UDC 347.77:620.9
DOI https://doi.org/10.24144/2307-3322.2025.91.3.27

PUBLIC–PRIVATE PARTNERSHIPS IN RENEWABLE ENERGY: INTERNATIONAL APPROACHES OF LEGAL REGULATIONS

Pashynskyi V.Y.,
Doctor of Law, Associate Professor,
Department of Administrative Law and Procedure,
Educational and Research Institute of Law,
T. Shevchenko National University of Kyiv.
ORCID: 0000-0001-7349-2227

Yefimenko K.,
PhD Student,
Department of Administrative Law and Procedure,
Educational and Research Institute of Law,
Taras Shevchenko National University of Kyiv;
Deputy Director,
Department of Strategic Planning and Investment Development –
Head of the Division for Recovery and Investment Activities,
Ministry of Culture and Strategic Communications of Ukraine
ORCID: 0000-0001-5865-5673

Pashynskyi V.Y., Yefimenko K. Public-private partnerships in renewable energy: international approaches of legal regulations.

The article systematizes international approaches to the legal regulation of public–private partnerships (PPPs) in the field of renewable energy, with a particular emphasis on off-grid solutions. The authors conduct a comparative legal analysis of regulatory documents of UNECE, the European Commission (CEAP, Buying Green), as well as analytical reports by IRENA, UNDP/ETH Zurich, ESMAP/World Bank, and case studies from Africa, Asia, and Europe. Special attention is paid to PPP models (BOO/BOOM/DBO/JV), the concepts of "Value for Money/People/Planet" and PIERS, as well as practices of scaling mini-grids (India, Kenya), establishing community energy schemes in Germany, and institutional models in Uganda and the Solomon Islands. The study highlights that the integration of UNECE standards with European approaches to Green Public Procurement (GPP) and the Circular Economy Action Plan (CEAP) contributes to greater transparency, investment attractiveness, and sustainability of energy projects, especially for remote communities. Practical checklists are proposed to incorporate environmental criteria at all stages of the PPP life cycle – from planning and technical specifications to bid evaluation and contract implementation. The article also explores the Ukrainian context: current legislation in the field of PPPs and energy, strategic documents, as well as existing challenges – fragmentation of the regulatory framework, absence of sectoral by-laws, weak institutional support, and limited practice of PPP implementation in renewable energy. The authors emphasize the necessity of digitalizing processes, expanding access to international financing, and strengthening the role of local self-government. The practical value of the research lies in creating a roadmap for integrating off-grid PPP projects into Ukraine's post-war reconstruction, with an emphasis on environmental sustainability, social justice, and economic efficiency.

Key words: public–private partnership; public interest; renewable energy; energy PPP; regulation; state–private partnership; investments.

Пашинський В.Й., Єфіменко К. Публічно-приватне партнерство у відновлюваній енергетиці: міжнародні підходи до правового регулювання.

У статті систематизовано міжнародні підходи до правового регулювання публічно-приватного партнерства (ППП) у сфері відновлюваної енергетики з особливим акцентом на позамережевих

рішеннях. Автори здійснили порівняльно-правовий аналіз регуляторних документів ЄЕК ООН, Європейської Комісії (CEAP, Buying Green), а також аналітичних звітів IRENA, UNDP/ETH Zurich, ESMAP/World Bank і практичних кейсів країн Африки, Азії та Європи. Особливу увагу приділено моделям ППП (BOO/BOOM/DBO/JV), концепціям «Value for Money/People/Planet» та PIERS, а також практикам масштабування мінімереж (Індія, Кенія), створення громадських енергетичних схем у Німеччині та інституційним моделям в Уганді та на Соломонових островах. Дослідження підкреслює, що інтеграція європейських підходів до зелених публічних закупівель і Плану дій із циркулярної економіки сприяє підвищенню прозорості, інвестиційної привабливості та сталості енергетичних проєктів, особливо для віддалених громад. Запропоновано практичні чек-листи для включення екологічних критеріїв на всіх етапах життєвого циклу ППП – від планування й технічних завдань до оцінювання пропозицій і реалізації контрактів. Окремо розглянуто український контекст: чинне законодавство у сфері ППП і енергетики, стратегічні документи, існуючі проблеми: фрагментацію нормативно-правової бази, відсутність галузевих підзаконних актів, слабку інституційну підтримку та обмежену практику реалізації енергетичних ППП. Автори наголошують на необхідності цифровізації процесів, розширення доступу до міжнародного фінансування та посилення ролі місцевого самоврядування. Практична цінність дослідження полягає у створенні дорожньої карти інтеграції позамережевих проєктів ППП у післявоєнну відбудову України з акцентом на екологічну сталість, соціальну справедливість та економічну ефективність.

Ключові слова: публічно-приватне партнерство; державно-приватне партнерство; публічний інтерес; відновлювана енергетика; енергетичні ППП; регулювання; інвестиції.

Problem statement. Access to affordable, reliable, and clean energy in off-grid settings requires delivery models that align public goals with private capabilities. Given wartime damage to Ukraine's energy sector, PPPs focused on renewable, resilient, and distributed solutions are particularly relevant.

The development of the energy sector is one of the key areas for economic growth, ensuring energy security, and environmental sustainability of the state. In conditions of budgetary constraints and high demand for investment, public-private partnerships are seen as a promising tool for implementing energy projects. This mechanism allows the financial and managerial resources of the state and business to be combined, while ensuring socially significant results. Access to affordable, reliable, and clean energy in off-grid settings requires delivery models that align public goals with private capabilities.

Contemporary standards emphasize not only Value for Money (VfM) but also Value for People (VfP) and Value for the Planet (VfPL) [1].

In the EU, Green Public Procurement and the Circular Economy Action Plan provide procurement-level levers to operationalize climate and circularity objectives within PPP contracts [2]. Recent deployments in India and Kenya indicate that standardized BOO/BOOM portfolios can scale mini-grids while maintaining service quality [3].

Community-owned microgrids in Germany further illustrate how prosumers and virtual power plants can improve resilience and equity [4]. Although many sustainable off-grid initiatives are launched by citizens and private sector proponents, the government has a prominent role in launching off-grid projects and regulating them through enabling environments.

There is a need to provide exact regulation to governments when using PPPs to deliver investment in renewable, resilient and sustainable off-grid energy infrastructure as a way of meeting the United Nations Sustainable Development Goals (SDGs).

Given the situation in Ukraine due to military actions, in particular, constant attacks by the Russian Federation on the energy sector, the issue of implementing renewable energy projects with a focus on off-grid solutions is quite relevant. It is also important to achieve sustainable development goals while satisfying public interests in the process of implementing PPP projects in the energy sector, primarily environmental criteria.

Research objective. To systematize international regulatory approaches to energy PPPs and adapt them for the Ukrainian context, emphasizing off-grid models and sustainability criteria.

State of research. In recent years, scholarly interest in public–private partnerships (PPPs) for renewable energy has intensified, covering diverse legal, institutional, and practical perspectives. Numerous studies have examined enabling legal frameworks, governance mechanisms, risk allocation, and regulatory innovations in both developed and developing contexts. Othman and Khallaf provide a

comprehensive review of success factors in renewable energy PPPs, pinpointing governance, bidding efficiency, political stability, and supportive legal norms as critical enablers [5]. Meanwhile, Tabash et al. (2025) explore the socioeconomic impacts of PPP investments in energy sectors across BRICS countries, linking energy PPPs to labor market dynamics and poverty alleviation [6]. Other authors like Arimoro (2025) [7] and Baziar & Parsa (2024)[8] investigate sustainable PPP models and legal challenges in renewable energy projects, particularly focusing on regulatory coherence and jurisdictional complexity.

However, gaps remain in cross-jurisdictional comparative legal analysis specifically within post-conflict or transitioning economies (such as Ukraine). Limited attention has been paid to how international PPP regulatory models can be effectively adapted to specific national legal systems facing unique governance and energy-security challenges. Therefore, this study seeks to systematize and critically evaluate international regulatory approaches to renewable energy PPPs and to adapt them for the Ukrainian context, emphasizing off-grid models.

Main material presentation. In Ukraine, the legal framework for PPPs is primarily established by the Law of Ukraine "On Public-Private Partnership" [9], which defines the general principles of PPPs, the typical forms of partnership, the procedure for evaluating efficiency, the process of competitive selection of a private partner, the conditions for concluding agreements, mechanisms for risk allocation, as well as guarantees for investors. The law is framework in nature; however, it does not take into account the specific features of individual sectors of the economy, including energy, which necessitates the development of sectoral regulation.

In the energy sector, the additional legal basis is provided by the Law of Ukraine "On the Electricity Market" [10], which defines the legal, economic, and organizational foundations for the functioning of a competitive electricity market, conditions of access to infrastructure, and mechanisms for regulating relations among electricity producers, suppliers, and consumers. This law contains certain provisions that directly or indirectly relate to public–private cooperation, particularly regarding infrastructure investment, the development of new generating capacities, the connection of renewable energy facilities.

At the same time, the use of alternative energy sources is governed by the Law of Ukraine "On Alternative Energy Sources" [11]. This law provides mechanisms to incentivize investors to develop renewable energy, establishes the procedure for setting the "green" tariff, defines the scope of state guarantees and benefits, and allows for the implementation of projects through PPPs. The law is of significant importance in the context of Ukraine's transition to a climate-neutral economy and harmonisation with the European Green Deal.

At the strategic level, an important guideline is the National Economic Strategy until 2030, approved by the Resolution of the Cabinet of Ministers of Ukraine of 03.03.2021 No. 179. The document provides for increasing the share of renewable energy, the development of "smart" grids, the attraction of international investment, reducing the carbon footprint, and integrating the national market with the EU. Among the instruments for achieving the strategy's objectives, priority is assigned to PPPs in energy, particularly in projects for infrastructure modernisation and digitalisation [12].

The practical implementation of PPP projects in the energy sector requires compliance with a formalised procedure stipulated by the Resolution of the Cabinet of Ministers of Ukraine of 11.04.2011 No. 384, which approves the Procedure for Conducting an Efficiency Analysis of Public-Private Partnerships. This document outlines the stages of project preparation, methods for assessing socio-economic feasibility, instruments for risk identification, and criteria for selecting the form of partnership, etc [13].

Despite the formation of a basic regulatory framework, the practice of implementing PPP projects in the energy sector in Ukraine remains limited. The main challenges are associated with the fragmentation of legislation, the absence of sector-specific by-laws, regulatory instability, imperfect tender procedures, and risks for private investors. To date, only a few successful renewable energy PPP projects (RES) have been implemented in Ukraine — in particular, wind and solar power plants with the participation of foreign companies such as EuroCape New Energy and Scatec Solar. However, most of these have been carried out under standard investment agreements, without the application of a full PPP model.

Othman and Khallaf (2024) argue that the success of public–private partnerships (PPPs) in renewable energy projects across developing countries depends on a combination of institutional, political, and economic enablers. The authors identify several key determinants, including strong governmental support, which encourages private investors to participate in renewable energy initiatives, and the existence of a comprehensive strategic plan and policy framework that creates a stable environment

for long-term private sector engagement. They also stress the importance of efficient and transparent bidding procedures, which help to reduce implementation and operating costs while fostering investor trust. Furthermore, political stability is viewed as a major factor that influences market risks and investment confidence; instability generates uncertainty, discouraging participation, whereas a stable political context facilitates sustained cooperation. Finally, Othman and Khallaf highlight that robust legal and regulatory frameworks play a decisive role in shaping effective PPP models for renewable energy, ensuring accountability and alignment between public and private interests [5].

Owojori et al. (2025) assert that **good governance and anti-corruption measures are fundamental prerequisites** for the success of green public–private partnerships, because they foster transparency, accountability, and trust between public and private stakeholders [14].

At the international level, the practice of PPPs in the energy sector has a long history and considerable success. In the European Union, an example of effective implementation is the TAP (Trans-Adriatic Pipeline), built in partnership with private energy companies and several governments. In the United States, concession models are widely applied in constructing infrastructure for transmitting energy from RES.

In Germany, the concept of "energy villages" is developing, where residents become not only consumers but also producers ("prosumers"). For example, in projects in Schönau, communities invest in solar panels, wind turbines, and bioenergy. A virtual power plant is created, where each participant supplies surplus energy, and the system accumulates and distributes it. The distinctive features of these initiatives are: citizen participation in decision-making; economic independence from the electricity market; scalability of the model – over 200 communities in Germany have adopted this approach.

For Ukraine, the experience of renewable energy for refugees in Ethiopia, Rwanda, and Iraq can also be valuable. The Renewable Energy for Refugees (RE4R) project, implemented through a PPP mechanism and funded by international organisations together with private companies, aims to replace diesel generators in refugee camps with solar and hybrid mini-grids. The project outcomes include: stable access to electricity for tens of thousands of displaced persons; the possibility of connecting educational and medical institutions; reduction of fuel costs and CO_2 emissions [15].

The experience of Africa and Oceania is also noteworthy (institutional PPP models, e.g., Uganda (WENRECO)). In West Nile, since 2003, a PPP (concession) for the construction and operation of the Nyagak I hydropower plant (3.5 MW) has been in force. The project was supported by the World Bank within the Energy for Rural Transformation programme. Its implementation resulted in electricity supply to remote areas not connected to the national grid [15].

On the Solomon Islands, the National Electrification Program provided for the use of decentralised off-grid systems. A key element was the active participation of local communities in planning and operation. Thus, the combination of public financing and private investment made it possible to address the social and environmental challenges of island territories [15]. Such experience could also be applied in certain regions of Ukraine.

Asian scaling practices, exemplified in India (Uttar Pradesh), demonstrate that the programme for the installation of 25,000 solar mini-grids attracted more than USD 1.2 billion in private investment. The use of LED lamps and the possibility of mobile phone charging enabled households to reduce expenses and created new jobs [15].

In Kenya, 8,000 mini-grids have been implemented for 3.5 million residents. The key mechanism is the Build-Own-Operate (BOO) model, where the private sector finances, constructs, and operates the system, while the state provides an enabling environment (permits, subsidies, guarantees) [15].

International regulatory approaches to PPPs in the energy sector demonstrate that UNECE, in its draft standard, recommends for energy PPPs: a focus not only on value for money, but also on value for people and value for planet; ensuring accessibility and fairness (energy equity); the introduction of flexible contractual models: BOO, BOOM, DBOM, JV; mandatory assessment of environmental and social sustainability [15].

Comparative analysis shows that countries with advanced PPP practice provide not only transparent partner selection procedures but also state guarantees for investment return, political risk insurance, and access to arbitration. Specialised institutions (such as the UK Infrastructure Bank or Canada's PPP Canada), as well as the support of the International Finance Corporation (IFC) and the World Bank, play an important role in this process.

At the same time, international experience shows that significant savings of time and resources can be achieved if key governmental and non-governmental actors (local authorities, NGOs, communities)

are clearly identified, with due consideration of knowledge needs and responsibilities. Stakeholder mapping should determine coordination mechanisms and strategies for addressing any identified gaps in accountability, duplication of responsibilities, or conflicts of interest.

For Ukraine, it is important to codify in a separate legal act the specificities of PPPs in the energy sector. It would be advisable to establish a State Agency for the Development of Energy Partnerships, which would coordinate the preparation of feasibility studies, provide legal support for projects, and interact with international donors – or to ensure that these functions are fully performed by the existing State Organisation "Agency for Support of Public-Private Partnerships." It is also necessary to introduce digital project registries, update Procedure No. 384 [13] with due regard to the specifics of the energy sector, and introduce electronic procedures for partner selection. Furthermore, cooperation with international agencies such as USAID, GIZ, and EIB should be intensified to ensure financial and technical support.

In the context of post-war recovery, PPP mechanisms may become a catalyst for the restoration of damaged generation and network facilities, particularly in the eastern and southern regions of Ukraine. PPPs can serve as an instrument for the rapid launch of new capacities, reducing dependence on imports, and fostering energy localism (local energy production). This would also allow the adoption of new technologies, reduce budgetary expenditures, and increase investor confidence.

One of the problems hindering the development of PPPs in Ukraine's energy sector is the absence of judicial practice that would consolidate consistent approaches to the interpretation and implementation of partnership agreements. Private investors are often wary of potential risks associated with permit cancellations, delays in approvals, and regulatory changes, as evidenced by a number of cases in commercial courts. For example, in several instances, decisions of local authorities on the allocation of land plots for the construction of energy facilities under concession agreements were challenged, which resulted in project suspension for years. This highlights the need to improve coordination between local self-government bodies and central authorities in the context of PPPs, and to ensure the prioritisation of PPP agreements as those serving a socially important function.

Another pressing issue is the fragmentation of regulatory frameworks. Although the Law of Ukraine "On Public-Private Partnership" defines general principles, in many cases there is no specific subordinate legislation regulating the particularities of PPPs in the energy sector: technical requirements, tariffs, procedures for interaction with the TSO (transmission system operator), PSO (public service obligations), etc. It is also essential to ensure compatibility of PPP agreements with current legislation on public procurement, antitrust restrictions, and environmental protection. This requires harmonisation of the provisions governing energy PPPs with the Laws of Ukraine "On Regulation of Urban Development," "On Strategic Environmental Assessment," and "On State Aid to Business Entities."

To reduce barriers to market entry, the state should consider introducing institutional support for PPP projects. For example, a special agency established under the Ministry of Economy or the Ministry of Energy should oversee all stages of implementation – from the preparation of feasibility studies to the auditing of energy PPP projects. In other countries, such institutions already exist: in the United Kingdom, the Infrastructure and Projects Authority (IPA); in France, the Mission d'Appui aux Partenariats Public-Privé (MAPPP); in Poland, the PPP Platform under the Ministry of Funds and Regional Policy. A similar structure in Ukraine could consolidate best practices, conduct training for public authorities, and develop standard contracts.

The implementation of energy projects through PPPs also requires financial support mechanisms: partial risk guarantees, preferential taxation, and access to credit resources from international financial organisations. For instance, involving Ukrgasbank, Eximbank of Ukraine, or establishing a PPP Support Fund to cover initial feasibility study costs would increase project attractiveness for small and medium-sized enterprises.

Particular attention should be given to digitalisation of processes. Publishing an up-to-date list of PPP projects, their implementation stages, and financial parameters on a unified state platform would increase transparency, facilitate investor access to information, and reduce corruption risks. Examples include the Polish platform ppp.gov.pl or the European Investment Bank's portal.

An essential component of developing PPPs in Ukraine's energy sector is strengthening the role of local self-government authorities. It is at the community level that demand for energy-efficient solutions is generated – the modernisation of street lighting systems, heating of schools and hospitals, installation of solar panels on municipal buildings, etc. Such projects require support from both the state and international partners. An illustrative example is the "U-LEAD with Europe" initiative, under

which communities receive advisory support for preparing feasibility studies and tender documentation to attract private capital.

Successful cases of local PPP implementation in energy efficiency demonstrate that municipalities can become key drivers of change. For instance, in the city of Slavutych, with the support of NEFCO (Nordic Environment Finance Corporation), a project for the modernisation of the heating system was implemented, replacing natural gas with alternative sources. Such cases prove that, given institutional support and legal safeguards, even small communities are capable of effectively implementing complex technical solutions.

The role of international financial institutions in advancing partnership initiatives is equally important. The European Bank for Reconstruction and Development, the European Investment Bank, and the International Finance Corporation provide not only loans, but also technical assistance, project preparation grants, and international oversight of transparency. While most of these institutions already cooperate with Ukraine, more active engagement requires the establishment of an appropriate legal environment – ratification of international agreements on investment protection, integration of dispute resolution mechanisms, and harmonisation of procurement standards.

In this context, the idea of creating a Regional Hub for Energy PPPs, based in one of Ukraine's regions with concentrated critical infrastructure, available human resources, and facilities for reconstruction, appears promising. Such a hub could bring together communities, businesses, and international partners around specific projects, enabling the piloting of new legal models (e.g., energy service contracts with PPP elements, local concessions, pay-as-you-save mechanisms).

To ensure a systematic approach to the development of PPPs in the energy sector, it is also necessary to introduce performance evaluation indicators for implemented projects. It is important not only to assess the technical outcomes (amount of saved kWh or reduced CO_2 emissions), but also the impact on employment, the development of the local economy, and the financial stability of communities. The presence of such indicators would allow more informed decisions on scaling up initiatives.

Conclusions. PPPs in renewable energy are instrumental for mobilizing investment, modernizing infrastructure, and achieving SDGs. For Ukraine's post-war recovery, establishing a specialized energy-PPP agency, digitalizing procedures, and aligning procurement with GPP/CEAP will accelerate implementation.

The presence of a developed legal system, a coherent institutional architecture, and transparent procedures forms the foundation for the effective functioning of PPP mechanisms in strategic sectors, particularly energy.

PPP projects in Ukraine's energy sector are implemented in a fragmented manner. The absence of specialized subordinate legislation, the instability of regulatory policy, and the complexity of interaction among different levels of government create substantial obstacles to the wide-scale introduction of PPPs.

A particularly acute issue is the insufficient preparedness of local self-government bodies, which lack the resources or expertise to fully launch projects. This constrains the potential of communities in the fields of energy efficiency and renewable energy, and also complicates Ukraine's participation in international sustainable-development support programs. Ukrainian PPP law is framework in nature and lacks sector-specific by-laws for energy. Comparative analysis shows that advanced PPP jurisdictions ensure transparent partner selection, guarantees for investment return, political risk insurance, and specialized institutions. UNECE draft standards recommend flexible PPP models (BOO/BOOM/DBOM/JV), VfM/VfP/VfPL metrics, and mandatory environmental and social sustainability assessment. Case studies from India, Kenya, Germany, Uganda, and the Solomon Islands demonstrate pathways to scaling off-grid and community energy.

REFERENCES:

1. UNECE. (2024). Guidelines on green and sustainable procurement of PPPs for the SDGs (ECE/CECI/WP/PPP/2024/5). United Nations Economic Commission for Europe. https://unece.org/sites/default/files/2024-11/ECE_CECI_WP_PPP_2024_05-en.pdf.
2. European Parliament. Study: The Role of Public-Private Partnerships in Infrastructure Development. 2017. IPOL_STU(2017)602065_EN. URL: https://www.europarl.europa.eu/RegData/etudes/STUD/2017/602065/IPOL_STU(2017)602065_EN.pdf.
3. UNDP, & ETH Zurich. (2018). Derisking renewable energy investment: Off-grid electrification. United Nations Development Programme & ETH Zurich. https://www.undp.org/publications/drei-grid-electrification-2018.

4. NREL. (n.d.). Grid modernization – Microgrids. National Renewable Energy Laboratory. URL:https://www.nrel.gov/grid/microgrids.html.
5. Othman K., Khallaf R. A Review of Public-Private Partnerships for Renewable Energy Projects in Developing Countries. In: Proceedings of International Structural Engineering and Construction (EURO-MED SEC-04). ISEC Press, 2022. URL: https://www.isec-society.org/ISEC_PRESS/EURO_MED_SEC_04/pdf/ENR-01.pdf.
6. Tabash M.I., Farooq U., Gherghina Ș.C., Varma M., Aljughaiman A.A. (2025). Evaluating the effects of public private partnership investment in energy on labor market dynamics and poverty alleviation in BRICS countries. Discover Sustainability, 6, 573. URL: https://doi.org/10.1007/s43621-025-01494-1.
7. Arimoro, A. E. Sustainable Public-Private Partnerships in Sub-Saharan Africa. // *Journal of Infrastructure Systems (SAGE Publications)*, 2025. Vol. 31, No. 2. Article 1087724X251356462. ISSN 1087-724X. DOI: 10.1177/1087724X251356462.
8. Baziar, A., Parsa, N. Legal Challenges in Renewable Energy Development: A Comparative Study of China and Selected Countries. arXiv e-prints, 2024. ID arXiv: 2412.10203. URL: https://arxiv.org/abs/2412.10203.
9. Verkhovna Rada of Ukraine. (2010). On public-private partnership: Law of Ukraine of July 1, 2010 No. 2404-VI. *Vidomosti Verkhovnoi Rady Ukrainy*, 2010(40), Art. 524.
10. Verkhovna Rada of Ukraine. (2017). On the electricity market: Law of Ukraine of April 13, 2017 No. 2019-VIII. *Vidomosti Verkhovnoi Rady Ukrainy*, 2017(27), Art. 312.
11. Verkhovna Rada of Ukraine. (2003). On alternative energy sources: Law of Ukraine of February 20, 2003 No. 555-IV. URL: https://zakon.rada.gov.ua/laws/show/555-15#Text.
12. Cabinet of Ministers of Ukraine. (2021). On approval of the National Economic Strategy until 2030: Resolution of March 3, 2021 No. 179. URL: https://zakon.rada.gov.ua/laws/show/179-2021-%D0%BF#Text.
13. Cabinet of Ministers of Ukraine. (2011). On approval of the Procedure for conducting an efficiency analysis of public-private partnership implementation: Resolution of April 11, 2011 No. 384. URL:https://zakon.rada.gov.ua/laws/show/384-2011-%D0%BF#Text.
14. Owojori O. M., A Review of Public-Private Partnerships for Renewable Energy Projects in Developing Countries. *Proceedings of International Structural Engineering and Construction*, 2022, Vol. 9, No. 1: State-of-the-Art Materials and Techniques in Structural Engineering and Construction. ISEC Press. P. ENR-01-1 – ENR-01-6. ISSN 2644-108X. DOI: 10.14455/ISEC.2022.9(1).ENR-01.
15. United Nations Economic Commission for Europe (UNECE). Draft Standard on Off-grid Renewable Energy: Public Review v1.0. Geneva: UNECE, 2024. 46 p. URL: https://unece.org/sites/default/files/2024-07/UNECE_Draft_Standard_on_Off-grid_Renewable_Energy-Public%20Review%20v1.0.pdf.
16. European Commission. (2016). Buying Green! A handbook on green public procurement (3rd ed.). Publications Office of the European Union. https://op.europa.eu/en/publication-detail/-/publication/8c2da441-f63c-11e5-8529-01aa75ed71a1.
17. European Commission. (2020). A new Circular Economy Action Plan (COM(2020) 98). https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52020DC0098.
18. Frontiers in Energy Research. (2021). Development of an intelligent power management system for solar PV–wind–battery–fuel cell integration. URL: https://www.frontiersin.org/articles/10.3389/fenrg.2021.613958/full.
19. Grid Alternatives. (n.d.). Case study: Solar lighting program in Nicaragua – Lorena Torres. URL: https://gridalternatives.org/case-study-solar-lighting-program-nicaragua.
20. IRENA. (2016). Policies and regulations for private sector renewable energy mini-grids. International Renewable Energy Agency. URL: https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2016/IRENA_Policies_Regulations_minigrids_2016.pdf
21. IRENA. (2018). Policies and regulations for renewable energy mini-grids. International Renewable Energy Agency. URL: https://www.irena.org/publications/2018/Oct/Policies-and-Regulations-for-Renewable-Energy-Mini-Grids.
22. WAPPP. (2025). Guidelines for small-scale PPPs. World Association of PPP Units & Professionals. URL: https://wappp.net/wp-content/uploads/2025/07/SSPPPs-Guidelines-July-8-2025.pdf.