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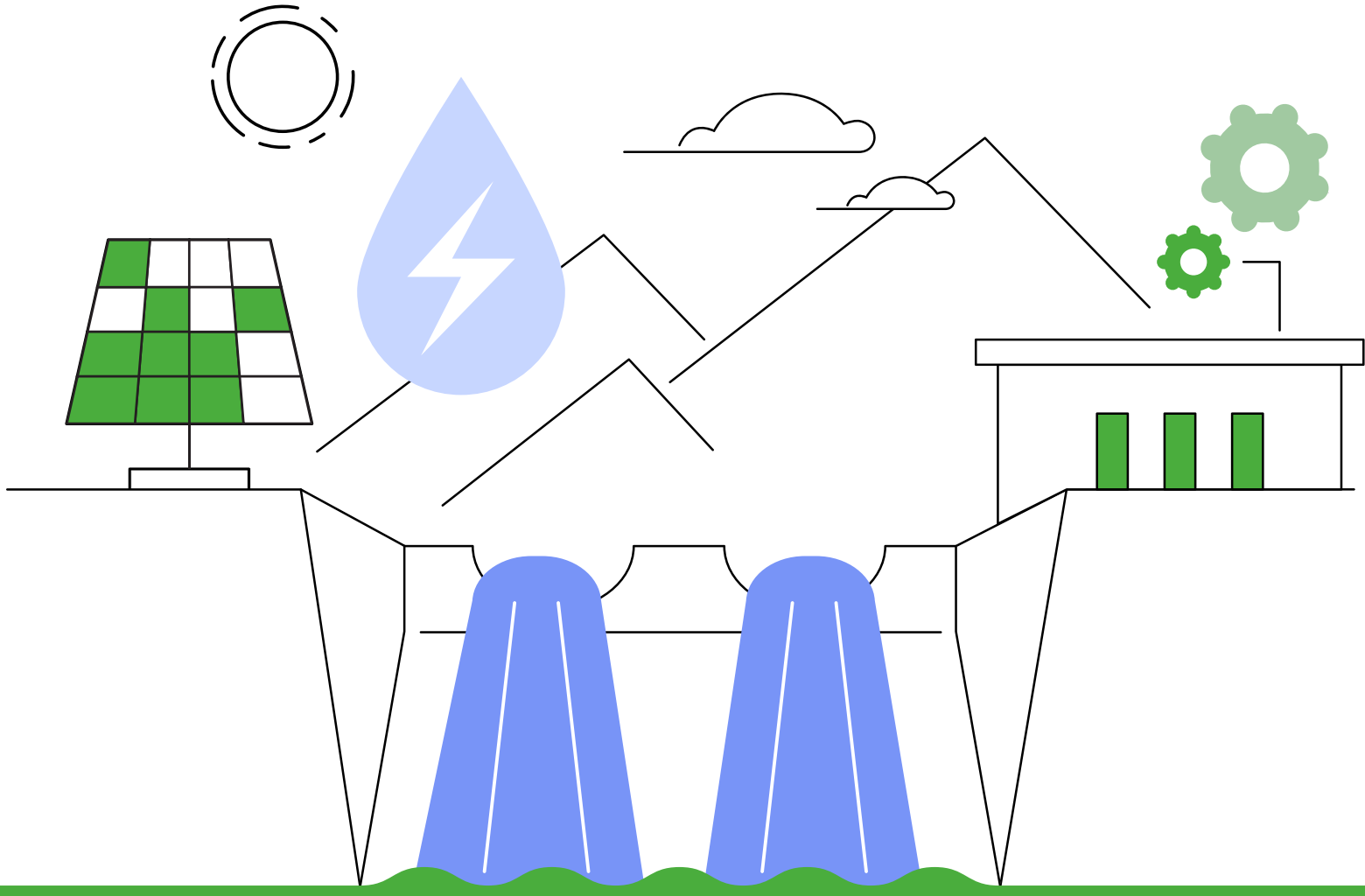
CHALLENGES AND OPPORTUNITIES FOR SOLAR POWER PLANTS

in the water and wastewater sector of Ukraine



by O. Savchenko

This document contains information about the challenges in implementing solar power projects for water utilities and recommendations for their improvement.

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ЗМІСТ

LIST OF ABBREVIATIONS

RES – renewable energy source

SPP – solar panel plant

IP – investment programs

DP – development plans

CWS – centralized water supply and wastewater disposal systems

NEURC – National Energy and Utilities Regulatory Commission

RA – regulatory act

LGA – local government authorities

ME– municipal enterprise

USA – United States of Amercia

EU – European Union

CMU - Cabinet of Ministers of Ukraine

SUMMARY

The installation of solar power plants (SPPs) at centralised water supply and wastewater disposal facilities is an important step towards energy security, reducing energy costs and promoting environmental sustainability. The study analysed the Ukrainian legislation in the field of centralised water supply and wastewater disposal, practical experience of SPP implementation, foreign experience and identified problems and barriers in the current regulatory framework with proposals for their elimination.

The identified problems cover various aspects, ranging from administrative and financial challenges to technical and legislative barriers. Below are ***the key issues identified in the study:***

1) Dependence on local government decisions
Water and wastewater companies, which in most cases are Utility, need approvals from local governments to raise finance and allocate land plots. This creates a dependence on the political will of local council members and can slow down the process of implementing SPPs.

2) Difficulty in attracting financing
Utilities often operate at a loss due to low tariffs and high operating costs. This limits their ability to accumulate funds to invest in SPPs. Financial institutions are also reluctant to provide loans to companies with a high risk of insolvency.

3) Approval of land allocation
Land allocation for SPPs requires multi-stage approval, including the development of a land management project, approval by local councils, and compliance with the requirements of the Land Code of Ukraine.

4) Lack of effective information policy
Insufficient awareness of enterprises about the possibilities of cooperation with international donors and non-governmental organizations that can provide grants and technical support for the installation of SPPs.

5) Difficulty in obtaining permits
The process of obtaining and processing permits for the construction/installation of SPPs is complex and time-consuming, which can stop water and wastewater companies from implementing such projects or significantly delay the commissioning of SPPs.

6) The need for additional qualified personnel
The maintenance of SPPs requires highly qualified personnel, which creates additional challenges in terms of availability of specialists and increased costs for the enterprise.

7) Lack of government support programs
Currently, despite the direct requirement of the law, the Program for the Development of Distributed Generation has not yet been approved, and support programs in the form of credit preferences are not yet in place.

8) Currency risks when attracting international loans
Raising international loans usually involves obtaining funds in foreign currency, which creates currency risks for utilities when repaying these loans.

The following steps are proposed to eliminate the identified problems and barriers to the implementation of SPPs at centralized water supply and wastewater ***treatment companies:***

1) Simplification of approval procedures:
In this context, it is proposed to develop standardized procedures and reduce the timeframe for approving land allocation and obtaining permits.

2) Financial support and incentives:
The proposal is to introduce state support programs and financial incentives for enterprises implementing SPP projects. It is also proposed to create conditions for the introduction of market-based tariffs for centralized water supply and sewerage and to attract investments.

3) Legislative changes:
To increase the economic feasibility of tariffs for water supply and wastewater treatment, the legal framework regulating the procedure for setting and approving tariffs should be amended to simplify and specify them.

4) Simplification of the procedure for obtaining permits:
It is proposed to simplify the process of obtaining permits by introducing standardized forms of project documentation, reducing the number of necessary approvals and simplifying requirements for SPP projects.

These measures will facilitate more efficient implementation of solar power plants at centralized water supply and wastewater treatment enterprises, increasing their energy efficiency.

1. ANALYSIS OF UKRAINIAN LEGISLATION IN THE FIELD OF WATER SUPPLY AND WASTEWATER DISPOSAL.

1.1. List of regulations in the field of water supply and wastewater disposal.

In Ukraine, activities in the water supply and wastewater disposal sector are regulated by a number of legislative and regulatory acts that establish the procedure for organizing, operating and controlling this sector. The main legal acts are:

- ***The Law of Ukraine "On Drinking Water and Drinking Water Supply" of 10.01.2002 № 2918-III***

Main points: The Law regulates relations in the field of drinking water and wastewater disposal, defines the subjects of these relations, objects of legal regulation, and establishes the principles of state policy in this area. The regulatory act (hereinafter referred to as the "RA") also covers tariff setting, licensing, monitoring, water quality control, and consumer protection.

The RA stipulates that networks, facilities, and equipment of centralized drinking water supply in settlements as particularly important objects of life support are not subject to privatization (Article 14).

Also, the list of documents on the basis of which drinking water supply companies carry out their activities has been fixed, namely:

- special water use permit or subsoil use permit (in case of groundwater use);
- license for economic activity on centralized water supply;
- state act on the right of permanent use or ownership of land;
- a technical project for the placement of water supply networks, structures and equipment, agreed and approved in accordance with the established procedure (Article 16).

It is determined that economic activity in centralized water supply is subject to licensing (Article 18).

The Law also provides for the possibility of developing investment projects by business entities in the field of centralized water supply (Article 18-1).

The Law of Ukraine "On Wastewater Disposal and Treatment" of 12.01.2023 № 2887-IX

Main points: The Law defines the legal, economic and organizational framework for wastewater disposal and treatment. The RA regulates activities in the field of wastewater disposal, sets requirements for the quality of wastewater treatment and the procedure for controlling these activities.

The RA stipulates that centralized wastewater disposal is provided by centralized wastewater disposal enterprises, and in settlements with a population equivalent of 2,000 or more, the introduction of centralized wastewater disposal is mandatory (Article 15).

The activities of centralized water disposal enterprises are carried out on the basis of the following documents:

- permits for special water use (in cases provided for by law);
- licenses for conducting business activities in centralized sewerage;
- conclusion on environmental impact assessment (in cases stipulated by law);
- technical design for the placement of networks, structures and equipment for collection, transportation, treatment of wastewater, treatment and disposal of wastewater sludge, agreed and approved in accordance with the established procedure;
- technological regulations in the field of water disposal;
- local rules for acceptance of wastewater into the centralized wastewater disposal systems of a settlement (part 2 of Article 15).

In addition, the Law of Ukraine "On Wastewater Disposal and Treatment" provides for the possibility to develop investment projects (part 1 of Article 20). In order to make settlements under investment projects in accordance with the procedure established by law, centralized wastewater treatment companies open special accounts.

To these accounts, the centralized wastewater disposal companies transfer funds in the amount provided for in the established tariffs for the implementation of investment projects.

The Law prohibits the foreclosure and seizure of funds held on special accounts and on special accounts for credit funds of centralized sewage enterprises (part 2 of Article 20).

The Law of Ukraine "On Housing and Utility Services" of 09.11.2017 No. 2189-VIII

Main points: The Law defines the legal, economic and organizational framework for the provision of housing and Utility services, including water supply and wastewater disposal. It regulates the relationship between consumers and service providers, the procedure for concluding contracts, as well as the issues of tariff setting and quality control.

The Law of Ukraine "On Natural Monopolies" of 20.04.2000 No. 1682-III

Main points: The Law No. 1682-III regulates the activities of natural monopolies, which include water supply and wastewater disposal companies. The Law establishes the procedure for regulating prices (tariffs) for goods (services) of natural monopolies, control over their activities, and consumer protection.

Law No. 1682-III stipulates that centralized water supply and sewerage activities are subject to licensing (Article 7).

It also stipulates that prices (tariffs) for goods produced (sold) by natural monopolies (which include centralized water supply and sewerage companies) are subject to state regulation (Article 8).

The Law of Ukraine "On Local Self-Government in Ukraine" of 21.05.1997 No. 280/97-VR

Main points: The Law defines the powers of local self-government bodies to set tariffs for centralized water supply and wastewater disposal services (except for tariffs for these services set by the National Energy and Utilities Regulatory Commission (hereinafter - the NEURC).

Article 28 of the Law No. 280/97-VR stipulates that the executive bodies of village, town and city councils are responsible for Setting tariffs for heat energy (including its production, transportation and supply), tariffs for centralized water supply and centralized sewerage, other utilities (except for tariffs for heat energy, its production, transportation and supply, tariffs for utilities set by the NEURC), household, transport and other services in the manner and within the limits established by law.

The Procedure for Setting Tariffs for Centralized Water Supply and Centralized Wastewater Disposal, approved by the NEURC Resolution No. 302 dated March 10, 2016 (hereinafter - Procedure No. 302)

Main points: The Procedure defines the mechanism for calculating tariffs for centralized water supply and wastewater disposal services, taking into account the economically justified costs of enterprises, including electricity, wages, materials, reagents, depreciation and other costs directly related to the provision of services.

Procedure No. 302 applies to natural monopolies that provide centralized water supply and wastewater disposal and are licensed by the NEURC.

In order to set tariffs for centralized water supply and/or centralized wastewater disposal, the licensee shall submit to the NEURC by June 01 of each year in printed and electronic form an application for tariff setting and tariff calculations in the established forms with supporting materials and documents used for the calculations (clause 1.9.).

The tariffs are formed on the basis of annual plans for centralized water supply and wastewater disposal activities, taking into account economically justified costs (clause 2.1.).

Tariffs for centralized water supply and/or centralized sewerage are calculated by dividing the sum of the annual planned full cost expenses, annual planned profit, the amount of cost adjustment (compensation or reduction of expenses) and the amount of reduction of tariff components that were provided for the implementation of investment program (investment project) activities by the planned annual volume of centralized water supply and/or centralized wastewater disposal, determined by the annual plans of licensed activities for centralized water supply and wastewater disposal.

Procedure No. 302 defines the cost elements that are taken into account when calculating the tariff.

Thus, tariffs are calculated by dividing the sum of annual planned costs, annual planned profit, the amount of cost adjustment and the amount of reduction of tariff components by the planned annual volume of centralized water supply and wastewater disposal.

Cost elements:

1) Direct material costs: costs of electricity, reagents, materials.
2) Direct labor costs: salaries of production personnel, additional salaries, other payments.
3) Other direct costs: social security contributions, depreciation, energy service contracts.
4) General production expenses: production management costs, depreciation and amortization, and maintenance of fixed assets.

The tariff for centralized wastewater disposal is formed on the same principle.

Procedure for setting tariffs for centralized water supply and centralized sewerage, approved by the NEURC Resolution No. 364 of March 24, 2016 (hereinafter - Procedure No. 364)

Main points: The procedure regulates the procedure for submitting documents for tariff setting, including the list of required documents, their analysis and decision-making by the regulatory authority. It ensures the transparency of the tariff setting process and the reasonableness of the companies' costs.

This regulatory legal act establishes (in clause 4.2) the grounds on which tariffs may be changed, namely in the following cases:

1) changes in the volume of centralized water supply and/or centralized wastewater disposal services taken into account when setting the current tariffs;

2) changes in the licensee's investment program (investment project) in accordance with the established procedure;

3) changes during the validity period of the tariffs in the volume of certain components of the tariff structure for reasons beyond the licensee's control, namely, an increase or decrease in the minimum wage, subsistence minimum, taxes, fees, payments, increase or decrease in prices (tariffs) for reagents, fuel and energy resources, purchase of water from other business entities and/or treatment of own wastewater by other business entities, exchange rate in the presence of obligations on borrowings (loans, credits) from international financial organizations;

4) failure of the licensee to implement the investment program (investment project), which was taken into account in the current tariffs, which is the basis for the removal of unused funds from the tariff structure that were provided for the implementation of the investment program (investment project), or the inclusion of these funds as a source of financing for the investment program (investment project) for the planned period;

5) the licensee's failure to comply with the cost structure in accordance with the items approved in the tariffs for centralized water supply and/or centralized sewerage, as well as the use of funds received from centralized water supply and/or centralized sewerage activities for other purposes than the intended purpose;

6) the presence of cross-subsidization between the centralized water supply and/or centralized sewerage activities and other types of economic activities of the licensee.

-The Rules for the provision of centralized water supply and sewerage services, approved by Resolution of the Cabinet of Ministers of Ukraine No. 690 dated July 5, 2019 (hereinafter - Rules No. 690)

Main points: The Rules regulate the procedure for the provision of services, define the rights and obligations of consumers and suppliers, and set requirements for concluding contracts and providing information on the quality of services.

The Rules No. 690 stipulate that the provision of centralized water supply and wastewater disposal services is carried out exclusively on a contractual basis.

The services are provided to the consumer in accordance with the terms of the agreement concluded in accordance with standard service agreements in accordance with Articles 13 and 14 of the Law of Ukraine "On Housing and Utility Services".

In order for a consumer to join the terms of an individual agreement (acceptance of the agreement), it is sufficient for the consumer to perform any actions that indicate his or her desire to enter into the agreement, in particular, to provide the contractor with a signed application for accession, pay the bill for the services provided, and receive the services (clause 14).

Clause 32 of the Rules No. 690 provides that the cost of centralized water supply and wastewater disposal services is determined by the volume of services consumed and the tariffs established in accordance with the law, and in case of change (adjustment) of tariffs during the term of the contract, the new tariffs are applied from the moment they come into effect and do not require additional amendments to the contract by the parties.

Rules for the use of centralized Utility water supply and wastewater disposal systems in settlements of Ukraine, approved by the Order of the Ministry of Housing and Utility Services of Ukraine No. 190 dated June 27, 2008 (hereinafter - Rules No. 190)

Main points: The Rules establish the procedure for the use of centralized water supply and wastewater disposal systems, regulate the rights and obligations of consumers and suppliers, and define the requirements for the maintenance and operation of these systems.

According to paragraph 1 of Section II of Regulation No. 190, the centralized water supply/centralized wastewater disposal service provider shall maintain street, block and yard water supply and wastewater disposal networks, facilities and equipment, as well as technological devices and devices

on them, which are on its balance sheet or for which it has a corresponding service agreement with the consumer.

In addition, if the water supply and wastewater disposal network owned by the centralized water supply / centralized wastewater disposal service provider passes through a land plot transferred on the basis of ownership or use to another business entity and/or individual, the latter should not oppose the elimination of leaks, elimination of other damage to the networks in these areas and the performance of planned works on the network (clause 7 of section II of Regulation No. 190).

The procedure and requirements for connecting facilities to centralized drinking water supply and centralized wastewater disposal systems are set forth in Section III of Regulation No. 190.

The Procedure for the Development, Approval and Validation of Investment Programs (Investment Projects) of Business Entities in the Field of Centralized Water Supply and Wastewater Disposal, Licensed by the NEURC, approved by Resolution of the NEURC No. 364 of March 24, 2016 (hereinafter - Procedure No. 364)

Main points: The Procedure defines the procedure for the development, coordination and approval of investment programs and development plans aimed at improving the quality and reliability of water supply and wastewater disposal services.

In order to justify the planned expenses of licensees for capital investments in the construction, reconstruction, modernization of centralized water supply and wastewater disposal facilities, acquisition of tangible and intangible assets and/or amounts to be used for the repayment of loans and other liabilities to be used to finance these purposes, the licensee shall develop development plans and investment programs and ensure their approval, coordination, approval and implementation (clause 2.1 of Procedure No. 364).

Thus, the plan for the development of centralized water supply and wastewater disposal systems (hereinafter referred to as CWS) is a consistent plan for the implementation of measures for five years for new construction, reconstruction, modernization and technical re-equipment to ensure an increase in the level of reliability and efficient operation of CWS systems in the future development of the settlement.

Investment programs and development plans should include a description of activities and necessary costs to be implemented, namely:

- measures to reduce specific electricity consumption (energy saving);
- measures to reduce water consumption for technological needs, including measures to ensure technological accounting of resources, measures to ensure commercial accounting of resources, etc;
- measures to improve the quality of centralized water supply services;
- measures to implement and develop information technologies;
- measures to modernize and purchase special and specialized vehicles;
- measures to improve environmental safety and environmental protection;
- other measures.

Every year, no later than June 01 of the base period, the licensee shall pre-approve measures with the NEURC for further inclusion in the draft investment programs (hereinafter referred to as IP) and development plans (hereinafter referred to as DP).

The decision to approve the IP and PD or approve changes to them is made by the NEURC at a meeting held in the form of an open hearing, by comprehensively and fully clarifying the positions of all participants of the meeting after reviewing and processing the materials provided (clause 1.6. of Order No. 364).

At the same time, the licensee for municipally and privately owned CWS facilities is obliged to coordinate the IP and PR with the local government body whose powers extend to the territory where the licensee operates. In case of state-owned CWS facilities, the licensee shall also take measures to approve the IP and DP by the executive authority.

Clause 1.5. Procedure No. 364 stipulates that the transfer of funds in the amount stipulated in the established tariffs for the centralized water supply for the implementation of IPs is made to current accounts with a special regime of use for the licensee to make payments for IPs exclusively for the implementation of measures according to the schedule for the planned period.

The licensee is obliged to submit to the NEURC applications for approval of the IP and the DP no later than August 01 of the base period (clause 4.1.).

The submitted applications are reviewed by the NEURC within 60 business days. In the absence of comments, the NEURC approves the draft decisions on their approval to ensure an open discussion of the draft decisions at the place of service provision by the licensee.

According to clause 4.12 of Procedure No. 364, the funds provided for the implementation of approved IPs and DP are included by the licensee in the calculation of tariffs for centralized water supply and/or centralized sewerage.

Chapter 7 of Procedure No. 364 also provides for the possibility for business entities in the field of centralized water supply and sewerage to attract loans from banking and financial institutions registered in accordance with applicable law.

Resolution of the Cabinet of Ministers of Ukraine dated March 5, 2022 No. 206 "Some Issues of Payment for Housing and Utility Services during Martial Law" (hereinafter - Resolution No. 206)

Main points: Resolution No. 206 regulates the procedure for payment for housing and Utility services, including water supply and wastewater disposal, during martial law. It defines special conditions for consumers and suppliers, as well as mechanisms to support the population during this period.

The Procedure for Consideration by Local Self-Government Authorities of Calculations of Tariffs for Heat Energy, Its Production, Transportation and Supply, as well as Calculations of Tariffs for Utilities Submitted for Their Establishment, approved by Order of the Ministry of Regional Development, Construction, Housing and Utility Services of Ukraine No. 239 dated September 12, 2018 (hereinafter - Procedure No. 239).

Main points: Procedure No. 239 regulates the process of reviewing utility tariff calculations by local governments. It defines the procedure for submitting, reviewing, approving and monitoring compliance with the established tariffs.

A utility company (applicant) submits tariff calculations to the local government in paper and electronic forms (including doc, docx, excel), together with an application, supporting materials and documents used in the tariff calculations.

Pursuant to paragraph 6 of Chapter I of Procedure No. 239, based on the results of the review of the tariff calculations submitted by the business entity (applicant), the local self-government body sets the relevant tariffs.

The decision to set tariffs must be accompanied by a tariff structure. Tariffs are set both upon a complete review (recalculation) of tariffs and their structure, and upon the results of tariff adjustments.

If the application and the documents attached thereto meet the requirements established by this Procedure, as well as the tariff calculations comply with the forms established by local self-government bodies, their consideration is carried out within one calendar month from the date of receipt of the relevant application (from the date of its registration) (clause 1 of Chapter IV of Procedure No. 239).

Thus, the activities of enterprises in the field of centralized water supply are carried out on the basis of a special water use permit or a subsoil use permit (in case of groundwater use); licenses for economic activities in centralized water supply and centralized sewerage.

The procedure for approving tariffs for water supply and sewerage services involves submission of applications by business entities to the NEURC or local governments (except for tariffs for services set by the NEURC) with a tariff structure calculation.

The tariff structure includes direct material costs (costs of electricity, reagents, materials), direct labor costs, other direct costs (social insurance contributions, depreciation, energy service contracts) and general production costs (production management costs, depreciation for general production purposes, costs of maintaining fixed assets, costs of improving technology and production organization).

Changes in tariffs are initiated by business entities based on changes in the volume of services, investment programs, or other cost components.

1.2. Forms of ownership of business entities in the water supply and wastewater disposal sector.

Companies of all forms of ownership can carry out activities in the field of drinking water supply.

At the same time, water supply and wastewater disposal are critical to the vital activity of the population. The Law of Ukraine “On Drinking Water and Drinking Water Supply” stipulates that networks, facilities and equipment of centralised drinking water supply in settlements are not subject to privatisation, as they are objects of particular importance to society (Article 14).

These networks, facilities, and equipment are on the balance sheet of territorial communities, which transfer them to municipal enterprises, the so-called water utilities, for maintenance.

Thus, most water supply and sewerage companies are municipal enterprises, which allows to guarantee the provision of centralised water supply and sewerage services to the population.

At the same time, municipal enterprises are often inefficient, which leads to their unprofitability and low implementation of possible development programmes due to lack of investment.

In order to create conditions for more efficient operation of housing and Utility services enterprises by attracting private investment in this sector, as well as to guarantee the interests of territorial communities and preserve Utility property in case of attracting such investment, the Law of Ukraine

" On Specifics of Lease or Concession of Municipal Central Water Supply, Heat Supply and Water Discharge Facilities " dated 21.10.2010 No. 2624-VI (hereinafter - Law No. 2624-VI) was adopted.

The Law No. 2624-VI defines the peculiarities of leasing and concession of municipally owned centralised water, heat and wastewater facilities and the peculiarities of leasing and concession of such facilities.

Pursuant to Article 5(1) of Law No. 2624-VI, a municipally owned heating, water supply and wastewater disposal facility may be leased at the initiative of individuals and legal entities that may be lessees under the Law or executive bodies of village, town or city councils or local executive authorities.

Law No. 2624-VI stipulates that the decision to lease municipally owned facilities in the areas of heat supply, water supply and wastewater disposal is made:

- in respect of facilities owned by the territorial community of a village, town or city, the relevant village, town or city councils;
- in respect of facilities jointly owned by territorial communities and managed by a district or regional council, the relevant district or regional council on behalf of the relevant councils of territorial communities.

The right to lease facilities in the areas of heat supply, water supply and wastewater disposal is granted through a competitive procedure, which results in the conclusion of a relevant lease agreement.

Thus, the legislator provides for the possibility of transferring water supply and wastewater disposal facilities to private individuals.

At the same time, at present, most enterprises in this sector remain Utility due to their social significance, the need for state control and financial support, as well as low tariffs for water supply and wastewater disposal, which discourages potential investors.

1.3. Tariff for water supply and sewerage.

How the tariff is formed

The tariffs for water supply and wastewater disposal in Ukraine are set in accordance with the Procedure for setting tariffs for centralised water supply and centralised wastewater disposal approved by the NEURC Resolution No. 302 dated 10 March 2016 and the Procedure for consideration by local authorities of tariff calculations for heat energy, its production, transportation and supply, as well as tariff calculations for utilities submitted for their establishment approved by the order of the Ministry of Regional Development, Construction, Housing and Utility Services. These procedures determine the mechanism for calculating tariffs based on economically justified costs of enterprises.

Key elements included in the tariff structure:

- Direct material costs: electricity, reagents, materials.
- Direct labour costs: basic salaries of production personnel, additional salaries, other incentive payments.

- Other direct costs: social security contributions, depreciation, energy service contracts.
- General production costs: production management costs, depreciation and amortisation, maintenance of fixed assets, costs of improving technology and production organisation.
- Tariffs are calculated by dividing the sum of annual planned costs, annual planned profit, cost adjustment and reduction of tariff components by the planned annual volume of centralised water supply and wastewater treatment.
- The level of tariffs at water supply and wastewater disposal companies depends on the local peculiarities of production and provision of these services, namely: the source of water supply, its remoteness from consumers, water quality in the source of water supply, the applied treatment technology, the volume of services sold, the condition of fixed assets, the network of communications and many other factors.

For example, tariffs for centralised water supply and wastewater disposal by water utilities with similar technologies and sales volumes are almost identical. In turn, the highest tariffs are for those companies that have low sales volumes, long networks, and use purchased water and/or treat wastewater from other licensees.

It is worth noting that, according to the NEURC, the share of electricity costs in the current structure of the draft tariffs for centralised water supply and centralised wastewater disposal of licensees that are planned to be set is the largest and amounts to

26% - in the tariff for centralised water supply;

29% - in the centralised wastewater tariff.

Who approves the tariff

The authority to set tariffs for centralised water supply and sewerage in Ukraine is divided between the NEURC and local governments.

In accordance with the eighth paragraph of clause 2 of part one of Article 6 of the Law of Ukraine " On State Regulation in the Sphere of Communal Services ", the NEURC sets tariffs for utilities for natural monopolies and business entities in related markets licensed by the NEURC.

At the same time, in accordance with clause 1.4 of the Licensing Conditions for the Conduct of Business Activities in Centralised Water Supply and Wastewater Disposal, approved by the NEURC Resolution No. 107 dated 22.03.2017. 2017 No. 307, the NEURC licenses business activities in centralised water supply (production and/or transportation and/or supply of drinking water to consumers) and/or wastewater disposal (wastewater disposal and/or treatment) if the centralised water supply and/or wastewater disposal systems of business entities are located in one or more settlements within the territory of one or more regions (including the city of Kyiv), the total population of which is more than one hundred thousand people and the sales volume of

Thus, the NEURC sets tariffs for centralised water supply and wastewater disposal for companies that meet the above criteria and are included in the Licence Register of Business Entities engaged in centralised water supply and wastewater disposal activities regulated by the NEURC.

In turn, pursuant to Article 28 of the Law of Ukraine "On Local Self-Government in Ukraine", Article 13 of the Law of Ukraine "On Drinking Water and Drinking Water Supply", Article 12 of the Law of Ukraine "On Wastewater Disposal and Treatment of Wastewater", the powers of local self-government bodies in the field of drinking water and drinking water supply include, in particular, setting tariffs for centralised water supply and wastewater disposal services (except for tariffs for those services set by the NEURC).

In other words, local governments set tariffs for centralised water supply and sewerage services for enterprises that are not subject to state regulation by the NEURC.

When the tariff is approved

In order to set tariffs for centralised water supply and/or centralised wastewater disposal, the licensee shall submit to the NEURC by 01 June of each year, in printed and electronic form, an application for tariff setting and tariff calculations in the prescribed forms with supporting materials and documents used for the calculations (clause 1.9. of the Procedure for Setting Tariffs for Centralised Water Supply and Centralised Wastewater Disposal, approved by Resolution No. 302 of the NEURC dated 10 March 2016).

Thus, the deadline for submitting applications for setting tariffs for the services set by the NEURC is 1 June each year.

At the same time, the deadlines for companies to apply to local authorities (hereinafter also referred to as "LGAs") for tariff revisions (which are subject to approval by LGAs) are not specified by law. This means that companies can apply to local authorities at any time.

The timeframe for reviewing and approving new tariffs by local governments and the NEURC for centralised water supply and wastewater disposal is not defined by law. They depend on the frequency of changes in the cost components of these services and the political will of the participants in this process.

At the same time, it is optimal to review tariffs once a year, which is often not implemented in practice. For example, before the decisions on approval of new tariffs for water supply and sewerage were made on 28.05.2024, the tariffs for the NEURC licensees were last reviewed before the large-scale war with the Russian Federation, namely in December 2021. This led to a significant reduction in the profitability of the current tariffs.

Moratorium on tariff increases

According to the Law of Ukraine "On Specifics of Regulation of Relations in the Natural Gas Market and the Heat Supply Sector during the Martial Law and Further Restoration of Their Functioning" No. 2479-IX dated 29.07.2022, during the martial law in Ukraine and for six months after the month in which the martial law is terminated or cancelled, it is prohibited to increase tariffs for all categories of consumers for natural gas distribution services, heat energy (its production, transportation and supply) and services for the supply of heat energy and hot water.

At the same time, the current legislative acts do not establish a moratorium on changes (increases) in tariffs for centralised water supply and wastewater disposal.

1.4. Legislative incentives for the installation of renewable energy generation facilities at water and wastewater companies.

In today's environment, ensuring energy independence and sustainable development is an extremely important issue for Ukraine.

One of the areas of development of the energy system is the need to stimulate the use of renewable energy sources (RES), in particular at water supply and wastewater disposal companies.

The Law of Ukraine No. 3220-IX "On Amendments to Certain Laws of Ukraine on Restoration and Green Transformation of the Energy System of Ukraine", adopted by the Verkhovna Rada of Ukraine on 30 June 2023 (hereinafter referred to as Law 3220-IX), amends certain laws of Ukraine to stimulate the green transformation of the country's energy system. The main provisions of this law are aimed at supporting the installation of generating facilities that produce electricity from renewable energy sources, as well as energy storage facilities.

This Law amended, among other things, the Law of Ukraine "On Alternative Energy Sources" dated 20.02.2003 No. 555-IV.

Article 9-6 of the Law of Ukraine "On Alternative Energy Sources" stipulates that the Cabinet of Ministers of Ukraine shall stimulate the installation of such generating and/or energy storage facilities for private households by approving a state target economic programme to stimulate the development of small distributed generation from renewable energy sources. The state target programme may also include mechanisms to stimulate the installation of generating units at critical infrastructure facilities.

At the same time, as of today, the Ukrainian legislation only makes limited reference to the need to develop renewable energy sources at water and wastewater enterprises. Although Law No. 3220-IX contains general provisions to stimulate the installation of renewable energy generating units, there are no specific mechanisms and support for water and wastewater companies in the legislation.

There is also a draft order of the Cabinet of Ministers of Ukraine "On Approval of the Concept of the State Targeted Economic Programme for Stimulating the Development of Distributed Electricity Generation from Renewable Energy Sources for the Period up to 2030", which provides for incentives for the installation of photovoltaic modules and/or wind power plants with a hybrid inverter, including together with energy storage facilities (hereinafter referred to as power supply systems), to cover the own electricity consumption of critical infrastructure facilities and households.

Installation of power supply systems is planned through the introduction of state support mechanisms in the form of:

- reimbursement of interest on a loan for the purchase and installation of a power supply system;
- reimbursement of a part of the interest on the loan for the purchase and installation of the power supply system;
- supply of equipment under international technical assistance; other mechanisms not prohibited by law.

The goal of the Programme is to stimulate the achievement of 500,000 power supply systems installed by active consumers in 2030. The functioning of power supply systems in the electricity market is envisaged under the self-production mechanism (Net Billing model) introduced by Law No. 3220-IX.

At the same time, the draft order of the Cabinet of Ministers of Ukraine "On Approval of the Concept of the State Target Economic Programme for Stimulating the Development of Distributed Generation of Electricity from Renewable Energy Sources for the Period up to 2030" has not been approved.

2. ANALYSIS OF PRACTICAL EXPERIENCE IN THE INSTALLATION AND MAINTENANCE OF SOLAR POWER PLANTS AT CENTRALISED WATER SUPPLY AND WASTEWATER DISPOSAL COMPANIES.

The installation of solar power plants (SPPs) at centralised water supply and wastewater disposal companies is a promising area of renewable energy development in Ukraine. This allows to reduce dependence on traditional energy sources, cut electricity costs and promote environmental safety.

This section discusses the practical experience of companies that have successfully implemented SPP projects and identifies the main challenges they faced.

In order to analyse the implementation of solar power plant projects at water and wastewater disposal companies, the following business entities were surveyed:

1) ME "Miskvodokanal" of the Sumy City Council;
2) ME "Bilhorod-Dnistrovskvodokanal";
3) ME "Myrhorodvodokanal" of the Myrhorod City Council;
4) ME "Brodyvodokanal" of Brody City Council;
5) ME Novohrad-Volyn City Council "Production Department of Water Supply and Wastewater Disposal".

These enterprises have installed solar power plants at centralised water supply and wastewater disposal facilities at the expense of grants and budgetary funds, so they have practical experience in implementing renewable energy generating facilities in their operations.

Based on the results of the survey and analysis of practical experience, the following issues have been identified:

1) Dependence on decisions of local authorities

The surveyed water and wastewater disposal companies are municipal enterprises, so they need approvals from local governments to raise funds, allocate land plots and other administrative procedures. This creates a dependence on the political will of local council members and may slow down the process of implementing SPPs.

In fact, dependence on local government decisions often turns into political dependence. Local councils, which include deputies, may have different priorities and political interests, which affects the speed and efficiency of decision-making on the implementation of SPPs.

The Law of Ukraine "On Local Self-Government in Ukraine" stipulates that the resolution of issues of local importance, including the management of municipal property, falls within the competence of local councils (Article 26, Article 60). This means that any decision to allocate funds or land plots requires council approval, which can delay project implementation due to lengthy administrative procedures and possible political instability.

2) Difficulty in raising funds

The need to obtain approval from local governments and the unprofitability of utilities complicate the process of raising funds on their own. This limits the ability of companies to implement SPP projects.

Many water and wastewater utilities operate at a loss due to low tariffs for their services and high operating costs. This consequently limits the ability of the companies to accumulate sufficient funds to invest in renewable energy projects.

The loss-making nature of the companies also affects their creditworthiness. Banks and financial institutions are usually reluctant to provide loans to utilities that cannot provide stable cash flow and are at high risk of insolvency. The property of such companies is often encumbered by outstanding debts, which also prevents them from securing loans against their existing property.

The Law of Ukraine "On Wastewater Disposal and Treatment" provides for the possibility to develop investment projects (part 1 of Article 20). In order to make payments under investment projects in accordance with the procedure established by law, centralised wastewater disposal companies open special accounts.

To these accounts, the centralised sewerage companies transfer funds in the amount stipulated in the established tariffs for the implementation of investment projects.

The Law prohibits the foreclosure and seizure of funds held on special accounts and special accounts for credit funds of centralised sewerage companies (part 2 of Article 20).

At the same time, the process of raising credit funds for the implementation of investment programmes, as provided for in the Procedure for Development, Approval and Approval of Investment Programmes (Investment Projects) of Business Entities in the Field of Centralised Water Supply and Centralised Wastewater Disposal, Licensed by the NEURC, approved by Resolution No. 364 of the NEURC dated 24 March 2016, is complex and requires approval from both the NEURC and local authorities.

This fact makes it very difficult to attract loans for the implementation of any innovations, including the installation of solar power plants at water and wastewater disposal companies.

3) Approval of land allocation

Land allocation for the installation of SPPs requires approval from local authorities. This issue often depends on political will and can be delayed due to bureaucratic procedures.

The process of approving land allocation for the installation of a solar power plant includes several stages, each of which requires separate approvals and decisions:

Development of a land management project. In accordance with Article 50 of the Law of Ukraine "On Land Management", a land management project is developed for the allocation of a land plot.

Approval of the project by local councils. Paragraph 34 of Article 26 of the Law of Ukraine "On Local Self-Government in Ukraine" stipulates that land management projects and decisions

on land allocation must be approved by local councils. This includes discussions at council sessions, voting and decision-making, which often depends on the political will of the deputies.

Compliance with certain requirements of the Land Code of Ukraine. Pursuant to Articles 93, 122 and 134 of the Land Code of Ukraine, the provision of land plots for the installation of SPPs may require land tenders, changes in land designation and other regulatory requirements.

4) Lack of an effective information policy

There is a lack of awareness among water supply and wastewater disposal companies about the possibilities of cooperation with international donors and non-governmental organisations that can provide grants, technical and organisational support for the installation of renewable energy generation facilities.

5) Difficulty in obtaining permits

The process of obtaining and processing permits for the construction/installation of SPPs is complex and time-consuming, which may stop water and wastewater disposal companies from implementing such projects

For example, according to the Law of Ukraine "On Architectural Activity", a ground-based generating plant is an architectural object, the construction of which requires obtaining permits and documents confirming the commissioning of the facility. The right to develop a land plot is exercised by its owner or user, provided that the land plot is used in accordance with the requirements of urban planning documentation in accordance with part 4 of Article 26 of the Law of Ukraine "On Regulation of Urban Development".

The design and construction of facilities, including ground-based power generating facilities, shall be carried out by the owners or users of land plots in the following manner:

- Obtaining initial data from the customer;
- Development of project documentation and its examination;
- Obtaining the right to perform preparatory and construction works;
- Execution of construction works;
- Conducting control geodetic surveys of completed facilities and making their technical inventory;
- Commissioning of completed construction projects;
- State registration of ownership of the completed and commissioned facility (its component).

The above indicates that obtaining permits is a complex process that becomes an obstacle to the faster implementation of distributed generation technologies.

6) Coordination with public authorities

The installation of solar power plants for water supply and wastewater disposal companies on state-owned facilities (land), if necessary, requires additional approvals from state authorities, which may also complicate the process of project implementation.

Pursuant to Article 123(1) of the Land Code of Ukraine, the Verkhovna Rada of the Autonomous Republic of Crimea, the Council of Ministers of the Autonomous Republic of Crimea, executive authorities or local self-government bodies shall provide state-owned or municipally owned land plots for use.

Decisions of the said bodies are made on the basis of land management projects for the allocation of land plots in case of allocation of a land plot with a change of its designated purpose.

If a water supply and wastewater disposal company is interested in obtaining a state-owned land plot for use based on a land management project for its allocation, it must apply for a permit to develop it to the relevant executive authority (Article 123(2) of the Land Code of Ukraine).

The installation of solar power plants for water supply and wastewater disposal companies on state-owned facilities (land), if necessary, requires additional approvals from state authorities, which may also complicate the process of project implementation.

Pursuant to Article 123(1) of the Land Code of Ukraine, the Supreme Council of the Autonomous Republic of Crimea, the Council of Ministers of the Autonomous Republic of Crimea, executive authorities or local self-government bodies shall provide state-owned or municipally owned land plots for use.

Decisions of the said bodies are made on the basis of land management projects for the allocation of land plots in case of allocation of a land plot with a change of its designated purpose.

If a water supply and wastewater disposal company is interested in obtaining a state-owned land plot for use based on a land management project for its allocation, it must apply for a permit to develop it to the relevant executive authority (Article 123(2) of the Land Code of Ukraine).

7) Need for additional qualified staff

The maintenance of SPPs requires highly skilled personnel, which creates additional challenges for water and wastewater companies. This includes the costs of training, professional development, and hiring new specialists.

SPPs are high-tech facilities that require specialists with a certain level of knowledge and skills to operate them.

Training and professional development of staff requires significant financial outlays, which are not always provided for in the budgets of water and wastewater companies.

According to the information received from the surveyed water and wastewater disposal companies, the need to hire additional new specialists will arise in the event of the installation of large-scale SPPs.

At the same time, the labour market may not have enough specialists with the necessary knowledge and experience in the field of renewable energy, and their salary requests may be unaffordable for water and wastewater companies.

8) Lack of state support programmes

The absence of state support programmes for the installation of renewable energy generation facilities at centralised water supply and wastewater treatment companies is a significant obstacle to the development of this sector. State support is therefore critical to stimulate the introduction of renewable energy sources, especially in sectors such as water and wastewater, which are of great importance to society and the economy.

At the same time, only Article 9-6 of the Law of Ukraine “On Alternative Energy Sources” provides for the need to approve a state targeted programme to stimulate the installation of generating units at critical infrastructure facilities. However, as of today, no such programme has been developed.

There is a draft order of the Cabinet of Ministers of Ukraine "On Approval of the Concept of the State Targeted Economic Programme for Stimulating the Development of Distributed Electricity Generation from Renewable Energy Sources for the Period up to 2030", which aims to stimulate the development of renewable energy, but this Concept has not yet been approved.

9) Currency risks when attracting international loans

Foreign exchange risks are an important issue when attracting international loans to finance solar power plant (SPP) projects at water and wastewater utilities. Raising international loans usually involves receiving funds in foreign currency, which creates a number of financial challenges for utilities. One of the main problems is the need to repay these loans in foreign currency as well. The terms of the loan agreements often require payments to be made in the currency in which the loan was received, exposing the companies to currency risks.

Foreign currency fluctuations are a significant risk factor as the exchange rate of UAH to foreign currencies may fluctuate significantly over the maturity of the loan. This means that the amount of liabilities denominated in UAH may increase as a result of the devaluation of the national currency. Significant depreciation of the UAH against foreign currencies leads to higher debt service costs, which becomes a financial burden for companies. This is especially true in an unstable economic environment and highly volatile currency market.

An analysis of the practical experience of enterprises that have implemented SPPs indicates the significant potential of this technology to improve energy efficiency and sustainability of water supply and wastewater disposal systems. However, the existing challenges, including bureaucratic obstacles, difficulty in attracting financing, and lack of support at the state level, require further efforts by the government to create favourable conditions for the development of renewable energy in Ukraine.

3. FOREIGN EXPERIENCE IN IMPLEMENTING SOLAR POWER PLANTS AT WATER SUPPLY AND WASTEWATER TREATMENT COMPANIES.

The introduction of solar power plants (SPPs) at water and wastewater companies is actively developing in the EU and the US. These projects aim to reduce energy costs, improve energy efficiency and reduce greenhouse gas emissions. Let's look at some examples of successful implementation of such technologies.

USA

The Environmental Protection Agency reports that drinking water and wastewater systems account for approximately 2% of total electricity consumption in the US, due to the need to pump large volumes of water. This is estimated to add more than 45 million tonnes of greenhouse gases to the atmosphere each year. For many local governments, drinking water and wastewater plants account for up to 40% of total energy consumption.

Thus, in the United States of America, the installation of renewable energy generating plants at water and wastewater facilities is very relevant.

In the United States, the introduction of solar power plants at water and wastewater facilities is actively supported at the state level. For example, the Solar for All programme, launched by the Biden-Harris administration, provides $7 billion in grants for the development of solar energy, particularly for companies serving low-income and vulnerable communities. The initiative aims to reduce energy costs, create jobs and improve the environment. The programme also includes financial support for the installation of solar panels, enabling water and wastewater companies to reduce their operating costs and improve energy efficiency

Several municipal enterprises in the United States are actively using solar energy to meet their needs. For example, Westmoreland County Utility in Pennsylvania has implemented a 3 MW solar PV project that generates more than 3 million kWh of electricity annually. This project ensures the company's resilience to power outages and helps reduce energy costs by reducing CO2 emissions by 3,515 tonnes annually, which is equivalent to planting more than 50,000 trees.

During the construction of a new wastewater treatment plant in Pueblo, Colorado, 309 kW of solar panels were installed, providing about 40% of the annual electricity needs. The project became economically viable thanks to federal funding and renewable energy incentives.

Many water and wastewater treatment facilities in the US have a limited amount of land owned or leased, making it difficult to install large-scale solar power plants. However, innovative solutions such as floating solar panels on reservoirs are helping to overcome this problem.

For example, a floating PV solar panel system was installed at the Kelseyville Wastewater Treatment Plant in California, which has delivered significant savings and reduced greenhouse gas emissions. The system was designed to cover the majority of the company's annual energy consumption, with projected annual energy savings of US$90,000.

However, in the United States, the introduction of SPPs in water and wastewater utilities faces several challenges that are common to many countries, including Ukraine. These include high initial installation costs and the need for qualified personnel for maintenance. Also important are the issues of integrating SPPs into existing energy systems and ensuring stable energy supply in the face of changing weather conditions.

For example, the United States has a net metering mechanism to provide electricity to companies that have installed renewable energy generating facilities. This mechanism allows the owners of solar power plants to use the energy they produce for their own needs, and to transfer excess electricity generated in excess of consumption to the general grid. In this case, the amount of electricity in kWh that can be used in case of insufficient capacity of generating plants (for example, at night) is credited to the individual balance sheet of the company.

The main difference between Net Metering and Net Billing is that the company's individual balance sheet is credited with kWh rather than cash for the excess energy generated.

This mechanism is envisaged by legislative and regulatory acts at the federal level, as well as at the level of individual US states. The federal Energy Policy Act of 2005 established the basic principles of net metering, while individual states have their own laws and regulations that define the terms and conditions for its use.

EUROPEAN UNION

EU countries are also actively implementing SPPs at water and wastewater companies. For example, in Spain, SPPs are used to reduce energy costs and improve energy efficiency. By installing solar panels on the territory of wastewater treatment plants, such enterprises can significantly reduce their operating costs for electricity and reduce greenhouse gas emissions.

In Germany, known for its Energy Transition strategy, municipal enterprises are also actively implementing SPPs. For example, one of the country's largest water treatment plants has integrated solar panels, which has allowed it to reduce electricity costs and ensure energy independence. It also helps the company meet strict environmental standards and reduce its environmental footprint.

In line with the Energy Transition strategy, many water and wastewater facilities are integrating solar panels, which helps to reduce electricity costs and ensure energy independence. Germany is actively introducing subsidies and concessional lending for renewable energy projects at water and wastewater companies.

The above is illustrated by the fact that the Schwarzenbruck wastewater treatment plant in Germany has implemented an "energy smart" concept, using a combination of technologies including hydroelectric power, photovoltaic solar panels, cogeneration units, batteries and an energy management system to balance energy consumption and production. This allows the plant to operate with minimal external energy supply.

Other EU countries are also actively promoting the installation of renewable energy generating plants at water and wastewater facilities, as evidenced by support programmes in this area.

For example, in Jurmala, Latvia, a 2.1 MW floating solar power plant was installed on the water surface at a wastewater treatment plant to provide the necessary energy for the plant's full operation, reduce electricity costs and cut carbon emissions.

In fact, the European Union has a number of targeted programmes that support the introduction of renewable energy sources, including solar power plants (SPPs), at water and wastewater companies. The main provisions are enshrined in the EU's climate and energy policy, which aims to significantly reduce greenhouse gas emissions by 2030.

In particular, in the EU, the Urban Wastewater Treatment Directive and other regulations set out requirements for wastewater treatment and the reduction of water pollution. These acts and programmes stimulate the use of renewable energy sources to ensure energy efficiency and environmental sustainability of water and wastewater companies.

> ***The experience of the EU and the US shows that the introduction of solar power plants at water and wastewater companies is an effective way to improve energy efficiency and reduce electricity costs. Such projects help reduce greenhouse gas emissions and ensure the stability of energy supply. In the US, the implementation of SPPs is supported at the state level through funding programmes and legislation that allows the use of self-generation mechanisms. In the EU, countries are actively integrating SPPs into their power systems, which is also supported by climate and energy policies that provide for significant reductions in greenhouse gas emissions. However, there are challenges, such as high upfront costs and the need for skilled personnel, that need to be addressed for the successful deployment of these technologies.***

4. PROBLEMS AND BARRIERS IN THE CURRENT REGULATORY FRAMEWORK AND PROPOSALS FOR THEIR ELIMINATION.

4.1. Lack of economically justified tariffs for centralised water supply and wastewater disposal companies.

The absence of economically justified tariffs is one of the key obstacles to attracting investment in the installation of renewable energy generating units at water and wastewater companies. The current tariff structure does not take into account the need to finance such investments, which limits the ability of enterprises to implement renewable energy projects.

Thus, it is necessary to consider the reasons that led to the economic inefficiency of water and wastewater tariffs and possible options for solving these problems.

Factors that make tariffs economically unjustified:

1) Worn-out infrastructure: According to the NEURC, before the outbreak of full-scale war, about 50% of water supply networks and 42% of wastewater networks needed to be replaced due to their deterioration and obsolescence. This leads to significant water losses and increased costs for network maintenance, which are not covered by tariffs. In addition, the war has significantly deteriorated the state of the water supply and wastewater infrastructure due to shelling and damage. At the same time, the current tariffs do not provide sufficient financial resources for the replacement and modernisation of fixed assets, which leads to increased inefficiency of the enterprises' equipment and higher costs of their ongoing maintenance.

2) High energy costs: One of the main cost elements in tariffs is electricity, which accounts for approximately 26-29% of the total costs of the centralised water and wastewater companies. The constant growth of energy prices leads to an increase in operating costs of the companies, which is not promptly taken into account in the current tariffs.

3) Bureaucratic obstacles: The process of approving new tariffs is lengthy and complicated, including numerous stages of approvals and approvals by the NEURC and/or local governments. This delays the implementation of necessary changes and the adaptation of tariffs to real market conditions.

In accordance with clause 1.9 of the Tariff Setting Procedure for Centralised Water Supply and Centralised Wastewater Disposal, the licensee must submit to the NEURC an application for tariff setting by 01 June each year in hard copy and electronic form. The application must be accompanied by tariff calculations in the prescribed forms with supporting materials and documents used for the calculations.

Thus, this provision restricts the calculation of tariffs and their components as of 1 June, while the approval of tariffs takes place in an indefinite period.

This situation leads to the fact that by the time the tariffs for centralised water supply and sewerage are approved, the cost of the components submitted for calculation has already changed (e.g., the cost of fuel, reagents, electricity has increased), which is not taken into account when the tariffs are finally approved.

In addition, the submission of the tariff application is tied to 1 June, and the main cost components (tax rates, minimum wage, etc.) for tariff calculations change from 1 January, which impairs the economic validity and relevance of the submitted calculations. Since licensees are forced to prepare their calculations based on data that is current as of the beginning of June, any changes in cost components that occur during the year are not taken into account until a new application is submitted the following year.

Another problem is that the legal acts regulating the setting/approval of tariffs for centralised water supply and sewerage do not contain provisions on clear deadlines for the NEURC to make decisions on tariffs.

This situation leads to uncertainty for water and wastewater companies in planning their activities and delays the revision of existing tariffs that have already lost their economic viability.

Clause 1.5 of the Procedure for setting tariffs for centralised water supply and centralised wastewater disposal stipulates that the calculation of tariffs does not take into account the costs of other unlicensed activities.

Thus, the calculation of tariffs cannot take into account the costs of electricity generation from renewable energy sources, in case of installation of generating units.

4) Political circumstances: Tariffs for water and wastewater services in Ukraine have traditionally been kept low for social and political reasons. This prevents companies from covering the costs of infrastructure modernisation and maintenance, as well as investing in new technologies.

For example, on 29.06.2023, the NEURC decided to raise tariffs for centralised water supply and wastewater disposal, but the President of Ukraine publicly condemned such actions, which led to the cancellation of the decision.

Thus, tariffs for utilities, including water supply and sewerage, remain dependent on the political will of the authorised persons rather than on the real economic indicators of tariff justification.

The above shows that centralised water supply and wastewater disposal companies cannot operate in a market economy on the principles of building profitable operations due to political circumstances.

5) Lack of government subsidies and compensation: The lack of government support programmes and subsidies for the modernisation of water and wastewater infrastructure limits the ability of enterprises to invest in improving the quality of services and introducing new technologies, including renewable energy generation.

6) Increased costs of imported reagents and materials: Due to the war, many domestic producers have ceased operations, forcing companies to purchase reagents and materials abroad at higher prices. This further increases production costs, which are not fully reflected in tariffs.

7) Reduced consumption: According to the NEURC, population migration and business cuts led to an 18% reduction in consumption of water and wastewater services. This means that fixed costs of infrastructure maintenance remained high, while revenues of water and wastewater companies declined.

4.2. Proposals for overcoming the reasons for the economic unreasonableness of tariffs and ways to stimulate the development of RES facilities at water supply and wastewater treatment companies.

1) Include the costs of installing and maintaining generating facilities in the tariff structure.

It is necessary to expand the structure of costs included in the tariff by amending the Procedure for setting tariffs for centralised water supply and centralised wastewater disposal approved by NEURC Resolution No. 302 of 10 March 2016 and the Procedure for setting tariffs for centralised water supply and centralised wastewater disposal approved by NEURC Resolution No. 364 of 24 March 2016 by adding the costs of installation and maintenance of renewable energy generating plants to the list of costs that are taken into account in the tariff. This will help to ensure sustainable financing of SPP projects.

2) Stimulating the introduction of energy-efficient technologies.

It is proposed to provide state-backed electricity discounts for those water supply and wastewater treatment companies that have installed renewable energy generating units.

In this regard, it is worth considering the proposal to include in the Law of Ukraine "On Alternative Energy Sources" No. 555-IV dated 20.02.2003 a provision stating that centralised water supply and wastewater treatment companies that have installed generating units that produce electricity from renewable energy sources are entitled to a discount guaranteed by the State Budget of Ukraine for the payment of electricity used for their operational needs.

At the same time, the Cabinet of Ministers of Ukraine should determine the details of the amount of such a discount and the procedure for its provision, which should also be provided for in Law No. 555-IV.

Under such conditions, companies using renewable energy sources will be able to significantly reduce their electricity costs. This will allow them to reduce their operating costs and allocate the savings to other important projects, such as infrastructure modernisation or improving the quality of services.

Such a step by the government will also encourage companies to invest in renewable energy sources, leading to an overall increase in energy efficiency in the industry and reducing dependence on traditional sources of electricity generation, which are under constant risk from the Russian Federation.

3) Improving the legal and regulatory framework.

To improve the economic validity of tariffs for water supply and wastewater treatment, it is necessary to amend the legal framework regulating the procedure for tariff formation and approval in terms of simplification and specification, in particular

- Establishing reasonable timeframes for each stage of tariff approval at the legislative level, which will avoid delays and ensure timely updates of tariffs in line with current economic conditions.

Therefore, it is proposed to amend the Procedure for setting tariffs for centralised water supply and centralised wastewater disposal, approved by the NEURC Resolution No. 364 of 24 March 2016, and add to Chapter III of Procedure No. 364 clause 3.6. as follows:

"paragraph 3.6. If the application and the documents attached thereto comply with the requirements set forth in this Procedure, they shall be reviewed within one calendar month from the date of receipt of the relevant application (from the date of its registration)."

In order to establish a clear timeframe for consideration of the application for tariff changes, it is proposed to add paragraph 4.3 to Chapter IV of Procedure No. 364 as follows:

"If the application for tariff changes and the documents attached thereto meet the requirements set forth in this Procedure, they shall be reviewed within 15 business days from the date of receipt of the relevant application (from the date of its registration)."

- Amendments to clause 1.9. of the Procedure for setting tariffs for centralised water supply and sewerage in terms of the deadline for licensees to submit applications for tariff setting. It is proposed to change the deadline for submitting applications from 1 June to 31 January in order to take into account economic changes (changes in taxes, minimum wages, etc.) that occur with the beginning of a new budget year when approving tariffs;

- Establishing a clear mechanism in the Procedure for setting tariffs for centralised water supply and wastewater disposal and the Procedure for review by local governments of calculations of tariffs for heat energy, its production, transportation and supply, as well as calculations of tariffs for utilities submitted for their establishment, which will allow prompt adjustment of tariffs within no more than 50% of the approved annual tariff within one calendar year in case of significant changes in the main cost components, such as the cost of electricity, fuel oil, etc.

4) Overcoming political dependence in the approval of utility tariffs.

The tariff policy in Ukraine has always been a populist mechanism, which results in unprofitable tariffs for utilities and leads to the decline of the industry as a whole. There is no clear solution to this situation, as it requires the political will of those in power.

However, if the latter is present, Ukraine needs to move to market-based tariff setting mechanisms in the utilities sector by reducing state regulation.

Alternatively, it is possible to consider amending the legislation to limit the possibility of political interference in the tariff setting process. For example, this could include a ban on public statements by politicians on tariffs during the tariff approval process.

5) Introduce state support programmes for centralised water supply and sewerage companies.

In order to support and develop enterprises in this sector, it is necessary to approve a state targeted programme to stimulate the installation of generating units at critical infrastructure facilities and to provide for

- Introduction of state subsidy programmes for the modernisation of water supply and sewage infrastructure;
- establishing grant programmes to support projects for the introduction of renewable energy sources at water supply and wastewater facilities;
- providing tax rebates for water supply and wastewater treatment companies in case of installation of renewable energy generating units.

6) Facilitating and protecting ESCO contracts.

ESCO contracts are contractual agreements between enterprises and energy service companies (ESCOs) that provide services for the implementation of energy efficiency measures. ESCOs finance and implement energy efficiency projects, including the installation of solar power plants, and pay for their services using the energy savings generated until the end of the ESCO contract.

The ESCO company provides financing for the project, which frees the company from the need to invest its own funds and performs the work on the implementation of energy efficiency measures, installation and commissioning of equipment.

In this case, water and wastewater companies provide only access to their systems and facilities where energy efficiency measures will be implemented, and in return receive reduced electricity costs, equipment upgrades and the installation of renewable energy generating units.

To encourage the conclusion of ESCO contracts by water and wastewater utilities and the ESCO company, it is necessary to guarantee at the legislative level the impossibility of foreclosure on funds and property received by water and wastewater utilities under ESCO contracts.

In addition, it is necessary to legislate that the funds received by water and wastewater companies through energy savings under ESCO contracts are earmarked and are intended to be paid to the ESCO companies before the end of the contract.

Such measures will help to increase the attractiveness of ESCO contracts for water and wastewater companies, ensure their financial stability and reduce risks for ESCO companies. This will also create favourable conditions for the introduction of energy efficient technologies, infrastructure modernisation and increased energy independence of enterprises.

4.3. Ambiguity in the legal requirements for obtaining permits for the construction of rooftop SPPs.

There are a number of regulatory and legal barriers to the introduction of modern energy efficient technologies that significantly complicate the construction process. These barriers particularly affect water and wastewater companies. One of these barriers is the ambiguity of the procedure for obtaining permits for the construction of rooftop solar power plants (SPPs), which creates numerous problems for water utilities in the process of implementing such projects.

Therefore, it is necessary to consider the process of obtaining permits for the construction of rooftop solar power plants, identify problematic aspects of this process and propose ways to solve them.

Part 5 of Article 26 of the Law of Ukraine "On Regulation of City Planning Activity" stipulates that the design and construction of facilities shall be carried out by owners or users of land plots in the following order:

1) the customer or designer receives the initial data;
2) development of project documentation and its examination in cases provided for in Article 31 of this Law;
3) approval of project documentation;
4) performance of preparatory and construction works;
4-1) conducting control geodetic survey of completed construction objects (except for objects that are classified as objects with minor consequences (CC1) according to the class of consequences (liability)) and their technical inventory (except for objects, the list of which is determined by the central executive body that ensures the formation and implementation of state policy in the field of construction, architecture, urban planning);
5) commissioning of completed construction objects;
6) registration of ownership of an urban development object.

Pursuant to Article 26 of the Law of Ukraine "On Regulation of City Planning Activity", the customer has the right to carry out construction works after:

submission of a notice of commencement of construction works to the relevant state architectural and construction control authority - for construction projects that are classified as objects with minor consequences (CC1) and for projects whose construction is carried out on the basis of a construction passport and which do not require a construction permit in accordance with the list of construction projects approved by the Cabinet of Ministers of Ukraine. The form of the notification on the commencement of construction works and the procedure for its submission shall be determined by the Cabinet of Ministers of Ukraine; or issuance of a construction permit to the customer by the state architectural and construction control authority - for facilities that are classified as having medium (CC2) and significant (CC3) consequences or are subject to environmental impact assessment in accordance with the Law of Ukraine "On Environmental Impact Assessment".

In most cases, due to the fact that rooftop PV plants are installed on existing buildings/structures, the class of impacts of rooftop PV plant construction is mostly defined as CC2 or CC3.

The Order of the Ministry of Regional Development, Construction, Housing and Utility Services of 06.11.2017 No. 289 "On Approval of the List of Construction Objects for the Design of Which Town Planning Conditions and Restrictions Are Not Provided" states that town planning conditions and restrictions are not provided for the installation of heating, ventilation, water supply, drainage, gas supply (including special), power and low-current systems that meet the needs of the main functional purpose of buildings and structures, as well as.

In turn, Resolution of the Cabinet of Ministers of Ukraine No. 406 of 7 June 2017 approved a list of construction works that do not require documents entitling them to be performed and upon completion of which the facility is not subject to commissioning.

In particular, the reconstruction, overhaul, and technical re-equipment of internal power and low-current systems that ensure the functioning of buildings and structures do not require permits.

However, the CMU Resolution No. 406 of 7 June 2017 does not clearly state that the installation of rooftop SPPs does not require permits.

Thus, the above regulations do not provide clear regulation for rooftop SPPs, which creates legal uncertainty and complicates the construction process for water and wastewater companies.

Given the legal uncertainty, in practice, permits for rooftop PV installations are subject to the general procedure.

This means that local governments, utilities (including water utilities), for which SPPs are installed, act as customers for the construction of rooftop SPPs in the process of the above procedure and are obliged to obtain all permits.

The imposition of additional obligations on persons intending to install a rooftop solar power plant on the roof of their building or structure to develop project documentation, obtain permits for construction works, conduct a technical inventory of the facility and commission the rooftop solar power plant negatively affects the attractiveness of such projects, as the need to develop project documentation and obtain permits significantly increases the cost of an already costly facility.

A particularly negative investment environment is created by the fact that the regulations do not explicitly require facility owners to go through the above procedures for obtaining permits for rooftop PV installations, but the architectural and construction control authorities, due to shortcomings in

the legislation, still do not have a single, well-formed and well-grounded position on this issue, which creates ambiguity in this regard.

That is why it is important to amend the legislation and provide that the construction of rooftop SPPs does not require permits, which entitle the owner to perform it, and after which the facility cannot be put into operation.

This, in turn, will relieve water and wastewater companies from the obligation to obtain a permit for the construction of a rooftop solar power plant, prepare a package of documents, such as the Act of readiness of the facility for operation, control geodetic survey, technical inventory of the building/structure on which the construction of the rooftop solar power plant was carried out, and obtain a document confirming the commissioning of the rooftop solar power plant.

Such changes will allow water and wastewater companies to avoid spending scarce financial resources on permits and will facilitate faster and more efficient implementation of solar power plants. This, in turn, will reduce energy costs and improve the energy efficiency of the companies.

4.4. Complicated procedure for obtaining permits

Given that the current legislation of Ukraine has certain gaps in terms of a clear understanding of the need to obtain permits for SPPs (including rooftop SPPs), in order to prevent violations of the law, construction customers go through the entire construction procedure, from obtaining the initial data to commissioning the facilities.

In this regard, the first step is to obtain the initial data for the design (technical specifications, urban planning conditions and restrictions, engineering and geological surveys).

However, SPPs are not included in the List of construction objects for which urban planning conditions and restrictions are not required.

In its turn, the Order of the Ministry of Regional Development, Construction, Housing and Utility Services No. 289 dated 06.11.2017 "On Approval of the List of Construction Objects for the Design of Which Urban Planning Conditions and Restrictions are Not Provided" allows not to obtain urban planning conditions and restrictions for the construction of linear engineering highways, networks and structures outside settlements, construction of linear cable telecommunications facilities in accordance with urban planning documentation.

We believe that such a list may also include ground-based solar power plants that are built within the boundaries of a land plot in accordance with urban planning documentation outside settlements.

The process of developing project documentation is also burdensome for construction customers. Thus, for the installation of SPPs (both ground-based and rooftop), construction customers are required to develop full design documentation of the "RP" stage (for facilities with consequence class CC1) or the "P" stage and the "R" stage (for facilities with consequence class CC2-CC3).

At the same time, while the majority of ground-based SPPs are classified as having consequence class CC1 (minor consequences), the construction of rooftop SPPs is possible only through the permitting procedure for the reconstruction of the building/structure on which the rooftop SPP is installed. The consequence class of such buildings/structures is determined by CC2-CC3, and therefore the reconstruction of such a facility and the installation of a rooftop SPP will also have a CC2-CC3 consequence class calculation.

Annex D of DBN A.2.2-3:2014 "Composition and Content of Project Documentation for Construction" defines the composition of project documentation for the construction (reconstruction) of facilities, including for the construction of SPPs (ground/roof).

Thus, the project documentation should include the following sections:

- explanatory note;
- architectural and construction solutions;
- technological solutions;
- engineering equipment solutions;
- basic drawings;
- construction management;
- estimate documentation.

An obligatory section of the explanatory note is an environmental impact assessment, calculation of evacuation time, etc.

The above requirements for the composition and content of construction project documentation should be provided for new construction, reconstruction or major repairs of facilities. However, the installation of a rooftop solar power plant, due to its design, method of mounting, and the absence of any negative impact on the environment, does not require such a volume of construction project documentation.

Moreover, the reconstruction of buildings and structures by installing rooftop solar power plants with consequence class CC2-CC3 requires the examination of construction project documentation, which can cost an average of UAH 100 thousand, which entails significant costs for its passage, as well as a delay in the time of installation work.

At the same time, all design and construction permits should be uploaded/received using the Unified State Electronic System in the field of construction. In most cases, water supply and wastewater treatment companies do not have special knowledge and skills to work with this system. Often, technical problems with the system itself take time to fix and delay the entire process of obtaining construction permits.

That is why there is an urgent need to simplify the mechanism for obtaining construction permits.

In addition, it is advisable to minimise the amount of project documentation for the construction of a SPP, limiting it to, for example, a preliminary design, possibly with the clarification of certain design sections. This will help save budgetary funds and time, as well as exempt from the obligation to undergo an expert review of project documentation.

It is also advisable to simplify the mechanism for the construction of onshore SPPs outside settlements, to exempt construction customers from the need to obtain urban planning conditions and restrictions, to establish the class of consequences of such facilities as CC1 and to minimise the volume of project documentation for the construction of such facilities.

On 4 October 2018, the Law of Ukraine "On Amendments to Certain Laws of Ukraine on the Investment Attractiveness of Renewable Energy Facilities Construction" came into force, which stipulates that facilities that generate electricity from wind energy are classified as CC1 - minor impact.

In view of this, it is necessary to adopt similar amendments to the legislation for solar power plants. Such amendments will significantly simplify the process of obtaining permits, reduce the administrative burden on water and wastewater companies, and facilitate the faster development of renewable energy in Ukraine.