

# ***LOW-CARBON STRATEGIES' FORECASTS WITHIN THE FRAMEWORK OF DIFFERENT GEOECONOMIC SCENARIOS OF UKRAINE***

Pierluigi Nichilo, dual degree Master of Science student in Mineral and Energy Economics at Colorado School of Mines and Petroleum Economics and Management at IFP School, +1 (720) 755-4099, pnichilo@mines.edu

## **Overview**

The current Russian-Ukrainian conflict is heavily impacting the economy of Ukraine and its infrastructures. This paper will present a few possible energy mix scenarios characterizing the Ukrainian economy in 2050. They will be diversified based on different geoeconomic variables: temporal framework of the conflict, estimates on the entity of damages, current policies and aid programs. The effects of the different energy mixes on the wealth of the country, the energy intensity of its economy and the carbon intensity of the energy industry will be evaluated. The analysis will elaborate on the role of low carbon energies in reconstructing the economy of the country, while assessing the placement of Ukraine on a worldwide basis in tackling climate change. Forecasted data will be benchmarked against their counterparts related to the EU.

## **Methods**

The current estimated capacities for the implementation of renewable resources within the country will be assumed to be fixed. The extent to which they will benefit investments and deployment will be estimated in few different scenarios dependent on the forecasted geoeconomic scenario. In first place, these conditions will be assumed to depend on the temporal outlook of the current conflict. The entity of damages will be represented through the indicators set for such purpose by the World Bank and the International Monetary Fund. The assumption of linear increase of damages to the economy with time holds, based on the contemporary trends. The direction set by the current policies in terms of changes in the energy mix and, consequently, in the amount of estimated resulting CO<sub>2</sub> emissions will be assumed to hold. A reduction factor scale on the level of investments projected at pre-war levels will assume to account for the disruptions to the energy transition brought by the war. The different results obtained with regard to the energy mix, will be related to different changes in the terms of the Kaya equation.

One assumption will be made about the forecasted values of population and GDP of the country for 2050. The overall consumption of energy will be assumed to reflect the current trend, stabilized around the plateau observed since 2015. The different results obtained for the energy mix will be related to different paths undertaken by the country in terms of energy intensity of the economy and carbon intensity of the energy industry. Infographics will display the variability of these two parameters in different scenarios, to be compared visually against the ones of the EU (historical and forecasted). The analysis will assume that the Ukrainian institutions will look at the EU as the reference for the implementation of changes in their political economy of energy, when reconstructing the country. The geographical context and the lagging-behind position of Ukraine in the energy transition represent the rationale behind the assumption that the evolution of the Kaya parameters in Ukraine until 2050 will reflect, to a certain extent, the evolution observed in the EU in the last decades. The pace of development will be adapted as a function of the geoeconomic scenario under analysis.

## **Results**

Given the assumptions stated in the “methods” section, a current possible scenario will see an increased annual production of low carbon technologies from the current level of 0.50 EJ to 1.04 EJ. Such scenario accounts for the different technologies to produce with the following shared quotas: wind 14.72%, solar 11.21 %, biomass 23.62%, geothermal 4.91%, hydro 17.51%, nuclear 28.03%.

## **Conclusions**

The mission of the paper will be to show how the current geoeconomic scenario could slow down the development of Ukraine, while at the same time accelerating the reach of important targets like energy efficiency and sustainability. The perspective offered will see the techno-economic gap between the EU and Ukraine decreasing, making the energy industry the leading sector in approximating Ukraine to the EU on a geopolitical basis. In line with the message of the conference, the indirect implications of the global energy transition toward decarbonization will be also explored. The main externalities identified in the reconstruction of the country through renewable energy are: enhanced security of energy supply and improved resilience against possible farther future geoeconomic – and climatic– disruptions.