



Auswärtiges Amt



COMPREHENSIVE ASPECTS OF ESTABLISHING ENERGY COMMUNITIES IN UKRAINE: Financial, Technical, Legislative, Informational, and Socio-Ecological Perspectives

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METHODOLOGY

THE PURPOSE OF RESEARCH

Explore the potential of creating energy communities in Ukraine (financial, technical, and legislative aspects, informational, and socio-ecological aspects).

OBJECTIVES OF RESEARCH

Identify prerequisites for creating energy communities in Ukraine.

Determine the barriers and incentives for the creation of energy communities in Ukraine.

Provide guidelines regarding the measures required to stimulate the creation of energy communities in Ukraine.

Research method: focus-group discussions (FGD) (5 focus-groups (FG)).

Research territory: Ukraine (territories under the control of the Government) – all regions, including the front-line territories.

- 1 FG with local-level experts
- 1 FG with regional-level experts
- 1 FG with national-level experts
- 1 FG with NGO representatives
- 1 FG with local activists and media

Research participants: employees of energy efficiency services of municipalities, representatives of professional governmental and non-governmental organizations, businesses (investors, companies that can implement and service projects on renewable energy sources (RES), scientists and local media).

Research dates: June 29 - July 1, 2023

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THE MAIN PART OF REPORT

CHAPTER 1. SPECIFICS OF ENERGY TRANSITION IN UKRAINE.

Relevance and benefits of the green transition in Ukraine.

The transition to renewable energy sources and increasing energy efficiency are extremely important for Ukraine.

First, these decisions **will strengthen the energy security of the country:**

- ✓ will reduce dependence on imported energy sources
- ✓ will increase the energy autonomy of communities in war conditions (social infrastructure and households will have backup energy sources).

Secondly, they are **economically beneficial**, in particular in the context of:

- ✓ reduction of costs on energy import
- ✓ the potential of entering the “green” energy market in Europe, increasing exports due to “green” energy
- ✓ increasing the competitiveness of enterprises due to the reduction of their energy costs

And finally, they will have a **positive impact on the environment** and counteract climate change.

At the same time, to ensure the effectiveness of this transition, it is necessary to comprehensively develop technical capabilities for accumulating the generated energy and increasing maneuverable capacities, both at the local and national levels.

Peculiarities of the green transition process in Ukraine.

In recent years, Ukraine has shown a **positive trend of the constant growth of renewable energy capacities** (the number of solar power plants (SPP) was growing especially rapidly). However, **this process had some structural flaws.**

In particular, significant **RES capacities were concentrated in certain areas** (e.g. in the south of Ukraine), which did not contribute to the energy security of the country.

“For all these years, our renewable energy industry has been characterized by gigantism. We built two of the largest SPPs in Europe, which are concentrated in one area. After the recent events, the vector has somewhat changed. It was necessary to initially develop small stations that are located close to the consumption center”, FG_Local

Nowadays, **it is not possible to use all the economic potential of producing “green” electricity**, since there is no practice of expedient use of the surplus of generated electricity. Instead of a “green” tariff, some mechanisms should be implemented to redirect the surplus of generated electricity to the general network on the terms of Net Billing; or it should be accumulated for further domestic use.

In addition, **energy production must be combined with energy conservation measures**, which have so far been insufficient.

Another feature of the energy transition in Ukraine is that the development of renewable energy projects is more interesting for businesses or individual households, while **the role of communities and initiative groups at the local level is insignificant**, and therefore **energy communities are a rare phenomenon in the country** (experts have only a few dozens of successful cases).

Therefore, it is more common to hear about projects implemented by local authorities than about energy cooperatives. And even those are implemented due to the grant funds and positioned as pilot projects intended to popularize the practice of energy communities, rather than autonomous and economically profitable projects.

CHAPTER 2. PREREQUISITES FOR CREATING ENERGY COMMUNITIES

The urgency of creating energy communities.

According to most experts, **creation of energy communities in Ukraine** is relevant in modern conditions.

To a large extent, this position was strengthened after the targeted attack of the Russian Federation on the energy infrastructure of Ukraine. After all, the creation of energy communities **will ensure a high degree of energy autonomy** for communities in wartime conditions. Citizens and businesses are aware of the need for a reliable source of electricity.

“Considering this winter, the need [to create energy communities] definitely exists! Current solar and wind farms cannot operate off-grid. With the transformer destroyed, a large settlement is left with windmills, solar panels, but without electricity. Energy cooperatives having certain equipment for autonomous operation could also be a kind of islands of energy supply”, FG_Local

At the same time, creating energy communities is expedient even in conditions of peace. Firstly, energy communities / cooperatives are a successful and effective European practice. Its implementation is connected with the transition to renewable energy, which is **part of Ukraine’s European integration obligations**.

“After all, RES is more about movement towards Europe, to those rules that are introduced in the European Union. And in terms of emissions, this is something that will come to us soon. It is not a question of whether to choose or not to choose. Otherwise, our producers will get no quotas for their products, and they will not be competitive”, GI_Regional

Secondly, **after joining the unified energy system of continental Europe, Ukraine must find additional sources of energy generation to balance the national system**. Such sources can involve decentralized capacities of energy communities (in particular RES). They can potentially provide 15% of the country’s energy needs.

“When we were connected to the power system of Russia, it stabilized us, covered balances due to its size. When we entered Europe, we have got connected, but the flows are very small. We must be independent”, FG_National

Thirdly, **this practice can be potentially beneficial to communities**, in conditions of constant increase in the price of energy / energy carriers and the cost of electricity supplies (due to the need to repair worn-out grids).

Thus, **the main advantages of creating energy communities for the society** are as follows:

- Guaranteed energy supply of social infrastructure facilities (hospitals, schools, kindergartens); increasing the quality and comfort of life
- Cost savings (e.g. free street lighting, lower electricity costs for social infrastructure, utilities or local businesses)
- Additional jobs
- Payment of taxes to the community budget
- Reducing CO₂ emissions, combating climate change
- Reputational advantages (environmentally conscious community/enterprises in conditions of growing popularization of ecotrends)
- Increasing financial availability of renewable energy sources (a project that is too expensive for individual farms is available for the owners' association)
- Grouping of the community, due to belonging to a particular community (thanks to the experience of joint implementation of the project, common goals)
- Formation of the solidarity culture (anti-individualism)

“When we talk about power autonomy for the hospital, there is no question of when it will pay off. The question is whether to be or not to be. This is a matter of comfort and life support of hospital's critical elements”, FG_Regional

“One person cannot cope with it alone, while several farms are able to create an energy complex. In addition, they can buy a windmill for the solar station, which supports energy production in winter”, FG_Regional

At the same time, **economic benefits of creating energy communities in today's conditions are debatable**. Some experts argue that the community will have to invest significant funds in equipment to generate and store energy, pay salary to service personnel, pay taxes, and dispose of equipment in the future. **The total amount of expenses may turn out to be higher than the cost of electricity received from the power system**. Against the background of these costs, even the use of gasoline generators is more economically feasible (if we are talking about power generation in force majeure conditions).

“You will not have free electricity, even if you install a solar station. You will spend money on its purchase, installation, maintenance, pay the same taxes, and people need to be paid their salaries.”, FG_Local

Some experts also claim that the payback period of such projects is more than 5 years, and therefore they are **unattractive for investors**.

However, only some experts question the expediency of creating energy communities in Ukraine's realities. Their opponents claim that the **economic feasibility of implementing such projects is achieved by proper financial planning, deliberate selection of objects** that will be supplied by renewable energy sources, and favorable government policy (e.g. the introduction of tariff incentives).

“If you pay UAH 2.64, i.e. 7 cents, and the cost of your power plant is 5 cents, you save only 2 cents. And if you pay 50 cents as a legal entity to the electricity supplier, then your savings amount to 45 cents. And this is a significant benefit”, FG_Regional

“If a solar plant has a higher capacity, and it generates a surplus of electricity that it cannot consume itself, or it limits generation and does not share with neighbors, then it will not Pay back. If it is possible to release this electricity into the power grid and then take it back, then the profitability of such projects improves. And then it is important for the state to set exactly these rules”, FG_Regional

In addition, in conditions of high probability of emergency blackouts this winter, local budgets of communities will face significant costs for fuel for generators. Against this background, RES energy will be both cheaper and more reliable (due to possible fuel supply interruptions).

Experts believe that it is very profitable to create completely autonomous projects for newly built cottage towns, streets, and houses (because the cost of the energy infrastructure of autonomous stations will only slightly exceed the cost of the infrastructure needed to connect to the system, but will provide a more reliable and ecological energy supply). The energy autonomy of communal institutions (perhaps in cooperation with the state) may also be promising.

“Generation of power by kindergartens, schools, hospitals can help substitute their costs. It could be profitable.”, FG_National

Today the most profitable projects for energy communities are as follows:

- Solar power plants on the roofs of apartment buildings
- Solar collectors for water heating at communal facilities
- Solar power plants to provide energy to utilities
- Wind generation
- Heat pumps for heating (allows both heating and cooling, balances solar RES capable of storing energy)
- Electricity from the processing of solid household waste
- Shared battery stations in settlements where a large number of households have their own SPP
- Autonomous stations in the territories that Oblenergo refuses to connect to the network
- Bioenergy: cultivation of energy crops and production of bio-thermal power plants (in the case of a need for generation of more than one megawatt)
- Utilization of low-potential heat (sewage system)

“At large landfills, we have gas generators and they quite successfully convert gases and waste from garbage into electricity”, FG_Local

The mentioned list of projects is not universal. During their implementation, the specifics of the object that is going to be supplied with energy should be considered. For example, installing solar panels on schools will be unprofitable (since their generation peak is during the vacation period). Instead, it would be more appropriate to install solar collectors. At the same time, for the institutions that work all year round (e.g. hospitals), the panels will be quite profitable.

“In the case of kindergartens and schools, it is irrational to install solar panels, because the main peaks of generation are in the summer, when the institutions do not work. It is profitable to install solar collectors on schools and kindergartens, i.e. when you have water heating and heating in the autumn and spring period. This saves a lot of money”, FG_Local

Another expert discussion on the expediency of creating energy communities is emerging in the context of the risks to unbalance the national energy system. The matter is that they will generate energy mainly during the daylight hours and in the summer (when there is no one to consume it), while in the winter and at night, when the energy deficit is rapidly increasing, the generation will fall.

“We shouldn’t forget that the energy system is not our cellar, where we store some preserved cucumbers during summer and take them up when winter comes. In the power system, energy is instantly consumed and not stored there. Therefore, you dump surpluses there all summer, and someone has to consume them. In winter, when no one generates, all those who generated during summer have to take it from somewhere, i.e. we have a significant imbalance”, GI_Local

This problem can be solved by using a comprehensive and thoughtful approach to the construction of local energy projects that will maintain the balance of the energy system and its ability to maneuver, precisely at the local level.

“Besides the wind and the sun, there must be something else in the system. It may be hydrogen, but now it is very expensive. It must be some additional generation, and some kind of energy accumulation”, FG_Regional

Lastly, the development of energy communities gives impetus to a kind of “decentralization” of management decisions and encourages communities to consciously define their own goals, act independently, and manage resources most profitably.

“Solutions cannot only be centralized, and local people do not understand what is wrong with them. Everyone must be involved in meeting the goals of the Paris Agreement. Resources are exhaustible and everyone should understand this and make their contribution to the economy and develop resources”, FG_Kyiv

Community interest.

It is difficult for experts to give a general assessment of community interest in creating energy cooperatives or energy communities. After all, communities in Ukraine are heterogeneous in terms of their potential (material and human). This inequality is exacerbated by war and communities that are closer to the front line are less capable than those in the rear.

To a large extent, the activity of communities in this direction depends on the personal characteristics of the leaders and the assets of each community. Therefore, individual communities are proactive in creating energy communities/cooperatives, they initiate projects on their own, look for funds and contractors. Others are not interested in this issue at all. There are few active communities in today’s conditions, but interest in projects is gradually growing.

“Every community is different from the others, and everything really depends on the people who live in it. As for my experience, about 10% are interested and look for opportunities on their own, while 90% don’t care at all”, FG_Local

“In Ukraine, there are some communities that want to develop energy more actively and to implement it. Some do not declare it, but I am sure that they will do it in a while as well”, FG_Regional

Communities are getting more interested in the creation of the energy community in the case of the availability of **grant funds** for the project implementation.

“We actively work with communities (we have a competition for grants from the European delegation). Every month we receive more than 50 applications from local governments and public organizations for energy infrastructure projects. So, the interest is really great”, FG_National

Less popular (but still common) are projects financed from the community budget. There are very few energy communities created on the principles of **co-financing or shared cost**.

This shows that the idea of creating energy communities has a positive perception as a whole, but this tool is either not perceived as attractive for investment, or is little known / not understood.

“Energy cooperatives, according to my experience, is the issue that can hardly be understood by people, as we had more than 300 applications, but there was none intended for financing, or for example, for the implementation of some energy cooperative projects at the local level. So, this topic is generally unknown to people, they confuse it with something else. They don’t get information about what it is”, FG_National

It can be noticed that the residents of the communities have not yet realized the practical benefits of the joint implementation of RES projects. Sometimes, they lack the competencies to develop a business plan and realize the economic benefits of cooperation.

“There is one district in Vinnytsia where there were blackouts both 10 years ago and a year ago. In such microdistricts, people should come to the idea that they need to put not only panels but finally do for the street as well”, FG_Regional

“Communities intuitively understand that it is useful for them, at least in terms of security, but from a monetary point of view they do not yet understand how to calculate it”, FG_Regional

The vast majority of community residents have a positive attitude towards the implementation of RES projects. Warnings regarding one or another renewable energy technology, if they occur at all, are extremely sporadic. However, this may be due to the low prevalence of green energy projects (and therefore, they have rarely affected anyone’s interests). At the same time, as the number of projects grows, there is a risk of spreading stereotypes related to the installation of RES (for example, fears of radiation, noise pollution, etc.).

“When I model a situation where a windmill appears with minimal vibration or noise - it immediately gives rise to a lot of myths about how it affects and some diseases are immediately attributed to this windmill”, FG_Kyiv

CHAPTER 3. CAPACITY FOR CREATING ENERGY COMMUNITIES IN UKRAINE

The concept of “energy community” does not have an unambiguous interpretation in the expert environment. It is mostly treated as a **conscious association of citizens who jointly own generating capacity**.

The concept of “energy community” is considered in several formats:

- Projects initiated by the authorities (at the expense of the community budget)
- Association of citizens (cooperative) to produce energy for their own needs
- Business project, investment in a RES project aimed at selling energy and making a profit (*rarely*)

A broader definition of the **energy community** also takes into account the social component of this phenomenon – it is the totality of all resources and human potential for achieving a common goal, namely producing electricity for one’s own needs or obtaining financial benefits.

Resource potential of creating energy communities in Ukraine.

Today, the resources for the organization of energy communities are available only to a **small part of communities**. Communities in large cities are in a better position. As a rule, they are provided with human resources (project managers, technical personnel), and have wider opportunities to attract finance (including grant and loan funds). Rural communities are mostly significantly limited in resources.

“If the community is proactive and has a good project manager, then, in fact, it can implement any project with grant funds, but it requires effort. Unfortunately, communities lack such specialists, and those who desire to introduce at least something”, FG_Local

One of the main problems holding back the introduction of energy communities in Ukraine is the **lack of financial resources**. Today, funds for the implementation of renewable energy projects in communities can be raised from five sources, in particular, grant funding from donors, state funding, loans, investments, and individual funds. However, a large number of communities do not know how to attract resources.

Communities are usually **unaware of the available opportunities for fundraising from donors** for the implementation of projects related to the creation of energy communities. They don’t have project managers who would monitor opportunities and know how to apply for a grant.

Community representatives (officials, heads of housing cooperatives) are often **uninformed about state support for the creation of energy communities**.

“As far as I know, the state does not support such projects in any way. No support, no programs”, FG_Local

In addition, officials often do not know how to go through the procedure of fundraising from the state budget. Communities lack specialists capable of formulating a strategy for the energy development of communities and preparing the documents necessary to raise funds.

“The search for funds begins with a program, a community development strategy. If it is not recorded in it that they want to do this, then no one will ever give them any grants or any funds. Then they write programs and specify projects (that we want to deliver this or that), and

only then they turn to various institutions, including (state). Because there are state programs (they were and funds were allocated, provided that everything is legally formalized), even at the deputy level, they can receive these funds.”, FG_Lokalni

Credit funds for communities are too expensive. Most of them do not try to find investors.

“I see little initiative on the part of communities. I personally initiate the search for these projects when investors apply”, FG_National (Investors)

It is extremely difficult to attract **financing** due to the lack of funds in the budget.

“To install a power plant, you must have free money. As far as I understand, on the contrary, we have a deficit of local budgets. And the grant funds are pilot projects to show the very possibility. But it seems to me that on a large scale and on a permanent basis it won't work” FG_Regional

Communities also lack appropriate human resources: project managers, technical specialists. Communities lack competences for the formation of commercial and technical projects. This issue is especially acute in rural communities, because they cannot offer competitive wages to specialists capable of preparing similar projects in a high-quality way (as they move to larger cities).

“The projects that are sent to us are unfinished. Communities have an idea (for example, to convert a hospital to clean energy), but when it is necessary to do some thorough work, give numbers, calculations, everything stop”, FG_National (Investors)

“When you start looking at the application, you find out that there are potentially very good projects, but it is clear that they lack project management, and representatives of the local government do not have understanding of how to bring the project to the end, or what indicators need to be submitted”, FG_National (GO)

Public organizations and international donors can become a source of resources for communities, both in the context of financial, technical and organizational support. Today, non-governmental organizations help to attract donors, assist in the preparation of applications, attract technical specialists and professional contractors for the implementation of projects.

“Ecodiya provides everything. Only consent to cooperation is required from the community. Such organizations themselves are looking for specialists who will develop, prepare everything, fill it out, bring it to the level of submission for obtaining grant funds for construction”, FG_Local (Scientists)

In addition to public organizations, similar functions are currently performed by energy efficiency centers at universities, the Association “Energy-Efficient Cities of Ukraine” (association of municipalities); Coalition of municipalities, citizens, and public organizations “Energy Transition”.

Given their successful work experience, it seems appropriate to create umbrella project organizations that would stimulate the process of creating energy communities: inform about the possibilities of attracting funding, provide the first impetus, the first contacts, and useful

connections, form ready-made action algorithms for communities that would be necessary to establish their own energy cooperative.

“It is necessary to create specialized companies that deal with energy cooperatives and help communities to create them. Because the algorithm has been worked out for large stations, specialists understand all the processes and procedures. In the field of distributed generation, communities are a one-time story, so recruiting specialists and having all the algorithms is unrealistic”, FG_National

Social capital as a resource for creating energy communities in Ukraine.

In general, average residents of Ukraine are not too interested in creating energy communities and cooperatives. They do not oppose their implementation by decision of local authorities, but do not consider their own participation in this process.

“We have entire streets where everyone has an individual solar station and no one wants to join cooperatives. They resettle in Oblenergo, receive dividends and are doing well there. Of course, they do not object to the community, as a body of local self-government, establishing its own station, but we have nothing to do with it, we are in our own backyard”, FG_Local

First of all, they are not sufficiently informed about energy communities as a phenomenon.

“In my area, average residents perceive this idea neutrally. The matter is that people are ignorant and don’t understand what it is and what it is intended for”, GI_Local

In addition, they do not quite understand the benefit of the implementation of such projects (financial, environmental, economic) and do not see the advantages of cooperation.

“It is ineffective when everyone has his own station. When there is a cooperative, there are many flows of electricity, we save on storage capacities. But the real problem here is with people. They don’t see it”, FG_Local

The other side of the problem is the extreme individualism of Ukrainians. It is difficult for them to build cooperatives (**negotiate, balance interests**). Therefore, there is a need for dialogue facilitation.

“Even at the level of the housing cooperative, everything is quite complicated. Any decision is made through real horror! Someone doesn’t care, someone tries to criticize everything. And the overall result is rarely achieved”, FG_Regional

“I have my own station with a battery, as I understand that it is difficult to share something with neighbors. It’s easier for me to have my own station than to figure out who consumes, how much is consumed, who spends, how much is spent, and what it is spent on”, FG_Regional

It is extremely difficult to organize projects on the basis of joint cost in Ukraine. In some cases, this is due to reluctance to invest one’s own funds, in other cases due to a difference in priorities or views.

“I can share my experience of installing an uninterruptible power supply for elevators. When I climbed to the 25th floor on foot in winter, I realized how necessary it was. The cost

of the project was broken down into apartments and it turned out to be \$100 each. It was extremely difficult to collect that \$100. Somebody is not in, someone rents out an apartment, or lives on the first floors and they don't need it", FG_Regional

"There are proactive people who want to do something, but they have to deal with those who say, "What do we need it for? We have lived like this for 30 years, so let it be like it is. If you have to contribute 10-20% of your money, then the project simply falls apart.", FG_Local

Wealthy citizens who have free funds and are ready to invest in their own energy independence and reliable energy supply show somewhat higher interest in creating energy cooperatives.

"The idea of a cooperative seems to be possible for wealthy people. Such a request was particularly formed after the winter blackouts, when people widely began to buy generators. But that was only an upper layer of society that could afford it", FG_Regionalni

Since the beginning of the full-scale invasion of the Russian Federation, another important trend directly related to human capital can be observed. Mass migration of the educated and progressive population from Kyiv to the regions stimulates the formation of energy communities in the regions.

"Now there is a huge number of such initiatives, due to the fact that many qualified specialists moved from Kyiv due to the difficult autumn of 2022. People [capable of initiating such projects] appeared in the communities - so-called providers", FG_National

CHAPTER 4. BARRIERS TO THE CREATION OF ENERGY COMMUNITIES IN UKRAINE.

Although the majority of experts consider the creation of communities in Ukraine to be relevant, this practice has not become widespread.

To some extent, this situation is caused by the factors that we have already considered (lack of finances, specialists, social capital). At the same time, the range of barriers to the creation of energy communities is significantly wider.

For convenience, we will divide them into four groups:

- Cultural
- Informational
- Economic
- Regulatory

Cultural factors

- **Inertia in the thinking** of the population and community leaders. Lack of interest in innovations, reluctance to understand a new topic, invest effort in changes.
- **Individualism of Ukrainians** (inability to negotiate and balance interests)
- **Lack of social capital** (trust)
- **Lack of leadership** in communities, proactive people capable of rallying the population around changes

“People did not trust each other and now it is very difficult, because you have to make a material contribution, people do not trust even if you are from the same community. And the second issue is leadership, because there must be the person, the leader, who will bring this matter to the end.”, FG_National

Low level of political capitalization of the creation of energy communities, implementation of RES projects for government representatives

“Heads of unified territorial communities can receive the same political dividends for smaller-scale projects that do not require such an individual resource. The chairman says, “We are going to build playgrounds for you”. And families will be grateful to him, FG_Regional

The inherited mentality of the USSR. Schools, hospitals, and kindergartens are still perceived by the residents of the community as “nobodies”

“Communities perceive their facilities, their hospitals, their institutions as something that is not clearly someone else’s, but definitely not mine. Hence, there is still no desire to invest and think about safety, about savings”, FG_Regional

Informational factors

- Misunderstanding by communities of the benefits and advantages of the implementation of energy projects, the introduction of new technologies (in particular, economic, and environmental)

“There is still no understanding of what is cheaper together”, FG_Regional

- Ignorance of community leaders about available technical solutions and funding opportunities

“At large landfills, there are gas generators and they quite successfully convert gases and waste from garbage into electricity. And there is Green Energy, a company that does this, and there are such installations across Ukraine. But, for communities, it goes as part of participation in the agreement of the Mayors’ Program. And if the community does not participate in the agreement of mayors, it will not know about these methods. And these measures are actively encouraged there. Thus, if the community gets involved there, it can get funds and support” GI_Local

- Misunderstanding of the algorithm for creating energy communities. Lack of information on how to start and develop the process

“There is a request from the communities, but the question is how to do all this, implement and ensure it from a technological, financial, legislative, technical point of view”, FG_Regional

- Lack of informational measures aimed at popularizing the energy transition among the broad masses of the population
- Inability to search for information and useful contacts (e.g. between heads of communal institutions and the public sector)

Economic factors

- Limited budgets of communities, other priorities of funding (perhaps lack of priority – transition to RES, both in the state and in donors)

“The community does not have free money to finance these projects. They are divided according to priorities, e.g. for roads, construction, repairs, depending on what is more important to voters. And critical infrastructure, in case of blackouts, was provided with generators (money from grants and budget funds)”, FG_Regional

- Too high cost of loans (high interest rate, fixing of loans in foreign currency)

“The availability of loans is necessary so that the community can create a cooperative. As the Germans say, “You have a 15-20% loan. Are you so rich people? There should be a 2.5% loan for the community, because even 5% is a lot for such a project”, FG_Local

- Fear of investing in facilities during war (high risk of destruction)
- Long investment payback period, in case of limited possibility to discharge excess electricity

“Cities where electricity and heat can be sold into the district heating system. This is a completely different payback, in terms of return on investment. Therefore, the main thing is to adapt legislation and infrastructure (electrical networks) to the use of this type of energy.”, FG_Regional

- Weather dependence of green energy, due to which there is a need to bear costs twice: both for RES and for energy from the power system.
- Economically unprofitable conditions for the installation of RES for housing cooperatives (which could potentially become initiators of the creation of energy cooperatives)

“When representatives of communities contact us and we explain what the current legislation in this area regarding the types of these communities or cooperatives is, they understand that they will not gain anything from this. Housing cooperatives are non-profit organizations, and they are not entitled to any profit from the sale of electricity to the network, they only have the right to save. It used to be UAH 1.68, now it is UAH 2.46, and it is still unprofitable”, FG_National

“During the period of my work, we did not launch any cooperatives, because for legal entities, like housing cooperatives, there are completely different tariffs, conditions, and volumes of work, and that’s where the question was settled”, FG_National

- Low cost of electricity for the population (it is cheaper to buy energy than to invest in creating a cooperative)

“Tariffs for the population are artificially accepted at an understated level, they are not economically justified. And strictly speaking, it has not yet reached the point that it is necessary to move in this direction.”, FG_Regional

- **Too expensive land** in capable communities, making RES installation less cost-effective, and lack of capability in communities where land is inexpensive

“Communities that have specialists who can collect and submit documents, work with grant funds, are mostly not interested in this issue, because these communities are located near large regional cities where the land is very expensive. And small communities, which are not very capable, who are very interested in this, do not have funds and there are no specialists who could implement such projects”, FG_Local

Regulatory factors

- **A significant number of unregulated issues** related to the creation of energy communities, for example:
 - Admissibility of budgetary co-financing of solar stations during wartime
 - Balance sheet ownership of renewable energy sources of utility enterprises
 - Permissibility of installing solar stations in the first sanitary zone, etc.
- **Complicated procedures for allocating funds for the maintenance of RES installations and write-offs for obsolete equipment**
- **Lack of an alternative to selling electricity to the general network**

“In my opinion, as I have already mentioned, another important issue is to create conditions, to ensure options for dumping the residual electricity. To have a choice. What is the point for people’s joining into cooperatives, if they are either in cooperatives or operate individually, there is no alternative, apart from Oblenergo, to charge them with a green tariff”, FGD_Local

Experts do not try to determine which group of factors is a priority. Obviously, they all have an accumulative effect. Lack of knowledge, trust, and leadership, a significant number of issues that are not regulated by legislation lead to the fact that this process seems to be complicated and burdensome. And non-obvious economic benefit makes these efforts pointless.

CHAPTER 5. PROBLEMS OF ACTIVE ENERGY COMMUNITIES IN UKRAINE.

If the community does decide to create an energy community, it may face problems both **at the project launch stage** and **in the process of its operation**.

Experts mention quite a lot of problems at the project launch stage. There are significantly fewer problems at the stage of operation. This is due, first of all, to the fact that there are few active energy communities. Presumably, most communities failed to overcome the problems of the first stage and to launch active projects.

Problems at the stage of launching energy communities

- **Negative reaction of community residents to the authorities’ intentions**, due to problematic communication or mistrust.

“Many ordinary people mistrust the authorities, believe that the state is going to deceive them, and something is definitely going to be wrong. But, if there is a good communication, and the community has a good communicator, who explains why, what, where, and how, this eventually leads to a result”, FG_Local

“There was a garbage dump in one of the villages. And there was a very active chairman of the village council. He got a grant for the construction of a waste processing plant. However, the community did not agree. They were afraid of emissions from that plant. But they were not afraid of the landfill nearby. And they did not take into account that that would provide additional jobs and electricity”, FG_Regional

- **Lack of solidarity.** Difficulties in agreeing conditions in the cooperative (for example, regarding how the land plot will be protected, how energy will be distributed), or the inability to collect co-financing funds (refusal of part of the residents to join the collection of funds)
- **Lack of knowledge and skills of local officials** regarding documentation and support of energy communities.

“People who hold certain positions are not fully educated. For many of them there arises a question of how to formalize everything properly as well as the issue of legal responsibility for conducting this process”, FG_Local

- **Lack of technical specialists and qualified contractors** (there is an especially critical lack of specialists who could work with budget organizations).

“We did not manage to find contractors who would have experience in designing, developing estimate and project documentation specifically with budget organizations. There are many companies that work with private businesses, with individuals as until recently there were few such projects in this field”, FG_Regional

- **Oblenergo countermeasures:** difficulties at the stage of forming permit documentation and joining the network.

“These institutions lack transparency and openness. It may seem that it is not profitable for them to create such cooperatives, that there is no benefit of having energy autonomies, that it is not beneficial for them if people gain information, have access, and are able to do something”, FG_Local

“Oblenergo is such an organization... if it wants to do mischief so that you do not implement it, it will find a reason. It will issue such technical conditions that it will not be possible to implement them”, FG_Regional

- **Corruption** (demanding bribes or kickback schemes) on the part of local authorities or conciliation institutions/executive institutions.

“You submit the load, the time, what generating plants are applied, what consumers there are and what technical conditions are provided. And all this should be taken into account to calculate the optimal price and technical solution for you. As a result, you are offered a list of equipment that a particular contractor has. And then a certain percentage from the sale of equipment goes into the pocket of a particular person”, FG_Regional

“I dealt with it myself. They came to the community with their money, with their people saying, “We will make grant money for you” and then they say “How much will you give me for this?”, FG_Local

- A significant number of permit documents, a lengthy registration procedure.

*“Permit for documentation, operation, proper operation. To put a rooftop station on the roof, you need the permission of the building’s owner. If it is a utility company, then a lot of documents must be prepared (starting with the decision of the city council, commissions, etc.)”,
FG_National*

Problems at the stage of operation

- Conflicts with Oblenergo regarding the connection of a built object, installation of equipment that monitors flows

“Some parts of our Oblenergo are owned by Russians. It is difficult to find interaction with them not only in terms of energy sharing but also to install equipment that would monitor flows and limit generation in their substation. They immediately set us conditions that cannot be fulfilled”, FG_Regional

- Low-quality performance of the contractor (due to the fact that on the Prozoro platform the contractor is selected exclusively based on the criterion of the lowest price).
- Inability to calculate the economic feasibility of the RES project, lack of financial literacy (and, as a result, disappointment in their feasibility).

“People were not given full information. They were just told, “This is a profitable business project” and everyone ran there. And that was just a speculation by manufacturers to increase sales! In many villages, the entire streets were covered with solar panels”, FG_National

- Lack of maintenance of RES facilities after installation

“A case from the public budget: a bench with solar panels was installed – it was either stolen or something happened to it. Another case: an electric tree was installed, but in at least six months it has already become rusty. No one uses it any longer”, FG_National

Recipes for success and failures of energy communities

The analysis of specific cases allows us to identify recipes for success and failure of implementing energy community projects in Ukraine.

Identifying recipes for success are useful because they can be scaled. Negative experience can be useful if it is analyzed and mistakes are considered to avoid future failures.

*“One pilot project is not enough to say what worked and what didn’t. It is necessary to work it out with the communities. Some recommendations appear based on pilot projects”,
FG_National*

Success is facilitated by:

- 1) Community cohesion / trust in the community or community residents for the local government. If it is available, projects have a high chance of implementation, if it is not, they fall apart at the planning stage

“There is a successful example, precisely from the point of view of cooperation. Back in 2017, the head of one of the housing cooperatives agreed with the neighbors and rented the roof of an apartment house, installed a technical station there, issued a green tariff there and earned money there. Apartment house”, FG_Regional

2) Motivation of community to implement RES projects

“Usually, our PO is applied to with the need to build a solar station. We announce a competition. It is not so easy to get to us. You have to be really motivated, you have to make sure that you really plan to do something, you have calculations. Because when you choose the community yourself, well, they are like that, well, they started, then they do it. First of all, we look at whether people are ready to co-finance all this. Because if it's all completely free, then it really doesn't have that much value for people”, FG_Regional

3) Relying on values (and not just pragmatic considerations) allows us to attract investments more effectively.

“Recently, investors have been saying, ‘We want to do something valuable, something that is needed.’ It is clear that profitability and profit are a key indicator, but what it brings for communities, for people, for the region – these are very important factors, and if there is no value component, it is not easy to attract investments.”, FG_National

4) Declaring intentions for the development of energy communities and commitment to the green transition. Signing of the agreement of Mayors

“Many cities are signatories to the agreement of mayors and assure the responsibility to increase the share of energy recovery in the territory of the community. The fulfillment of the commitments undertaken is a very good story from the point of view of the recognition of the community among European donors”, FG_Regional

5) Work with donors. Attracting grant funds

“Hostomel, Horynka. This winter they installed a small solar station, 10 kilowatts of solar panels, 5 inverters and a small battery. During all these blackouts, they had electricity. They cover more than 60 percent of their own consumption at the expense of this. And the main point is that there was money, these are European grants., FG_Local

“In Western Ukraine, there is a Chairman of the Association of Energy-Efficient Cities, and his success is very simple: there are solar systems, solid fuel boilers, etc., but probably 80% of his budget is foreign money, funds. He knows how to make money (grants and investments)”, FG_National

6) Attracting state support (as in the case of the community in Slavutych)

7) Willingness to implement completely autonomous projects. Complex solutions

“Displaced persons from Donbas were allocated land without electricity. The supplier put up unreal technical specifications (repair a couple of megawatt transformers, because I can't connect you). This led to the fact that the community, really a community of up to 50 people, began to look for alternative ways out of this situation. An alternative project – microgrids

- was proposed. It included wind generation, solar generation, which includes the grids and diesel, all together it had to serve 50 apartments. This would save the unit cost of one unit up to 50%. In other words, it is cheaper to build a cooperative, chip in, and build than to build 50 separate and independent power plants., FG_Regional

Experts are convinced that project leaders/initiative groups are motivated primarily by economic and security dividends. If the project is implemented by the local self-government of the community, image (political) advantages may be added to those already mentioned, thanks to the implementation of a trendy energy solution.

Failures in the organization of energy communities are caused by:

- 1) **Oblenergo countermeasures** (corruption manifestations, bureaucratic obstacles)

“There was a project of a small solar station in one of the communities of Poltava region. Electricity was to be sold at a green tariff, and the proceeds were to be used for community development. Everything was wonderful, they had their own land. But they got problems with Oblenergo, e.g. with obtaining technical specifications, as very big money had to be paid unofficially for this”, FG_Local

“Slavutychy, Sunny City, people jointly invested money. The problem arose precisely with Oblenergo, they could not be connected to the network for several years”, FG_Local

- 2) **Savings on equipment.** Some of the photovoltaic power plants are equipped with inexpensive inverters that do not work without power from the network. Therefore, they turned out to be unsuitable for generation in blackout conditions.

- 3) **Corruption**

“Bortnytsk aeration station in Kyiv, which the Japanese have been trying for God knows how many years, and the technologies were offered, but where is the upgraded station? Nothing was done, no biogas plant was installed there, because decisions were made only because of money. All this is just about the corruption”, FG_National

- 4) **Land disputes.** The neighboring community refused to allocate land under an already agreed project with allocated credit.

- 5) **Lack of leadership**

“Our Ecoclub partners tried to create an energy cooperative in one of the communities, and in the end it was not implemented. The cooperative exists in the documents, but it does not exist in real life since at one point the person who managed this process got disinterested in it, and other people did not grasp this idea”, FG_National

The analysis of the success/failure factors of the creation of energy communities in Ukraine proves that a significant part of them depends on the level of their motivation to implement the project, willingness to learn, take initiative, look for solutions and sources of financing, and overcome difficulties.

At the same time, a significant factor that can undermine the potential of creating energy communities is corruption and the opposition of the oligarchy.

CHAPTER 6. ASSESSMENT OF STATE SUPPORT FOR ENERGY COMMUNITIES.

According to experts, today the state **does not actively support the creation of energy communities in Ukraine, does not form incentives and barriers, does not offer special programs**¹.

Experts also claim that **the current legislation of the country is not sufficiently adapted to the needs of creating energy communities.**

Today, this issue is regulated by the Laws of Ukraine:

- On Local Self-Government (which prescribes the duties of local self-government, regarding the implementation of energy management, and therefore indirectly stimulates the creation of energy communities).
- On Cooperation
- On Green Transformation (On amendments to some laws of Ukraine regarding restoration and “green” transformation of the energy system of Ukraine)
- On the Green Tariff (On amendments to some laws of Ukraine regarding the improvement of the conditions for supporting the production of electricity from alternative energy sources)

“From the point of view of legislation, there is now the usual Law on Cooperatives and the Law on the Green Tariff. There is no other legislation for the implementation of such energy communities”, FG_Local

At the same time, Draft Law 9011-d (Draft of the Law on Amendments to Certain Laws of Ukraine on the Restoration and Green Transformation of the Energy System of Ukraine) is in the process of implementation. According to experts, it is quite progressive (in particular, it provides tariff incentives, the possibility of distributed generation, etc.), but it will come into force after 2025.

“The draft law 9011-d clearly states that an active consumer can join and create an energy cooperative”, FG_National

“You mentioned “Net Billing” – it can be found there. Issues related to sales can be found there as well. There is an issue of the development of aggregators, there is support for distributed generation and generation for individual consumption.”, FG_National

The state controls the work of Oblenergo to an insufficient extent. Laws that regulate their activities leave some space for manipulation, fines for violations are insignificant. The state does not try to simplify the conditions for the creation of RES projects in communities and their connection to the general network.

“Even within the same region, regional electrical networks (REM) act differently and may have different rules. Although there is a single law, REMs treat things in different ways and sometimes puts sticks in the wheels, claiming that this or that thing is wrong”, FG_Local

At the same time, it is difficult for experts to propose an effective formula for limiting Oblenergo’s outrage. One of such solutions could be the implementation of an automated

¹ Only one of the experts claimed that there is a state program in Ukraine that allows communities to receive funds for the installation of RES.

process of obtaining / approving technical documentation. Its advantage is the reduction of corruption risks, while its disadvantage is the complexity of implementation, due to the peculiarities of network connection possibilities in each specific case.

“The energy system is a rather complex mechanism, and each specific city has different possibilities for connecting to a transformer or something else. I believe that it will be difficult to automate it”, FG_Local

Instead, a more effective tool to counteract Oblenergo’s lobbying could be the coordinated efforts of public organizations and associations. In particular, they could advocate legislative changes needed by the public. Associations of renewable energy and solar energy are working quite effectively in this direction today. Changes in state policy are not possible without the active participation of the public.

“There are many complaints about the fact that our legal regulations are imperfect, and there are many other points. But I have a question, “How many of you take an active part in the discussion of various regulatory documents when they are being developed, and presented in general? Does anyone write comments? I think very few people. Maybe everyone should be more actively involved in this process”, FG_Local

Despite the active criticism of the inadequacy of the State’s efforts aimed at supporting energy communities, experts still note the measures being taken in this direction:

- thematic meetings organized at the Regional Administrations;
- arrangement regarding an energy audit of state and communal educational and cultural institutions;
- introduction of the position of curator for energy conservation, energy efficiency and renewable energy in the structures of state power (at the State Agency for Energy Efficiency, Regional Administrations);
- managing grant programs and involvement of international donors in the purchase and installation of solar panels at critical infrastructure facilities;
- financing the installation of solar panels on the roofs of 200-250 communal institutions.

“I have repeatedly participated in such interesting meetings at the Regional State Administration. If a public organization organizes something, 2-3 people come to the meeting. And as soon as the RSA organizes an event, the people immediately gather. And people are eager to attend these events”, FG_Regional

“The State Agency for Energy Efficiency, the Rivne Administration, in fact people who were in the structure and performed the functions of energy saving and development of renewable energy in the region were present in the districts, i.e. at least one person who was an expert”, FG_National

However, these activities have become less common when the war began.

CHAPTER 7. GUIDELINES FOR PROMOTING THE DEVELOPMENT OF ENERGY COMMUNITIES IN UKRAINE.

Ukraine is a signatory to the Paris Climate Agreement, therefore, one way or another, it has to fulfill its obligations to increase the share of RES in its energy system. This implies higher involvement of communities in the process of energy transition. Considering the fact that today their interest remains low, there is a need for additional stimulation of communities to switch to alternative energy sources.

Creation of energy communities should be promoted on the basis of the following ideas:

- ✓ quick implementation
- ✓ financial benefit
- ✓ ecological expediency
- ✓ resource availability

Initiators of energy communities.

The experts do not have a single view regarding the issues of who should initiate the creation of energy communities in Ukraine.

Representatives of communities (local authorities, public activists, representatives of housing cooperatives) are largely inclined to assign the role of the initiator to the state. The main argument in this case is the lack of resources in communities (informational, human, financial) for the implementation of innovative practices. Thus, communities expect leadership from the state in the form of a special program that would provide a comprehensive approach to the development of energy communities in Ukraine. This program should include a development strategy, a list of model solutions (that communities can implement) and financial incentives.

“As for communal facilities, I think that the state should focus more on them. The state together with the communities. And it also depends on the resource potential of each community in particular”, FG_Local

Instead, other stakeholders (businesses, public organizations, scientists) are convinced that the initiative should come from communities, since the state is not able to work simultaneously with hundreds of communities throughout the country. Instead, it is the local government / active members of community that better understand local needs and capacities.

“It is the community of the city and the local government that should be (and in many places are) the driving force for implementing such projects in their territories. The state government only sets the rules, while the communities implement them locally”, FG_Regional

At the local level, experts assign the leading role to the **local government**, which should act as the main initiator of project implementation and be the coordinator of interested parties.

“One of the initiators should be representatives of the authorities at local levels, e.g. managers or departments. Someone should lead and say, “Dear community, there is a particular budget, investors, so let’s work, let’s get together”, FG_National

The state, in turn, should be responsible for creating prerequisites for the effective functioning of energy communities. The sphere of its responsibility involves drafting relevant

legislative acts, guarantees ensuring that the projects will be profitable (which is especially relevant in the context of discussions on the cancellation of the green tariff), popularization of energy cooperatives.

Sporadically, experts expressed the opinion that the initiators of the creation of energy communities could be developers who build cottage towns. In particular, they could represent the energy autonomy of the settlement as one of the marketing advantages of their project.

Expectations from the central government.

In order to increase the capacity of the energy transition for communities, **targeted changes are needed, and the prerogative for their implementation should be given to the central government.** The main task of the state is to create conditions for the development of energy communities, to simplify the implementation of RES projects, so that communities could strengthen their energy capacity, making less effort.

To achieve this goal, it is important, firstly, **to make amendments to the regulatory and legal framework** at the national level for promoting the development of energy communities. In particular, it is necessary to:

- Bring the regulatory and technical base into compliance with the 4th EU Energy Package

“We are implementing the 3rd Energy Package, and I think we have done almost nothing at the legislative level for the 4th Package. However, Communities is the 4th Energy Package, i.e. Europe’s trend”, FG_National

- Legislative introduction of a modern approach to tariffing electricity consumption (three tariffs are not enough, the tariff needs to be changed depending on the surplus of energy in the system). Stimulating the development of smart networks
- Simplifying permit procedures for connecting to the network
- *Change of the law on the purpose of land use (permission to use the same land plot for several purposes).*

“There is an interesting experience of combining solar panels and cropping areas. We have severe summer droughts and too much sun. You can cover the field with solar panels after some time. Then the shadow will move throughout the day. This way the yield will be higher and we will get electricity from this field. But now we must have a target purpose of land, either agricultural or energy lands”, FG_Local

- Cancellation of the resolution of the National Commission on State Regulation of Energy and Communal services (NCSRECS) that bans the installation of solar power plants on lands

“In fact, this has only led to an increase in corruption, additional problems for the owners of small solar power plants”, FG_Local

- Changing the principles of SES power calculation (transition from calculation by panels to calculation by investors)

In addition, there are proposals to make changes to state building regulations and oblige:

- developers to install 3-zone/”smart” electricity meters in new buildings (in order to increase public interest in conscious consumption of electricity)

- to design solar stations on the roof during the construction of municipal buildings

To increase the financial capacity of communities, the state needs to consider the issue of **affordable foreign investment insurance**, or **offer its own grant programs / subsidies / soft loans** for communities that want to install RES for their own consumption.

Idea! Launch a state program for co-financing energy initiatives at the level of housing cooperatives.

In addition to these steps, the task of the state is to **demonstrate the financial benefit** the residents of communities will get in case RES projects are implemented.

For example: **a gradual increase in electricity prices will encourage consumers** to think first about energy efficiency measures for their homes, and then about the projects for joining energy cooperatives.

However, such a policy is debatable, considering its social component. Today, it is difficult to estimate the proportion of citizens who will need subsidies due to their financial inability to pay the increased tariffs.

To ensure benefits of RES projects for community residents, **a certain percentage of installations must be collectively owned by citizens for their further monetization**. However, such a scenario is possible if the community is ready to invest its own funds in the project (which is mostly affordable only for the residents of large cities), or allocate a plot of land for the project, otherwise, the installations can be intended for infrastructure needs (e.g. street lighting).

It is important for the state to guarantee the investments made and to inform about the financial benefits of “green” energy, as a more expertly capable structure.

Another large-scale challenge that needs to be solved at the state level is the lack of technical specialists who could accompany renewable energy projects in the future. The solution to this problem is considered in the context of **reforming higher engineering and vocational education**. First of all, it is necessary to modernize educational programs, support relevant technical specialties. In addition, a course on Project Management can be introduced in the curriculums.

Also, the state is expected **to develop and share standard recommendations and step-by-step instructions, clarifications at the meetings in the Regional State Administration** that are related to the issue of creating energy communities.

An important direction of the state’s work is the **formation of a discourse on the importance and benefits of the formation of energy communities in the mass consciousness**.

This effect can be achieved through the following measures:

- Social media advertising
- Work with communities: active members and authorities, in particular:
 - clarification of economic benefits of project implementation, showing specific cases with calculations
 - informing about beneficial projects
 - dissemination of information about successful cases (promo stories on social networks)
- Informing older schoolchildren about the sources of RES and energy communities within the school curriculum (though it’s quite controversial since children do not make decisions regarding the formation of energy communities)
- State program aimed to stimulate the creation of energy communities, state support, state guarantees of return on investment in similar projects

“When we see that it is expensive for people to install solar power plants (SPP), we tell them that there are 4 more houses nearby and that maybe it makes sense to join together. It will be cheaper and more comprehensive. Half of them agree”, FG_Local (Business)

“In fact, every time you need to do a training course on the use of renewable energy at your enterprise or in your community”, FG_National

Instructions, clarifications from the state and meetings at the level of the Regional State Administration are perceived by the expert community with interest and enthusiasm.

To some extent, the state is expected to support the implementation of pilot energy projects in the regions in order to systematize the practical experience of implementing a new energy solution based on them.

“These projects create a basis for summarizing energy results, how it works technically, legally, and develop centralized guidelines”, FG_Regional

And finally, **opposition to oligarchs** and lobbying the interests of big business in the Verkhovna Rada of Ukraine is critically important.

“Let’s be honest. Who are the owners of Oblenergo and all other large energy institutions? Oligarchs. People who control entire parliaments of more than one convocation. They did not give us the opportunity, and they will not give us the opportunity, because these are their profits, these are their excess profits.”, FG_Local

Expectations from local authorities

Local authorities (regional and local levels) are expected, first of all, to make efforts to educate the community on the subject of energy sustainability and energy efficiency.

Idea! Promote the idea of implementing RES projects at social infrastructure facilities and among consumers of their services.

“Take into account the specific target audience. Organize an information campaign among people who get services. These are hospitals, bakeries, facilities that pump water. Share relevant leaflets, posters, so that many lives will be saved through an independent autonomous power supply system”, FG_National

In addition, local authorities could inform the initiative groups about the successful experience of those who had already created energy communities and ensure the process of exchanging experiences. The implementation of such practical tools as programs for co-financing initiatives and training on project management will be effective. Besides, it is suggested to appoint a separate employee at the Regional State Administration who would advise communities on the implementation of renewable energy projects.

It is important to motivate experts who are familiar with RES to stay in the community, as they tend to leave for big cities.

“When they come to Kyiv from the remote districts, having graduated from the university, and get a salary of UAH 25,000-30,000, they will not agree to return and work with the salary of UAH 6,000 to implement projects. Local managers should provide special rates for people who will manage the projects”, FG_National

Ultimately, local governments can initiate the creation of an energy community, act as a leader and ideologue of establishing a RES project in the community.

Basic needs of communities for project implementation.

Experts outline a number of needs that are important to be met in order to intensify the creation of energy communities and energy cooperatives. First of all, they involve the following ones: information, support of organizational capacity, finance.

COMMUNITY NEEDS	
INFORMATION	<ul style="list-style-type: none"> ● Regular informing about grant opportunities for communities ● Rules for connecting to the electrical networks of the distribution system operator (in the context of Net billing and Net metering) ● Step-by-step instructions with technical requirements for RES installation
ORGANIZATIONAL CAPACITY (SPECIALISTS)	<ul style="list-style-type: none"> ● Training of specialists (project managers, specialists in preparation of technical conditions and documentation, technical specialists) ● Assistance of project managers or technical specialists ● Organization of youth technical hubs / laboratories for future specialists, at the level of specialized educational institutions
FINANCE	<ul style="list-style-type: none"> ● Loans in national currency with a minimum interest rate (1-3%) for a long term ● Financial encouragement of specialized specialists / organizations to work with communities (allocation of subventions)
OTHER	<ul style="list-style-type: none"> ● Development of a strategy for redirecting residual electricity (for the needs of the community / local business) ● Measures that would prevent corruption at the stage of maintenance development ● Activities intended to popularize energy communities (advertising, festivals, demonstrations of the results of pilot projects)

It is expected that this assistance will be provided by various levels of government. Information requests will be met by local authorities, but all others will rely on state authorities.

Idea! Private specialized companies should be involved in working with communities as operators for state funds, who will deal with project management and technical expertise.

As for foreign donors, they are considered, first of all, as grantors. At the same time, they can be a valuable source of experience and expertise.

The following formats of their support will be appropriate:

- consulting support
- project support at all stages
- sharing experience in communities
- organizing foreign trips to energy communities for the representatives of local authorities

CHAPTER 8. ACCESS TO INFORMATION.

Currently, the majority of public activists, journalists and scientists declare a lack of information on energy transition and creation of energy communities.

Information about the possibilities of creating energy communities in Ukraine was obtained from the following sources:

- Ukrainian Bioenergy Association;
- Thematically related online publications (e.g. “Ukrainian Energy”, “Economic Truth”);
- Profile groups in social networks;
- Search systems;
- Expert discussions.

The following resources inform about the possibilities of implementing RES projects:

- Prostir UA;
- USAID;
- Personalized emails.

Instead, **none of the group participants received relevant information from energy managers** from their own community.

Experts get a little more information about energy communities from European sources. However, it is more difficult to perceive it due to the language barrier (most texts are translated through online translators). Experts get most of the information from the websites of the European Commission and the embassies they cooperate with.

Attempts to establish partnerships with organizations working to promote the practices of creating energy communities in Ukraine were rare. The experience of such cooperation has shown low effectiveness of cooperation, in particular due to the lack of understanding of Ukrainian realities by foreigners.

“We had some experience with a German company, they wanted to enter our market in terms of forecasting. We have also been dealing with this issue for the last 5 years and it turned out that we are no worse in this regard. In addition, the peculiarities of their work on the market showed that they cannot do anything with their models here. So they gave it up”,
FG_Regional

At the same time, the experience of European partners regarding the creation and operation of energy cooperatives may prove to be especially effective at the legislative level. Internship experience in existing European energy communities will be valuable as well.

“As for the technical support, we are equal, sometimes even better. And from the point of view of the institution, i.e. how to do it, how to organize a cooperative, legislation, everything else in real life - it creates difficulties”. FG_Regional

The public and international structures that provide support for renewable energy projects involve the following ones:

- Ecoclub;
- Ecodiya;
- Energy Action for Ukraine;
- EBRD;

- USAID;
- World Bank;
- AFC Agriculture & Finance Consultants GmbH.

Experts of the public environment noted **the need for information on the following topics:**

- Available legislative regulation;
- Digest of grant programs;
- Examples of economic calculations;
- Practical cases;
- Overview of the state of development of energy communities in Ukraine (what has already been done / what is in the process of implementation / main changes).

Today, **the most convenient channels for distributing necessary information** are as follows: email newsletters (digest), web pages on specialized sites, expert discussions/ interviews (in video or text format), webinars.

It can be effective to create an information hub of verified experts or RES installers, who can be asked for consulting support. It could be expedient to create mobile teams that would visit interested communities and provide informational, advisory, and expert support in the communities.

CONCLUSIONS

- Green transition is not only a matter of protecting the climate or saving money for households, but also a matter of energy independence, a key component of the state's energy security and sustainable innovative development.
- Communities are one of the entities that can intensify the green transition due to the massive installation of RES. At the same time, the creation of energy communities in Ukraine has not gained significant popularity.
- In Ukraine, to a somewhat greater extent, there can be found energy communities that have installed RES projects at the initiative of local self-government bodies (for heating / lighting of communal institutions, streets). Most of them are pilot projects implemented with grant funds, which became successful thanks to the financial, informational, and technical support of donors. However, this option is available only to capable communities that have active leaders, good project managers, and resources for co-financing, and know how to build up contacts (for example, they have become a member of the Association of Energy-Efficient Cities of Ukraine, joined the Agreement of Mayors).
- Projects implemented by local self-government bodies at the expense of the communities' own budget or credit funds were much less common, since most communities are limited in human resources (they do not have project managers and technical specialists) and finances. In many communities, government officials tend to think inertly or are unable to communicate the advantages of the energy community model to the community.
- Cooperatives founded by the residents of communities are not wide-spread. First of all, this is due to the lack of information (about the essence, advantages and benefits of the implementation of such projects). At the same time, the essential restraining factors here were the lack of social capital (the ability **to negotiate with each other and balance interests**) and trust, both to the residents of the community and to the authorities.
- In today's conditions, the prospects for scaling up the practices of forming energy communities are evaluated as quite controversial. On the one hand, the interest in this tool is gradually growing. On the other hand, communities are faced with a significant number of problems, they often get disappointed and change their plans.
- In addition, the creation of energy communities is restrained by various economic factors (including high cost of loans, limited budgets of communities, risk of investments during war, artificially low cost of electricity for the population and economically unfavorable conditions for installing RES for housing cooperatives, a long investment payback period in the case of limited ability to discharge residual energy).
- Experts also note a significant number of unregulated issues related to the implementation and operation of RES projects in communities. Although the new draft law 9011-d removes a significant part of these issues, it will fully come into force only in 2025.

- At the stage of starting up energy communities, communities often face the following problems:
 - **Disagreement in the community** (lack of solidarity and trust in the authorities)
 - **Lack of knowledge and skills of local officials** regarding documentation and support of energy communities.
 - **Lack of technical specialists and qualified contractors**
 - **Oblenergo countermeasures:** difficulties at the stage of forming permit documentation and joining the network
 - **Corruption** (requirements for bribes or schemes with kickbacks) on the part of local authorities or conciliation institutions
 - **A significant number of permit documents**, a lengthy registration procedure
- At the stage of operation, the following problems may arise:
 - **Conflicts with Oblenergo** on the issue of connecting a built object, installation of equipment that monitors flows
 - **Low-quality performance of the contractor** (since on the Prozoro platform the contractor is selected exclusively on the basis of the lowest price criterion)
- Analysis of the success/failure factors of creating energy communities in Ukraine has proved that they depend to a great extent on how the community is motivated to implement the project, on its willingness to learn, take initiative, look for solutions and sources of funding, and overcome difficulties. At the same time, corruption and oligarchs are a powerful force capable of undermining the potential of creating energy communities.
- A wide range of problems and difficulties faced by communities prompts the idea of the need to create state support for the creation of energy communities in Ukraine.
- Most experts are not informed about state support for this process. Today, the state does not actively support the creation of energy communities in Ukraine, does not form incentives and barriers, does not offer special programs². State legislation is not sufficiently adapted to the needs of creating energy communities.
- Therefore, at the state level, it is important to start a policy for supporting energy communities, which should involve adapting legislation, simplifying permit procedures for connecting to the network, introducing tariff incentives (including the refusal to subsidize prices for electricity for the population), liberalization of electricity market (granting the right to transmit energy not only to the network, but also to other consumers), financial support (subsidies / cheap loans). In addition, the state should take on the function of informing the population about the prospects and benefits of creating energy communities.
- Local authorities (regional and local levels) are expected, first of all, to make efforts to educate the community on the issues of energy sustainability and energy efficiency. In addition, local authorities could inform initiative groups about the successful experience of those who have already created energy communities, ensure the process of exchange of experience, and initiate projects in the community.

² Only one of the experts claimed that there is a State Program in Ukraine that allows communities to get funds for the installation of RES.

- In this process, foreign donors are treated, first of all, as grantors. At the same time, they can be a valuable source of experience and expertise.
- And finally, today public organizations play an important role in the formation of energy communities in Ukraine. They act as umbrella structures that help communities attract donors/investors, assist in the preparation of applications, attract technical specialists and professional contractors to implement projects.
- Taking into consideration their successful work experience, it seems appropriate to create umbrella project organizations that would stimulate the process of creating energy communities: inform about the possibilities of attracting funding, provide the first push, first contacts, and useful acquaintances, form complete algorithms for communities that would like to set their own energy cooperative.
- Examples of “pilot projects” and ready-made “road map” algorithms for the joint implementation of green energy projects are effective for promoting energy communities.