

DOI: [https://doi.org/10.30970/fp.1\(59\).2026.242252253](https://doi.org/10.30970/fp.1(59).2026.242252253)

JEL Classification: L32, Q48, H54

MECHANISMS OF PUBLIC-PRIVATE PARTNERSHIP IN THE MODERNISATION OF THE ENERGY SECTOR OF THE NATIONAL ECONOMY

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Abstract. *The article examines public-private partnership (PPP) mechanisms as a tool for modernising the energy sector of the national economy in the context of the transition to renewable energy sources and post-war reconstruction. Based on a systematic analysis of the regulatory framework, international experience of PPP projects in the United Kingdom, Poland, Germany and China, and the current state of Ukraine's energy sector, the main PPP forms (BOT, BOOT, PPA, concession, joint venture) and the conditions for their effective application are described. Legal, financial, institutional and security barriers to PPP implementation in Ukraine are systematised, and mechanisms for attracting international financial institutions (EBRD, EIB, IFC, World Bank) are identified. Strategic directions for building a PPP ecosystem to achieve the targets of the National Energy and Climate Plan (NECP) for 2025–2030 are substantiated.*

Keywords: *public-private partnership, energy modernisation, renewable energy sources, carbon neutrality, concession, investment attraction.*

The research explores the conceptual foundations and practical implementation of public-private partnership (PPP) mechanisms as a strategic tool for the modernization of the energy sector within the national economy. Given the unprecedented challenges posed by the full-scale military invasion of Ukraine, which resulted in energy infrastructure damages exceeding \$56 billion, the traditional centralized energy model has proven vulnerable. Consequently, the study emphasizes the urgent need for a transition toward a decentralized, resilient, and "green" energy system. The purpose of the article is to substantiate the organizational and economic mechanisms of PPP that facilitate the attraction of private capital and technological innovation into the energy industry.

Methodologically, the study employs a systemic analysis of international best practices and a comparative evaluation of diverse PPP models. The results identify that achieving the targets set in the National Energy and Climate Plan (NECP)—specifically reaching a 27% share of renewable energy sources by 2030—requires a robust investment framework. The paper provides a detailed classification of PPP forms, including Build-Operate-Transfer

(BOT), Build-Own-Operate-Transfer (BOOT), and Power Purchase Agreements (PPA), highlighting their capacity for optimal risk distribution between the state and private partners.

Special attention is paid to the role of digitalization and the integration of smart grid technologies as catalysts for energy efficiency. The author argues that digital tools must work in synergy with fiscal incentives to ensure the economic viability of green projects. The study concludes that creating a favorable investment climate and harmonizing national legislation with EU standards are critical for successful PPP. The proposed conceptual model offers a structured approach to fostering long-term cooperation, ensuring energy security, and promoting the sustainable modernization of the national energy infrastructure in the post-war reconstruction period.

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Дата надходження статті: 13.03.2026

Дата прийняття статті: 23.03.2026

Дата публікації статті: 31.03.2026