

Policy Brief

Low-Hanging Fruits of Decentralised Energy: The Prosumer Model as a First Step Towards a New Architecture for Ukraine's Energy System

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Executive Summary

This Ukraine Facility Platform (UAFP) analysis demonstrates how Ukrainian communities can begin building their own generation capacity by leveraging existing grid connections and the prosumer mechanism established under Ukrainian law.

The concept is the product of UAFP's engagement with at least 18 communities and of its analysis of European approaches to financing Ukraine's reconstruction that must rest on a foundation of private investment.

The prosumer model offers a decisive practical advantage: it enables communities to launch new generation projects within existing infrastructure, without legislative changes, and to do so rapidly. This approach can serve as the starting point for the systemic development of decentralised generation in Ukraine – a process that has yet to materialise.

Its practical value is multifaceted: strengthening the energy system's resilience against infrastructure strikes; building a balanced technology mix of generation capacity at the community level; drawing private business into energy projects; and securing backup power supply for critical infrastructure. The volume of capacity that can be brought online through this model is relatively modest at the level of any individual municipality – yet it remains the most realistic and expedient means of ensuring energy supply to critical infrastructure ahead of the next heating season.

In the medium term, scaling up new capacity through the prosumer model is not merely a winterisation measure – it is the first meaningful step towards a new generation architecture centred on communities: initially through existing grid connections, and subsequently through new connections and the full integration of businesses as participants in the energy market.

Against this backdrop, the barriers identified in this document – a lack of local expertise, the absence of standardised partnership models, insufficient funding for grid connection, and a deficit of trust between business and local authorities – and the recommendations put forward – risk insurance mechanisms, cross-guarantees, a clear allocation of tariff responsibilities, and a dedicated communication platform – are equally relevant to the prosumer model and to the systemic development of decentralised generation that UAFP proposes as an instrument for implementing the national energy strategy.

The consistent implementation of the proposed measures, with due regard for long-term planning horizons, makes it possible to pursue two objectives simultaneously: ensuring readiness for the coming heating season and laying the institutional groundwork for the development of new generation capacity over the medium term.



1. Ukraine's Core Challenge: A Chronic Generation Deficit

The power deficit caused by Russian strikes on Ukraine's energy infrastructure has become a systemic problem that the country has been struggling to address every year since the start of the full-scale war. During the coldest months of the 2025–2026 heating season, attacks drove peak-hour energy shortfalls to 4.5–4.7 GW – a figure comparable to the combined output of the Khmelnytskyi and Rivne nuclear power plants. At that level of deficit, it becomes impossible to fully meet residential electricity demand which, despite the war, remained high on cold winter evenings and exceeded 18 GW during certain hours of the day.

The consequences of attacks during the coldest months were severe. In February 2026, when temperatures fell to – 20°C, approximately 10 million consumers were simultaneously left without electricity – for up to 16–18 hours a day – as a result of either scheduled or emergency outages. Electricity consumption across all Ukrainian enterprises and businesses was subject to continuous restrictions as well.

This winter, Russia combined multiple tactics. Alongside their established targets – all major thermal and hydroelectric power plants, combined heat and power plants, and large renewable energy installations – each winter Russian attacks destroy at least 60% of Ukraine's operational generation capacity. According to the transmission system operator Ukrenergo, strikes during the 2025–2026 winter damaged approximately 6 GW of thermal and hydro generation.

Russian forces also carried out more than 4,000 attacks on high-voltage substations in 2025 alone. The primary targets were substations critical to transmitting nuclear power plant output into the grid, as well as high-voltage infrastructure enabling electricity transfer from western to eastern regions of the country.

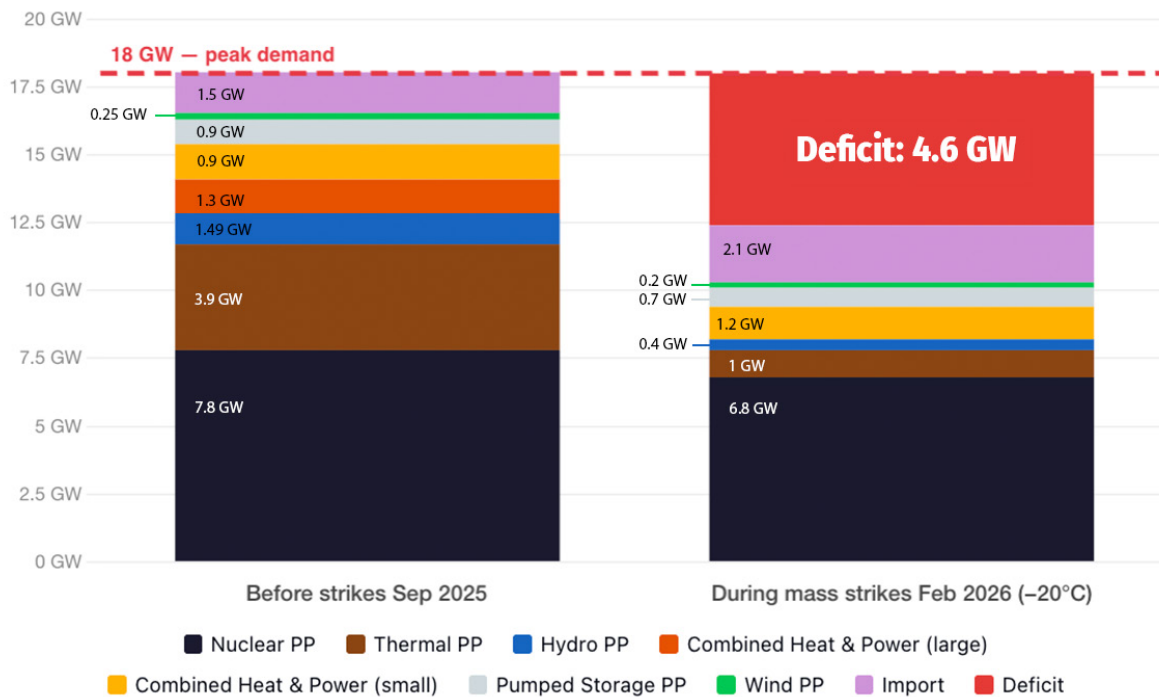
From the second half of 2025, Russia expanded its target list. Regional electricity and gas distribution infrastructure, district heating systems, gas production facilities, and gas storage sites all came under deliberate attack.

According to Ukrenergo's estimates, overcoming the generation deficit and ensuring the resilience and flexibility of the energy system will require Ukraine to bring 9.5 GW of new generation capacity – across a diversified mix of technologies – online over the next ten years. That figure exceeds the combined winter consumption of the three Baltic states.

The foundation of this new decentralised mix, designed to complement the existing baseload capacity of nuclear power plants, is to be built on renewable energy sources. System flexibility is to be provided through a combination of hydroelectric plants, energy storage installations, and new dispatchable generation drawing on various technologies – both gas-based and biomass.



Figure 1. Ukraine Power Generation: Before vs. During Mass Strikes*



**Figures are illustrative. Actual generation data is closed under Ukrainian martial legislation.*

2. How to Build Decentralised Generation Effectively

Under conditions of persistent Russian attacks, the decentralisation and regional distribution of generation capacity is essential to building additional resilience into the energy system. Rather than large-scale power plants – which have become standard targets for Russian missiles and drones – Ukraine needs many smaller installations. Striking one or several such units should be costly for the adversary, and hitting any single one pointless, as it would not produce a significant generation deficit in the region.

The Ministry of Energy [reports](#) that 1.5 GW of distributed generation has been commissioned since the start of the full-scale war. In practice, however, this additional capacity goes unnoticed by Ukrainians during winter peak demand periods. The figure encompasses not only newly commissioned installations, but also restored pre-war capacity and renewable energy projects without storage – which do not power facilities



during blackouts. Most importantly, these are capacities that frequently fail to meet communities' most critical needs following Russian attacks and during cold winter days: energy supply to critical infrastructure, including urban water and heat supply systems.

The current government approach places responsibility for developing new decentralised capacity on state energy companies, local authorities, and military-civil administrations. The primary source of funding is support from international partners and donors, who – following the difficult winter of 2025–2026 – are prepared to assist Ukraine in rebuilding and developing a new energy sector. Priorities for such financing are determined through the Single Project Pipeline and are publicly accessible via the DREAM system.

This approach, however, has not produced new energy facilities in the system at sufficient scale, as neither communities nor state-owned companies possess the capacity or resources to design, construct, and connect new installations to the grid. As a result, UAFP estimates that more than 900 MW of new energy equipment transferred to Ukrainian communities by donors remains unconnected to the power grid.

Field research conducted across 18 communities in which UAFP is preparing pre-feasibility studies has shown that **the most effective model for building new decentralised generation is public-private collaboration – structured around financial arrangements that are viable for private business, while ensuring communities receive reliable electricity and heat, and entrepreneurs can count on project payback.**

This project format not only enables the construction of new generation capacity, but also most closely reflects the reconstruction logic articulated at both government and European partner level: creating the conditions to attract private investment as a more effective path than relying exclusively on public funding.

Drawing on the characteristics of «decentralised generation» defined in the relevant [EU directive](#) and Ukraine's Cabinet of Ministers [Strategy for the Development of Distributed Generation](#), **UAFP's research identifies the following priority features:**

- **Scale:** A set of installations of no more than 5–20 MW each. Their small size and limited output deprive the adversary of any incentive to designate them as targets for missile or drone strikes.
- **Diversified technology mix:** A balanced combination of all technologies needed to ensure uninterrupted electricity supply to a community throughout the day – for example: wind, solar, biomass, gas, and energy storage.
- **Proximity to end consumers:** Generation located close to the final consumer,



which creates advantages for powering critical infrastructure facilities and enables the formation of regional energy clusters.

Such projects are best initiated in cities with populations of 50,000 to 200,000 – where centralised heat supply already exists or where enterprises capable of acting as stable heat and/or electricity consumers are operating. This allows for rapid demonstration of effectiveness in both the short and long term. Project preparation methodology follows two stages.

The first involves analysing electricity and heat consumption data for the community's residents, local businesses, and municipal utilities, as well as assessing existing technical capacity: access to electricity and gas infrastructure, water supply, availability of biomass feedstock, and land for new installations. On this basis, a generation technology mix appropriate for the specific community is determined.

The second stage involves designing the energy mix for specific locations, with a focus on speed of deployment and supply reliability: solar and/or wind power plants with energy storage, gas piston or other small-scale cogeneration units, and biogas power plants.

This approach both strengthens government policy on decentralised generation development and addresses one of the key challenges facing Ukrainian regions – stable energy supply to critical infrastructure. In particular, selecting an energy mix that includes storage will enable the uninterrupted operation of water utilities and district heating companies, which during Russian energy strikes in winter have been unable to guarantee centralised water and heat supply to residents.

The involvement of private business in such projects also ensures quality outcomes in equipment selection, energy mix design, and all stages of implementation – as it is entrepreneurs who possess the expertise and organisational capacity needed to deliver results.

In Ukraine, private businesses may connect new generation to the grid through one of three options:

- **New connection:** The conventional approach, requiring the development of entirely new grid infrastructure.
- **Existing connection:** Shared use of an existing connection point (cable pooling) – optimising existing capacity.
- **Prosumer model:** Connection to the consumer's own grid network. The fastest route for implementing decentralised solutions.



All three approaches have a role to play. The prosumer model, however, offers the fastest path to constructing new generation or commissioning donor-transferred equipment.

UAFP analysts describe this model as «**low-hanging fruits**»: it offers solutions that can bring a portion of new capacity online during the 2026–2027 heating season. At the same time, generation commissioned under this model represents an effective solution for the next three to five years.

3. Low-Hanging Fruits: How to Launch New Energy Projects Quickly

Low-hanging fruits refers to rapid solutions that can be implemented before the 2026–2027 winter. These solutions are built around the prosumer model, which draws on communities' existing grid connections – including connections to the networks of municipal utilities such as water companies and district heating providers – and on land already in their possession.

Data analysed by UAFP indicates that the majority of Ukrainian communities face energy deficits and are unable to ensure the operation of critical infrastructure during blackouts caused by Russian attacks.

At the same time, communities hold enormous potential for applying the prosumer model. Many have municipal utilities with substantial electricity consumption – and, equally, significant permitted connection capacity, at least 50% of which, according to UAFP estimates, goes unused. These include water utilities and district heating companies, but also metro systems, urban electric transport, water treatment facilities, street lighting authorities, and others. Their permitted grid connection capacity is a valuable asset that can be put to effective use.

Every large electricity consumer in Ukraine is also a potential producer and a site for new energy project development.

There are tens of thousands of locations across Ukraine where new generation can be installed at municipal utility sites under the prosumer model. If utilised effectively, the total installed capacity from such sites could reach hundreds of megawatts.



A significant share of the 900 MW of donor-supplied energy equipment provided to communities in previous periods – equipment that has yet to be connected to the grid – could be commissioned within six months under the prosumer model. This would substantially advance winterisation efforts, in particular by powering critical infrastructure: water utilities and district heating companies.

In parallel, communities should be preparing optimal energy mix projects tailored to their specific capacities and needs. This would enable the construction, over two to three years, of generation installations capable of ensuring long-term community resilience – for example, biomass cogeneration where stable fuel logistics are available.

Ukrainian legislation has permitted businesses to use this model for energy investment and mutually beneficial cooperation with communities since late 2023. Nevertheless, instances of such cooperation between municipal and private enterprises for the purposes of building new generation remain uncommon in Ukraine.

Legal framework of the prosumer model

Ukrainian law provides that a consumer who acquires prosumer status may officially not only draw electricity from the grid, but also produce it for own use and sell unconsumed surpluses to the grid. Law [No. 3220-IX](#), which entered into force on 30 June 2023, amended the [Law on the Electricity Market](#) by introducing a dedicated Article 58-1: «Active Consumer».

A prosumer is defined as a consumer who does not intend to engage in professional activity on the electricity market, but operates generation installations of up to 5 MW and/or energy storage installations of up to 5 MW, uses them primarily to meet own needs, and sells surpluses to the grid. A prosumer is not required to obtain any licences related to electricity generation or sale.

Consumer status does not automatically become prosumer status upon the installation of generation or storage equipment. To acquire this status, the consumer must sign a self-generation electricity purchase and sale agreement with their electricity supplier and notify the distribution system operator (formerly the regional energy company) of the installation. Surplus electricity produced will be purchased by the prosumer's electricity supplier at a rate slightly below market price – for example, the day-ahead market price minus 5–10% – without the need for the owner to maintain a dedicated energy trading team.

A prosumer does not pay electricity distribution and transmission tariffs on the volume of electricity generated by a power plant connected to its internal networks and consumed by that same prosumer.

The capacity of a generation and/or storage installation is capped at 5 MW and may not exceed the consumer's permitted connection capacity.



A prosumer has the right to connect generation installations belonging to third parties to its own electrical networks. For example, a water utility may act as the prosumer while a private business owns the generation asset. The generation owner is required to sell all electricity produced to the prosumer, who in turn has the right to sell surplus electricity to the grid. The volume of such sales may not exceed 50% of the prosumer's permitted consumption capacity.

In practice, new generation for self-supply under the prosumer model can be brought online relatively quickly: a solar power plant requires approximately three months; a gas piston unit or an energy storage installation, approximately six months each.

Timelines depend largely on equipment availability in Ukraine or Europe. Where equipment must be imported, project timelines extend accordingly – energy storage systems shipped from China, for instance, may take approximately three months in transit.

4. Advantages of the Prosumer Model

Building new generation under the prosumer model can serve as a template for mutually beneficial cooperation between business and communities. Each party stands to gain a distinct set of advantages.

4.1 Advantages for the Private Investor

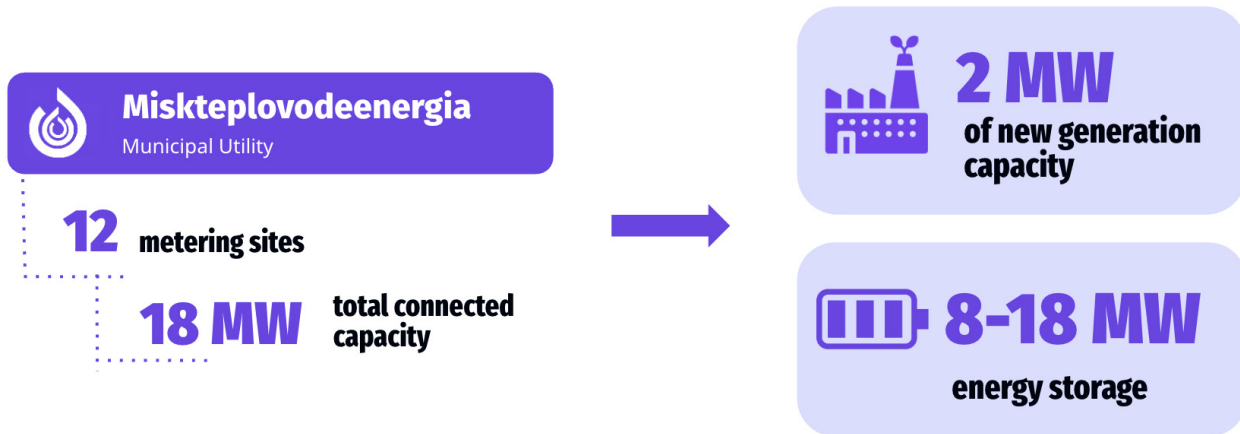
A wide choice of grid connection points

Businesses can select from a large number of available sites for energy project development, without the need to identify a region where a new grid connection can be secured – municipal utilities already hold existing connections.

According to UAFP's assessment, the municipal utility Mistkteplovodeenergiya in Kamianets-Podilskyi (Khmelnitskyi Oblast) alone could host energy storage projects with a combined capacity of 8 to 18 MW, as well as approximately 2 MW of new generation capacity. And this is just one municipal utility in a city of 115,000 residents.

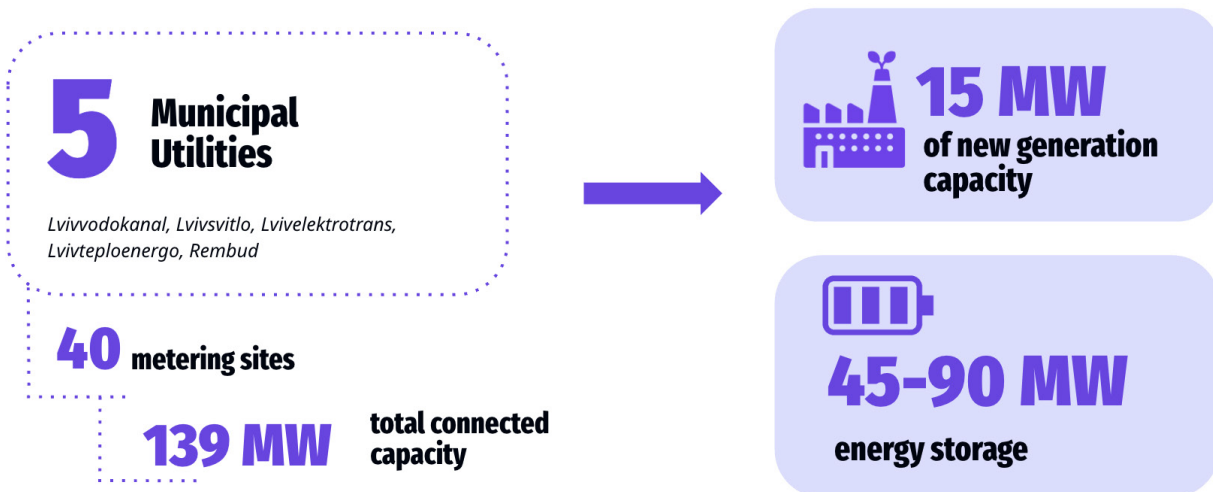


Figure 2. The Kamianets-Podilskyi case



A high-level analysis of consumption and permitted capacity across 40 metering points at five municipal utilities in Lviv (Lviv Oblast) indicates the potential to install up to 90 MW of energy storage and up to 15 MW of new generation capacity. This would allow the following municipal utilities to be powered: Lvivvodokanal (water supply), Lvivsitlo (street lighting), Lvivelektrotrans (public transport), Lvivteploenerho (district heating), and Rembud.

Figure 3. The Lviv case



Cost savings in project implementation

The prosumer model offers investors significant cost savings. No new grid connection is required – and therefore no connection capacity fee is payable. For reference, the cost of connected capacity for an energy storage installation is approximately UAH 2,000 excluding VAT per kilowatt. This means that for a 2 MW energy storage installation, capacity charges alone (excluding external network construction) would amount to approximately UAH 4.8 million including VAT. Businesses are also spared the need to



build access roads, as roads to municipal utility sites already exist. All of this reduces project capital expenditure (CAPEX).

Greater economic attractiveness compared to alternative approaches

An energy project developed under the prosumer model will achieve a higher return on investment than projects supplying electricity to the integrated power system, since the municipal utility guarantees to purchase the entire volume of electricity produced.

This can reduce project payback periods by 20% to 50% compared with generation connected to the grid through other means and operating across various electricity market segments. Critically, the business secures a guaranteed offtake agreement from the prosumer – an asset that strengthens its position when seeking project financing.

4.2 Advantages for Communities

Powered water and district heating utilities

Communities stand to gain the greatest benefit from energy projects built on municipal utility infrastructure when the energy mix includes storage. In such cases, water utilities and district heating companies can continue providing services even during power outages. Even the installation of a solar power plant or gas unit – which powers the municipal utility directly – frees up electricity resources for residents and businesses in the region during periods of energy deficit or constrained transmission capacity.

Rapid deployment of donor-supplied equipment

Communities gain the opportunity to use municipal utility sites to connect and commission donor-supplied equipment within six months. To operate this generation, a community may either establish a dedicated organisation, form a cooperative arrangement with neighbouring communities, or engage private business through a competitive procurement process.

Reduced electricity costs for municipal utilities

In all scenarios, installing new generation at municipal utility sites will reduce electricity costs, since a prosumer pays no transmission or distribution tariffs on electricity generated by installations connected to its internal networks and consumed by that same prosumer.

Attracting investment to the region

Converting municipal utilities into prosumers will support the attraction of private investment to the region, the creation of jobs, and additional tax revenues. If an investor registers the company owning the generation installations within the community, that



community will receive corporate income tax receipts. Territorial communities can take an active role in incentivising investors to install new generation at municipal utility sites through open competitive tenders – for example, via the Prozorro platform – offering businesses connection terms with a guarantee that the municipal utility will purchase electricity produced at a defined volume and price over a specified period. Existing legislation on the lease of state and communal property provides a sufficient legal basis for conducting such tenders.

5. Implementation Barriers: Community and Business Perspectives

Despite legislation permitting electricity self-generation and the sale of unconsumed surpluses to the grid for over two years, municipal utilities have largely not adopted this model.

Barrier 1. Lack of expertise

Regions lack specialists with the knowledge required to develop, construct, connect, commission, and subsequently operate new generation within Ukraine's integrated power system.

Barrier 2. Concern that power plants may become targets for Russian attacks

Some community representatives believe that even small-scale new generation could attract Russian strikes. UAFP specialists have documented cases in which local authorities have delayed the connection and commissioning of donor-supplied energy equipment on these grounds.

Barrier 3. Absence of established practice for municipal utility use of the prosumer model

Local authority representatives are reluctant to be first movers in implementing prosumer model projects, fearing scrutiny from law enforcement agencies that may initiate inspections on suspicion of unlawful activity.

Barrier 4. Insufficient funding for connecting new generation capacity

Donor-supplied equipment motivates local authorities to explore installation options



using municipal utility infrastructure. A shortage of specialists with the requisite expertise complicates this task. In practice, communities frequently receive generation or energy storage equipment without any financial or technical feasibility analysis for its use – meaning that even where equipment is connected and commissioned, it often operates inefficiently. In some cases, communities are unable to connect and commission donor equipment at all, as they lack the funds to cover associated costs – equipment and works.

Barrier 5. Absence of a structured mechanism for local authority–business cooperation

Ukraine lacks an established framework for cooperation between communities and businesses for the joint development of energy projects. Municipal utility managers tend to seek donors willing to provide generation equipment free of charge rather than enter into partnerships with private businesses.

Barrier 6. Risk of arrangements unravelling following a change in local leadership

Businesses are deterred by the risk that agreements may collapse if local leadership changes. Energy market participants have identified two principal risk scenarios:

- a new mayor may refuse to honour prior arrangements and demand the disconnection or removal of energy equipment from municipal utility premises;
- new local authorities may seek to contest ownership of generation equipment and attempt to reclassify it as communal property.

In summary, the core problem is the absence of standardised frameworks for formalising community–business partnerships – frameworks that would protect entrepreneurs’ assets and ensure the enforceability of agreed terms should the political landscape change.

For their part, businesses prepared to build new generation under the prosumer model face a lack of structured data on communities and the capacities of their municipal utilities.

Building a community–business partnership is a complex process – but without it scaling projects of this kind is impossible.



6. Recommendations: Enabling the Prosumer Model for Investors

Deploying the prosumer model to power critical infrastructure in the regions does not require significant legislative or other systemic changes. Nevertheless, a number of steps could streamline the launch of such projects.

1. Needs assessment and analysis

To unlock the potential of communities and their municipal utilities to build decentralised generation, the first priority is an audit of community consumption and resources: permitted capacities and connection points to electricity, gas, and heat networks. On the basis of the data gathered, optimal energy mix options should be developed for specific locations. UAFP is working on both of these tasks to build a quality database of community capacities and the solutions best suited to them.

2. Cooperation frameworks

To disseminate information on the prosumer model's potential across regions and among businesses, clear frameworks for structuring such partnerships should be made available. UAFP representatives are engaged in this work. We are exploring cooperation arrangements already provided for under legislation on the lease of state and communal property, as well as through investment tenders, agreements for the siting of generation installations, and electricity offtake agreements with the facility's balance-responsible party.

3. Technical assistance to communities

Where international donors transfer energy equipment to communities, they should assist local authorities in identifying a partner to commission the generation installation and ensure its operation. This would both accelerate the process and improve its effectiveness.

4. Investment tenders

The government could facilitate the launch of decentralised generation in the regions by establishing a framework for community–business cooperation on energy projects using municipal utility infrastructure. Such cooperation should be organised on a competitive basis: communities issue tenders for services, which can subsequently be remunerated from the revenue generated by managing the generation installation.



UAFP proposes the following measures to strengthen the position of investors:

- 1. Political risk insurance (PRI)** could mitigate the concerns of foreign investors regarding changes to operating conditions across political cycles. A business owner registered abroad may approach the relevant institutions in their country to insure against the risk of seizure of their assets (generation installations) in Ukraine, expropriation, and/or non-performance of contractual obligations by the community-owned entity.
- 2. Cross-guarantee mechanisms** can protect both parties – the community and the investor. For example, the business provides a financial guarantee to construct the generation or energy storage facility; in turn, the local self-government body provides a financial guarantee to purchase a defined volume of electricity produced at a defined price.
- 3. Where a loss-making tariff** is imposed on a municipal utility, the local self-government body should also bear responsibility for the utility's resulting debts.
- 4. An electronic communication platform** should be established by the government to facilitate engagement with investors. The mechanism would work as follows: businesses register on the platform and receive notifications when specific communities or municipal utilities are seeking a partner to jointly develop an energy project.
- 5.** While existing legislation already permits the lease of communal property for the siting of generation installations, **the government should provide further detail in secondary legislation** on the specific terms governing relationships between businesses, municipal utilities, and communities.