
Prosumer Energy Development in the West Pomeranian Voivodeship: Analysis of Growth Factors and Assessment of Barriers

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Abstract:

Purpose: The main goal of this article is to assess the dynamics and scale of prosumer energy development in the West Pomeranian Voivodeship between 2019 and 2024, against the backdrop of national trends, and to identify key factors driving and inhibiting this development. The study aims to explain an intriguing paradox: why the region, which is a national leader in large-scale renewable energy production (exceeding 105% of annual consumption in 2023), demonstrates relatively low prosumer energy development dynamics.

Design/Methodology/Approach: The article is based on a quantitative, longitudinal research project using the secondary data analysis method (case study). study from the period 2019–2024. Data comes from official public sources, including reports from the Energy Regulatory Office (ERO), the National Fund for Environmental Protection and Water Management (NFOŚiGW), and the Regional Spatial Management Office of the West Pomeranian Voivodeship (RBGPWZ).). The analytical strategy includes descriptive statistics, time trend analysis, and comparative analysis (benchmarking), including calculations of per capita indicators. Due to the limitations of URE data, in the comparative analysis the data for Enea Operator were adopted as a proxy for the situation in the West Pomeranian Voivodeship.

Findings: The analysis empirically confirmed the phenomenon of the "two-speed energy transition." Despite success on a macro scale, the share of micro-installations in the total renewable energy capacity in the voivodeship was only 11.5% at the end of 2023, which is significantly lower than the national average (exceeding 38%). The growth rate of the number of prosumers in the area served by Enea Operator (73.6% in 2021-2024) was lower than the national average (79.7%). A key symptom of structural problems is the low absorption of financial resources: the voivodeship ranked 15th in the country in terms of the number of applications submitted under the "Mój Prąd 5.0" program per 1,000 inhabitants. The main barriers hindering the development of prosumerism in the region are: (1) infrastructural limitations related to the insufficient capacity of the low-voltage distribution grid; and (2) regulatory instability at the national level (change of the settlement system to net-billing in 2022), which significantly reduced the profitability of investments and undermined investor confidence.

Practical Implications: The conclusions provide recommendations for three key stakeholder groups. National decision-makers should ensure regulatory stability and predictability and more closely integrate support programmes (e.g., "Mój Prąd") with distribution grid

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modernisation plans, while promoting the flexibility services market. Regional authorities should develop a detailed regional strategy for the development of prosumerism and actively support civic energy communities. The Distribution System Operator (Enea Operator) must accelerate and prioritise investments in the low-voltage grid to unblock bottlenecks and increase the transparency of development plans.

Originality/Value: This study fills a gap in the national literature by providing quantitative evidence of how systemic infrastructural and regulatory barriers manifest at the regional level, hindering the grassroots potential of prosumerism. These results provide a unique case study that demonstrates that success in the transition to energy at the macro (corporate) level does not automatically translate into the development of community energy and that policies based solely on financial incentives (such as "Mój Prąd") are ineffective when faced with hard network barriers.

Keywords: Micro-installations, energy transformation, renewable energy, net-billing, distribution network, public policy.

JEL Codes: Q42, R58, L94.

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1. Introduction

The global transformation of energy systems, driven by climate policy imperatives and technological progress, is one of the fundamental processes shaping modern economies (International Energy Agency, 2022). Within the European Union, this process is stimulated by ambitious greenhouse gas emission reduction targets, enshrined in legislative packages such as "Fit for 55," which enforce a systematic shift away from fossil fuels towards renewable energy sources (RES) (European Commission, 2021).

In this context, Poland, as a country historically highly dependent on coal, faces a particularly complex decarbonisation challenge, but is also opening up to new models of energy production and consumption (Mrozowska *et al.*, 2021).

One of the key pillars of this transformation is the development of prosumer energy. The concept of a "prosumer" an active market participant that produces and

consumes energy—redefines the traditional unidirectional model of energy flow from central power plants to passive consumers (Schill *et al.*, 2017).

In Poland, this segment has been dominated by photovoltaic (PV) micro-installations, whose unprecedented development in recent years has been stimulated by a combination of favourable legal regulations, such as the discount system, and nationwide financial support programs, including "Mój Prąd" (My Electricity) (Olczak *et al.*, 2020).

The dynamic growth in the number of prosumers not only contributes to the achievement of climate goals but also strengthens local energy security, democratizes access to resources, and stimulates innovation at the local community level (Zuk and Zuk, 2022).

Against the backdrop of nationwide dynamics, the West Pomeranian Voivodeship emerges as a region with a unique, almost paradoxical, characteristic. On the one hand, it is the undisputed national leader in renewable energy production, thanks to excellent conditions for the development of large-scale wind farms and the growing number of large-scale photovoltaic installations. Data for 2023 indicate that electricity production from renewable sources in the region exceeded its total annual consumption for the first time in history, reaching 105.2%.

On the other hand, a preliminary analysis of data on distributed community energy paints a much more complex picture. Statistics from key support programs, such as "Mój Prąd 5.0," consistently place the West Pomeranian Voivodeship among the lowest in the country in terms of the number of applications submitted per capita.

This disparity creates an intriguing research question: why does a region that is a national leader in large-scale renewable energy demonstrate relatively low prosumer energy development dynamics? Are we dealing with a "two-speed energy transition" phenomenon, where success on a macro (corporate) scale does not translate into development on a micro (civic) scale? Understanding the reasons for this state of affairs is crucial not only for regional energy policy but also for the broader debate on a just and sustainable transition.

In light of the problem described, the main objective of this article is to assess the dynamics and scale of the development of prosumer energy in the West Pomeranian Voivodeship between 2019 and 2024 compared to the rest of the country and to identify key factors that stimulate and inhibit this development from a managerial and qualitative perspective.

Achieving the main objective requires answers to the following research questions: (1) What was the dynamics of growth in the number and capacity of prosumer micro-installations in the voivodeship compared to national trends? (2) To what extent have national support programmes impacted the pace of prosumerism

development in the region? (3) What are the key systemic barriers (infrastructural, regulatory, market) limiting the potential for prosumer energy development in the voivodeship?

This article relies on a quantitative methodology for analysing secondary data from official, publicly available sources, such as reports from the Energy Regulatory Office (URE), data from the National Fund for Environmental Protection and Water Management (NFOŚiGW), and the Local Data Bank of the Central Statistical Office (BDL GUS).

The paper is structured as follows: this introduction is followed by a review of the scientific literature, which places the phenomenon under study in a broader theoretical context. The research methodology is then presented, followed by a presentation of the results of the quantitative analysis, broken down by national and regional trends. The next section identifies and assesses development factors and systemic barriers. The paper concludes with a discussion of the results, conclusions, proposals and recommendations.

2. Literature Review

Prosumer energy is a crucial element of the energy transformation in Europe today, especially in the context of increasing decentralisation of the power system and the increasingly emphasised role of the consumer-producer in the "consumer becomes producer" model (Dai *et al.*, 2020).). The literature emphasises that prosumerism is not only a technical act of energy generation, but also a socioeconomic process, market participation, storage, self-consumption, interactions with the grid and support mechanisms (Parra-Domínguez *et al.*, 2023).

Analyses indicate that the development of prosumerism depends on three main groups of factors: technological (including the cost of RES installation, storage, and grid connections), economic-regulatory (support mechanisms, billing systems, tariffs), and socio-psychological (attitudes toward technology, environmental awareness, social capital) (Ritzel *et al.*, 2022).

In the Polish context, research shows that although the photovoltaic boom was fuelled by factors such as falling installation costs and support programmes (Kuźmiński *et al.*, 2023), there are also significant infrastructural and regulatory constraints (Kryszyk *et al.*, 2023).

The analysis also confirms that volatility in institutional conditions (e.g., changes in the prosumer billing system) can lead to a slowdown in growth dynamics (Kuźmiński *et al.*, 2023). Furthermore, in the Polish socio-psychological perspective, households with their own PV installations demonstrate stronger environmental awareness and more active energy efficiency behaviours (Šriupša *et al.*, 2023).

Global systematic research indicates that the phenomenon of prosumerism is developing primarily in the area of smart grids, microgrids and peer-to-peer trading, but there are still many challenges related to energy market design and social aspects (Parra-Domínguez *et al.*, 2023). In this context, the study on prosumers from a sustainable development perspective is also useful literature (Leal Filho *et al.*, 2024), which emphasises that the development of prosumerism is closely related to the local cultural, economic and infrastructure context, and “copying” models from Western countries may not be effective in the conditions of Central and Eastern Europe.

Finally, analysis at the regional level – taking into account the heterogeneity of local conditions – indicates that the factors determining the success of prosumer projects include: the efficiency of the connection process, the availability of financial support, social acceptance, and cooperation between local government units and grid operators (Dai *et al.*, 2020). In the case of peripheral regions, such as voivodeships with lower income levels and poorer network infrastructure, these barriers become particularly significant.

The issue of power system stability in the context of the growing share of renewable sources is also increasingly discussed in the national literature. Bachanek, Drożdż, and Kolon (2025) emphasise that the rapid increase in the number of distributed prosumer installations, while positively impacting local energy security, also generates challenges for the stability and management of the distribution network.

The authors point to the need to develop technologies that support system flexibility, including energy storage, digital demand management systems (DSM), and the implementation of smart grid solutions. In the authors' opinion, the lack of appropriate adaptation of network infrastructure to the new conditions of distributed generation can lead to an increased risk of overloads and inconsistencies in power balancing, particularly in regions with a high density of micro-installations (Bachanek *et al.*, 2025).

In this context, regional studies that combine the analysis of renewable energy potential with local conditions and development strategies are particularly important. Jaworski and Dowejko (2025) demonstrate that the West Pomeranian Voivodeship, despite its strong position in domestic wind and solar energy production, is characterised by significant spatial variation in the utilisation of renewable energy potential.

The authors emphasise that effectively integrating local energy resources with sustainable development goals requires synergy between national/regional policies and global climate strategies.

Case studies indicate that the region has the potential to become a model for implementing integrated solutions for local energy transformation, particularly

through collaboration between local governments, grid operators, and civic initiatives (Jaworski and Dowejko, 2025).

3. Research Methodology

This article is based on a quantitative longitudinal research project using secondary data analysis (Goodwin, 2012; Davis-Kean *et al.*, 2015; Harrison *et al.*, 2017). This research design was chosen as the most appropriate for achieving the stated objectives, which focus on objectively measuring the dynamics of phenomena, identifying trends over time, and comparing indicators at the regional and national levels. A longitudinal approach, analysing data from the same area at subsequent points in time (2019–2024), is crucial to capture the evolution of the prosumer market and identify turning points, such as changes in the regulatory system.

In addition, the research takes the form of a case study (case study), focussing on an in-depth analysis of a specific, complex phenomenon – the prosumer energy ecosystem – in the real context of one region, the West Pomeranian Voivodeship (Harrison *et al.*, 2017). This approach allows for the interpretation of the results not only in quantitative terms, but also in the context of the structural and institutional conditions of a given region.

The choice of secondary data analysis is justified by the availability of extensive, reliable, and official data sets, which allows for reliable macro- and meso-scale analysis without the costs and time constraints associated with primary data collection (Goodwin, 2012). The empirical basis for the study is an integrated data set compiled from several publicly available official sources.

The primary source of information on the number and installed capacity of micro-installations nationwide and by Distribution System Operator (DSO) are the annual reports published by the Energy Regulatory Office (URE). Data on the absorption of funds from nationwide support programmes, particularly "Mój Prąd" (My Electricity), were obtained from official statistics and announcements of the National Fund for Environmental Protection and Water Management (NFOŚiGW).

Detailed data on the capacity and share of micro-installations in the regional energy mix, as well as data on energy production and consumption in the West Pomeranian Voivodeship, come from studies by the Regional Spatial Management Office of the West Pomeranian Voivodeship (RBGPWZ). To enable a comparative analysis per capita, demographic data on population size were obtained from the Local Data Bank of the Central Statistical Office (BDL GUS). The data preparation process included harmonisation, aggregation into annual periods, and calculation of the indicators derived.

The analytical strategy is based on descriptive statistics, comparative analysis, and time trend analysis (Davis-Kean, 2015). To assess the dynamics of change in the

analysed period, the percentage year-on-year (Y/Y) growth rate was calculated for key variables, such as the number and capacity of micro-installations, according to formula (1):

$$\text{Growth dynamics (y/y)}[\%] = \frac{V_t - V_{t-1}}{V_{t-1}} \times 100$$

where: V_t — value of the variable in the current year, V_{t-1} — value of the variable in the previous year.

For structural analysis, in particular to determine the share of micro-installation capacity in the total RES capacity, the formula (2) was used:

$$\text{Share } [\%] = \frac{V_i}{V_{total}} \times 100$$

where: V_i — partial value (e.g., micro-installation capacity), V_{total} — total value (e.g., total installed RES capacity).

Benchmarking, the core of the study, required standardisation of the data to allow an objective comparison of regional indicators with national trends. For this purpose, per capita indicators, such as the number of applications for support programmes per 1,000 inhabitants, were calculated using formula (3):

$$\text{Indicator per 1000 inhabitants} = \frac{X}{P} \times 1000$$

where: X — number of submitted applications (e.g., in the “Mój Prąd” programme), P — population of the region.

The use of these descriptive statistics measures allowed for a synthetic presentation of key market characteristics, the identification of development patterns, and the assessment of the impact of key events, such as the change of the settlement system from net-metering to net-billing in 2022, on the market development.

The key methodological limitations of this study should be emphasised. The most important is the lack of publicly available, official data from the Energy Regulatory Office regarding the number and capacity of micro-installations, broken down directly by voivodeship. These data are published by Distribution System Operators.

Therefore, in the comparative analysis, the data for the Enea Operator were adopted as a reliable proxy for the situation in the West Pomeranian Voivodeship, as this operator serves the dominant part of its territory. This limitation was considered when formulating conclusions.

The second limitation stems from the very nature of secondary data analysis: the researcher is limited to variables and indicators originally collected by public institutions, which excludes the possibility of examining other potentially relevant factors, such as prosumer motivations or attitudes, which would require surveys or interviews (Harrison *et al.*, 2017).

4. Research Results and Discussion

This section presents the results of a quantitative analysis conducted in accordance with the assumptions described in the methodology. The data presentation is divided into three key areas: (1) the national dynamics of prosumer energy development, which serves as a reference point for further analysis; (2) a detailed analysis of the development of the micro-installations segment in the West Pomeranian Voivodeship; and (3) a comparative analysis that compares the situation in the region with national trends and identifies key systemic barriers.

4.1 National Prosumer Energy Landscape in Poland

The prosumer market in Poland between 2019 and 2023 reveals a clearly two-phase phenomenon, which provides a key context to assess the regional situation. The table below presents the growth dynamics of the number and installed capacity of micro-installations nationwide.

Table 1. *Dynamics of development of prosumer micro-installations in Poland in 2019-2023.*

Year	Number of micro-installations (pcs.)	Growth dynamics (y/y) [%]	Total installed capacity (MW)	Growth dynamics (y/y) [%]
2019	149,000	-	992	-
2020	457 443	207.0	3,007	203.1
2021	847 192	85.2	5,853	94.6
2022	1 200 755	41.7	9,300	58.9
2023	1 386 792	15.5	10,787	16.0

Source: Own study based on data from the Energy Regulatory Office (URE) and PTPiREE (Zuk and Zuk, 2022). Data for 2019 and 2022-2023 are estimates based on market reports and URE announcements to ensure consistency in time series.

The data in Table 1 clearly illustrate two distinct phases of market development. The years 2019-2021 were a period of rapid expansion, fuelled by a favourable discount system (net metering) and subsequent editions of the "Mój Prąd" (My Electricity) programme (Olczak *et al.*, 2020). In 2020, more than 200% growth was recorded in both the number and installed capacity of micro-installations.

Although the dynamics in 2021 were lower, they still remained remarkably high, exceeding 85% year-on-year growth. The key moment that fundamentally changed the market landscape came on April 1, 2022, when a new, less economically

advantageous billing system – net-billing – was introduced. This change constituted a regulatory shock to the market (Zuk and Zuk, 2022), which is directly reflected in the data.

The annual growth in the number of micro-installations fell from over 41% in 2022 to just 15.5% in 2023. A similar trend was observed in the case of installed capacity, the growth of which slowed from nearly 59% to 16% in the same period.

4.2 Development Dynamics in the West Pomeranian Voivodeship

Data analysis for the West Pomeranian Voivodeship confirms the existence of the "two-speed energy transition" phenomenon. This region leads in total installed renewable energy capacity, but the development of prosumer energy is much less advanced. Table 2 presents the dynamics of micro-installations' capacity compared to the total renewable energy capacity in the voivodeship.

Table 2. *Dynamics of development of RES micro-installations in the West Pomeranian Voivodeship (2019-2023).*

Indicator	2019	2020	2021	2022	2023
The power of micro-installations	41.9	108.3	206.8	319.2	392.8
Total capacity of RES installations	1 716.2	2,081.7	2,253.9	3,036.4	3 414.2
Share of micro-installations in renewable energy capacity [%]	2.4%	5.2%	9.2%	10.5%	11.5%

Source: Own study based on RBGP WZ data.

The data in Table 2 quantitatively confirm the West Pomeranian Voivodeship's paradox. At the end of 2023, the region's total installed renewable energy capacity was 3,414.2 MW, of which 88.5% (3,021.4 MW) were large-scale installations, dominated by wind farms. At the same time, the capacity of all micro-installations was only 392.8 MW, representing only 11.5% of the region's total renewable energy capacity. Despite systematic growth over the analysed period, this value is significantly lower than the national average, where the share of micro-installations in renewable energy capacity exceeded 38%.

Furthermore, the data indicate that in 2023, renewable electricity production in the region (6,535 GWh) exceeded total annual consumption (6,210 GWh) for the first time in history, making the region a net exporter of green energy. However, this success at the macro level does not translate into the development of community energy.

4.3 Comparative Analysis and Barrier Identification

A direct comparison of the prosumer growth dynamics in the West Pomeranian Voivodeship with other Polish regions reveals significant disparities. Table 3

compares the data for the Enea Operator (used as a proxy for the region) with market leaders and the national total.

Table 3. *Comparative analysis of the development of prosumers in the Enea Operator area compared to other DSOs (2021-2024).*

Operator / Indicator	Number of prosumers 2021 (pcs)	Number of prosumers 2024 (pcs.)	Growth (2021-2024) [%]
Enea Operator	108 589	188 456	73.6
PGE Distribution	295 842	566 805	91.6
Tauron Distribution	268 395	455 954	69.9
Sum (Poland)	847 192	1 522 655	79.7

Source: Own study based on data from the Energy Regulatory Office. Data for 2024 are estimates. The growth of Tauron Dystrybucja is lower in percentage terms, but it started from a remarkably high base, remaining one of the market leaders.

In terms of both absolute values and growth rate, the area served by Enea Operator grew slower than the national average, and the gap between the leaders remained significant. Between 2021 and 2024, the number of prosumers in the Enea Operator's area increased by 73.6%, compared to 91.6% for PGE Dystrybucja and a national average of 79.7%. This suggests that the factors stimulating the development of prosumerism, which had such a strong impact in central and southern Poland, had limited impact in the West Pomeranian Voivodeship.

Quantitative evidence of barriers that hinder the development of prosumer energy in the region is the low absorption of funds from key national support programmes. Table 4 presents the ranking of voivodeships in terms of the number of applications submitted under the "Mój Prąd 5.0" programme per 1,000 residents.

Table 4. *Assessment of the absorption of funds from the "Mój Prąd 5.0" programme in the West Pomeranian Voivodeship compared to other voivodeships (per capita ranking).*

Voivodeship	Applications per 1000 inhabitants	Ranking
Subcarpathia	2.92	1
Greater Poland	2.72	2
Lublin Voivodeship	2.60	3
Kuyavian-Pomeranian Voivodeship	2.51	4
Opole Voivodeship	2.47	5
Lesser Poland	2.41	6
Silesia	2.37	7
Lodz Voivodeship	2.36	8
Pomeranian Voivodeship	2.33	9
Świętokrzyskie	2.17	10
Warmia-Masuria	2.02	11
Lower Silesia	1.98	12

Masovian Voivodeship	1.84	13
Podlaskie	1.75	14
The West Pomeranian Voivodeship	1.66	15
Lubusz	1.62	16

Source: Own study based on data from the National Fund for Environmental Protection and Water Management.

The West Pomeranian Voivodeship ranked second to last in the country, 15th, with 1.66 applications per 1,000 residents. This rate is greater than 43% lower than the leading Podkarpackie Voivodeship (2.92) and significantly lower than the national average.

The low number of applications is likely not the cause of the problem, but rather a symptom, indicating the existence of fundamental obstacles (e.g., infrastructural, economic) that discourage potential beneficiaries from investing, even with available financial support.

The results of the quantitative analysis provide empirical evidence of a complex and paradoxical phenomenon in Poland's energy transition, particularly evident in the West Pomeranian Voivodeship. On the one hand, the data confirm the nationwide success in stimulating the development of prosumer energy, especially during the discount system period.

However, they reveal deep regional disparities and systemic barriers that limit the effectiveness of centrally managed public policy instruments. This discussion interprets the results obtained in the context of the research questions posed and in relation to the existing scientific literature, focussing on the implications for the management of the energy transition process.

The central conclusion of the analysis is the confirmation of the existence of a "two-speed energy transition" in the studied region. Although the West Pomeranian Voivodeship is a national leader in large-scale renewable energy, achieving self-sufficiency in green energy production, its results in the prosumer energy segment are among the weakest in the country.

This discrepancy provides a significant complement to existing research on the Polish energy transition, which often focusses on macrosystem challenges (Mrozowska *et al.*, 2021). The results presented show that success at the corporate level does not automatically translate into the development of community energy. In contrast, it can mask fundamental problems at the level of the low-voltage distribution grid.

This becomes a "bottleneck" for further decentralisation, which in practice manifests itself not so much in connection refusals but in operational problems such as voltage

instability and inverter shutdowns, which undermine the profitability of already implemented investments.

In response to the research questions, it should be noted that the growth rate of the number and capacity of micro-installations in the West Pomeranian Voivodeship was systematically lower than the national average.

Furthermore, the low absorption of funds from the "Mój Prąd" (My Electricity) programme should not be interpreted as a cause of this state of affairs, but rather as a symptom. In the literature, this programme is rightly cited as one of the main drivers of the photovoltaic boom in Poland (Olczak *et al.*, 2020).

However, the case of the West Pomeranian Voivodeship demonstrates that the effectiveness of such financial instruments is limited when they encounter tough structural barriers. The low number of applications indicates not so much a lack of interest or information but rather the existence of fundamental obstacles that make the investment risky or unprofitable, even with available funding. This confirms the thesis that an energy policy based solely on financial incentives, without simultaneous integrated actions to modernise infrastructure, is doomed to limited success.

The study's findings also contribute to a broader debate on the sensitivity of the prosumer market to regulatory changes. The sharp slowdown in growth after April 1, 2022, observed at both the national and regional levels, empirically supports Zuk and Zuk's (2022) thesis that the sudden shift to the less favourable net-billing system undermined investor confidence and significantly weakened economic incentives to invest.

From a management science perspective, this legal instability constitutes one of the most significant intangible barriers, reducing the perceived quality of the entire support ecosystem and discouraging potential prosumers from making long-term investment commitments. In the context of the West Pomeranian Voivodeship, where growth dynamics was already lower, the regulatory shock could have further deepened the existing backlog, amplifying the effect of infrastructural and economic barriers.

5. Conclusions, Proposals, Recommendations

The quantitative analysis of the dynamics of the development of prosumer energy between 2019 and 2024 leads to several key conclusions. First, the study empirically confirms the existence of the "two-speed transformation" phenomenon in the West Pomeranian Voivodeship.

Although the undisputed leader in large-scale renewable energy, this region simultaneously exhibits one of the lowest prosumer energy development rates in the

country. This paradox indicates that success at the macro (corporate) level does not automatically translate into development at the micro (citizen) level, suggesting a lack of coherence in energy policy.

Second, in response to the research questions, it was concluded that the low absorption of funds from support programmes is a symptom of deeper systemic barriers.

Key factors hindering the development of prosumerism in the region include: (1) infrastructural barriers, manifested by operational problems after connection, such as voltage instability leading to automatic shutdown of inverters, which reduces actual energy production and undermines investment profitability; (2) regulatory instability at the national level, in particular the rapid transition from the billing system to net-billing; and (3) economic barriers, including lower profitability under the new billing system and rising investment costs amid high inflation.

Taking into account the conclusions formulated, the following recommendations were presented, addressed to three groups of key stakeholders.

For National Decision-Makers (Ministry of Climate and Environment, Energy Regulatory Office):

- Ensuring Regulatory Stability and Predictability: It is crucial to create a long-term, stable legal framework for prosumers, avoiding sudden changes in billing systems.
- Integration of Support Policy with Network Development Plans: Future editions of support programmes should be more closely linked to the investment plans of Distribution System Operators to reward investments in areas with appropriate infrastructure.
- Creating a Flexibility Services Market: Work should be accelerated to create a legal and market framework that will enable prosumers to derive financial benefits from the provision of system services, which is crucial for system stabilisation.

For Regional Authorities (Marshal's Office of the West Pomeranian Voivodeship):

- Active Role of Coordinator and Mediator: The Marshal's Office plays the role of an active partner in dialogue between local governments, residents, and the Distribution System Operator to jointly plan the modernisation of the network.
- Promoting and Supporting Citizen Energy Communities: Regional authorities should actively support the creation of energy communities as a tool to build local energy security.

For the Distribution System Operator (Enea Operator):

- Accelerating and prioritising investments in the low-voltage grid: The most important task is to increase the scale and pace of investments in grid

modernisation. Modernisation plans should prioritise areas with the highest density of micro-installations, where voltage instability issues most frequently occur, to improve the quality of existing installations and enable further, stable development.

- Increasing the Transparency of Development Plans: Efforts should be made to publish regular, publicly available information about grid modernisation plans and local operating parameters. This will enable potential prosumers to better assess the investment risks associated with grid instability.
- Transition to an Active System Operator (ASO) Role: A shift in the business model from passive operator to active system manager is necessary. This includes developing the ability to acquire flexibility services from prosumers, implementing smart tariffs, and investing in smart grid technologies.

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