ATTITUDES TO CLIMATE CHANGE FROM THE PERSPECTIVE OF THE CZECH REPUBLIC, HUNGARY AND POLAND

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Abstract:
Successful climate change mitigation and adaptation depend on several factors that are crucial for the effective implementation of the environmental policy tools in a country. One of these is the people’s attitudes to this issue, their awareness about it, and their willingness to change their behaviour in a way that will contribute to a cleaner environment. Climate change is a serious problem and the recent changes are the real reason for our concerns. The impact of global warming is transforming our environment, and, especially, increasing the frequency and intensity of extreme weather events. The Intergovernmental Panel on Climate Change (IPCC) issued in October 2018 its Special Report on the impact of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways. Without stepping up international climate action, global average temperature increase could soon reach 2°C and will continue to rise. This will have an irreversible climate impact on the Earth and severe consequences on the productivity of Europe’s economy, infrastructure, ability to produce food, public health, biodiversity and political stability. The Paris Agreement, ratified by 181 countries, requires swift action in all countries to reduce greenhouse gas emissions, with the aim to hold a global temperature increase below 1.5°C. The goal is also to achieve a balance between emissions by sources and removals by sinks of greenhouse gases on a global scale. The threats and risks of climate change are known, and so are many ways to prevent them, which can be tackled if people actively engage. To succeed in the transformation to net-zero greenhouse gas emissions, citizens will need to play a central role.

In this paper, we present the results of analysis that examines the public attitudes to climate change in three selected countries – the Czech Republic, Hungary and Poland, in comparison with other countries which participated in the survey. The analysis is based on data from the European Social Survey Round 8 collected from 2016-2017, on a sample of 44,387 respondents from 23 countries. We analyse the attitudes related to climate change beliefs, concerns about climate change and energy security and energy preferences. The analysis confirmed that people in all countries perceive that climate is changing and that it will have a bad impact across the world. Despite very similar perceptions of climate change, the climate concerns differ among countries and reflect the energy sources and traditions specific to each country. The respondents in all our three selected countries expressed only small worries about climate change. As regards climate concern, the analysis showed that respondents have more worries regarding energy affordability than from energy reliability. We can expect that these attitudes might be different where the prices for energy changed radically in the country or there is a lack of energy sources. Therefore, energy dependency and energy supply are the two other very important concerns in public attitudes. The biggest worries from energy affordability in the selected countries was seen in the Czech Republic, followed by Poland and then Hungary. The energy supply sources, as the other analysed aspect in this paper, pointed out the popularity of renewable energy sources in comparison with fossil fuels as the source that has to be replaced. We can see the differences in energy sources preferences among all countries, which differs in the prevailing energy source used...
Introduction

Climate change and its negative consequences are the greatest environmental threat the world is currently facing. It is assumed that a large number of people, especially those living in poorer areas, will be threatened by water and food shortages, health risks, natural disasters or other adverse effects of climate change (IPCC 2000-2020, Arrow, 1995; Stern, 2006). In view of this, it is absolutely essential to make a joint effort to mitigate climate change and to adapt to its effects. Development cannot be sustainable without giving priority to this issue at every level. Preventing a ‘dangerous’ level of anthropogenic interference with the climate system has become a major international policy objective. All European countries have ratified the Kyoto Protocol and agreed to jointly fulfil their required emission reduction targets.

In 2014, the European Commission presented its new ambitious 2030 framework, aiming for a reduction in greenhouse gas emissions by 40% below 1990 levels, together with a target for renewable energy of at least 27%, and a renewed focus on energy-efficiency policies (European Commission, 2014). This framework was revised in 2019 and a new growth strategy called the European Green Deal was approved. It aims to transform the EU into a fair and prosperous society, with a modern, resource-efficient and competitive economy where there are no net emissions of greenhouse gases by 2050, and where economic growth is decoupled from resource use. It also aims to protect, conserve and enhance the EU's natural capital, and protect the health and well-being of citizens from environment-related risks and impact. At the same time, this transition must be just and inclusive. The Commission presented an impact assessed plan to increase in a responsible way the EU’s greenhouse gas emission reductions target for 2030 to at least 50% and towards 55% of 1990 levels. To deliver these additional greenhouse gas emissions reductions, the Commission will by June 2021 review and propose to revise, where necessary, all relevant climate-related policy instruments. This will comprise of the Emissions Trading System, including a possible extension of European emissions trading to

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new sectors, Member State targets to reduce emissions in sectors outside the Emissions Trading System, and the regulation on land use, and land use change and forestry. The Commission will propose amending the Climate Law to update it accordingly (European Commission, 2019). During the EU Summit held in Brussels on December 11, 2020 EU Heads of State or Government approved a new and more ambitious net greenhouse gas emissions reduction target in 2030 of down to at least 55% of 1990 levels. The Commission proposed this new target in September 2020, to put the EU on a balanced path towards climate neutrality by 2050 (European Commission, 2020).

To be climate-neutral or CO₂ neutral means when activities do not put a strain on the climate. Climate neutrality can be achieved if CO₂ emissions are reduced to a minimum and all remaining CO₂ emissions are offset by climate protection measures. However, this does not mean that in 2050 there will be zero greenhouse gas emissions. It will be always in the environment in some amount, but it is important to make an offset of the part that cannot be eliminated and where gases that have already been emitted are saved elsewhere. This is referred to as "climate-neutral" and this is the objective of the European Green Deal, in line with the EU’s commitment to global climate action under the Paris Agreement. The transition to a climate-neutral society is both an urgent challenge and an opportunity to build a better future for all. All parts of society and economic sectors will play a role – from the energy sector to industry, transport, buildings, agriculture and forestry. The EU can lead the way by investing in realistic technological solutions, empowering citizens and aligning action in key areas, such as industrial policy, finance and research, while ensuring social fairness in this transition.

It is not possible to understand national climate and energy perceptions without taking the wider socio-political context into account. European countries have their own environmental policies with widely diverging energy infrastructures. When it comes to the national level, the public are exposed to different political and media landscapes. These are often shaped by the economic and social context of differentiated dependence on fossil fuels, the perceived threat to the labour market or certain lifestyles. There are many factors which impact on how people feel and think about climate change, energy security and different energy technologies. Decisions about decarbonising future energy supplies cannot be separated from other energy policy considerations, together known as the ‘energy trilemma’, which is described as a balance between energy security, energy equity and environmental sustainability. Energy security reflects a nation’s capacity to meet current and future energy demand reliably; to withstand and bounce back swiftly from system shocks with minimal disruption to supplies. Energy equity assesses a country’s ability to provide universal access to affordable, fairly priced and abundant energy for domestic and commercial use. Environmental sustainability represents the transition of a country’s energy system towards mitigating and avoiding potential environmental harm and climate change impact. Balancing these three goals constitutes a ‘Trilemma’, and balanced systems enable prosperity and competitiveness of individual countries. The World Energy Trilemma Index enables countries to keep track of their own progress and to learn with and from each other about what’s working and what’s not (World Energy Council, 2020).

Climate change is a collective problem and can only be solved through collective action. Beliefs about the effectiveness of individual and collective actions, as well as trust, are critically important in the willingness to engage in pro-environmental behaviour. Scientists play a key role in promoting the uptake of both public and private behaviour, including the willingness to pay higher taxes, to support climate policies and to behave in climate-friendly ways (Cologna & Siegrist, 2020). The attitudes to climate change differs in the profile of national energy usage and in the economic indicators, as well (for example, unemployment, economic growth). To
monitor the perceptions of climate change it is, therefore, important to take into account socio-political values and engagement (human values, socio-political values, and political engagement), climate change beliefs and personal norms, efficacy beliefs and social and institutional trust (European Social Survey, 2016). Even if individuals are concerned about climate change and feel personally responsible, they may not act if they think others will not play their part. A similar collaborative relationship has to be nurtured between individuals and national governments/institutions. Trust in governments (and other responsible institutions) to design effective climate change and energy policies is therefore a prerequisite for public support for individual action (Lorenzoni & Pidgeon, 2006). Even people who worry about climate change are substantially more likely to support climate policies if they live in a society where impartial institutions, such as the legal system and the policy (as opposed to the political system) is generally perceived as trustworthy (Kulin & Sevă, 2020).

There are a number of theoretical approaches that can help to better understand individual climate risk perceptions. Self-transcendence values have consistently been found to play a central role in engagement with climate change and energy issues (Corner et al., 2014). Human values and political engagement have been routinely assessed as part of the ESS (e.g. Davidov et al., 2008). But the role of these factors may differ across different European countries. For example, there are indications that climate scepticism is largely an Anglophone phenomenon and is less common in many other European countries. It can be expected that polarisation is the greatest in countries where there is a political home for such views through continued media attention and political representation (Engels et al., 2013), as well as those with a greater economic dependency on fossil fuels (e.g. Tvinnereim & Ivarsflaten, 2016). The energy dependency rate shows the proportion of energy that an economy must import. It is defined as net energy imports (imports minus exports) divided by gross inland energy consumption plus fuel supplied to international maritime bunkers, expressed as a percentage. A negative dependency rate indicates a net exporter of energy, while a dependency rate in excess of 100% indicates that energy products have been stocked (Eurostat). Ensuring a reliable and secure supply of energy has become increasingly important, as well as keeping energy affordable for all households. Many coal-fired facilities need to be replaced by other (low-carbon) energy production technologies that can deliver reliable, secure and affordable energy. Relating to the ACEE report, the indicator of energy affordability is a household’s energy burden—the percentage of household income spent on energy bills. Factors that may increase energy burdens include the physical condition of a home, a household’s ability to invest in energy-efficient upgrades, and the availability of energy efficiency programs and incentives.

The Visegrad countries (the Czech Republic, Poland, Hungary and the Slovak Republic) have a common Communist heritage of centralised and exploitative decision making; these were regimes in which the emphasis was on heavy machinery, mining and intensive centralised agriculture. They also share new challenges including rapid urbanisation and rising amounts of traffic. For many years, environmental protection and interest in environmental changes and threats came very low on the priority list of the Central European political establishment. But this situation is changing. After the fall of Communism, they restricted heavy industry and took initial steps to promote environmental education and environmentally friendly and sustainable planning. It must be stressed that this transformation is not connected to any visionary political agenda but rather to particular crises and catastrophes (floods, droughts, torrential rain and landslides) and external pressure (EU law and OECD environmental assessments). Each of these countries share a number of environmental problems that threaten not only their national security but also the safety of citizens and the quality of life (Waisová, 2018).
Research questions and aim of the survey

Using data from the European Social Survey this paper aims to show the public attitudes to climate change in the Czech Republic, Hungary and Poland from several points of view – climate change beliefs, concerns about climate change and energy security and energy preferences. The analysis does not include the Slovak Republic because the country did not participate in the ESS Round 8. But the results from these three neighbouring countries could be perceived as challenging for Slovakia and could set up a good initial point for future analyses carried out in the Slovak Republic.

The main research questions in the article are what the perceptions of climate change are at the national level, how it shaped the tools of environmental policy implemented in the selected countries and if there are relations among these factors.

Research sample

The analysis draws on data from the European Social Survey (ESS) Round 8 which were collected between August 2016 and December 2017 in 22 European countries and Israel on a sample of 44,387 respondents (European Social Survey, 2016). The research sample in the Czech Republic consisted of 2,269 respondents (48.8% men), in Hungary of 1,614 respondents (47% men) and in Poland of 1,694 respondents (47.8% men).

The European Social Survey is an academically-driven, cross-national survey that was established to create a reliable dataset that allows researchers, academics and policy makers to map and to measure social attitudes, beliefs and behaviours within and across European nations. Every two years, face-to-face interviews are conducted with newly-selected, cross-sectional samples. Individuals are selected by strict random probability methods through every stage using sampling frames of individuals, households or addresses. They represent the entire residential population aged 15 and over in each country. The data is weighted to ensure that the sample of respondents accurately reflects the demographics of the entire population. Each participating country with a population larger than 2 million has to achieve a minimum effective sample size of 1,500 respondents. Smaller countries have to achieve a minimum sample of 800 respondents. 38 countries have taken part in at least one round of this survey and 15 countries have participated in all nine rounds.

Method

The analysis used questions from the Module “Public Attitudes to Climate Change, Energy Security and Energy Preferences” ESS Round 8, which could be divided into 4 main sections:

1. Climate Change beliefs (reality, impact and cause)
   - “Do you think the world’s climate is changing?” (1 – definitely changing, 2 – probably changing, 3 – probably not changing, 4 – definitely not changing);
   - “How good or bad do you think the impact of climate change will be on people across the world?” (0 – extremely bad, 10 – extremely good);
   - “Do you think that climate change is caused by natural processes, human activity, or both? (1 – entirely by natural processes, 2 – mainly by natural processes, 3 – about equally, 4 – mainly by human activity, 5 – entirely by human activity).

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1 The ESS data is available free of charge for non-commercial use and can be downloaded from this website www.europeansocialsurvey.org
2. Climate concern and energy security concern
   - “How worried are you about climate change?” (1 – not at all worried, 5 – extremely worried).
   - “How worried are you -
     - that there may be power cuts? (energy reliability)
     - that energy may be too expensive for many people? (energy affordability)
     - about being too dependent on energy imports from other countries? (energy dependency)
     - about being too dependent on using energy generated by fossil fuels such as oil, gas and coal? (energy supply)
     - that energy supplies could be interrupted by natural disasters or extreme weather?; by insufficient power being generated?; by technical failures?; by terrorist attacks? (internal and external vulnerability)

3. Energy supply sources
   - “How much electricity used in <country> should be generated from: coal, natural gas, hydroelectric power generated by flowing water from rivers, dams and seas, nuclear power, sun and solar power, wind power and biomass energy generated from materials like wood, plants and animal excrement?” (1- a very large amount, 2 – a large amount, 3 – a medium amount, 4 – a small amount, 5 – none at all).

4. Attitudes to environmental policies
   - Increasing taxes on fossil fuels, such as oil, gas and coal.
   - Using public money to subsidise renewable energy, such as wind and solar power.
   - A law banning the sale of the least energy-efficient household appliances.
     (1 – strongly in favour, 2 – somewhat in favour, 3 – neither in favour nor against, 4 – somewhat against, 5 – strongly against)

The data were analysed in the programmes IBM SPSS Statistics and JASP by using descriptive statistics, Pearson correlation coefficient and one-way analysis of variance.

Results

Climate change beliefs

Public awareness about climate change has been slowly rising across the world since this issue become a major global environmental challenge. To find out, how people perceive this change, the respondents were asked to answer the question: “Do you think the world’s climate is changing?” and could answer on the 4-point scale (1 – definitely changing, 2 – probably changing, 3 – probably not changing, 4 – definitely not changing). The aim was to capture people’s mental representation of the climate change phenomenon that they accept as true, and their evaluative beliefs about the impact. The frequency analysis showed that respondents in all participated countries think the climate is definitely or probably changing (see Graph 1). In most countries more than 90% of respondents think so. From our three selected countries, those respondents mostly persuaded were from Poland (92.6%), then Hungary (91.4%) and then the Czech Republic (88.9%).

Relating to the degree of impact of climate change, the analysis revealed some differences. On the question: “How good or bad you think the impact of climate change will be on people across the world?” respondents could answer on the scale from 0 to 10 (0 – extremely bad, 10 – extremely good). Most of the respondents from all countries answered in the scale from 0 – 4 but there were some cross-national variations. The average score from all countries was 3.20.
The average score of answers in Hungary was 2.74 (SD=2.06), in Poland 3.32 (SD=2.06) and in the Czech Republic 3.43 (SD=1.98). The belief that climate change will have a bad impact across the world ranged from 68% of respondents from the Czech Republic, to 70.4% for Poland to 77% for Hungary.

**Graph 1**

*Percentage expression of climate change reality, climate impact and climate concerns*

Climate concern is defined as an affective evaluation on the seriousness of the impacts of climate change, reflected in personal feelings towards the issue (European Social Survey, 2016) and this is typically defined as a personal, active and motivational emotional state that is characterized by the repeated experience of anxious thoughts about a potential negative event, which is closely related to an individual’s personal goals, preferences and behaviours (Bouman et al., 2020). In this survey respondents were asked to answer on the 5-point scale the question “How worried are you about climate change?” (1 – not at all worried, 5 – extremely worried). In spite of the fact that respondents from many countries thought that climate change will have a bad impact across the world, their worries were relatively small. Only in three European countries were more than 44% of respondents extremely or very worried about climate change (Germany, Spain, Portugal). Most respondents in the Czech Republic, Hungary and Poland expressed “somewhat worried” (Czech Republic 34.2 %, Poland 50.6 %, Hungary 51.3%).
From all three countries, Czech respondents were worried the least (42.3% - not at all or not very worried). Further surveys conducted in the Czech Republic since this particular ESS (for example by STEM – Institute for empirical research Prague) have shown that Czech citizens have gradually changed their opinion, and the widespread opinion about Czech as climate-sceptics is no longer valid. On the other hand, there exists the concerns of citizens that the low-emission transformation could endanger Czech industry (see the Report of the Institute of empirical studies, 2020).

As discussed in Bouman et al. (2020), the concern about climate change can play an important role in motivating individuals to support specific climate policies and to undertake personal behaviours to mitigate climate change. In the analysis the authors confirmed that individuals who worried more about climate change were more likely to support climate policies. Our analysis of the relation between the attitudes of citizens and the effort of the countries through environmental policy tools is given in the next part of this paper.

The next question in the survey was focused on climate change causes. The respondents were asked if they think that climate change is caused by human activity, natural processes or a combination of the two. The results are shown in Graph 2. Most of the respondents think that climate change is caused by human activity in some way. About 44.9% of Hungarians, 50.6% of Czechs and more than 57% of Poles assign of equal importance both human activity and natural processes. As confirmed in a recent study (Verschoor et al., 2020), the more people believe that climate change is caused by human actions, and the more they believe that climate change has negative impacts, the more they worry about climate change.
Atitudes to Climate Change from the perspective of the Czech Republic, Hungary and Poland

Graph 2

Percentage expression of climate change cause

| Country           | Entirely by natural processes | Mainly by natural processes | About equally by natural processes and human activity | Mainly by human activity | Entirely by human activity | I don't think climate change is happening |
|-------------------|-------------------------------|-----------------------------|------------------------------------------------------|--------------------------|---------------------------|------------------------------------------|
| Poland            | 3.1%                          | 7.2%                        | 57.2%                                                | 28.9%                    | 3.1%                      | 0.5%                                     |
| Slovenia          | 1.9%                          | 6.1%                        | 53.6%                                                | 32.9%                    | 6.3%                      | 0.1%                                     |
| United Kingdom    | 2.3%                          | 6.6%                        | 53.5%                                                | 33.1%                    | 4.1%                      | 0.3%                                     |
| Estonia           | 1.5%                          | 9.6%                        | 53.1%                                                | 29.9%                    | 5.2%                      | 0.7%                                     |
| Ireland           | 1.2%                          | 7.6%                        | 51.1%                                                | 35.3%                    | 4.6%                      | 0.2%                                     |
| Czech Republic    | 0.9%                          | 9.5%                        | 50.6%                                                | 29.4%                    | 7.8%                      | 2.0%                                     |
| Switzerland       | 1.0%                          | 4.6%                        | 49.8%                                                | 40%                      | 4.1%                      | 0.1%                                     |
| Norway            | 1.5%                          | 10.6%                       | 49.9%                                                | 35.8%                    | 2.4%                      | 0.3%                                     |
| Lithuania         | 3.2%                          | 14.0%                       | 44.0%                                                | 29.5%                    | 4.6%                      | 0.7%                                     |
| Netherlands       | 1.7%                          | 6.5%                        | 46.4%                                                | 39.5%                    | 5.7%                      | 0.2%                                     |
| France            | 2.1%                          | 4.1%                        | 45.7%                                                | 40.4%                    | 7.2%                      | 0.4%                                     |
| Hungary           | 1.0%                          | 6.3%                        | 44.9%                                                | 36.4%                    | 10.8%                     | 0.5%                                     |
| Russian Federation| 6.2%                          | 8.9%                        | 44.5%                                                | 24.8%                    | 8.8%                      | 6.7%                                     |
| Portugal          | 1.4%                          | 5.0%                        | 43.7%                                                | 41%                      | 8.4%                      | 0.2%                                     |
| Finland           | 1.4%                          | 4.7%                        | 42.9%                                                | 45.1%                    | 6.8%                      | 0.1%                                     |
| Sweden            | 1.0%                          | 6.5%                        | 40.2%                                                | 46.9%                    | 5.9%                      | 0.0%                                     |
| Belgium           | 1.2%                          | 4.7%                        | 40.2%                                                | 45.4%                    | 8.0%                      | 0.4%                                     |
| Israel            | 4.5%                          | 9.7%                        | 44.1%                                                | 31.8%                    | 11.0%                     | 2.9%                                     |
| Germany           | 0.9%                          | 4.3%                        | 40.0%                                                | 49.2%                    | 5.4%                      | 0.2%                                     |
| Iceland           | 0.9%                          | 4.5%                        | 38.8%                                                | 48.5%                    | 7.0%                      | 0.0%                                     |
| Italy             | 1.5%                          | 4.9%                        | 36.5%                                                | 45.2%                    | 11.7%                     | 0.2%                                     |
| Spain             | 1.1%                          | 3.2%                        | 35.3%                                                | 47.2%                    | 12.4%                     | 0.3%                                     |
| Austria           | 1.8%                          | 6.3%                        | 29.4%                                                | 51.3%                    | 10.3%                     | 1.0%                                     |

Concerns about climate change and energy security

An affective evaluation of the seriousness of risks and threats to energy security is reflected in personal feelings on the issue. This covers concerns about general dependencies within the energy supply system, as well as specific threats to a country’s energy supply and concerns about their possible consequences (for example interruptions to domestic energy supply and price rises). To find out what the worries of the people relating to the energy issue are, the respondents were asked to answer the questions “How worried are you -

- that there may be power cuts?
- that energy may be too expensive for many people?
- about being too dependent on energy imports from other countries?
- about being too dependent on using energy generated by fossil fuels such as oil, gas and coal?
- that energy supplies could be interrupted by natural disasters or extreme weather?, by insufficient power being generated?, by technical failures?, by terrorist attacks?
Graph 3 shows that the three highest concerns are regarding energy affordability, energy supply and energy dependency. The average score from all countries in answer to the question “How worried are you that energy may be too expensive for many people in the country?” was 3.24 (SD=1.03). The Portuguese had the biggest concerns (M=3.81; SD=0.80) while Swedish respondents had the smallest worries (M=2.31; SD=0.84). Answers from the respondents of the Czech Republic, Hungary and Poland oscillated around the average.

**Graph 3**

Average values of perception on energy security reflected in personal feelings on the issue

| Country             | How worried, energy too expensive for many people | How worried, country too dependent on energy imports | How worried, country too dependent on fossil fuels | How worried, energy supply interrupted by natural disasters or extreme weather | How worried, energy supply interrupted by insufficient power generated | How worried, energy supply interrupted by technical failures | How worried, energy supply interrupted by terrorist attacks |
|---------------------|--------------------------------------------------|---------------------------------------------------|-------------------------------------------------|----------------------------------------------------------------------|------------------------------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------------------|
| Portugal            | 2.63                                             | 3.81                                              | 3.44                                            | 3.50                                                              | 3.17                                                             | 3.16                                                             | 2.84                                                       |
| Spain               | 2.52                                             | 3.80                                              | 3.32                                            | 3.35                                                              | 2.73                                                             | 2.84                                                             | 2.69                                                       |
| Belgium             | 2.40                                             | 3.62                                              | 3.21                                            | 3.16                                                              | 2.76                                                             | 2.81                                                             | 2.75                                                       |
| Russian Federation  | 2.34                                             | 3.36                                              | 2.36                                            | 2.79                                                              | 2.91                                                             | 2.75                                                             | 3.02                                                       |
| Lithuania           | 2.58                                             | 3.35                                              | 2.80                                            | 2.69                                                              | 2.94                                                             | 2.81                                                             | 2.79                                                       |
| France              | 2.28                                             | 3.33                                              | 3.07                                            | 3.31                                                              | 3.04                                                             | 2.86                                                             | 2.78                                                       |
| Israel              | 2.60                                             | 3.32                                              | 2.76                                            | 2.76                                                              | 2.88                                                             | 2.57                                                             | 2.66                                                       |
| Czech Republic      | 2.12                                             | 3.20                                              | 2.66                                            | 2.70                                                              | 2.65                                                             | 2.37                                                             | 2.61                                                       |
| United Kingdom      | 2.15                                             | 3.19                                              | 3.20                                            | 3.11                                                              | 2.54                                                             | 2.37                                                             | 2.44                                                       |
| Italy               | 2.34                                             | 3.19                                              | 3.09                                            | 3.05                                                              | 2.83                                                             | 2.57                                                             | 2.50                                                       |
| Slovenia            | 2.23                                             | 3.17                                              | 2.90                                            | 3.14                                                              | 3.00                                                             | 2.60                                                             | 2.55                                                       |
| Germany             | 1.90                                             | 3.10                                              | 3.09                                            | 3.20                                                              | 2.62                                                             | 2.11                                                             | 2.45                                                       |
| Poland              | 2.32                                             | 3.08                                              | 2.95                                            | 2.71                                                              | 2.78                                                             | 2.61                                                             | 2.75                                                       |
| Finland             | 2.32                                             | 3.07                                              | 3.20                                            | 3.25                                                              | 2.73                                                             | 2.49                                                             | 2.49                                                       |
| Estonia             | 2.38                                             | 3.05                                              | 2.84                                            | 2.77                                                              | 2.65                                                             | 2.31                                                             | 2.52                                                       |
| Hungary             | 2.25                                             | 2.99                                              | 3.05                                            | 3.01                                                              | 2.62                                                             | 2.36                                                             | 2.71                                                       |
| Ireland             | 2.01                                             | 2.90                                              | 2.73                                            | 2.78                                                              | 2.33                                                             | 2.39                                                             | 2.22                                                       |
| Netherlands         | 1.90                                             | 2.73                                              | 2.88                                            | 3.05                                                              | 2.35                                                             | 2.19                                                             | 2.31                                                       |
| Austria             | 1.80                                             | 2.63                                              | 2.55                                            | 2.58                                                              | 2.37                                                             | 1.70                                                             | 2.16                                                       |
| Norway              | 2.01                                             | 2.59                                              | 2.55                                            | 2.91                                                              | 2.49                                                             | 2.29                                                             | 2.53                                                       |
| Switzerland         | 1.80                                             | 2.49                                              | 2.71                                            | 2.83                                                              | 2.37                                                             | 2.23                                                             | 2.27                                                       |
| Iceland             | 1.80                                             | 2.37                                              | 1.83                                            | 2.02                                                              | 2.22                                                             | 1.92                                                             | 2.10                                                       |
| Sweden              | 1.90                                             | 2.31                                              | 2.52                                            | 2.74                                                              | 2.17                                                             | 2.08                                                             | 2.09                                                       |

Legend: 1 – not at all worried, 2 – not very worried, 3 – somewhat worried, 4 – very worried, 5 – extremely worried
Another two concerns were the dependency of a country on fossil fuels (energy supply – M=3.03, SD=1.02) and the dependency of the country on energy imports (energy dependency - M=2.91, SD=1.07). The answers of respondents from Hungary were in both factors slightly over the Mean (energy supply (ES): M=3.01, SD=0.91 and energy dependency (ED): M=3.05, SD=0.89). In these two factors, respondents from the Czech Republic had the least worries (ES: M=2.70, SD=1.02 and ED: M=2.66, SD=1.05). These low concerns could be seen as a little bit confusing when considering the current situation in environmental and energy issues in the Czech Republic. The reason might be a consequence of existing coal reserves as well as the result of the “mining tradition” in the country. The citizens might perceive the mining companies as a guarantee of energy supplies and as a “power security” for some time into the future. There might also be a low level of awareness amongst people on this issue. According to the latest reports from the Czech energy and transmission system (ČEPS), it transpires that by 2040 the Czech Republic will expect a relatively significant decrease in production resources, which needs to be replaced. This would mean that the Czech Republic would gradually become dependent on electricity imports from 2030 (see the Report of the Ministry of Industry and Trade of the Czech Republic, 2019). Poland is the last EU coal power, with the biggest volume of coal mining from all Visegrad four countries. The reason is mainly the affordability of classic fossil fuel sources and the log-term tradition of coal mining. The collieries employ more than 100,000 miners. The coal as a source comprises about 80% of energy source mix in the country (in comparison, in Hungary it is about 10%, in Slovakia about 20% and in the Czech Republic about 50% of the energy source mix). Poland and Hungary were the countries which blocked the approval of the new, tougher aims for 2030 emissions reduction. Even if the current situation in Poland and the Czech Republic using coal as an energy source is a decreasing trend, it can be assumed that in 2030 coal will still have a relatively large share in the generation of electricity. The countries show no or very little willingness to decrease coal production by 2030. In Hungary the situation is further complicated by the lack of a constructive debate about the transition. From this point of view, it is very important to prepare the conditions in countries for the transition to a cleaner form of energy and to increase the importance of the awareness of this new environmental challenge that all countries are facing. Info-campaigns and an open social dialogue will play a very important role in this direction.

The smallest concerns respondents had been related to questions regarding the energy reliability of domestic energy supplies. Concerns about the affordability of energy is higher than concerns about energy reliability in every country, and it is higher than concerns about climate change in the majority of countries. The percentage comparison among respondents’ answers in the Czech Republic, Hungary and Poland is seen in Graph 4.

**Graph 4**

*Percentage expression of high worries about climate change and energy security in the Czech Republic, Hungary and Poland*

|               | Climate concern | Energy affordability | Energy supply | Energy dependency | Energy reliability |
|---------------|-----------------|----------------------|---------------|------------------|--------------------|
| Hungary       | 27.1%           | 26.1%                | 28.6%         | 29.6%            |                    |
| Czech Republc| 23.5%           | 41.3%                | 23.0%         | 22.3%            |                    |
| Poland        | 15.9%           | 35.0%                | 18.6%         | 29.9%            | 8.6%               |
As mentioned before, we can see the biggest concerns about energy affordability amongst all three countries, followed by energy dependency, energy supply and climate concerns. Energy affordability concerned mostly older respondents than younger ones (see Graph 5). The biggest worries about energy affordability were amongst older respondents, aged 65+ in the Czech Republic (almost 50%) followed by respondents from Poland (38.8%) and Hungary (29.5%).

Graph 5

*Percentage expression of high worries about energy affordability by age in the Czech Republic, Hungary and Poland*

As the recent study confirmed (Verschoor et al., 2020), a strong positive relationship was found between concern about the affordability of energy, and the dependency on fossil fuels and energy imports. The Pearson correlation analysis (Table 1.) conducted on selected countries confirmed medium-strength correlation in selected countries between energy affordability and energy dependency (CZ: $r = 0.393$; HU: $r = 0.532$; PL: $r = 0.565$; $p < 0.01$), energy affordability and energy supply (CZ: $r = 0.389$; HU: $r = 0.450$; PL: $r = 0.488$; $p < 0.01$), energy dependency and energy supply (CZ: $r = 0.627$; HU: $r = 0.618$; PL: $r = 0.632$; $p < 0.01$) and energy supply and climate concern (CZ: $r = 0.314$; HU: $r = 0.339$; PL: $r = 0.441$; $p < 0.01$). The climate concern also correlated with energy dependency and energy affordability.

**Table 1**

*Correlations among climate concern and selected energy security concern*

|                      | Energy affordability | Energy dependency | Energy supply |
|----------------------|----------------------|-------------------|--------------|
| **Czech Republic**   | Energy affordability | -                 | -            |
|                      | Energy dependency    | .393**            | -            |
|                      | Energy supply        | .389**            | .627**       |
|                      | Climate concern      | .196**            | .289**       |
| **Hungary**          | Energy affordability | -                 | -            |
|                      | Energy dependency    | .532**            | -            |
|                      | Energy supply        | .450**            | .618**       |
|                      | Climate concern      | .259**            | .353**       |
| **Poland**           | Energy affordability | -                 | -            |
|                      | Energy dependency    | .565**            | -            |
|                      | Energy supply        | .488**            | .632**       |
|                      | Climate concern      | .350**            | .399**       |

To compare the selected three countries, a one-way analysis of variance was used. The results are shown in Table 2. The analysis confirmed statistically significant differences between
countries in energy affordability (F(2) = 10.979; p<0.01), energy dependency (F(2) = 43.903; p<0.01), energy supply (F(2) = 37.832; p<0.01) and climate concern (F(2) = 39.979; p<0.01). It is necessary to point out that these differences were with small effects (Ƞ² = 0.004 – 0.016) and were trivial in spite of the confirmation of statistically significant differences.

### Table 2

Energy security concerns

| Country | Mean | Standard deviation | F     | p          | η²  |
|---------|------|--------------------|-------|------------|-----|
| How worried are you that energy may be too expensive for many people in <country>? | CZ | 3.19 | 1.19 | 10.979 | p<0.001 | 0.004 |
|         | HU | 3.00 | 0.93 | 43.903 | p<0.001 | 0.016 |
|         | PL | 3.07 | 0.99 | 37.832 | p<0.001 | 0.014 |
| How worried are you about <country> being too dependent on energy imports from other countries? | CZ | 2.66 | 1.04 | 39.979 | p<0.001 | 0.015 |
|         | HU | 3.01 | 0.90 | 39.979 | p<0.001 | 0.015 |
|         | PL | 2.70 | 0.93 | 39.979 | p<0.001 | 0.015 |
| How worried are you about climate change? | CZ | 2.73 | 1.06 | 10.979 | p<0.001 | 0.004 |
|         | HU | 3.06 | 0.84 | 43.903 | p<0.001 | 0.016 |
|         | PL | 2.74 | 0.86 | 37.832 | p<0.001 | 0.014 |

df = 2

In energy affordability the Czech Republic differs significantly (albeit marginally) from Hungary (Cohen’s d = 0.195); in energy dependency the Czech Republic differs from Hungary (Cohen’s d = -0.395) and Poland (Cohen’s d = -0.281), in energy supply and climate concern the Czech Republic differs from Hungary (Cohen’s d = -0.315 and -0.283) and Hungary from Poland (Cohen’s d = 0.330 and 0.344).

### Energy supply sources

The European Green Deal underlines the fact that in order to meet the EU’s climate and sustainability goals, all sectors must increase their use of renewable energy and phase out fossil fuels. One of the crucial points is to supply clean, affordable and secure energy. The current attitudes to energy supply sources in ESS 8 Round were found out by answering the questions “How much electricity used in <country> should be generated from – coal, natural gas, hydroelectric power generated by flowing water from rivers, dams and seas, nuclear power, sun and solar power, wind power and biomass energy generated from materials like wood, plants and animal excrement?” The respondents could answer on 5-points scale (1 - a very large amount, 2 – a large amount, 3 – a medium amount, 4 – a small amount, 5 – none at all). It referred to preferences for different sources that can be used to generate domestic electricity and how usage is regarded in the respondents’ countries. As Graph 6 shows, we can see that energy from coal, natural gas and nuclear power are not very popular. The respondents supported especially solar, wind and hydroelectric power. Energy from biomass energy needs to be more promoted and people need to be educated on (almost 5% of the respondents said they have not heard of this energy source before). The used descriptive statistics showed also
differences in energy sources preferences amongst all countries depending on the prevailing energy source used in the country.

Graph 6

*Attitudes to energy supply sources*

Respondents’ preferences of energy source in the Czech Republic, Hungary and Poland are shown in Graph 7.

Graph 7

*Percentage expression of the largest amounts of energy supply sources in the Czech Republic, Hungary and Poland*

| Energy Source         | Czech Republic | Hungary | Poland  |
|-----------------------|----------------|---------|---------|
| hydroelectric power   | 56.3%          | 70.4%   | 76.6%   |
| solar power           | 51.2%          | 93.3%   | 86.2%   |
| nuclear power         | 47.6%          | 35.0%   | 22.9%   |
| wind power            | 47.4%          | 86.2%   | 81.1%   |
| biomass energy        | 34.7%          | 64.3%   | 51.8%   |
| natural gas           | 23.2%          | 31.2%   | 44.6%   |
| coal                  | 11.4%          | 22.2%   | 28.2%   |

More than half of respondents in the Czech Republic expressed the opinion the energy should be made from hydroelectric and solar power. Nuclear and wind power as an energy source is popular for almost 48% of Czech respondents. This is connected to the current use of nuclear plants for energy supply in the country. In Hungary more than 93% of respondents preferred solar power, followed by wind and hydroelectric power. Biomass energy was preferred by more
than 64% of respondents. The preferences of Poles are very similar to Hungarians, but a little bit lower in percentage expression.

**Table 3**

*Energy supply sources*

| Energy supply sources | Country | Mean | Standard deviation | F     | p      | $\eta^2$ |
|-----------------------|---------|------|--------------------|-------|--------|---------|
| How much of the electricity used in <country> should be generated from sun or solar power? | CZ      | 3.09 | 5.53               |       |        |         |
|                       | HU      | 1.62 | 2.47               | 35.379| p<0.001| 0.013   |
|                       | PL      | 1.99 | 4.03               |       |        |         |
| How much of the electricity used in <country> should be generated from nuclear power? | CZ      | 3.69 | 7.15               |       |        |         |
|                       | HU      | 3.17 | 2.30               | 23.240| p<0.001| 0.009   |
|                       | PL      | 4.93 | 8.33               |       |        |         |
| How much of the electricity used in <country> should be generated from biomass? | CZ      | 4.63 | 9.22               |       |        |         |
|                       | HU      | 6.01 | 13.75              | 32.969| p<0.001| 0.013   |
|                       | PL      | 3.55 | 7.38               |       |        |         |

$df = 2$

The one-way analysis of variance (Table 3) confirmed statistically significant differences between countries in attitudes to generating energy from sun or solar power ($F(2) = 35.379; p<0.01$), energy generated from nuclear power ($F(2) = 23.240; p<0.01$), and from materials like wood, plants and animal excrement ($F(2) = 32.969; p<0.01$). The differences among countries were with small effects ($\eta^2 = 0.009 – 0.013$).

In using electricity generated from sun or solar power, the Czech Republic differs significantly (albeit marginally) from Hungary (Cohen’s d = 0.299) and the Czech Republic from Poland (Cohen’s d=0.199). In using electricity generated from nuclear power, the Czech Republic differs from Poland (Cohen’s d = -0.153) and Hungary from Poland (Cohen’s d= -0.264). And again, significant (albeit marginal) differences in using electricity generated from biomass were confirmed between the Czech Republic and Hungary (Cohen’s d= -0.151) and Hungary and Poland (Cohen’s d=0.250). Though the analysis confirmed statistically significant differences amongst countries, the differences were small.

**Attitudes to the environmental policy**

The use of environmental policy economic tools is favoured by many EU countries with the aim of improving the conditions of the environment in the context of sustainable development. The rate of their use depends on the knowledge of the region specifications and environmental conditions, and the necessity to know both the economic and environmental character of the tools and their running and utilization. Many governments face a hard choice between effectiveness and popularity of the tools.

Environmentally related taxes are an important instrument for governments to shape relative prices of goods and services. Environmental taxes are most often divided into four basic areas:

- energy (greenhouse gases, energy products intended for transport purposes – e.g. unleaded petrol, diesel; or stationary purposes - natural gas, heating oil and others);
transport (import or sale of motor vehicles, use of roads, congestion charges and city taxes, etc.);

- pollution (measured or estimated emissions to air, emissions of ozone-depleting substances, waste management, noise and others);

- resources (water extraction, collection of biological resources, extraction of raw materials, changes in the landscape and tree felling);

The energy subsidies, as the other tool of environmental policy, can be either beneficial or damaging to the environment. Damaging subsidies are those that lower the price of behaviour that is detrimental to the environment; for example, encouraging excessive energy consumption, or making the cost of more environmentally harmful fuels lower relative to those that are less harmful. In contrast, subsidies that are beneficial to the environment improve the competitiveness of environmentally sound practices by reducing their price relative to those that damage the environment (European Environmental Agency, n.d.). There is no agreed definition of energy subsidies among Member States. The IEA (2007) defines subsidies as: “any government action that concerns primarily the energy sector that lowers the cost of energy production and raises the price received by energy producers or lowers the price paid by energy consumers”.

In the survey, the respondents had to express their opinion on the three types of environmental policy tools: increasing fossil fuel taxes, renewable energy subsidies and banning the sale of the least energy efficient household appliances. People’s attitudes to the tools of the national environmental policies are shown in Graph 8.

**Graph 8**

*Preferences to the environmental policy tools*

![Graph showing preferences to environmental policy tools](image)

As we can see, the taxes on fossil fuels are the least popular strategy (see as well Umit & Schaffer, 2020). Only 29.6% of respondents support it. On the other hand, the most popular strategy is supporting the renewable energy sources. 73.7% respondents were in favour of it. Banning the sale of the least energy efficient household appliances was preferred by 58% of respondents from all countries. Graph 9 represents the percentage expression of these attitudes in the Czech Republic, Hungary and Poland.
In Poland only 14.9% of respondents support increasing taxes on fossil fuels (almost 60% are against this strategy). Subsidising renewable energy is the most popular in Hungary (88.9%), follow by respondents in Poland (78.4%) and finally the Czech Republic (61.1%). This low percentage expression might be connected with the predominating mining tradition.

To compare the current situation in revenues from environmental taxes in the Czech Republic, Hungary and Poland, we used data from Eurostat (Table 4 – Table 6). In Table 4 the indicator is presented as the proportion of environmental tax revenues in Gross Domestic Product (GDP) and in Table 5 there are individual types of the environmental taxes, again as the proportion of GDP. The percentage of total revenues from total environmental taxes and social contributions (excluding imputed social contributions) is seen in Table 6. We can see decreasing trend of these revenues.

**Table 4**
*Total environmental tax revenues as % of gross domestic product (GDP)*

|                | 2016 | 2017 | 2018 |
|----------------|------|------|------|
| Poland         | 2.71 | 2.68 | 2.71 |
| Hungary        | 2.53 | 2.44 | 2.28 |
| EU 28 countries| 2.46 | 2.41 | 2.39 |
| Czech Republic | 2.10 | 2.01 | 1.96 |

Source: Eurostat, Environmental tax revenues

Table 4 shows the changing proportion of environmental taxes in GDP over a short period of time. It shows that the percentage in Poland and Hungary were in 2016 and 2017 above the average of the EU 28. On the other hand, the Czech Republic’s revenue from environment-related taxes remains among the lowest in the EU. In 2018 there was a visible decrease in the percentage of total environmental taxes of GDP in all selected countries.
Table 5

Total environmental tax revenues as % of gross domestic product (GDP) by the type of the environmental taxes

| Country/Year | Energy taxes | | | | Transport taxes | | | | Taxes on Pollution/Resources | | |
|--------------|--------------|-----|-----|-----|-----------------|-----|-----|-----|-----------------|-----|-----|-----|
|              | 2016 | 2017 | 2018 | 2016 | 2017 | 2018 | 2016 | 2017 | 2018 |
| EU 28 countries | 1.9 | 1.86 | 1.85 | 0.48 | 0.47 | 0.47 | 0.08 | 0.08 | 0.08 |
| Czech Republic | 1.95 | 1.87 | 1.82 | 0.13 | 0.13 | 0.12 | 0.01 | 0.01 | 0.01 |
| Hungary | 1.93 | 1.83 | 1.71 | 0.36 | 0.34 | 0.33 | 0.25 | 0.26 | 0.4 |
| Poland | 2.34 | 2.33 | 2.37 | 0.23 | 0.23 | 0.23 | 0.14 | 0.12 | 0.11 |

In general, the energy taxes comprise the largest share of environmental taxes, followed by transport taxes (Table 5). Pollution and resource taxes represent a very small percentage of total tax revenues from these taxes. The percentage of revenues from all these taxes among these three countries is comparable, but we can see differences among the categories. The biggest proportion of energy taxes in GDP is in Poland, and in transport taxes in Hungary. Taxes on Pollution and Resources is lowest in the Czech Republic and highest in Hungary.

Table 6

Percentage of total revenues from total environmental taxes and social contributions (excluding imputed social contributions)

|             | 2016 | 2017 | 2018 |
|-------------|------|------|------|
| Poland      | 8.11 | 7.85 | 7.70 |
| Hungary     | 6.47 | 6.43 | 6.16 |
| EU 28 countries | 6.34 | 6.19 | 6.12 |
| Czech Republic | 5.99 | 5.67 | 5.44 |

Source: Eurostat, Environmental tax revenues

When we look at the Environmental Implementation Review from 2019, Poland has not been using environmental taxes to encourage more efficient energy use and reduce greenhouse emissions. The implicit tax rate on energy, at below 60% of the EU average, remains relatively low; rates on transport fuels are below the EU average and a number of tax exemptions are available (European Commission, 2019). Relating to this report, in Hungary there were some examples of sound fiscal measures on the environment. One is the air pollution load charge that was introduced in 2003 and has helped reduce air pollution levels in some areas of the country (European Commission, 2019). In the Environmental Implementation Review issued for the Czech Republic, it has since 2015 made some progress in reforming the tax system, shown notably by the increasing amount of total tax revenues as a proportion of GDP. However, the Commission has repeatedly observed in the European Semester that environmental taxes continue to remain low compared to the rest of the EU. One of the most positive environmental taxes is the air pollution fee, which has existed since 1967 and was last amended in 2012. The charges have increased by about 37% on average, with further yearly increases laid down in the legislation (European Commission, 2019).

All these perceptions and attitudes, tax revenues and environmental policy tools have a big impact on how the countries will fulfil the aims in the area of a clean energy and climate. The Regulation on the Governance of the Energy Union and Climate Action (the Governance Regulation) requires each Member State to adopt a 10-year National Energy and Climate Plan.
(NECP), to map out how they will contribute to binding climate and energy targets for 2030. It includes five dimensions: energy security, internal energy market, energy efficiency, decarbonisation and research, innovation and competitiveness. Each member state recently received from European Commission an Assessment of the NECP with recommendations.

The Czech Republic set out a target of reducing total greenhouse gas emissions by 44 Mt by 2030, corresponding to a 30% reduction relative to 2005, and implies a similar level of ambition. Under the Effort Sharing Regulation (ESR), the Czech Republic has a binding national target for greenhouse gas (GHG) emissions not covered by the EU Emissions Trading System (EU ETS) of -14% by 2030, compared to 2005. The Czech Republic’s renewable energy contribution to the 2030 EU-level target is 22% of gross final energy consumption in 2030. This is considered unambitious as it is below the share of 23% by 2030 resulting from the formula in Annex II to Regulation (EU) 2018/1999 on the Governance Regulation. As regards the following climate and energy-related investments and reform measures, the Commission services recommended considering, for example, measures to promote renewables and energy efficiency to reduce dependency on coal, and improve the flexibility of the grid - including by reducing administrative burdens to speed up building renovation. Also missing is the new fiscal incentives (a carbon tax) that would encourage investment in measures that increase energy efficiency (European Commission, 2020). Moreover, public discussion was missing. As we know, people must be involved in such a process because then they better understand what is needed, and what kind of changes are expected. Then they can better support the environmental policy tools. In our survey, 29.1% of Czech respondents were strongly or somewhat in favour of increasing taxes on fossil fuels (50.7% were neither in favour nor against), more than 61% preferred subsidising renewable energy and 58.7% of Czechs wanted to ban the sale of the least energy efficient household appliances.

Hungary’s final integrated NECP sets a 2030 target for GHG emissions not covered by the EU Emissions Trading System (non-ETS). The target is -7% compared to 2005, as set out in the ESR. As regards renewables, the final plan provides for a renewable contribution of 21%. This is considered unambitious, as it lies below the minimum share of 23% resulting from the formula in Annex II to Regulation (EU) 2018/1999 on the Governance Regulation. One of the recommended measures for the following reforms and investments are measures to promote renewables in the electricity and heating sectors, including measures to boost electricity production with solar photovoltaics, and measures to upgrade existing infrastructure, storage capacity and smart grids (European Commission, 2020). As the survey showed, Hungarians are in favour of subsidising renewable energy – almost 89% of respondents preferred it. Banning the sale of the least energy efficient household appliances was wanted by 53.5% of them. Increasing taxes on fossil fuels was supported by almost 30% of respondents. As in the Czech case, public participation was not great. Hungarian NGOs have been closely following the process of the NECP since 2018, but the final NECP was published and submitted without the opportunity of NGOs or the public to see or comment on it.

Poland’s final NECP shows that significant additional measures are required to achieve its 2030 greenhouse emissions target – for sectors not covered by the EU Emissions Trading System – of 7% below 2005 levels. On renewable energy, the NECP includes an explicit contribution to the 2030 EU target in a range between 21-23%. This would still be unambitious. The NECP does not outline a plan for reducing the country’s dependence on coal and lignite, which still accounts for roughly 80% of electricity generation. The Commission services also recommend that Poland measures supporting investments in renewable energy to reduce dependency on coal and in energy efficiency in buildings and industry; measures enhancing energy system integration and promoting the decarbonisation of gas consumption - including by developing
the market for storage technologies and clean hydrogen (European Commission, 2020). The draft NECP was subject to extensive consultations, but not the final one. From our survey we can see that less than 15% of Polish were in favour of increasing taxes on fossil fuels, more than 78% preferred subsidising renewable energy and 60% of respondents wanted to ban the sale of the least energy efficient household appliances.

The analysis of NECPs carried out by CEE Bankwatch network showed that most countries in central and eastern Europe were not committed to an ambitious energy strategy. Moreover, the development of nuclear energy as a primary source of decarbonised electricity and the widespread use of biomass as a renewable energy solution highlighted a pattern of minimal effort. In many cases, measures to phase-out coal (if any) are supported by a switch to gas, and the NECPs generally do not contain a real assessment of the investment needs to achieve these 2030 objectives (CEE Bankwatch review, 2019).

**Discussion and Conclusion**

Countries develop different environmental policies based upon their domestic circumstances with varying natural resources, geographies, and socioeconomic systems. This divergence of differing systems and contexts mean that there is no single way for a successful energy transition. Each country in coordination with the EU will need to determine its own best energy policy pathway considering its national situation and priorities. A study conducted by Tvinnereim & Ivarsflaten (2016) confirmed that levels of support for various policies depend on characteristics of the measures themselves, and notably on their potential to generate new economic activity and employment opportunities.

The present paper investigated the public attitudes to climate change in the Czech Republic, Hungary and Poland in comparison with attitudes in other countries involved in the European Social Survey, by using data from this survey. The attitudes were analysed from several points of view: climate change beliefs, concerns about climate change and energy security and energy preferences. Another aim was to find out if the citizens perception shape the tools of environmental policy implemented in the selected countries.

The analysis confirmed the strong perception of a changing climate with its bad impact across the world, but worries about climate change differs amongst countries. Respondents in the Czech Republic, Hungary and Poland had only minor worries, with the Czech Republic being the least worried. As regards the climate concerns, it was especially energy affordability, energy supply and energy dependency where respondents expressed significant or great worries. Answers from the respondents of the Czech Republic, Hungary and Poland oscillated around the average. Another two concerns were seen in the dependency of the country on fossil fuels (energy supply) and a dependency of the country on energy imports (energy dependency). The answers from respondents from Hungary were in both factors slightly over the mean. The Czech Republic respondents, again, had the least concern. The Poles were in these concerns somewhere in the middle. A strong positive relationship was found between the concern about the affordability of energy and the dependency on fossil fuels and energy imports. In energy affordability, the Czech Republic differs significantly (albeit marginally) from Hungary; in energy dependency the Czech Republic differs from Hungary and Poland; in energy supply and climate concern the Czech Republic differs from Hungary, and Hungary from Poland.

Relating to the energy supply sources the analysis showed a support for solar, wind and hydroelectric power. Energy from coal, natural gas and nuclear power were not so popular. In general, lower support was confirmed for low-carbon energy sources in East and South Europe. Positive attitudes to fossil fuels are seen especially in post-communist countries. In the case of the Czech Republic and Poland, it can be assumed that in 2030 coal will still have a relatively
large share in electricity generation. Countries show no or very little willingness to reduce coal by 2030. The reason could be a long-term belief in such an energy source and also the state of economy. The last part of the analysis focused on the attitudes towards the concrete environmental policy, which confirmed that increasing taxes on fossil fuels is the least popular strategy in most of the countries. Less than 30% respondents in the Czech Republic and Hungary, and less than 15% of respondents in Poland were in favour of this environmental policy tool. From the other two possibilities a more popular strategy was to subsidise renewable energy than ban the sale of the least energy efficient household appliances. But the differences were not so substantial.

Finally, we compared the current situation in revenues from environmental taxes in the Czech Republic, Hungary and Poland and their National Energy and Climate Plans. It can be seen that the percentage of revenues from environmental taxes in GDP is less than 3% in selected countries, and also in the EU 28 countries. Poland holds a good position here, with revenues from environmental taxes higher than the EU average, especially in energy taxes. The other two countries made some progress, but it still has hidden reserves. As regards the NECP, they did improve compared to the draft, but again there are still opportunities and gaps which deserve to be considered. For example, in the Hungarian NECP concrete targets are missing relating to energy poverty, which was mentioned in the NECP. What was not mentioned is the phasing out of fossil fuel subsidies, which could be an obstacle in the energy transition. The Polish NECP did not commit to phase out coal as an energy source and there is no plan to phase out fossil fuel subsidies; moreover, it states that the coal industry will continue to be subsidised. The issue of a coal phasing out date is a problem as well in the NECP of the Czech Republic. We can see some similar gaps in the NECP across the selected countries, though their plans and aims copy the industrial tradition and economic condition in that country. Therefore, more effort will need to be spent on each change than in other countries which do not have this mining tradition or have a better starting point in the economy.

We can expect that some implications of the pandemic situation for energy can be visible in the future steps of the countries, but it cannot be the obstacle for fulfilling the targets given in the European Green Deal, even if the Czech Prime Minister, Andrej Babiš, said on 16 March 2020 that Europe should abandon the Green Deal and focus on the coronavirus epidemic instead. This view was shared by Janusz Kowalski, Poland’s Deputy Minister of State Assets, who suggested that the EU should abolish the emissions trading system or exempt Poland. To favour the current COVID-19 issue could negatively influence the state priorities in many countries in a way that climate change will also reduce the interest of the responsible states’ representatives or citizens. The recent research conducted by Policy Solutions and Friedrich-Ebert-Stiftung (2020) confirmed the changes in public attitudes, in which the Hungarian citizens saw the biggest problem to currently be the quality of healthcare and low wages, whereas the lack of fighting climate change was in last place.

Missing data from Slovakia somewhat limited the analysis, but on the other hand it creates space for further research. The analysis needs to be elaborated on more deeply by using, for example, the factor analysis. A useful focus might be a comparison over time comparing the data from 2016 - 2017 with the new observed data, and to analyse how the changes in the world (new EU Green Deal targets, Covid-19) influenced the perception of Europeans on these environmental issues. Deeper research among these countries is desired in environmental policy tools and public attitudes to climate change, especially as an answer to the current pandemic situation and the possible changes that might influence the environmental policies in countries. In this paper we wanted to give a number of insights into the environmental issue from the perspective of three neighbouring countries: what is common in public perceptions, where the
differences are and what needs to be improved. This thesis is very current, very wide and is worthy of further research.

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