Stakeholders' attitudes towards green energy innovations as a prerequisite to successful implementation: international experience and lessons learned in the Ukrainian Carpathians

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Energy cooperatives, "zero non-renewables" towns and other community initiatives in renewable energy (RE) are emerging across the world, in particular, in Europe and the North America. Such social initiatives vary in size, success rates and implementation strategies. Decentralization consistently appears to be one of the most important characteristics of institutional development and generally, increases the institutional space for local (community) players (Oteman, 2014). Analysis of international cases shows that a range of systemic problems hamper the rapid development and diffusion of RE. Therefore, additional attention is needed from policy makers and other stakeholders that have an interest in speeding up the diffusion process. A study by Negro et al (2012) shows that a lack of stable institutions, and poor alignment of these institutions with practices in other sectors and across governance scales are key systemic problems.

In Ukraine, there are a growing number of social initiatives in the field of energy: community-led, civil societies and NGOs, as well as initiatives promoted by government at national, regional and local levels (Buchan and Keay, 2016). However, Ukrainian energy governance has traditionally been centralized and top-down, and the process of transition to a system which takes into account stakeholders' attitudes is ongoing. A range of indicators characterizes the implementation of RE initiatives. For example Kharlamova *et al* (2016) states that process (technological) efficiency is characterized by the interaction of physical and cost indicators related to land use availability , labour market, and the raw material resources required for the production of electricity, such as absolute growth rates and GDP; output increase of each type of alternative energy sources; and the total percentage of RE sources. Innovative solutions concerning the implementation of green energy projects depend considerably on the support of policy at the local level, development of the institutional network, individual household economic status and living conditions. Despite the positive perception of RE by local authorities and especially ENGOs, in many cases RE projects in the Ukrainian Carpathians meet substantial local opposition. While bioenergy and solar energy projects are rarely opposed, hydro- and wind energy projects, considered by business as an attractive investment, are of often not supported by stakeholders. In particular, hydropower development is associated with significant environmental risks, which need to be regulated by policies which ensure transparent planning, appropriate procedures, and compatibility with international and national environmental legislation (ELP, 2017).

This study focuses on rural communities in three Carpathian Oblasts: Transcarpathia, Lviv and Ivano-Frankivsk. The research followed a mixed-method approach (Morse 2016). Semi-structured

interviews were carried out with stakeholders associated with RE development. It assesses stakeholder' attitudes about the significance and future potential of wood energy, its efficient use for the regional economies and consumers, households, including municipalities, from an environmental, economic and social perspective (Björnsen Gurung & Seidl 2017).

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