

## **Perceptions of Climate Change in Hungary: Challenges to adoption of renewable energy**

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### **Abstract**

The aim of this research is to present the effects of climate change in Hungary, the public opinion on climate change and the related social acceptance of renewable energy sources and the reasons for their adaptation. Previous surveys have shown that Hungarians are aware of the dangers of climate change, although they are less willing to act against either climate change or pollution. Global climate change threatens peripheral regions more than central regions, as several studies have shown. Hungary has so far successfully met its climate targets but is still far from reaching the 2050 climate neutrality target. The financial and economic situation in Hungary does not currently allow for the widespread adoption of opportunities offered by renewable energy sources, but individuals who can afford to invest in the technologies do so primarily for the financial savings, not to fight climate change.

**Keywords:** climate change, Hungary, renewable energy

### **Introduction**

Climate change is one of the greatest – if not the greatest – threats currently facing humanity. Climate change takes place on a global scale, which means that it is having some form of impact everywhere, and Hungary is no exception. Hungary must also play its part in the fight against climate change, be it through EU efforts (such as the 20-20-20 commitments) or through people’s everyday habits. An effective tool in this fight could be the use of renewable energy sources, an area in which Hungary is not performing particularly well. This study is based on a literature review, aiming to shed light on the attitude of Hungarian society towards climate change and the use of renewable energy sources as a powerful weapon against it.

### **Methodology**

The study is based entirely on literature review. In preparing it, I did not use my own database or a survey I had prepared myself, but only articles from the references.

### **Climate change and Hungary**

Several studies have been published on the subject, but the so called “VAHAVA Report” (which is an acronym for the Hungarian word combination change-impact-response) titled: *Climate change and Hungary: mitigating the hazard and preparing for the impacts*, published

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in 2010, is perhaps the most detailed research work about the potential impacts of climate change on Hungary.

The report shows that the annual distribution of precipitation and the annual and monthly average temperatures are changing (Bartholy and Pongrácz, 2010). The annual amount of precipitation isn't going to change much, because precipitation in the summers is expected to decrease by between 24 and 33 percent, while winters will become 23 to 37 percent wetter. Therefore, the maximum of precipitation distribution will shift toward the winter months.

Depending on geographical location and altitude, temperatures will rise by 0.5-2 degrees Celsius (Bartholy and Pongrácz, 2010). Meanwhile the annual number of frost days will decrease and conversely, the number of heatwaves and summer days will show an increasing trend. As a result, climate extremes are set to become more frequent, with heavy rainfall, windstorms, more serious and longer droughts, and more severe floods, together with shifts in precipitation distribution and rising temperatures, causing serious damage to agricultural production, the economy, and people's daily lives.

Poor people are more exposed to environmental shocks and stressors and more vulnerable to their impacts (Hallegatte et al. 2018). That means poor people, especially in peripheral settlements of Hungary, are more vulnerable to the effects of climate change. Their greater vulnerability also means they have weaker adaptive capacity against climate change. Earlier, Nagy (2021) highlighted the negative impact that environmental injustices can have on poor people in Hungary who are more vulnerable to climate change.

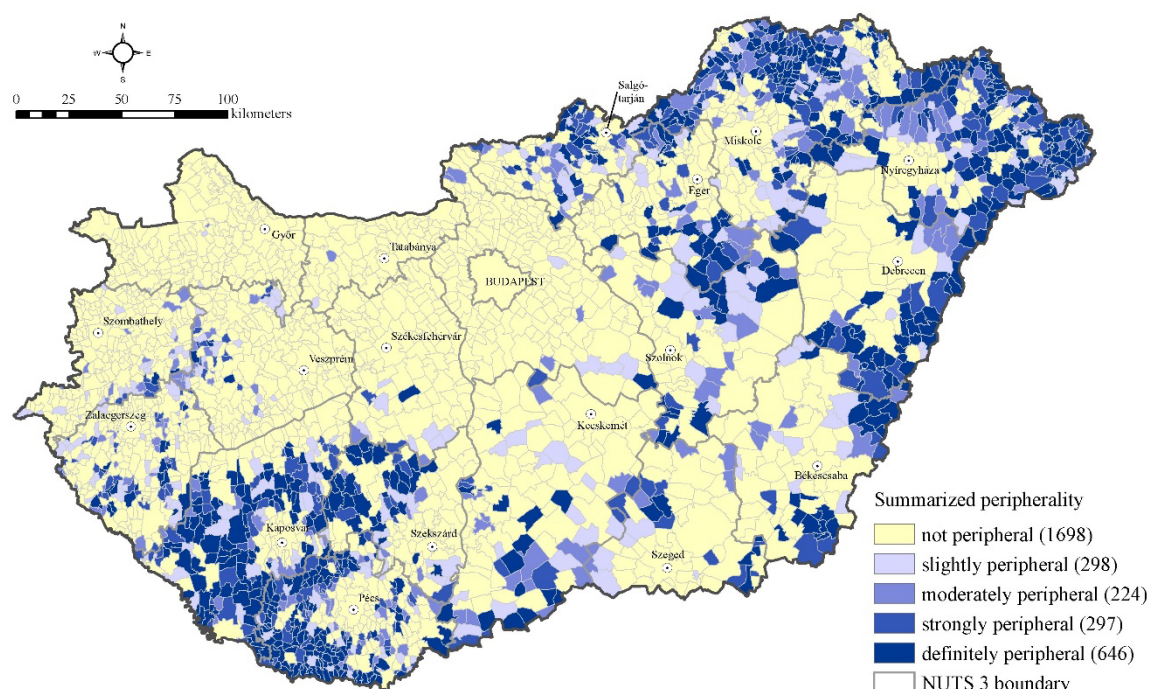


Figure 1. Summarised pattern of peripherality/backwardness based on the results of four different computations

Source: Péntzes and Demeter, 2021

Figure 1 shows the peripheral areas of Hungary. The bluer the area, the more peripheral, and therefore the more vulnerable it is. Péntzes and Demeter's study shows that the most peripheral

areas of Hungary are the borderland areas and the inner peripheries of the Great Hungarian Plain and the Transdanubian hills.

The predicted rise in the number of hot days and extreme weather conditions (for example rainstorms, drought, windstorms) cause cumulative problems in the case of the poor settlements. The disadvantaged health condition of the deprived and old age population can be expected to result in above average hospitalization and death rates during summer heat waves. Even under normal conditions, residents of peripheral areas face poor access to medical institutions (Pénzes and Demeter, 2021).

Agriculture is still the main source of employment for most people in rural areas (Ritter, 2020), especially in peripheral areas, and therefore climate change is a threat to their livelihoods. As a result, food prices could rise further due to decreasing crop yields caused by climate change, which would be a particular problem in poor, peripheral areas. In addition, built environment is also more vulnerable because the buildings are old, the quality of infrastructure is low, and these areas lack financial stability. Therefore, there is no possibility to invest in renewable energy, improved insulation or insurance. In light of these factors, adaptation to the challenges of climate change tends to produce significant regional disparities.

### Perceptions of climate change in Hungary:

In 2021, the European Commission published the results of a survey on citizen support for climate change. About 26,700 participants from all around the EU were asked about climate change, among whom were 1046 Hungarians. The survey is not representative, so it is for information purposes only.

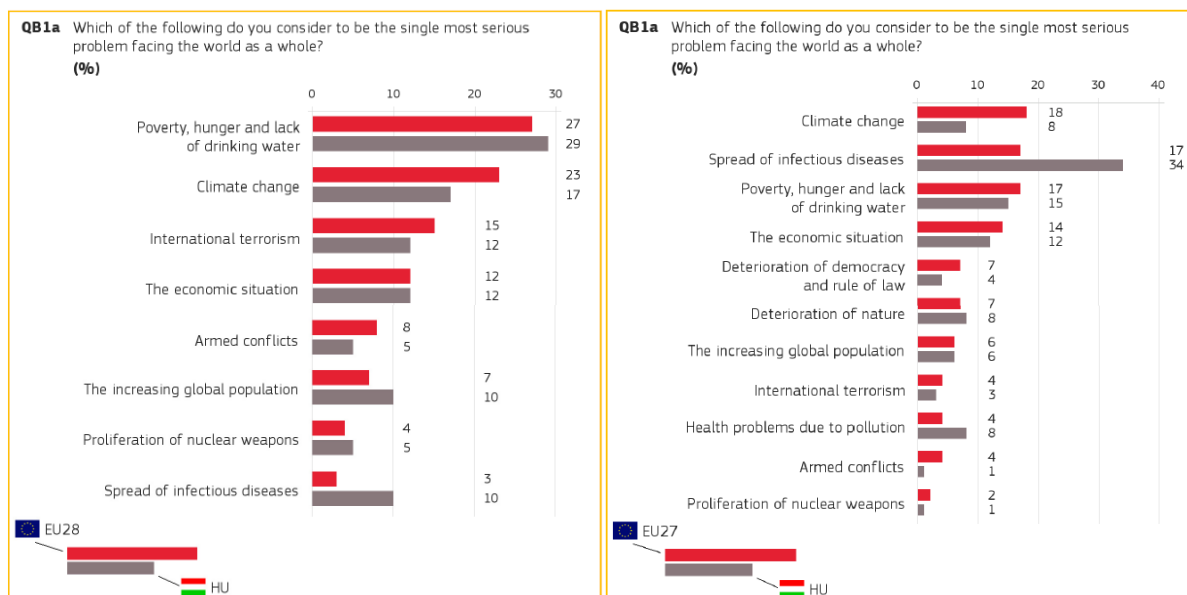


Figure 2. The single most serious problem facing the world according to EU citizens in 2019 (left) and 2021 (right)

Sources: European Commission, Eurobarometer

As figure 2 shows, the survey demonstrates that the Hungarian population is aware of the threat posed by climate change. The survey points out that 81% of respondents thought climate change was a “very serious” problem compared with the EU average 78%, which is not a big

difference. On the other hand, only 8% of respondents (compared with EU average 18%) think that climate change is the single most serious problem facing the world. The previous survey in 2019 showed that respondents from across Europe thought it was a more important problem. In 2019, 17% of the answers were climate change in Hungary and 23% in the EU, so that climate change was seen as the second most dangerous problem at the time. In 2021 Hungarians thought climate change is only the fourth most serious world problem head-to-head with health issues due to pollution and deterioration of nature. The first problem was spread of infectious diseases, the second was poverty hunger and lack of drinking water, while the third one was the economic situation. This is partly the result of the current pandemic and its economic impact. However, it is a positive result that the EU's climate neutrality objectives are more supported by Hungarians than the EU average (96 percent compared with 90 percent).

Participants were asked what actions they take against climate change and environmental pollution. The results are shown in Figure 3. Most respondents stated that they try to collect waste separately and recycle it (63 percent), but Hungarians are below the EU average which stands at 75 percent. About half of the respondents answered they try to cut down on the consumption of disposable items and 41 percent of respondents said they are climate conscious by buying energy efficient products for example refrigerators, washing machines or TV sets. On the other hand, in almost all of the available options, the Hungarians were in most cases doing less to tackle climate change than the EU average as the figure below shows.

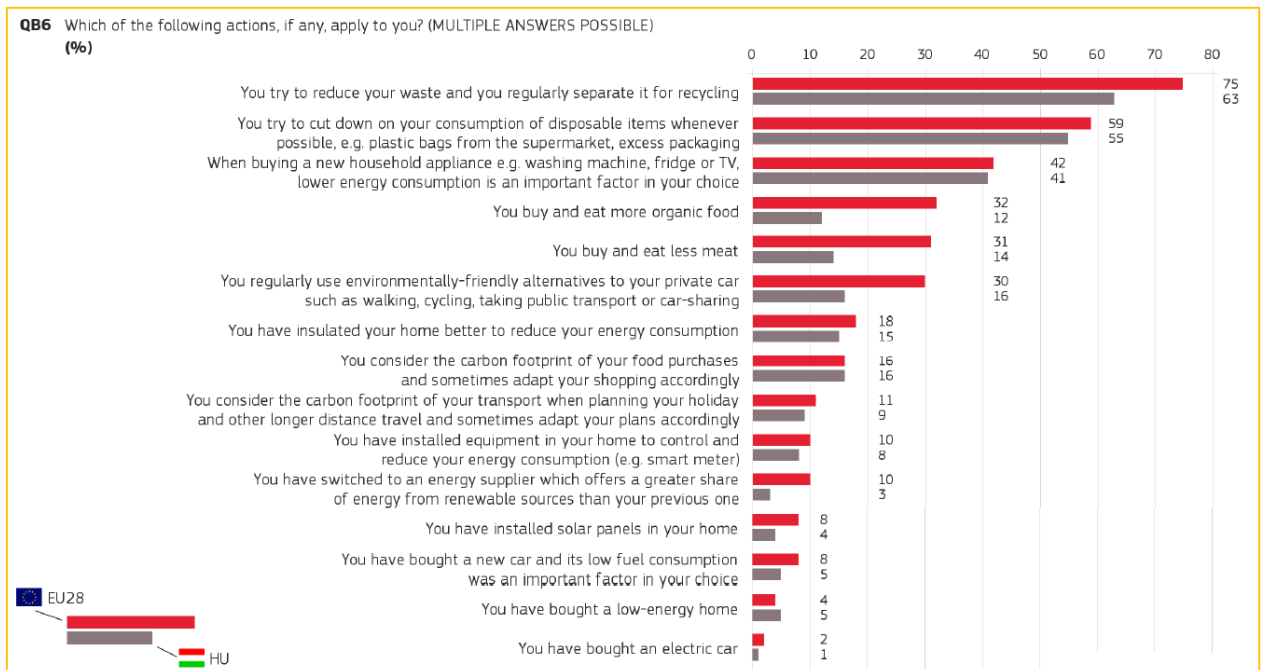


Figure 3. How EU citizens act against climate change and environmental pollution.

Sources: European Commission, Eurobarometer

An article from 2012 highlights that energy awareness is a trend in Europe, however, energy and environmental awareness is declining eastwards and southwards, and Hungary is a transition between the two extremes (Mills and Schleich, 2012).

**Hungary against climate change**

The 27 countries of the European Union adopted a set of climate targets in 2007 to be achieved by 2020 (European Commission, 2022). These targets call for reducing greenhouse gas emissions by 20 percent compared with 1990 levels, increasing the share of renewable energy use to 20 percent, and improving energy efficiency by 20 percent (EEA, 2021a). Twenty-one countries, including Hungary, have achieved these goals. The other six countries had to buy emission quotas from other EU countries to comply with their legal obligations to achieve these goals.

Although Hungary reached its 2020 climate goals, the country needs to take action in two areas to achieve climate neutrality. The EU adopted new climate neutrality goals for 2050. The main goal is to reach net zero carbon neutral energy production (European Commission, 2019). To achieve this goal, Hungary must stop its wasteful energy use by modernising household energy efficiency. Hungarian households have one of the worst energy efficiencies in the EU. As a study by Odyssee shows (figure 4) for heating purposes, Hungarian buildings use the most energy after Latvian buildings (Enerdata, 2021). This is the result, considering the local climate. Another study shows, that in some areas of Hungary, the energy efficiency of the housing stock is so poor that only about half of the homes are insulated (Pénczes et.al, 2014).

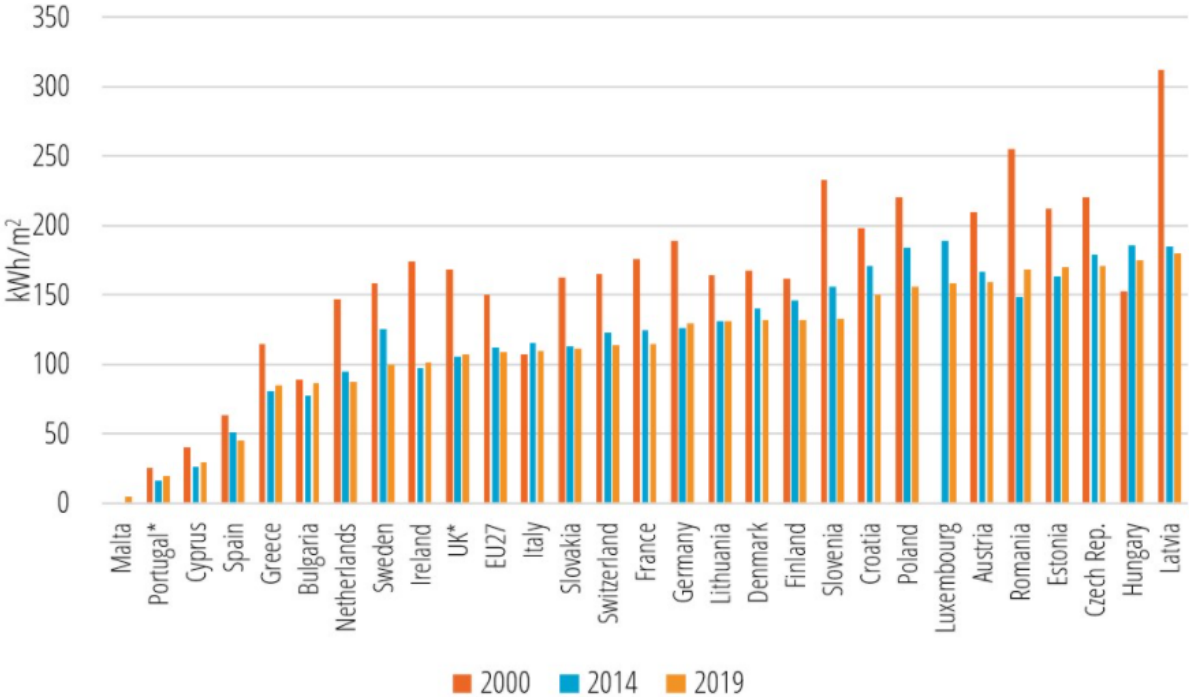


Figure 4. Households heating consumption per m<sup>2</sup> (climate corrected)  
Sources: Odyssee: Energy Efficiency Database

The second action is to achieve zero CO<sub>2</sub> emissions from energy production by using renewable energy sources. The 2020 climate target of Hungary was to produce 14.65 percent of energy from renewables. The production was above 15.5 percent in Hungary, one percent more than the original target (Portfolio, 2021).

### **Use of renewable energy sources in Hungary**

Although the use of renewable energy sources is widespread in Hungary, current trends show that the penetration of renewable energy is much slower than the EU average, especially compared to the Western European region (EEA, 2021b). In 2020, around 22 percent of the gross final energy consumed in the European Union was produced from renewable energy sources, while in Hungary it was just over 13.9 percent, which means that only three countries consumed less energy as a percentage from renewable energy sources (European Commission, 2022). These countries are Belgium, Luxembourg, and Malta. There are both political and social reasons for the slower growth rate, which means that Hungary is unfortunately not at the forefront of the adoption of renewable energy sources.

According to the results of a representative survey conducted in 2014 (Töröcsik et al, 2014), the adult population in Hungary uses renewable energy sources mainly to save money. Despite the widespread support for climate neutrality, the Hungarian population does not use renewable energy sources for environmental reasons, which shows that the nature of action in response to climate change is strongly influenced by people's financial and economic status. This phenomenon can be explained by the fact that most Hungarians have below-average incomes compared with the EU, while spending a lot of money on energy for everyday life, be it heating or electricity.

While writing this article, in addition to attending university, I work part-time as a project manager for a company that installs solar systems. My work experience confirms that the vast majority of my costumers do not think about fighting climate change or protecting the environment: the main reason why they want to invest in these systems is to lower their utility bills.

### **Summary**

Global climate change is also having an impact in Hungary: average air temperatures are rising, the annual distribution of precipitation is shifting towards the winter half of the year and extreme weather events are becoming more frequent, with peripheral regions suffering the most. Peripheral and poor settlements are more vulnerable to climate change, especially old people and people working in agriculture. Overall, while Hungary is meeting its climate targets so far, there is still plenty of room for improvement before the EU's deadline.

Concerning the 2050 long-term strategy for climate neutrality, Hungarians are aware of the dangers of climate change. They think it is one of the most dangerous threats of current times, but they are underperforming compared with the EU average when it comes to tackling climate change. They are not doing nearly as much as the EU average to tackle climate change or pollution. As surveys show, the use of renewable energy sources is mainly driven by financial considerations, not by environmental or energy security concerns. The financial situation of most Hungarians does not let them invest in renewable energy: even if they do have the financial means, reducing utility costs is their main motivation when switching to more efficient products.

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