Coalition for a Clean Tomorrow

Local Government, Clean Energy Production and Energy Clusters

START Final Report

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Disclaimer

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Introduction

The report provides insights and lessons for Libiaz and the powiat of Chrzanow regarding the involvement of local government and communities in the production & distribution of clean energy and other elements of the energy system. Analysis is based on a desk-based review of literature pertaining to local government & community involvement in the production and distribution of clean energy and energy system innovation at the local level in Poland and Europe. Adoption of international analysis facilitates broader comprehension of policy options, benefits, challenges and good practice. Given the unique Polish regulatory and policy context these international insights and lessons are circumscribed and have limitations regarding transferability. Even so, they can facilitate and provoke public sector actors to reassess potential local opportunities, challenges and options in a wider frame of reference.

The report begins by framing energy clusters in the context of EU and Polish policy, before considering the Polish experience of energy clusters, at the national level and in specific localities, and key lessons to date. In turn, the report considers localised policy activism relating to local energy systems in Europe, using appropriate cases. This analysis sets the scene for the identification of lessons for Libiaz and Chrzanow powiat relating to: strategy; legislation, regulation and financing; the involvement of citizens; and governance and capacity. There is limited reference to energy co-operatives in this report.

Importantly, the national regulatory framework for the establishment of energy clusters is complex. The START team are not legal experts nor have detailed familiarity of the Polish legal and institutional context. Therefore, the content of this document does not represent guidance or analysis based on legal opinion, counsel or familiarity and should not be treated as such. Relevant public actors will need to seek appropriate expertise and advice on both legal and technical matters.

The Top-down Policy Context in the EU and Poland

This section of the report frames the plans and ambitions for the production and distribution of clean energy from solar farms for public and municipal buildings of Libiaz and the powiat of Chrzanow in the wider EU and national policy context.

EU policy framework

The rights of citizens and communities to engage directly in the energy sector have been recognised by the European Commission Clean Energy for all Europeans package (2019) in the form of two directives. The revised Renewable Energy Directive (EU) 2018/2001 (RED II) covers renewable energy and sets an enabling framework to put **renewable energy communities (RECs)** on an equal footing with other market players and to promote and facilitate their development.[1] The Member States had until June 2021 to transpose the RED II into national law giving citizens, as prosumers, the right to consume, store or sell renewable energy generated on their premises. The revised Internal Electricity Market Directive (EU) 2019/944 introduces new roles and responsibilities for **citizen energy communities (CECs)** in the energy system and covers all types of electricity. It states that 'citizen energy communities constitute a new type of entity due to their membership structure, governance requirements and purpose'.[2]

The legislation adopted at the EU level represents a holistic attempt to define energy communities. RECs and CECs have common characteristics, related to governance (participation must be 'open and voluntary'), ownership and control (participation and effective control should be limited to citizens, local authorities and smaller businesses whose primary economic activity is *not* the energy sector) and purpose (generation of social and environmental benefits rather than financial profits).[3] However, both directives focus on slightly different aspects of the activities that energy communities can conduct. The Electricity Market directive defines the role of energy communities in the energy system, including cooperation with network operators, as well as indicating possible activities in the

1 Lowitzsch et al (2020), Lowitzsch, J., C. E. Hoicka, and F. J. Van Tulder. "Renewable energy communities under the 2019 European Clean Energy Package–Governance model for the energy clusters of the future?." Renewable and Sustainable Energy Reviews 122 2020

2 https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019L0944

3 JRC. Energy communities: an overview of energy and social innovation. Publications Office of the European Union, 2020

entire chain of processes related to the functioning of the energy market.[4] The RED II Directive, on the other hand, focuses its attention on renewable energy sources, giving importance to the regulatory foundations to eliminate possible barriers and stimulate the uptake of such initiatives.

Polish policy framework

In the context of energy communities, the Polish regulatory framework recognises two types of such organisations: energy cluster (klaster energii) and energy cooperative (spółdzielnia energetyczna).

An energy cluster, as defined in the Renewable Energy Sources Act of 2015, is a civil law agreement which may include natural persons, legal entities, scientific units, research institutes or local government units. The activity of an energy cluster should focus on energy generation, demand balancing, distribution and trading of energy from renewable energy sources or from other sources or fuels. The only limitation concerns the level of the distribution network to which these sources can be connected - it is a network with a rated voltage lower than 110 kV. The act also defines the geographical area for the scope of the cluster functioning, which is limited to one poviat or 5 municipalities and stipulates that the energy cluster is represented by the coordinator, which is a cooperative, association, foundation or any member of an energy cluster indicated in a civil law agreement.[5]

Another example of energy community defined in Polish law is an energy cooperative. An energy cooperative is subject to detailed provisions contained in the Cooperative Law (1982) which indicates procedures for establishing and the functioning of a cooperative, as well as and internal regulations and the requirement to enter into the register of cooperatives. An energy cooperative's activity is defined as production of electricity, biogas or heat from renewable energy sources and demand balancing, solely for the own needs of an energy cooperative and its members, connected to an area-defined power distribution network with a rated voltage lower than 110 kV or a gas distribution network or heating network.[6] According to the legal requirements, an energy cooperative should also meet several conditions[7]:

- Operate in a single rural or urban-rural municipality or in the area of no more than three such municipalities directly adjacent to each other
- Members of the cooperative should be less than 1000
- Total installed capacity of all electricity installations should cover not less than 70% of the own needs of the energy cooperative and its members during the year, and at the same time should not exceed 10 MW; in the case of heat, the total thermal capacity may not exceed 30 MW, and in the case of biogas, the annual capacity of all installations may not exceed 40 million m3.

Energy cooperatives and energy clusters differ in that cooperatives are legal entities. This translates into the way of concluding contracts - energy cooperatives may conclude them on their own, whereas only the cluster coordinator can conclude them for an energy cluster.

Comparing the provisions on energy communities defined in the Clean Energy package with the current Polish legislation, the provisions for the citizen energy community largely correspond to the provisions for energy clusters, while the provisions for renewable energy communities corresponds closely with the provisions on energy cooperatives.[8]

Energy clusters: The Polish experience and key lessons to date

This section of the report considers the Polish experience of energy clusters at a broad national level and then at a more specific local level through utilising specific examples.

National experience and key lessons

Since the national regulation for energy clusters was adopted in 2016, there have been two rounds of national certification leading to the establishment of 66 energy clusters across Poland. The Polish Government had originally anticipated that 300 energy clusters would be created by 2030. However, many of the clusters that have been granted certificates have been seemingly slow to develop or have stalled. The likelihood of significant numbers of additional energy clusters remains uncertain and the ambition of creating hundreds of successfully

4 Mataczyńska, Ewa, and Anna Kucharska. Klastry energii: regulacje, teoria i praktyka. Rzeszów: Instytut Polityki Energetycznej im. I. Lukasiewicza, 2020.
5 Renewbale Energy Act (2015) amended in 2021 https://isap.sejm.gov.pl/isap.nsf/download.xsp/WDU20150000478/U/D20150478Lj.pdf
6 Renewable Energy Act (2015) amended in 2021 https://isap.sejm.gov.pl/isap.nsf/download.xsp/WDU20150000478/U/D20150478Lj.pdf
7 Mataczyńska, Ewa, and Anna Kucharska. Klastry energii: regulacje, teoria i praktyka. Rzeszów: Instytut Polityki Energetycznej im. I. Lukasiewicza, 2020.
8 Mataczyńska, Ewa, and Anna Kucharska. Klastry energii: regulacje, teoria i praktyka. Rzeszów: Instytut Polityki Energetycznej im. I. Lukasiewicza, 2020.

functioning clusters by 2030 seems a challenging one. Commentators[9] have noted generic challenges relating to legislation and regulation, financing, strategy, governance, and community support and awareness.

Legislation and regulation

The energy cluster is a uniquely Polish institutional response to the promotion of localised energy generation and consumption. This uniqueness means that it is not covered in EU regulation as part of the Clean Energy Package, as are Citizen Energy Communities (which are explored later in this paper). Its potential organisational heterogeneity and the absence of a legal identity means that comparison and learning from other forms of localised energy generation and consumption, such as Energy Co-operatives, is difficult. Although drafting and signing a cluster agreement between members of energy can be relatively easy, the challenge is in the interpretation and application of legislation and regulation.

Recent research and commentary have observed that members of energy clusters and potential clusters identify a seemingly disparate and complex legislative and regulatory framework that makes comprehension of inter-dependencies and application challenging. Key elements of this framework include the Polish Energy Law, the Renewable Energy Sources (RES) Act, the Procurement Law Act and the Act of Commune Self Government. In the RES Act, one of the main regulatory references for an energy cluster, the existing provisions for a cluster are relatively brief and therefore require interpretation.

In one study (Dragan, 2020)[10], cluster members noted that cooperation with Distribution System Operators (DSOs) needs further clarification and elaboration. In the energy cluster model, charges relating to distribution significantly affect the viability of the cluster. Although the RES Act notes that a DSO needs to conclude an agreement for the distribution of generated electricity, the study notes there are no other provisions in relation to co-operation or lowering distribution rates. If the cluster does not have its own grid, it must enter the distribution network on market terms or use the financial supports provided by the RES Act. In addition, it notes that a cluster is exposed to financial obligations created by the imbalances it causes in the energy system; and does not have recourse to a settlement system like Energy Co-operatives. As is the case with wider European experience, negotiating access to the grid can be a time consuming, costly and bureaucratic exercise.

Dragan (2020) and Liput (2021)[11] observe that given that Public Procurement Law (PPL) may apply to an energy cluster where significant elements of it are controlled by the municipalities, this is a critical area for assessment by public actors. Where the municipalities control more than 50% of the shares or have control of the management body, contracts may have to be awarded by competitive tender. If the price offered by the cluster is higher than that offered by another provider, the contract to supply energy would go to the other provider. There are exclusions to this law, for example contracts may be awarded to entities controlled by the municipalities without going to tender if 90% of the activities of the provider are carried out for local government or entities controlled by it. However, as earlier noted, a seemingly complex legislative and regulatory framework can make comprehension of public procurement implications challenging.

There is also a degree of ambiguity on when clarity will emerge. Dragan (2020) indicates that “energy clusters expect legislative changes to be made in some areas connected with cluster operation”. However, Liput (2021) noted “Although the current PPL is a relatively new act, which has recently replaced its predecessor, minor changes to the PPL are currently undergoing the legislative process. These are cosmetic changes and will not significantly impact the current legal framework.” It is recommended that specific legal advice is taken regarding the implications of PPL on an energy cluster.

Financing

Although a key reason for the establishment of energy clusters was the creation of a financial model that was conducive to cost-effective and cost-efficient generation of clean energy, the reality has been more problematic[12]. Raising the finances for initial capital costs and covering ongoing operating costs have proven an obstacle for many cluster concepts; although falling technology and operating costs in recent years has partially mitigated this issue, especially regarding solar energy. EU funding through the National Fund for Environmental Protection and Water Management (the implementation mechanism for the Infrastructure and Environment Operational Programme, 2014-20) has covered the initial capital costs of a range of energy clusters[13].

9 Including: Wiktor-Sulkowska, Anna, Do Polish Energy Clusters have a Chance to Become Units independent from External Energy Supplies, Journal of Polish Mineral Engineering (2018); Dragan, Dagmara, Legal Barriers to the Development of Energy Clusters in Poland, European Energy and Environmental Law Review, (March 2020); Siudek, Alekasandra and Klepacka, Anna, Energy Clusters in Poland: A Theoretical approach, Annals of Polish Association of Agricultural and Agri-business Economics (2020); Liput, Jacek, Public Procurement 2021 | Laws and Regulations | Poland | ICLG.

10 Dragan, Dagmara, Legal Barriers to the Development of Energy Clusters in Poland, European Energy and Environmental Law Review (2020)

11 Liput, Jacek, Public Procurement 2021 | Laws and Regulations | Poland | ICLG.

12 Wiktor-Sulkowska, Anna, Do Polish Energy Clusters have a Chance to Become Units independent from External Energy Supplies, Journal of Polish Mineral Engineering (2018); Siudek, Alekasandra and Klepacka, Anna, Energy Clusters in Poland: A Theoretical approach, Annals of Polish Association of Agricultural (2020);

13 Siudek, Alekasandra and Klepacka, Anna, Energy Clusters in Poland: A

Critically, the principal business model for energy clusters – higher costs of generation offset by lower costs of distribution to the benefit of consumers– has proven problematic to implement. As previously noted, although a DSO should conclude a distribution agreement with the cluster, there are no other provisions in relation to co-operation or lowering distribution rates (Dragan, 2020). Thus, clusters may be at risk of distributing more expensive energy at market terms or be dependent on the financial supports provided by the RES Act. Also, as noted, a cluster is exposed to financial obligations created by the imbalances it causes in the energy system[14].

Strategy

Although Polish energy clusters are heterogenous in nature - for example, in terms of members, geographic coverage and energy technologies - their broad aims primarily relate to developing cleaner, cheaper energy for consumers, the promotion of energy security, and the stimulation of the local economic and community development and viability. However, analysis has indicated that cluster strategies are often partial, unaligned and overly focused on the desire for cheap energy rather than how such a benefit can be levered for greater socio-economic advantage. Moreover, such strategies should link to other ambitions of the energy system, such as environmental improvement, energy efficiency and demand management. Studies have observed a lack of rigorous conceptual justification in local energy projects[15].

KAPE (The Polish National Energy Conservation Agency) states that a cluster strategy should address the above issues through a document that contains the following components:

- Detailed description of the energy cluster
- Functional scope of the energy cluster
- Principal goals and benefits
- Cooperation with the DSO
- Model of energy balancing
- Financing
- SWOT

Governance

Clusters with many members (public and private) can bring economies of scale and widen the potential scope of benefits within a local area. They can also dilute the vested interests of one or two large members and promote a more collective, collaborative and balanced form of governance.

To this end, Stazkow and Nowacki (2017) note the appointment of an appropriate cluster co-ordinator is critical. The cluster co-ordinator is responsible for developing, animating and managing relations between cluster members, as well as the provision of specialised services to members. Their specific functions usually relate to: energy trading; mediating relations and settlements between producers and consumers; arranging distribution; representing the cluster; and managing its development. It has been noted by commentators that having an overly powerful entity as a cluster co-ordinator can lead to tensions. Therefore, choosing a co-ordinator which will not dominate the cluster requires careful consideration by the members. For example, the successful governance of Baltic Eco-Energy Cluster (BEEC) was ascribed to the appointment of a research body to the role of a co-ordinator and not a large utility company[16].

Community and local stakeholder support and awareness

Although local energy projects do not require community groups / civil society or local enterprises to be members, it has been noted that involving local organisations, enterprises and interested / informed individuals can create economies of scale in demand, enhance innovation and create legitimacy and acceptance of energy transition in localities[17]. In addition, clusters can act as a focal point for discussion on reinvention and development within communities and offer a reference for young people in terms of future employment and opportunities. Many local energy projects place an emphasis on promoting training, education, events and communications in their local communities[18].

Theoretical approach, Annals of Polish Association of Agricultural and Agri-business Economics (2020);
14 Wiktor-Sulkowska, Anna, Do Polish Energy Clusters have a Chance to Become Units independent from External Energy Supplies, Journal of Polish Mineral Engineering (2018); Dragan, Dagmara (2020)
15 Stazkow, Michal and Nowacki, Filip, Clusters in the Renewable Energy Sector in Poland, Managing Global Transitions (2017); Nowakowski, Piotr, Energy Clusters as an example of energy communities, KAPE (2018)

16 Stazkow, Michal and Nowacki, Filip, Clusters in the Renewable Energy Sector in Poland, Managing Global Transitions (2017);
17 Chodkowska-Miszczuk, Justyna and Novotny, Ladislav, Renewable Projects in Peripheries, Regional Studies, Regional Science 7:1 (2020)
18 Furmankiewicz, Marek, Europeanisation of Energy Policy and Area-based Partnerships: Regional diversity in interest in Renewable Energy Sources in local development strategies in Poland, Conference Series Earth and Environmental Science (2020)

Local experience – lessons and good practices

Below are two Polish cases relating to the successful development of energy clusters. One relates to lessons and good practice regarding governance and the other to operationalisation. More cases are available at the request of Gmina of Libiaz.

"Żywiecka Energia Przyszłość" – governance: importance of diverse partnership approach

Żywiec cluster was one of the 33 Pilot and Certified energy clusters selected in the 2018 competition organised by the Polish Ministry of Energy and is considered one of the most dynamic and most recognizable energy clusters in Poland. It was established with an aim of providing sustainable and eventually self-sufficient energy to Żywiec region and to make a positive contribution to the local low-emission economy.

The cluster **integrates the capabilities of local government officials with business entities** to create a cooperation network of various private and public actors. According to the cluster members, the most important value and principle of the cluster is the joint action of local government officials with business, although business is the key investor. On the local government side, there is a wide participation of all local government units – 15 municipalities and a poviat - who have **previous experience** of cooperating together and who are committed to development of the cluster.

Another interesting feature of the governance of the cluster is that an association of municipalities for ecology in Żywiec (Związek Międzygminny ds. Ekologii w Żywcu, ZMGE) acts as a cluster leader. As energy planning and management tasks require a broad range of competences, the experience of ZMGE proves that **cross-municipal cooperation helps to reduce the risks** resulting from the competency gap in local governments (especially smaller ones). It was therefore decided that the duties and tasks of municipalities would be concentrated in one institution that cooperates with other entities of the energy market within the cluster.

Another important element that influenced the development of the cluster was **cooperation with the scientific community**, which has led to good understanding of the latest technological and system trends in the energy sector.

Source: https://www.facebook.com/ZywieckaEnergiaPrzyszlosci/

https://klasterzywiec.pl

ZKlaster – lessons learnt from setting up a successful renewable energy cluster in a coal mining region

Zgorzelec Cluster for the Development of Renewable Energy Sources and Energy Efficiency (Zklaster) is a civil agreement covering 42 entities (including 20 RES energy producers, 1 distribution company with its own power grid, 2 universities and 3 local government units). While local government administration is involved in activities of the cluster and it issued the letter of intent, it was **private investors who initiated the creation of the cluster**. The project was financed from the funds of other cluster members and from a loan obtained on preferential terms. Almost 100% of cluster investments are financed from private funds of entrepreneurs who are cluster members.

Due to the rich deposits of brown coal, the energy industry is the dominant branch of the economy in Zgorzelec. There is an extensive power distribution and transmission system in the area of the Zklaster with one of the largest and oldest lignite-fired power plants - the Turów power plant – in its vicinity. Thus, the **shift to "green energy" has been based on existing infrastructure**, derived from investments in conventional energy sources. An important aspect of the development of the project, which is based on a large complex of PV farms, is the geographical location ensuring good sunlight, as well as high energy awareness of the inhabitants of Zgorzelec.

Nevertheless, at the beginning, the cluster activities were perceived with scepticism by the local population who did not believe that the cluster would be of benefit. It also faced opposition from trade unions in the Turów mine and power plant, who perceived the cluster as an "enemy". Inhabitants of the region have a **strong sense of social identity based around their mining tradition** and they feared losing their jobs due to the energy transition. The breakthrough in the perception of the cluster occurred when the cluster started specific activities, i.e. building renewable energy sources, participating in events, being involved in educating and informing residents about its activities, and demonstrating the operational side, rather than a theoretical concept. The actors closely related to the power plant and the mine are passive via-a-vis cluster activities and are not taking any actions related to phasing out of coal while they wait for a decision from central government. The cluster, on the other hand, has identified an **opportunity to recruit employees when the operations of mines and power plants are shut down**.

Apart from the city of Zgorzelec, the region has had little economic development in recent years and all economic activity is based mainly on cooperation with coal mine and power plant in Turów. However, the mining activities are scheduled to end in 2040. In light of this, the poviat of Zgorzelec recognized the **urgent need to transform the region** from coal towards the development of low-emission industries. Human capital (most of the people employed in the mine, power plant and associated companies are highly qualified engineers and technicians), post-industrial areas and a well-developed power infrastructure are important assets of the region on which ZKlaster has built its success. In addition, ZKlaster strongly supports the idea of **just transition**. In 2019, as part of ZKlaster, the Committee for the Transformation of the Turoszów Region was established. This cooperates with the European Commission's "Platform for Coal Regions in Transition".

Source: https://www.er.agh.edu.pl/projekt-klaster/raporty-publikacje/#Spoleczne_czIII

https://instrat.pl/wp-content/uploads/2019/09/Energia-Miast-Fundacja-Instrat-%E2%80%93-ZIELONY-RENESANS-%E2%80%93-Samorzadowy-podrecznik-transformacji-energetycznej-%E2%80%93-wrzesien-2019.pdf

Bottom-Up Policy Activism in Europe

Changing technologies, changing regulations, changing economics

Over the past decade, the costs of renewable power generation have fallen sharply.[19] This is the result of a combination of steadily improving technologies, economies of scale, competitive supply chains, and the accumulation of experience of renewable energy project developers. These developments have been stimulated by policy frameworks that have encouraged the development of renewable energy sources, not least to address the decarbonisation challenge posed by climate change. At the EU level, the Renewable Energy Directive (REDII) provides a general framework for the promotion of energy from renewables within the Union to ensure the achievement of the binding EU renewable energy target of at least 32% by 2030, with a 38% to 40% of gross final energy consumption target proposed under the EU's latest 2030 Climate Target.

At the same time, growth in the use of renewable energy sources has resulted in the need for greater decentralisation of energy systems, with more distributed supply of energy. This has been enabled by liberalisation of European electricity markets, which has allowed for a massive introduction of renewable energy plants and upended the traditional 'top down' model of a small number of monopoly companies producing, transporting, and distributing electricity via their own grids to end-consumers. Certainly, the future model of electricity production in Europe will be decentralised, with both large and small producers generating electricity or heat at every level of the grid.[20]

In turn, the development of decentralised renewable energy technologies has made direct participation in energy production and management more accessible, including for self-consumption by individuals and collectives, and through the formation of so-called energy communities[21]. Currently, the most common type of energy communities found in Europe involve community owned generation assets that are not targeted to self-consumption, but rather to sales of energy to a supplier with revenues typically shared among members of the community or reinvested in energy projects.[22]

The EU's Clean Energy Package (CEP) leaves the definition of energy communities relatively open to interpretation at the national level, while some currently observed models will fall outside the CEP framework (e.g., where they involve an existing energy company). Consequently, how energy communities are interpreted and transposed into national law, together with regulatory frameworks for other forms of localised energy generation and consumption, will be critical for their viability and for determining their role and contribution at local and national levels. Key considerations that should be adequately addressed in national regulatory frameworks, include[23]:

- **Consumer rights:** to ensure that participants maintain the same rights as other consumers (e.g., with regard to switching supplier and contractual certainty).
- **Balancing and flexibility:** effective market design is required to ensure support for integration of renewables and new technologies (e.g., electric vehicles) into the grid, while reducing costs overall, and not just for those within the energy community (or alternative model); equally, effective management of multiple suppliers to consumers will require clear contractual arrangements and data transparency.
- **Business models and market functioning:** to ensure that local consumption still responds to effective market price signals.
- **Grid ownership, operation, and development:** to ensure that development of energy communities (or alternative models) does not result in inefficient duplication of assets, and that customers receive an adequate level of quality of service.

The shift to renewable power installations (e.g., wind, solar PV, and hydro) implies a fundamental change in the economics of energy production. These technologies are characterised by high shares of up-front investment costs and low shares of operating costs, which are also less volatile than current fossil fuel-based production. Consequently, the dominance of fixed costs changes the financing structure of energy supply, with a greater need to manage economic risks – such as changes in domestic political, administrative or market conditions – that could impact on financing costs of investments. The same applies for renewable energy using

19 For example, NRDC (2021) indicates that, for the US market, costs of wind technologies have fallen be 74% since 2008, while distributed solar has fallen by 60% and utility scale solar by 81%. Source: Natural Resources Defense Council (NRDC), *Revolution Now: the future is here for clean energy technology*, Fact Sheet, April 2021.
20 Agora Energiewende, *European Energy Transition 2030: The Big Picture. Ten Priorities for the next European Commission to meet the EU's 2030 targets and accelerate towards 2050*, March 2019
21 The concept of energy communities was introduced into EU legislation under the Clean Energy Package. See the section on 'EU policy framework', above.
22 Source: Council of European Energy Regulators (CEER), *Regulatory Aspects of Self-Consumption and Energy Communities*, CEER Report, 25 June 2019.
23 *Ibid.*

installations such as batteries, electric vehicles, charging infrastructures, power grids and energy efficiency investments. In turn, this may pose a social challenge to those groups that do not have access to savings or finance to invest in new technologies or energy efficiency measures.[24]

Rationales and aims of local government involvement in clean energy production and distribution and the energy system

The preceding sections have identified some potential benefits from local government and community participation in the production & distribution of clean energy and other elements of the energy system. The types and scale of benefits that can be realised will depend on the extent and form of involvement in the energy sector, together with the adopted business and governance models. The adopted approach will, in turn, be shaped by local challenges, resources, and the policies and regulatory frameworks affecting participation in energy-related activities.

Local participation in clean energy may be motivated by possibilities to achieve better value for money for local consumers and residents. This may come from better quality and more reliable energy supply, savings from reduced energy bills, or more stable and predictable energy costs that enable consumers to better manage their energy expenditures. Similarly, local energy solutions may provide flexibility and the possibility to adapt energy services to the specific needs of consumers and communities. Such benefits may be facilitated by related supporting measures, such as energy efficiency schemes and adoption of smart metering technologies, which can also be part of actions targeted at addressing energy poverty.

Beyond direct benefits to consumers and residents, development of local energy solutions may be motivated by their potential for revenue generation. Revenue generation potential and the associated risks will depend on the operational model chosen by local administration and communities (see below). At one end of the spectrum, land may be leased to a third-party energy company, providing lease payments together with property and income taxes on production. Operational models involving more active involvement of local administration and communities offer opportunities for royalty payments and profit sharing. These revenues can be returned to local communities, for example by contributing to the costs of delivery of frontline services or providing funds that can be reinvested in local projects and programs.

Participation of local government and communities in clean energy projects may be motivated by their job-creation potential, whether during construction phase or subsequent operation and maintenance. Clean energy projects can offer quality and stable job opportunities and provide a motivation for reskilling and specialist training of local workers towards green economy activities. Also, local ownership of projects may facilitate the involvement of local businesses, if tenders for works can be opened up to local suppliers and tradespersons, eventually offering opportunities to gain experience to enter or strengthen positions in clean energy supply chains. Further, local commitments to, and availability of clean energy may represent a ‘selling point’ for attracting investments to the area.

Investments in clean energy production and distribution may be made to improve local environmental conditions, notably by reducing air and water pollution levels, with accompanying benefits to human health and eco-systems. Lower water consumption requirements of clean energy solutions (e.g., solar and wind) compared to fossil fuel power plants may be an additional factor in locations where water scarcity is an issue. Beyond local issues, clean (low carbon) energy solutions bring benefits in terms of avoided CO_2 emissions, and thereby contribute to achieving local (and wider) climate-related and sustainability goals.

Clean energy projects can act as a catalyst for improving climate and environmental awareness among local citizens, while the possibility to demonstrate benefits of clean energy to local communities can help to improve social acceptance of the transition from fossil fuels to clean (low carbon) energy solutions. Moreover, combined with benefits to the community, the possibility to involve local communities in decision making processes and to recognise and respond to their concerns can enhance the social legitimacy and reduce potential opposition to clean energy projects.

The potential benefits accruing from local government and community’s participation in clean energy need to be set against the associated risks and the possible technical, financial, and regulatory challenges. Not least, where local governments or communities take on the role of an energy supplier, they will be faced by the day-to-day business challenges of securing and retaining customers, ensuring the supply of energy at competitive costs, and maintaining an adequate cash-flow to finance their operations.

24 S*ource: Agora Energiewende (2019) op. cit.*

Delivery and governance options for local government and considerations

As noted earlier, the energy cluster is a uniquely Polish institutional response to the promotion of localised energy generation and consumption. Therefore, comparison with other international models for the generation and supply of clean locally sourced energy involving local government is challenging. Even so, consideration of these models can facilitate and provoke Polish public sector actors to assess potential local opportunities, challenges and options in a wider frame of reference. Moreover, they indicate the existence of alternate local government models that, although perhaps not aligning with the Polish regulatory environment, are more readily implemented in a range of contexts and may merit further investigation.

At the international level, there are a wide range of operational models for a municipality to enter the renewable energy market. Despite this variety, all the models are predicated on robust business and financial cases detailing income and expenditure over the project life cycle being developed before a decision is taken by local politicians. The table below summarises the advantages and disadvantages of some of the options for delivery commonly used by local authorities outside Poland. Also, many of the issues that need to be considered by local government policy makers and practitioners are relevant to public actors in Poland.

Table 1: Local Government options for entering the RES market

Options	Potential advantages	Potential disadvantages	Issues for consideration
Self develop on own land	No rental payments No need to acquire land rights and establish clean title No onerous restrictions or lease end date Likely to be within the geographical boundary of the authority Reliable electricity production Stable and predictable electricity cost Could provide an income stream	Funding may have to be diverted from other services Systems need to be professionally designed and maintained to optimise output Design, procurement and construction risks to be managed	Do you have a site which is suitable in terms of size, location and planning policy? Will you be foregoing an existing income stream? Is a suitable grid connection available? Do you have the skills and capacity for the development? Are you prepared to risk the development costs?
Develop a site on third party land	Identify site for its suitability (both size and location) rather than its ownership Wider search area and therefore more chance of finding a viable grid connection or private wire Reliable electricity production Stable and predictable electricity cost Could provide an income stream	Funding may have to be diverted from other services Systems need to be professionally designed and maintained to optimise output Viability model will need to account for landowner rent Asset lifespan limited by lease arrangements Design, procurement and construction risks to be managed	Do you have the capacity to acquire the site on appropriate terms for the development What is the timescale for the land acquisition? Do you have the skills and capacity for the development? Are you prepared to risk the development costs?
Acquire project rights from a third party	Removes development risk, avoiding potentially abortive costs and providing certainty Land rights, accepted grid offer, and planning consent will be in place significantly reducing capacity required in the authority to deliver the project	Funding may have to be diverted from other services Viability model will need to account for the landowner rent and for costs of acquiring the project rights Asset lifespan limited by lease arrangements Design, procurement and construction risks still to be managed	Which available option is most advantageous to the municipality? Are rights available at a scale or location which is suitable for the municipality?
Acquire a completed project from a third party	Removes development and construction risks Land rights, accepted grid offer, planning consent and functioning asset will be in place Private sector developers often prefer to sell post construction and commissioning Build price and quality may be higher due to third party having ongoing relationships with construction companies	Funding may have to be diverted from other services Viability model will need to account for the rent and costs of acquiring project rights, which will be higher as developer has taken on risks Asset lifespan limited by lease arrangements Design, procurement and construction risks still to be managed Municipality cannot drive scale or location of the project	Which available option is most advantageous to the municipality? Are rights available at a scale or location which is suitable for the municipality?
Lease land and enter a supply agreement with a power company	No upfront costs to municipality Provides municipality with access to green energy Income generated from lease of land	Income from lease and savings in energy costs will be less than models where a stake is held No control over future developments	How will costs of lease and power be agreed?
Joint venture (majority control)	Careful choice of partner can bring skills and knowledge to the project Municipality retains control of the assets Project is accountable to the municipality Design, construction and maintenance can be outsourced to partner Upfront costs will be reduced Funders may be reassured with experienced partner on board Have control over operations and decisions Could provide an income stream	Funding may have to be diverted from other sources If operations are outsourced to partner, costs may absorb all the profits Representatives of the municipality on the JV board may face conflicts of interest	Who has ownership of the site? What are the respective voting rights? What future contributions are required? How will profits be shared? How can the partnership be dissolved? Is the complexity of the partnership justified by the project scale?
Joint venture (minority control)	Careful choice of partner can bring skills and knowledge to the project Municipality retains some control of the project Design, construction and maintenance can be outsourced to partner Upfront costs will be reduced Funders may be reassured with experienced partner on board Have some control over operations and decisions Could provide an income stream	Operational costs more likely to be absorbed There will still be accountability but the municipality will have less control Reputational risk Representatives of the municipality on the JV board may face conflicts of interest	How will profits be shared? Does the municipality have a veto on decisions and to what level? How are disputes resolved? How can the partnership be dissolved? Is the complexity of the partnership justified by the project scale?

Models of Energy Communities and Citizens Participation

In addition to the local government models noted above, approaches involving citizens in the generation of renewable energy can increase social acceptance and thus foster energy transition to carbon neutrality. Energy communities, predating the recent EU legislation, can be found across EU in various legal forms and governance models. There are several ways to organise energy communities, which will be determined by the stakeholders involved, resource availability and community demand. The overall mission and objectives of the endeavour will also influence organisational strategy, structure and activities, as well as financing.[25] Depending on the scale of the community energy project and local capacities and capabilities, the governance can be either community-led (e.g., energy cooperative) or hybrid model whereby partnership between commercial developers, community organizations and local authorities may be formed to secure sufficient capital financing while also bringing benefits to local communities.[26] The table below provides an overview of legal structures used by energy communities and lists some of their benefits.

25 https://www.interregeurope.eu/fileadmin/user_upload/plp_uploads/policy_briefs/2018-08-30_Policy_brief_Renewable_Energy_Communities_PB_TO4_final.pdf

26 6 Hanna, R. F. "Community Renewables Innovation Lab: Energy Transition Platform policy briefing." (2017)

Table 2: Overview of possible legal structures for energy communities

Legal structure	Description	Potential benefits
Energy cooperatives	Most common and fast-growing form of energy communities. It is popular in countries where renewables and community energy are relatively advanced and in countries with strong community traditions (e.g. Germany, Sweden). They combine flexibility, public participation based on a 'one member-one vote' principle, and social responsibility.	This type of legal ownership primarily benefits its members (distribution of profits is limited and surpluses are reinvested to support its members and/or the community) Democratic governance (one member-one vote)
Limited partnerships	Governance is usually based on the value of each partner's share, and the voting power will be determined by the stake that each individual puts into the company.	Allows for distribution of responsibilities and generation of profits Liability limited to the share value Suitable for larger projects with high investment volume
Community trusts and foundations	Their objective is to generate social value and local development rather than benefits for individual members. Profits are used for the community as a whole, even when citizens do not have the means to invest in projects (for-the-public-good companies). This ownership model may take a couple of different forms (e.g. Development Trusts in Scotland or Community foundation model in Denmark)	Good model for making sure that returns on investments are used for specific local or community purposes
Housing associations	Non-profit associations that can offer benefits to tenants in social housing, although they may not be directly involved in decision-making. They possess characteristics of a legal entity and can take out loans and undertake projects. Such projects can be financed by adjusting the rents of the tenants. Housing associations can be found in the United Kingdom, Denmark or Sweden.	Suitable for addressing energy poverty As they have a legal entity, the housing association can take out loans and undertake projects (e.g. install solar on roofs)
Non-profit customer-owned enterprises	Legal structures used by communities that deal with the management of independent grid networks. Ideal for community district heating networks common in countries like Denmark	Focus of the enterprise remains committed towards benefiting the local community Any realised profits are given back to consumers through savings on bills
Public utility company	Public utility companies are run by municipalities, who invest in and manage the utility on behalf of taxpayers and citizens. These forms are less common but are particularly suited for rural or isolated areas.	Suitable for rural or remote areas
Public-private partnerships	Local authorities can decide to enter into agreements with citizen groups and businesses in order to ensure energy provision and other benefits for a community. For example, local authorities can enter into agreements with community groups to help realise projects, by making public roofs available for installation of solar panels. Municipalities can also partner with socially or environmentally-minded private enterprises who can provide access to technical expertise, access to additional finance, and business planning.	When partnered with private for profit company, municipalities can get better access to technical expertise, to additional finance, and business planning.

Source: based on JRC (2020) and Roberts, J, Bodman, F and Rybski,R (2014)

Neilston Community Wind Farm, Scotland – example of a Limited Liability Partnership

Neilston Development Trust (NDT), a community-based charity governed by local residents and Carbon Free Developments, a specialised renewables developer company formed a Limited Liability Partnership (LLP) to set up a joint venture - Neilston Community Wind Farm. Carbon Free funded the technical, development, planning and construction aspects of the project, and NDT contributed community consultation and PR. The structure of the joint venture was designed to ensure that the Neilston community secured loan funding to invest in the wind farm and receive a share (28.3%) of the pre-tax profits generated by the wind farm. The four turbine 10MW windfarm was opened in May 2013 and generates 2.5 times the annual electricity requirements for Neilston.

In 2017 after repaying the loans taken out to fund NDT's share of the wind farm and deducting legal costs, NDT sold its shares to Renewables Infrastructure Group (TRIG) and with the proceeds of £2 million it will create a new fund to invest in the long-term development of the local area. Before the sale the joint venture was already £400,000 in profit.

Lessons learnt:

- The community and developer worked closely together to create an **agreement which maximised the mutual benefit from the project** and could be implemented fairly and effectively.
- Partnering with a private company **de-risked the development phase** and allowed the community time to identify sources of finance to fund its equity contribution to the joint venture.
- NDT kept the local community informed of the project's progress through regular website updates, events and other media. The **regular community newsletter** was utilised to share information and opinions were sought at all stages of the process, which also allowed for demonstration of benefits to the wider community.

Source: https://www.localenergy.scot/media/25476/neilston-case-study.pdf https://www.neilstonlegacy.org/about/history/

Bioenergy Village Jühnde, Germany – example of an energy cooperative

Jühnde is Germany's first village to produce heat and electricity by means of renewable biomass (plants in form of silage and wood chips), thus becoming the **first village to be self-sufficient and produce RES with consumers participation**. The system contains a 700kW CHP generator that runs on biogas to produce electricity and a 550kW woodchip boiler to supply heating. It cost EUR 5.2 million, of which EUR 0.5 million came from the investing citizens, EUR 1.3 million from a grant, and the remaining EUR 3.4 million from a bank loan. The biomass plants now produce 70% of the village's heating demand and 200% its electricity demand. The bioenergy facility is owned locally and collectively by the people of Jühnde. Residents are able to buy shares in the co-operative company that owns the facility and nearly 75% of Jühnde's inhabitants are members of this company, which means that the consumers of energy are also the producers of that energy. To become a member of the cooperative and have voting rights a fee of EUR 1,500 must be paid. The investment money was used to connect cooperative members' houses to the district heating.

Lessons learnt:

- The **University of Göttingen played a key role** in initiating the project and providing support throughout its development. Political support also proved vital, with the Mayor's role being particularly important in motivating local participation.
- Co-operatives are relatively widespread in Germany, and **village residents had an awareness of this business model** and shared belief in its value, which contributed to the success of the initiative.
- **Interpersonal trust and social cohesion** between residents in the village was strong, helping them to work together to development the project.

Source: https://enercommunities.eu/course/bioenergy-village-juhnde/

https://www.ieabioenergy.com/wp-content/uploads/2018/01/biogas_village.pdf and JRC (2020)

Duurzaam Ameland, the Netherlands – an example of public-private partnership

In 2006, public and private parties (municipality of Ameland, GasTerra, NAM, Eneco) agreed to jointly and individually invest in projects to contribute to the energy transition of Ameland and to stimulate sustainable economic growth and social entrepreneurship with the formalization of a covenant, Duurzaam Ameland. Between 2006 and 2018 the covenant expanded (Phillips, Alliander, EnTrance, TNO) and 8 large, innovative energy projects were realized. The **use of a succession of covenants** between the municipality and the private parties allowed for a long term and robust collaboration (however, not every covenant partner has contributed to the realization of each project). Key in this partnership was a **win-win-win approach** whereby companies can pursue their commercial goals while contributing to Ameland region development and the general energy transition. While large investments were made by private companies (the municipality's financial contribution was relatively small), the **municipality played a leading role** in the initiative, both by strong leadership of the former Ameland mayor and the facilitation by the municipal **Energy Transition team.**

Lessons learnt:

- **Decision-making** in the Duurzaam Ameland initiative was rather **informal, ad-hoc and exclusive**, ie local parties were not part of this process. This top-down, informal and ad-hoc character of the decision-making process has worked effectively at the start of the energy transition to realize innovation projects. It allowed parties with the ability to invest to make decisions based on their individual interests, without complete consensus. Currently the **covenant faces the challenge to adapt its decision-making approach to more inclusive one**. An integral energy transition plan requires an integral decision-making process in which a diverse set of knowledge, expertise and skills is represented, including local participation.
- The Energy Transition team of the municipality consisting of a coordinator, communication advisor and energy engineer has been crucial to the success of the energy transition of Ameland municipality. The team takes on the responsibility in the covenant to coordinate and facilitate the collaboration, to substantially contribute to the realization of innovation projects and to externally communicate the endeavours of the covenant.

Source: https://repository.tno.nl/islandora/object/uuid%3Ad19dd009-9d35-46a8-83db-cc839b99dcb9 and JRC (2020)

As presented in the table above, a number of different legal structures are possible to form energy communities, though the exact details and requirements will vary from country to country. Boxes below present some concrete examples of different ownership and governance models and draw some lessons learnt from them.

Linking Community Development with Energy Transition

In developing a local renewable energy strategy and initiative, it is usually important to engage with the wider community. In addition, by encouraging micro-generation at a business, organisation and household level, benefits can be secured for the whole community. In addition, other benefits can relate to:

- Developing acceptance, consensus and legitimacy for energy transition
- Creating economies of scale in terms of demand and organisational capacity
- Identifying and creating more socio-economic opportunities
- Creating community capacity and resilience

An example of this can be found in Loos-en-Gohelle[27], a town of 7000 inhabitants located in the North of France. The city was deeply affected by coal mining industries which closed in the 1980s. With strong political support from its mayors, the town has since chosen the road towards renewable energy through strong citizen involvement. It is now considered a "pilot city for sustainable development" in France.

In the village of Feldheim[28] in Brandenburg, Germany, co-operation between the citizens, businesses, local government and a renewable energy project developer has led to the village becoming self-sufficient in energy through private local heating and electricity grids.

27 CaseStudyLoos-en-Gohelle-FR.pdf (renewables-networking.eu)
28 Home - Neue Energien Forum Feldheim (nef-feldheim.info)

Lessons for Libiaz and the Powiat

From the above analysis of local energy transition experiences and research, several broad lessons for Libiaz and the powiat of Chrzanow can be identified. Although the Polish legislative and regulatory context for energy clusters is unique, the experience of communities both inside and outside Poland provide useful lessons. These lessons relate to: strategy; legislation, regulation and financing; the involvement of citizens; and governance and capacity.

Strategic framing

As noted, commitments to global efforts to reduce greenhouse gas emissions linked to new technologies and regulatory approaches offer opportunities for significant positive changes in the way in which energy is locally supplied, stored and used in communities.

See the bigger opportunity: The present and future energy needs of a community are most usefully considered in a 'whole system' approach. The overlapping nature and consequences of how power, heat and transport are used should ideally be considered holistically, and an integrated assessment of requirements made for the short and longer terms. Libiaz and the powiat of Chrzanow's ambition to create an energy cluster based on solar farms for the supply of public and municipal buildings would benefit from taking a broader strategic view of the changing nature of local energy demand and supply and the local energy system (e.g., energy efficiency, storage, behavioural change). This could also include widening the number of stakeholders (members) involved in the process to increase potential local green energy demand and potential supply via new energy technologies and unlocking additional local assets (land, buildings, knowledge, skills, funding etc).

By adopting a 'whole system' approach, solar technologies will sit alongside other technologies (e.g., geothermal) and initiatives (e.g., energy efficiency) that can be progressed if the realisation of the solar energy cluster continues to prove challenging. As regards the current narrow focus of the energy cluster, ownership issues, contamination, historic structures, and other unique site characteristics, may add additional time and costs relating to increased assessment/ feasibility, engineering and construction considerations.

Optimise the potential benefits: It is evident that intervening in the local energy system is a resource

intensive exercise for public actors but one with a potentially significant range of benefits. These benefits can relate to four broad interconnecting categories: developing distributed, cleaner, cheaper energy for consumers (not only public actors); the promotion of energy security and efficiency; the stimulation of local economic and community development; and the creation of a mandate and consensus for wider community transition. Tangibly, this can create cost savings and/or income generation through green power generation (dependent on distribution agreement etc.) and financial savings through energy efficiency and behavioural change. It can also lead to the creation of jobs within the local community. For example, solar PV and other RES technologies create jobs for electricians, technicians and fitters, whilst jobs in management, administration and governance can be created in the development of a new local energy system. Notably, developing a local energy system can be a catalyst for community reinvention, generating new positive narratives about the community's future, in the locality and also regionally, nationally and internationally.

By developing a better understanding of the benefits, a more realistic Cost to Benefit Ratio can be estimated. In terms of costs, alternate models of delivery beyond energy clusters should be considered (see later section).

Finally, although there are benefits, there are also evident risks e.g., in terms of financing investments and ensuring adequate revenues to cover the upfront costs of investment and the ongoing operating costs, if it is the municipality that makes these investments. The issue of risk will be returned to in a later section.

Develop a strategy – "the whole should be greater than the sum of the parts": A strategy can act as a critical reference for local, regional and national stakeholders and funders / investors, providing confidence in a planned, co-ordinated longer-term approach by the gminas and the powiat (and other stakeholders / members) and transparency of intent.

At the most basic level the strategy could explain the relationship of the development of the solar farms with the wider components of the Coalition for a Clean Tomorrow. The strategy could also set the ambitions of the gminas and powiat within a regional context for Western Malopolska and the voivodeship e.g., the Regional Climate and Energy Plan, Regional Just Transition Plan; thereby, promoting complementarity, co-ordination and transparency across projects and geographies. At a more sophisticated level the strategy, could explain how the bigger opportunity of a "whole system' approach and a wider set of benefits can be realised, thereby fostering synergies and economies of scale across the powiat and the local economy.

To develop such a strategy, the authorities would require:

- A vision for a "whole system' approach that has political and community acceptance at the level of the powiat
- Identification and engagement of a wider set of stakeholders (members)
- Appropriate, designated staff (skills and knowledge), financial resources and access to external legal and technical expertise
- Basic data on current energy usage, energy spend, energy procurement, and energy profiles of buildings, community behaviours, etc
- Information on possible sources of funding for implementation – loans, grants, feed in tariffs and subsidies etc - and broader understanding of potential commercial models
- Acceptance that the strategy represents a medium to long term process of change

However, if the need to pursue the development of the solar farms is an urgent political and commercial priority and an opportunity presents itself to progress the energy cluster in the immediate term, authorities should aim to develop the strategy in parallel.

Critically, given the modest capacity of gminas and powiats and the requirement for specialised legal, financial and technical advice in creating a local energy system and the need to place such systems in a wider regional context, there is a potential case for the Marshal's Office having a role in facilitating or advising on this process. The involvement of the Marshal's Office is also noted in the section on Governance and Capacity.

Finally for additional reference, Cornwall Council (UK) developed a green energy strategy in 2009 with the aim of energy self-sufficiency by 2025. It calculated its total usage at 140,00MWh (electricity, gas, oil) and aimed to reduce usage by 10% over the period; to be delivered by behaviour change and energy efficiency The current action plan (2019) sets out the plans to become carbon neutral by 2030[29].

29 Climate Change Plan: creating the conditions for change through direct action

Legislation, regulation and financing

A range of regulatory issues make progressing energy clusters a challenging undertaking for Libiaz and the powiat of Chrzanow. As noted, members of energy clusters and potential clusters identify a seemingly disparate and complex legislative and regulatory framework that makes comprehension and resolution of inter-dependencies and application challenging. For example, cluster members have noted that cooperation with Distribution System Operators (DSOs) needs further clarification and elaboration, as does the legislation relating to public procurement.

Regulation and financing are two sides of the same coin: In both Germany and the UK, a lack of clarity and integration regarding regulatory frameworks was previously a deterrent to public and private investments in alternate green technologies[30]. Although new EU operational programmes and instruments may part finance the capital costs of RES technologies, a challenging regulatory environment will suppress investment in general.

Review legal and commercial options to minimise risk: It may be prudent (potentially in the context of developing a local strategy) that the powiat and gminas explore and identify more certain legal and commercial structures with a lower element of risk for delivering their ambitions. As noted, although there are evident benefits, there are also evident risks e.g., in terms of financing investments and ensuring adequate revenues to cover the upfront costs of investment and the ongoing operating costs, if it is the municipality that makes these investments.

Table 1 in this interim report - Local Government Options for Entering the RES Market – noted seven common tried and tested options used by local government in a range of countries that may have transferable lessons for Libiaz and the powiat of Chrzanow. There may also be lessons to be drawn from the legal structures of energy communities and the examples which were provided earlier in this report.

The powiat and gminas should map respective risks of their preferred option(s) and decide whether adequate mitigation measures can be adopted to give sufficient confidence to allow progression.

Involving citizens and other local actors

Strength in numbers: The literature and the identified cases indicate that although local energy projects do not require civil society or local enterprises to be stakeholders (members), involving local organisations, enterprises and skilled and knowledgeable individuals can bring benefits that would also be applicable to Libiaz and the powiat of Chrzanow. Also, by only having a small number of stakeholders involved, risk is concentrated across a small number of actors. However, if there are more stakeholders, risk can be more effectively distributed.

Additional benefits: By involving more local stakeholders (members) benefits can be further optimised for the local authorities and the wider community and economy, relating to: creating economies of scale in demand; enhancing energy system innovation; creating legitimacy and acceptance of energy transition amongst citizens; identifying and creating more socio-economic opportunities (enterprise, education and skills); and creating community capacity and resilience.

Building a bridge from the past to the future: Local energy transition initiatives (including energy clusters – see ZKlaster and Żywiecka Energia Przyszłość cases) can act as a focal point for discussion on reinvention and development within communities and offer a reference for young people in terms of future employment and opportunities. Many local energy projects place an emphasis on promoting awareness, behavioural change, training, education and communications in communities.

Governance and capacity considerations

Diverse membership is an asset: Clusters with many members (public and private) can bring economies of scale, create capacity and widen the potential scope of benefits within a local area. They can also dilute the vested interests of one or two large members and promote a more collective, collaborative and balanced form of governance. A hallmark of successful Polish energy clusters identified in the report (BEEC, ZKlaster and Żywiecka Energia Przyszłość) was the involvement of a large number of diverse actors from the private, public and education/research sectors. In the case of Zklaster in southern Poland, only 3 out of 42 members were local government entities and in the case of the BEEC cluster, in northern Poland, only 14 of the 174 members were local government entities.

and a new form of place-based leadership for Cornwall to become net carbon neutral Climate Change Action Plan (cornwall.gov.uk) , A Guide to Solar PV projects in Local Government and the Public Sector (Stephen Cirell, 2012)
30 Journal of Offshore wind, 2014

Linking governance and capacity: The development of an appropriate cluster co-ordinator / leadership model is critical, not only for promoting good governance and legitimacy but also for ensuring appropriate capacity. Żywiecka Energia Przyszłość created an association of municipalities for ecology in Żywiec (Związek Międzygminny ds. Ekologii w Żywcu, ZMGE) to act as a cluster leader. As energy planning and management tasks require a broad range of competences, the experience of ZMGE proves that cross-municipal cooperation helps to reduce the risks resulting from the competency gap in local governments (especially smaller ones). Duties and tasks of the municipalities were concentrated in one institution that cooperates with other entities of the energy market within the cluster. Additionally, the successful governance of Baltic Eco-Energy Cluster (BEEC) was ascribed to the appointment of a research body to the role of a co-ordinator and not a large utility company or dominant actor.

Finally, given the modest capacity of gminas and powiats and the requirement for specialised legal, financial and technical advice in creating a local energy system and the need to place local energy systems in a wider regional context, there is a potential case for the Marshal's Office having a role in facilitating or advising on this process.

A Potential Role for the Marshal's Office

As noted above, it may be appropriate for the Marshal's Office to engage with and assist the gminas and powiats of Western Malopolska (and potentially the entire Voivodeship) in assessing the options and steps for local government involvement in the production & distribution of clean energy and other elements of the energy system. The Marshal's Office could also subsequently assist the gminas and the powiats in the development and implementation of demonstration initiatives. Such support would demonstrate a commitment at the regional and local levels to energy transition and could act as a national example.

The Marshal's Office assistance could relate to a range of issues and activities. Illustrative examples are noted below:

- The Marshal's Office could undertake a survey in Western Malopolska (or across the Voivodeship) to assess: the ambitions and plans of gminas and powiats regarding the production & distribution of clean energy; the related barriers that local government actors face; existing types of capacity and specialisation within local government; and areas of assistance required by these public bodies.
- In turn, the Marshal's Office could map and develop an inventory of actual and potential initiatives in Western Malopolska (or across the Voivodeship) and identify opportunities for synergies and networking to promote co-ordination, knowledge sharing, effective use of public resources and skills, and economies of scale amongst public actors.
- Moreover, developing a map and inventory would permit strategic analysis, framing and narration of the green energy opportunity at the level of the Voivodeship. Such strategic contextualisation would permit greater awareness of the opportunity amongst national and regional policy makers and potential investors and Distribution System Operators (DSOs). Furthermore, this contextualisation would permit an overview of the potential collective contribution of such green energy initiatives to transition and socio-economic development in Malopolska.
- The Marshal's Office could promote the co-ordination of local government interface with potential investors and DSOs to optimise the potential benefits for and consistency of experience of gminas and powiats in their dealings with these actors. This could minimise the risk of multiple, fragmented relations between public and private actors and strengthen the collective position of public actors.
- Based on a deeper understanding of collective need amongst gminas and powiats, the Marshal's Office could use its existing internal capacity or contract external specialised support to provide legal, financial, economic and technical guidance. Either approach could rationalise and enhance resource deployment amongst public sector actors in the Voivodeship, avoiding the duplication of specialised capabilities at the local level and promoting co-ordination and economies of scale in public procurement processes.
- In addition to specialised support, standard materials could be developed in relation to potential models for the production & distribution of clean energy by local government (pros and cons) and good practice. These materials could be complemented by a programme of workshops.
- Finally, the Marshal's Office could work directly with a small number of early-stage initiatives to ensure the development and delivery of a range of demonstration projects to inform and inspire other gminas and powiats.