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TOWARDS A GREEN UKRAINIAN ENERGY SYSTEM

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Анотація

Проведено аналіз необхідності та можливості переходу на альтернативні зелені види енергії в Україні. Проаналізовано зобов'язання України в енергетичному секторі пов'язані з інтеграцією Україні в ЄС і відповідними регулюваннями ЄС по зеленому переходу та зменшенню викидів парникових газів. Проаналізовано енергетичний баланс Україна та поставленні цілі по переходу на альтернативні джерела палива.

Ключові слова: Зелений перехід, централізоване теплопостачання, енергетичне планування.

Abstract

An analysis of the necessity and possibility of transition to a green energy system in Ukraine was carried out. The obligations of Ukraine in the energy sector related to Ukraine's integration into the EU and relevant EU regulations on the green transition and reduction of greenhouse gas emissions were analyzed. The energy balance of Ukraine and the goals set for the transition to renewable energy sources were analyzed.

Keywords: Green transition, district heating, energy planning.

Background

Ukraine aims to align its climate policy and legislation with the Paris Agreement and the European Green Deal by strengthening their cooperation with the EU on energy efficiency and substitutions for fossil fuels. However, the need for substantial rehabilitation of Ukraine's buildings and energy infrastructure and the huge debt in the district heating sector is challenging Ukraine's green transition towards energy security, efficiency, and sustainability [1].

Existing situation

Under the Soviet era, district heating (hereinafter DH) systems were built in several countries of the former Soviet Union.

In Ukraine, the state policy on the soviet-style DH systems has remained more or less the same since then, including dependency on fossil fuels, significant subsidies, inefficiencies, and high excess generation capacity compared to systems in the Nordic region.

Underinvestment and declined service quality have made the Ukraine's DH systems aging, inefficient and unreflective of customer needs.

The excess capacity and oversized district heating networks have further grown in Ukraine as customers disconnected from the DH networks, primarily due to the poor service quality, thus leaving the DH system ineffective and unbalanced.

Considering inefficient salary growth in relation to prices increasing, it became difficult for citizens to pay more for heat, especially during Ukraine's very harsh winter, where the temperature can drop to -26°C. As a result, the DH companies are faced with challenge when trying to increase heat prices, and recoverable tariff became more political rather than technical question.

Even with subsidies from local authorities, Ukraine's DH companies are unable to keep up with even basic maintenance investments in the DH network, pay salaries, while instead building up significant debt.

The debt of the DH companies to Ukraine's largest oil and gas company Naftogaz amounted to UAH 39 billion [2] (EUR 1 billion) in 2021.

An assessment by the Ministry of Territories and Communities Development states, that the DH sector requires at least EUR 5.2 billion in investments to modernize the networks, without considering the costs of new networks or more comprehensive renovations. Besides, there is need for investment to cover the upgrades in the electrical grid to support the heat. Thus, the total costs are likely much higher.

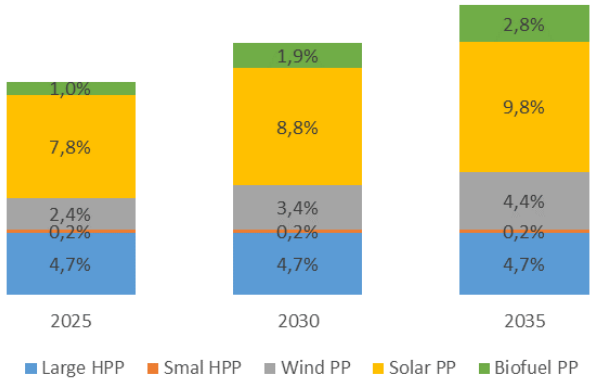
Due to the inefficiencies of Ukraine's DH sector leading to non-cost recovery for heat supply, the DH

tariffs for the residential sector have been held artificially low to match affordability. Tariffs are thus based on affordability rather than reflecting the true costs of DH. The huge cash flow gap leaves the DH companies unable to invest in the modernization of the DH systems.

Energy transition targets and potential

In recent years, Ukraine has taken major policy steps on the energy transition pathway to develop energy efficiency measures and phase out fossil fuels.

In 2017, the Ukrainian government adopted the Energy Strategy 2035 as a roadmap to improve energy effectivity, security, competitiveness, and sustainability of Ukraine's energy system. The goal is to reach 25% or renewables [3] in balance of primary energy and electricity balance in 2035 as can be seen in picture 1.



Picture 1. Renewable's goal in electricity balance according to State Agency on Energy Efficiency and Energy Saving of Ukraine

At the beginning of 2020, 'Ukraine's 2050 Green Energy Transition Concept' was proposed by the Ministry of energy and environmental protection, to join into the development and implementation of policies under the European Green Deal.

Also, Ukraine now seeks to align with the Paris Agreement by pledging reductions in greenhouse gas (GHG) emissions of 65 percent by 2030.

Meanwhile, further investments in nuclear and gas projects are considered by the government.

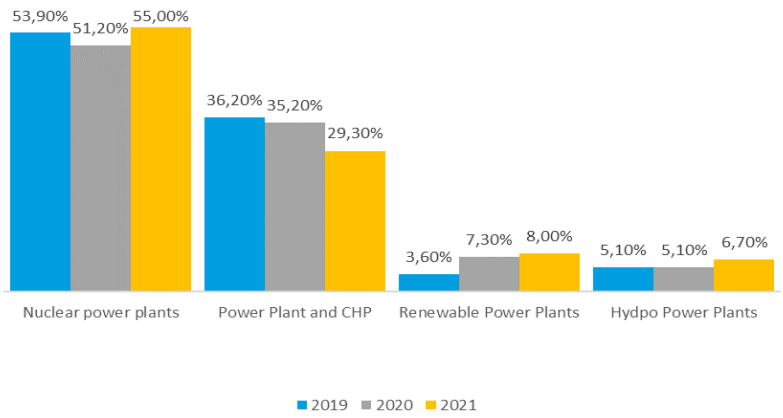
The efforts to cope with the ambitious climate targets thus suffers from several structural weaknesses and political decisions that question whether Ukraine will be able to achieve these visions.

Though, Ukraine's extensive DH infrastructure already in place holds a significant potential in providing a bridge to a sustainable RE-based system with biomass technology.

Ukraine being a country with great forests and highly fertile soil that offers exceptional agricultural conditions the potential market within biomass is considered significant .

Ukraine's biomass production annually (including crop production, waste, wood, forest maintenance and food processing residues) is significant and could be sold for electricity and heat production to replace natural gas consumption which would result in not only GHG emissions decreasing, but also the agricultural businesses would gain from it.

In March 2017, Ukraine adopted a RES tariff to stimulate investments in heat and electrical generation capacities from RES, which also made investments in biomass for heat and electricity production more attractive. Together with investments in the rehabilitation of existing DH infrastructure, this is a step toward decarbonization of the Ukrainian energy system and as it could be seen from the following picture, the personage of RE in the electricity balance of Ukraine in 2021 [4] increased more than twice since 2019 [5] as illustrated in picture 2.



Picture 2. Power generation sources

Additionally, in the summer of 2019 a new electricity market model was launched in Ukraine to liberalize the electricity market in accordance with the international obligations under the EU Energy Community Treaty agreement. The goal to integrate into the European power system ENTSO-E (The European Network of Transmission System Operators for Electricity) was reached in 2022. The integration with ENTSO-E is not only increases Ukraine's energy security, but also increases competition in the domestic market, expanding Ukraine's electricity market into regional markets and further facilitating the energy transition pathway.

Conclusions

The new electricity market model, implementation of EU regulations in Ukraine on the State level, and introduction of the Green Tariff for Heating and electricity provides a sufficient background to rehabilitate the District Heating system, together have the potential of making the green transition of the Ukrainian energy system possible.

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