/energia-dla-wsi (accessed 10 December 2023).

[24] *Ibid*.

The proposed scheme should be assessed with some uncertainty given the rather high investment costs and the largely loan-based nature of the aid. Farmers may be apprehensive about taking advantage of it due to the risk of losing significant financial resources in the event of investment failure, in particular, changes to the energy law regarding the use of energy generated for own needs. The numerous amendments to these laws, as well as their level of complexity, rather do not encourage risky investment activities. *De lege ferenda*, the maximum simplification of regulations related to the use of RES energy obtained for own needs and not introduced into the system should be postulated.

PLANNING ASPECTS OF LOCATING RENEWABLE ENERGY INVESTMENTS

The amendment to the Planning and Spatial Development Act introduced in 2023 established significant changes to the location of renewable energy sources. It should be pointed out that this applies to high-power installations. At the same time, it should be noted at the outset that the amendment did not remove the existence of other laws concerning renewable energy installations, such as the so-called distance law related to the location of wind farms.

These provisions have been clarified, not to say tightened. One example is the added Article 14(6a)(2) of the Spatial Planning and Development Act, which states that "A change in the land use concerning: installations of renewable energy sources not installed on a building, located: a) on agricultural land of class I-III and forestry land, b) on agricultural land of class IV, with an installed electrical power of more than 150 kW or used to conduct economic activity in the field of electricity generation, c) on land other than that indicated in lit. (a and b) with an installed electrical capacity of more than 1,000 kW – shall be on the basis of a local plan". On the one hand, this implies a strong protection of land with the best agricultural suitability through the spatial planning procedure but, on the other hand, it actually makes the location of renewable energy sources extremely difficult. The rather large capacities of RES installations enshrined in the above provision are supposed to safeguard against the establishment of entire farms without public consultation. This security of interest, however, in combination with other provisions, constitutes a restriction on the development of RES in rural areas.

Another provision intended to safeguard against uncontrolled development of RES investments is Article 15(7) indicating that "a local plan providing for the possibility to locate buildings also allows for the location of building-mounted renewable energy source installations using only solar energy for energy production and micro-installations within the meaning of Article 2(19) of the Act of 20 February 2015 on renewable energy sources (Journal of Laws of 20 February

2015, item 1436, 1597 and 1681), also in the case of a different land use than production, unless the local plan's provisions prohibit the location of such installations". This provision, referring only to investments in solar energy installations, also refers to spatial planning as a tool which enables the establishment of any RES installation.

In the context of these two provisions cited, the development of renewable energy sources in rural areas will, on the one hand, safeguard against uncontrolled siting, but, on the other hand, will significantly impede the realisation of the idea of a Smart Village based on green energy.

CONCLUSIONS

The presented selected issues which relate to the location of renewable energy sources in rural areas lead to several conclusions. Legal issues concerning the dispersion of regulations related to investments in renewable energy sources come to the fore. In addition to the discussed Act on planning and spatial development, we are dealing with a number of special laws which are subject to numerous amendments. Moreover, they do not create a uniform system that would promote legal certainty. An example of this is the regulations on the location of wind farms and their distance from buildings.

In addition to the planning regulations, it is necessary to point out the need to normalise the problem of feeding the energy obtained into the state's energy system. Insofar as it is possible to carry out investment in connection with renewable energy sources, the possibility of generating income from this becomes a problem due to the need to gain access to consumption and transmission networks. Lengthy and uncertain procedures, as well as Poland's infrastructural backwardness in this regard, are significant obstacles preventing investment in renewable energy sources.

Here, the Smart Village concept can be an aid to the transformation towards green energy. Renewable energy sources can be a part of changes in the countryside aimed not only at increasing profitability but, above all, at social and climate change. The proper use of the instruments provided for Smart Village related to the implementation of innovative solutions may prove to be an opportunity for the development of Polish villages.

However, it should be made clear that any investment in renewable energy sources should be preceded not only by a business plan showing the economic benefits but, above all, by resolving the conflicts between ensuring food security and access to green energy. There is a danger that earmarking too much real estate for

energy investments in the countryside could result in the inability to acquire land for food production, which could ultimately lead to the shortage of food.

Balancing solutions between energy security, climate security and food security is a challenge facing contemporary agriculture not only in Poland, but in the whole of Europe. Like in a lens, the problems of finding the right way to define sustainable development between technological progress,[25] and food production are concentrated in these issues. The Smart Village concept involving bottom-up action initiated by farmers themselves may prove to be the solution to these problems here, as they may know what, apart from economic profit, is important in the process of managing agricultural property. Of course, the State should remain in control in this regard, both in terms of energy and food security.

We should postulate *de lege ferenda* the development of legal solutions facilitating investment in renewable energy sources in rural areas. The measures discussed in the Strategic Plan or the Rural Energy Programme need to be coordinated and secured through appropriate legislation that is consistent. The energy transition opportunity should be exploited without compromising, or even improving, climate protection indicators and ensuring food security.

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[25] B. Jeżyńska, *Zrównoważone rolnictwo w rezerwatach biosfery*, "Studia Iuridica", 2022, vol. 94, pp. 143-160, DOI: 10.31338/2544-3135.si.2022-94.9.

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