

# ***LOCAL ACCEPTANCE OF WIND ENERGY IN SWITZERLAND, ESTONIA AND UKRAINE: A CROSS-COUNTRY ANALYSIS BASED ON CHOICE EXPERIMENTS***

Anna Ebers Broughel, University of St.Gallen, +41 712242880, anna.ebers@unisg.ch  
Andrea Tabi, University of Zürich, +41 446354773, andrea.tabi@gmail.com  
Rolf Wüstenhagen, University of St.Gallen, +41 712242487, rolf.wuestenhagen@unisg.ch  
Nadiya Kostyuchenko, Sumy State University, +380 502573755, kostyuchenko.nadiya@gmail.com  
Denys Smolennikov, Sumy State University, +380 501419413, smolennikov@gmail.com  
Liina Joller, University of Tartu, +372 5175504, liina.joller@ut.ee

## **Overview**

Transition towards a low-carbon energy system is critically dependent on social acceptance by individuals, investors, markets, and society as a whole. Over the few past decades, a steady stream of research has examined social acceptance of renewable energy technologies (Batel and Devine-Wright, 2015; Stigka et al., 2014; Wüstenhagen et al., 2007). Despite being one of the most cost-effective sources of renewable electricity, wind parks face intense local opposition, especially near residential areas (Söderholm et al., 2007; Wolsink, 2007). The environmental justice literature suggests that social acceptance of renewable energy can be increased by respecting procedural justice (fair, participatory planning processes) and distributional justice (fairly allocating costs and benefits). However, empirical evidence about how justice considerations play out with respect to the expansion of wind power is scarce. To close this gap, we conducted a choice experiment, jointly testing the influence of procedural and distributional justice on social acceptance, in combination with other factors, such as a wind project's environmental impacts, location, and ownership. Geographically, this study focuses on Eastern Switzerland, Western Estonia, and Southern Ukraine, which were identified as regions with high potential for wind power development. Such a set-up allows comparison of social acceptance in three countries that have different histories, levels of economic development, availability of natural resources, and electricity market structures.

## **Methods**

The analysis is based on a large-scale online survey of more than 2,000 respondents, which was conducted in January-February of 2017 in Estonia and Ukraine and in July-August of 2015 in Switzerland. In a series of conjoint-based choice tasks, respondents were asked to choose among potential wind parks to be constructed near their communities. The wind projects differed with respect to their location, project developer, revenue sharing scheme, possibility of public engagement, as well as ecological impacts. The survey also collected information on respondents' beliefs about wind energy and its perceived impacts on the landscape and local economies. Furthermore, the survey solicited the respondents' climate change perceptions, worldviews, and key socio-demographic variables.

## **Results**

In general, 96% of Ukrainian, 87% of Estonian, and 74% of Swiss respondents were in favour or somewhat in favor of wind energy development in their countries, and the majority of the respondents would not be disturbed by living within sight of a wind turbine. Despite current low rates of deployment, the Ukrainian respondents were the most optimistic about the share of electricity that will be generated from renewable sources in the coming 5-10 years.

The respondents in different countries had somewhat diverging concerns about wind energy. For example, only about 10% percent of Ukrainian and Swiss respondents perceived a link between wind turbines and health problems, in contrast to 42% of Estonian respondents. The major area of concern for the Estonian respondents related to real estate prices in the vicinity of wind turbines.

Despite their differences, local populations in all three countries held similar preferences with respect to the most desirable project features. Based on an evaluation of part-worth utilities, projects with the smallest impacts on local flora and fauna were most preferred. With respect to project location, respondents were most willing to accept wind parks in industrial and commercial zones and on agricultural land, rather than in ecologically significant regions or near residential areas. This is in line with previous studies showing the significance of the landscape and environmental impacts for local acceptance (e.g., Alvarez-Farizo and Hanley, 2002; Meyerhoff et al., 2010).

Electric utilities were viewed as the most suitable project developers. This confirms prior findings demonstrating that local ownership has a significant positive effect on acceptance (Bergmann et al., 2006; Warren and McFadyen, 2010). Interestingly, Estonian respondents viewed project development by individuals positively, as well as revenue sharing with local private landowners. By contrast, Swiss and Ukrainian respondents preferred revenue sharing with the municipality and all residents.

Engagement of the local population also contributes to social acceptance, but certain participation opportunities were viewed more positively than others. For example, having a public informational meeting or informational brochure and a website was not found to greatly increase a project's social acceptance. Yet, direct participation of the local population in determining the number and location of wind turbines was connected to higher social acceptance. Studies by Gross (2007) and Ek and Persson (2014) also confirmed that local participation in the planning process, and the transfer of revenue to a local community has a positive influence on social acceptance.

## Conclusions

The survey demonstrates high social acceptance of wind energy in Switzerland, Estonia, and Ukraine. Based on results from the discrete choice experiment, it was shown that minimizing ecological impacts of wind projects could significantly increase social acceptance. This finding underlines the importance of environmental impacts analyses, which can be seen as an instrument to secure social acceptance. The background of the project developer is found to be important for local population: the respondents in all three countries preferred the projects to be carried out by local utilities, either alone or in collaboration with a specialized investor. The involvement of foreign utilities is viewed with skepticism. Thus, keeping wind power projects local and nature-friendly are the two most important attributes influencing social acceptance among residents.

Furthermore, we find that wind power's potential to reduce energy import dependence, add value to the local economy and lower carbon emissions are key arguments that resonate with the population, while concerns remain with regard to the potential impact of wind projects on health and local real estate prices.

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