

IDENTIFYING CORE OPPORTUNITIES AND CHALLENGES FOR GREEN TRANSFORMATION OF THE UKRAINIAN ENERGY MARKET

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Introduction. The article provides an overview and analysis of renewable energy promotion measures in the current Ukrainian energy market, including an examination of the impact of liberalisation programmes and other measures supporting green energy policy in Ukraine. To this end, we first analyse the adoption of relevant renewable energy legislation in Ukraine and then examine specific challenges in key areas of renewable energy.

Presentation of the main research. There are four global challenges that drive the need for renewable energy technology development in Ukraine: the new EU strategy on adaptation to climate change on 24 February 2021, the EU strategy for sustainable economic growth, objectives of SDG 12 to the consumption and production patterns, and the concept of the Circular Economy that is being promoted in the EU and globally.

As is known, climate change poses an immediate threat to the well-being and security of citizens for any country, including leading to an increase in natural disasters, food security, water shortage, etc. The main actions to resist and adapt to climate change are in one way or another related to the transformation of the energy sector and the acceleration of the transition to renewable energy sources.

The new strategy sets out how the European Union can adapt to the unavoidable impacts of climate change and become climate resilient by 2050. The strategy covers four main areas: making adaptation smarter, faster and systemic, and boosting international co-operation on climate change adaptation (EU Climate Strategy, 2021). Each of them also includes tasks to accelerate the greening of energy production and use processes.

Thus, the implementing regulation on the Governance of the Energy Union and Climate Action supports the implementation of the

National Energy and Climate Plans, as well as for areas crossing several borders with common climate risks. In particular, the Commission explore options to better integrate climate resilience considerations into the construction and renovation of buildings (for example, through strengthening the Green Public Procurement criteria for public buildings, introductions to the Digital Building Logbook, etc.). Corresponding changes to EU legislation are expected as a part of the process to revise the Energy Performance of Buildings Directive and the Construction Products Regulation. The Strategy states that the Commission will consider raising the energy efficiency requirements and energy mix, and will look at how to raise the requirements for energy-design and energy labelling, including for housing and buildings, and energy savings in agriculture and industrial plants.

In Ukraine, climate problems are regulated within environmental law of Ukraine as a part of legal protection of ambient air and the ozone layer. In the legal literature airspace, wind energy, solar radiation, radio frequency resource, etc. are defined as natural resources of a special kind – "intangible natural resources" (Malysheva, 2015). However, legal regulations for their use in Ukraine are mainly only in the process of their formation.

The legal literature emphasizes that climate state policy of Ukraine is conditionally divided into two areas: mitigating climate change (e.g., by reducing greenhouse gas emissions) and adapting to climate change impacts (Kopytsi, 2021). The fundamental strategic documents are the Strategy of the State Environmental Policy of Ukraine for the period up to 2030 (Environmental Strategy 2030) and the Concept on State Climate Policy Implementation until 2030 (State Climate Policy 2030).

The Environmental Strategy 2030 states that in order to strengthen response to the effects of climate change and to achieve the goals of sustainable low-carbon development in all sectors of the economy, Ukraine must ensure the implementation of international instruments on climate change and atmosphere quality.

The State Climate Policy 2030 is the first national strategic document aimed at improving State policy on climate change in order to achieve sustainable development and a gradual transition to low-carbon development.

Energy Strategy of Ukraine up to 2035 (ESU 2035) outlines strategic guidelines for the development of Ukraine's fuel and energy complex for the period up to 2035. It envisages the completion of energy sector reform by 2025 to allow its integration with the energy sector of EU. However, ESU has been criticized for its inconsistency and inability to meet the challenges of the present. Analysts, in particular, note that the ESU does not form the State's model of flexible support for renewable energy sources in Ukraine. Namely, the State buys all 'green' electricity, the price of coal and nuclear generation is distorted, and there is no competition on the energy market, etc. (Kopytsi, 2021).

It is important to emphasize that the design of implementation measures is crucial for achieving environmental and climate policy goals. The implementation of policy targets may in fact be 'consistent and synergetic' only if economic growth in absolute terms is decoupled from resource and energy consumption, and if the consumed energy will increasingly come from renewable sources (Teebken et al., 2022).

Renewable energy offers a range of benefits for comprehensive solutions to problems in the field of climate, ecology and energy shortages in the context of the 2030 Agenda for Sustainable Development (Vona & Nicolli, 2014).

Figure 1 below shows the main steps that the Ukrainian government has taken to converge with the EU renewable energy policy. A revision of the Ukrainian legislation on renewable energy implies, inter alia, the implementation of the RES Directive 2009/28/EC according to the provisions of the Decision D/2012/04/MC-EnC of the Ministerial Council of the Energy Community on the implementation of Directive 2009/28/EC and amending Article 20 of the Energy Community Treaty. Ukraine submitted its four Progress Reports on the implementation of the Renewable Energy Directive to the Secretariat.

Decentralized wind, hydropower, biogas and biomass, and solar electricity energy systems are the main renewable energy technologies promoted for energy supply within national programs.

It should be reminded that the Ukrainian government has committed to increase renewables to 25 per cent of the energy mix by 2035. However, the implementation of the commitments was far behind schedule.

Figure 1

The adoption of relevant legislation on renewable energy in Ukraine

December 2020 Ukraine submitted its Forth Progress Report on promotion and use of energy from renewable sources under Article 22 of the Renewable Energy Directive

July 2020 The Law of Ukraine No. 810 was passed ensuring the improving the terms of support for production of electricity from renewable energy sources

January 2019 Ukraine submitted the third progress report on the promotion of renewable energy 2016-2017, outlining the progress and the challenges of renewable energy development during the reporting period

August 2018 Ukraine began to consider the revision of the existing support schemes based on feed-in tariffs and introducing auctions to grant support. Amendments to the Electricity Market Law and Alternative Sources Law are registered in the Ukrainian Parliament for public consultation

May 2018 The amendments to the Law on Alternative Fuels, covering the main biofuels principles of (Articles 17 to 21) Directive 2009/28/EC were submitted to the Parliament. Their adoption is still pending

In 2018, Ukraine reached only 7.1 per cent hare of energy from renewables, still below the trajectory of 9.1 per cent (Law of Ukraine, 2020). Given this weak growth and the sluggish Renewable Energy market, the Ukrainian Government has been taking a number of steps. Guaranteed access and gradual balance responsibility for large renewables producers in compliance with the *acquis* was introduced in the new Electricity Market Law No 2019-VIII, 2017. On 21 July 2020, the President of Ukraine has signed the long-awaited law of Ukraine No. 810 “On Amendments to Certain Laws of Ukraine related to Improvements of the Terms of Support for Production of Electricity from Renewable Energy Sources” (Law of Ukraine, 2020).

This Law is based on the Memorandum of Understanding for the Resolution of Problematic Issues in the Renewable Energy Industry of Ukraine signed between state authorities of Ukraine from the one side and European-Ukrainian Energy Agency, Ukrainian Wind Energy Association from the other side on 10 June 2020. In April 2020, the draft Law on amendments to legislative acts on the mandatory use of liquid biofuels (bio-components) in transport was registered in the Parliament – at the end of 2020, the share of renewable energy sources in transport is only 2.4 percent.

In order to stimulate the solar and wind industries, a feed-in tariffs (FiTs) have been established since 2009. Offtake of electricity under the FiT regime became an obligation for the state-owned Guaranteed Buyer, which subsequently began to suffer from liquidity problems. In the course of 2020 to 2021, the sources of funds to repay the indebtedness of the Guaranteed Buyer to RES producers were as follows: 1) State budget funds covering at least 20 per cent of the forecasted revenues of RES producers in the relevant year; 2) 35 per cent of funds received by the TSO from cross-border capacity allocation as of 1 July 2020; 3) Proceeds from placement of five-year term domestic state bonds. Nevertheless, the problem remained unsolved and had serious consequences for the prospects for a renewable energy market. According to the 2020 Report, in general, the implementation of the renewable energy program in Ukraine was moderately advanced (its implementation was assessed at only 52 percent).

In this regard, the Ukrainian Cabinet of Ministers has approved new Energy Strategy of Ukraine until 2050 (ESU 2050). Energy Strategy 2050 focuses on the development of nuclear and renewable power generation capacity and on the modernisation and automatisisation of transmission and distribution systems, in order to achieve carbon neutrality in the energy sector.

Analysis of official reports showed that there are still several principal challenges related to adequately development of the renewable energy market (see Table 1).

This includes strengthening government control, incentives and lobbying to support energy efficiency and sustainable development RES, in particular:

Table 1

Specific challenges in renewable energy markets (compiled from Dreshpak &Paliekhova, 2021)

Solar energy market	High cost of panels (lack of government loans); Selection of the optimal location (large network losses); Land acquisition
Wind energy market	High cost of turbines (long payback time); The need for environmental impact assessments; Land acquisition (the most prospective Azov and Crimean coasts are located in the conflict zone)
Hydro energy market	The need to restore abandoned stations; Land acquisition for hydraulic structures (dams); The need for environmental impact assessments
Biomass energy market	Insufficient number of agricultural bioenergy projects; biomass (in the form of wood pallets) is used for utilities, which contributes to the unfair consumption of forest resources

- solving the problem of balancing electricity in energy systems when using renewable energy sources;
- development of mechanisms to support the market for equipment and services for the RES industries;
- formation of comprehensive plans and programs for the development of territories, taking into account the placement of RES facilities; and strengthening state control over the targeted use of land;
- stimulating the process of energy management certification, especially in major polluting industries.

Conclusions. Research shows that a political-economic model of environmental policy, where both the power of government support and lobbying, and market competition are important is the most effective for Ukraine. The diffusion and adaptation of renewable energy technologies, and removing the obstacles to the entry of new actors in the renewable energy market plays a role that is at least as important as that played by other measures to curb climate change and prevent pollution.

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