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TALKING GREEN IN HUNGARY

LESSONS ON COMMUNICATING ENVIRONMENTAL POLICIES

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EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

There is a pressing need for action on climate change and the energy crisis. Building support for green policies is an essential part of these efforts. **The goal of this study is to give valuable input for the development of effective green communication.** Through a public policy analysis, **this study aimed to understand the key challenges and formulate policy proposals for four key environmental issues in Hungary: air pollution, plastic pollution, energy efficiency of buildings, and the country's energy mix.** The policy proposals were developed in collaboration with environmental organisations and served as the basis for our focus group research. The focus group discussions were held in five Hungarian cities in October 2022 and involved a diverse group of individuals who are potential supporters of green causes, but not already committed members of the green movement. **The goal of the research was to gain insight into people's perception of green issues and proposed solutions, and to test different narratives of green communication.**

Based on the lessons drawn from the focus groups, we gained valuable insights about what could be popular topics of future green communication campaigns and which topics are harder to communicate about:

- The focus of green communication should be on addressing industrial and household air pollution and promoting policies for improved waste management and recycling. **The emphasis should be on preserving human health and connecting climate policies to the real-life experiences of people.**

- It is worth promoting **policies that ready individuals for the green transition,** rather than highlighting negative consequences or penalties imposed on industries or consumers.

- **Green communication should steer clear of policies that place a heavy emphasis on personal responsibility** and that might be perceived as hostile to drivers.

- Communication about the energy crisis is challenging as some individuals in industrial cities view pollution's adverse impact on health as a necessary trade-off for economic growth and job creation. **It is advisable to highlight the significance and advantages of using renewable, clean energy sources** instead of criticizing the fossil fuel industry and coal and gas.

- The general public is not well-informed or even misinformed about green policies, technologies, and local pollution. **To raise awareness and interest in these issues among the Hungarian society,** educational material on topics such as electromobility, fuel consumption of cars, selective waste collection, green renovation programs and the harmful effects of fossil fuels and nuclear energy can be helpful. Future campaigns should also aim to bring attention to local pollution.

In our research, we also tested various approaches to communicating green issues. We formulated messages based on four different communication frames for each set of policy proposals. **These frames highlighted the economic benefits of green measures, their positive impact on quality of life, the harm caused by pollution and climate change and the responsibility of elites.** Although all kinds of frames had their merits and limitations, it became clear which ones are the most and least effective.

- The focus of future green campaigns should be on **messages that highlight the improvement of quality of life.** This type of framing has been found to be the least divisive and widely acceptable to various target groups. While stressing the importance of a liveable future and saving the planet is important, **it is crucial**

to present achievable goals and concrete solutions for the near future.

- Highlighting economic benefits can be an effective frame for communication about energy-related policies. In the Hungarian context, general **messages about "new green jobs" may be perceived as too vague or empty promises.**

- Highlighting the harm caused by environmental pollution and climate change can play a crucial role in green communication, but **it is essential to focus on threats that directly impact people** (e.g. air pollution, plastic pollution). **Long-term and abstract threats are less effective communication tools.** Participants in our study who were older or raising children were more receptive to messages about the health hazards of environmental pollution.

- Anti-elite framing in green communication has been found to be the least effective. **Messages that emphasize the responsibility of politicians and regulators or suggest the possibility of positive change, work better.** However, anti-elite framing is widely refused when it calls for a fight against elites or creates negative portrayals of big businesses and wealthy individuals. Our analysis suggests that older individuals living in smaller cities are more responsive to anti-elitist messages.

In conclusion, this study gained important lessons for effective green communication in building support for green policies in Hungary. **Our findings suggest that messages that highlight the importance of a liveable future and quality of life, point out the economic benefits for energy-related policies and emphasize the harm caused by pollution and climate change (with a focus on air pollution and microplastics) are the most effective.** On the other hand, anti-elite framing in green communication, as well as policies and messages considered to be 'anti-poor' or 'anti-car' (involving bans and fines) may not be well received. Although our results are based on research in Hungary, these lessons can be valuable for the wider context too. Policymakers and politicians should take these findings into account when developing green communication strategies and campaigns to engage the general public and build support for environmentally sustainable policies.

Our findings suggest that messages that highlight the importance of a liveable future and quality of life, point out the economic benefits for energy-related policies and emphasize the harm caused by pollution and climate change (with a focus on air pollution and microplastics) are the most effective.

INTRODUCTION

1. Introduction

In times of climate and energy crises, it is increasingly urgent to take decisive steps towards a green transition. Yet public support to climate-friendly and energy-efficient policies does not automatically arise. The Talking Green project, launched by FEPS in 2021, aims to raise awareness about the fact that policymakers must also pay attention to creating a narrative that manages to build trust in climate action across a broad spectrum of the population.[1] The green transition is not only a public policy challenge, but also a communication one that requires finding approaches that can gain support for green measures from the widest possible audience. To help this endeavour, we conducted six focus group discussions involving Hungarians belonging to those sociodemographic groups that place a relatively low emphasis on post-material issues, but do not necessarily oppose green proposals. Our goal was to gain insight from a diverse sample of participants from small, mid-sized, and large cities located throughout the country, including western, central, and eastern Hungary.

Our research examines four green issues that one can consider to be the most relevant topics of green politics in Hungary. According to a policy solutions research on the public perception of green policies in 2021, Hungarians consider air pollution and plastic pollution to be the two biggest environmental issues in the country.[2] In addition, the Russia-Ukraine war and the energy crisis have led to a significant increase in the public's awareness of energy efficiency (especially in buildings due to high utility bills) and the mix of the energy we consume, not only in Hungary but across the EU. These two issues linked to the energy crisis have thus been added to the issues of air pollution and plastic pollution.

A new feature of this study, compared to the previous survey-based researches of the Talking Green project, is the use of a qualitative methodology. We decided to apply a qualitative approach because focus groups allow researchers to explore and understand participants' attitudes, beliefs, and behaviours in a more nuanced way than surveys. This is exactly what is needed to identify effective communication strategies and messages that resonate best with people.

The development of green communication messages must be preceded by the accurate diagnosis of problems and the formulation of public policy proposals. We believe that even the best communications efforts are not worth much, unless they are based on high-quality substance; but also that even the best public policy ideas will likely fail to exert a great impact unless they are well-communicated. This paper follows this approach in both its content and structure.

> *"It is increasingly urgent to take decisive steps towards a green transition."*

We start our study with a comprehensive public policy analysis that explores the key challenges and policy proposals to our four environmental and climate change topics. The proposals have been developed together with civil society professionals from Clean Air Action Group, Greenpeace Hungary and Humusz Waste Prevention Alliance. The public policy proposals of the study were used to develop the communication messages, which were tested in six focus groups in five cities in October 2022. Following an outline of the research methodology, the thematic results of the qualitative research are presented in the fourth chapter of this publication. In the fifth section, we provide a general evaluation of the four possible communication strategies (quality of life, economic benefits, harm, anti-elitism) that we have examined. The concluding section summarises the findings and makes recommendations for future green messaging.

KEY ENVIRONMENTAL ISSUES IN HUNGARY: CHALLENGES AND POLICY SOLUTIONS

2. Key environmental issues in Hungary: challenges and policy solutions

We selected four major green topics to examine over the course of this research, namely air pollution, plastic pollution, energy efficiency of buildings, and the energy mix of Hungary. According to a 2021 public opinion research, air pollution was the most commonly mentioned environmental problem in Hungary, as every third respondent named this issue.[3] Plastic pollution was on the second place of the country's green problem list (15 percent mentioned it spontaneously). Another poll carried out after the start of the war in Ukraine (April 2022) showed that the vast majority of Hungarians wants to reduce the country's dependency on Russian natural gas (69%) and would like to build the country's energy mix primarily on renewables (80%).[4] The majority of respondents also supported the idea of state-funded energy efficiency investments to reduce Hungary's energy demand and to achieve energy independence.

Not only the visible public awareness, but also the warnings of experts and the scientific community underline the importance of studying these environmental issues. Besides being the main cause for climate change, air pollution is a significant environmental threat to biodiversity and human life. This problem causes 1 in 9 deaths worldwide.[5] Children are especially vulnerable to the impacts of air pollution, as exposure to it in early years can lead to reduced lung capacity.[6] According to estimates of researchers, the production and incineration of plastic led to more than 850 million tonnes of greenhouse gas emissions in 2019.[7] By 2050 these kinds of emissions could increase to 2.8 billion tonnes. Plastic waste in the oceans kills one million marine animals annually through entanglement, ingestion and interaction.[8] Although levels of microplastics and nanoplastics in the environment are too low to affect human health for the moment, researchers claim that their number will rise.[9]

World Energy Outlook (WEO) lists energy efficiency among the four key measures to reach drastic emission reductions by 2030 to close the gap

TABLE 1: MAJOR TOPICS AND SUBTOPICS OF OUR RESEARCH

Air pollution	Plastic pollution	Energy efficiency of buildings	Energy mix
Green transition of personal transportation	Regulating plastic production and packaging of products	Financially support individuals and businesses to effectively boost energy efficiency of buildings (e.g. energy-saving heating and cooling systems)	Reach energy independence by increasing Hungary's climate targets
Green transition of the industry and freight transport	Regulating retailers	Launch a large-scale renovation program for public buildings, block houses and other multi-family buildings	Reduce personal carbon footprint through incremental lifestyle changes
Household emiss ions of air pollutants	Waste management and developing recycling infrastructure		

between current pledges[10] and the 1.5 degrees Celsius trajectory, and to reach net zero emission by 2050.[11] Energy efficiency improvements in buildings (retrofitting, installation of heating, cooling, and so on) and the manufacturing of efficient appliances also have great potential to create new jobs. According to the IEA Net Zero Emissions by 2050 Scenario, an early policy focus on energy efficiency would triple the number of jobs created by 2030.[12] With energy efficiency investments, the need for energy imports and the cost of energy can also be reduced. Although developments in energy efficiency should play an important role, changing energy production has to be at the heart of the solution to climate change, as the energy sector accounts for around three-quarters of global greenhouse gas (GHG) emissions.[13] As global energy consumption is currently growing too quickly for low- or zero-carbon energy sources to keep up to effectively address the climate crisis, priority needs to be given to energy reduction and to transitioning to low carbon energy, primarily to renewables.[14]

In the following, we carry out an analysis of these problems and propose various policy solutions (Table 1). We will examine ways to improve air quality

TABLE 2: COMPLIANCE WITH AIR QUALITY STANDARDS, AIR POLLUTANTS AND THEIR HEALTH IMPLICATIONS IN THE EU AND HUNGARY

	EU	Hungary
Compliance with air quality standards and regulations	Although air quality in the EU has improved over recent decades, the levels of air pollutants still exceed EU standards and the guidelines of the World Health Organisation (WHO), which are stricter than the European standards.[I]	Air pollution regularly exceeds the health limits allowed by EU legislation. The health limit for NO_2 is regularly exceeded, and NOx concentration is often higher than shown by the official stations. Hungarian municipalities regularly exceed the WHO health limits (both 2005 and 2021).[II]
Main air pollutants and their sources	NOx, PM For national air pollution data, check data of the Member States here.[III]	PM pollution comes mainly from residential heating (e.g. burning lignite, wet wood, illegal burning of waste, and to a lesser extent, burning garden waste). NO_2 pollution mainly comes from diesel vehicles and to some extent also from natural gas heating.
Health implications	In 2018, there were some 417,000 premature deaths in Europe caused by PM pollution in ambient air.[IV] Exposure to NO_2 caused the premature deaths of 71,000 people in Europe in 2016.[V]	Air pollution caused by PM2.5 is responsible for around 9,500 premature deaths, NO_2 for about 1,400 premature deaths per year in Hungary.[VI] NO2 pollution from transport is especially worrying as many schools and kindergartens are situated along main roads.
Regional variations	Some cities in South-Eastern Europe had the worst air quality in the world over the last few years.[VII]	The air pollution limit values are typically most critical in Budapest, the Sajó Valley, Pécs and Nyíregyháza.[VIII]

I European Environment Agency (EEA) (2022c) "Emissions of the main air pollutants in Europe" (https://www.eea.europa.eu/ims/emissions-of-the-main-air)
II According to a report about air pollution in 2019, there were no Hungarian municipalities where the annual WHO health limit for PM2.5 was not exceeded. The National Meteorological Service's report on pollution data for 2019 shows that the 24-hour health limit value (50 µg/m³) was exceeded at all but two stations, even for PM10.
III European Environment Agency (EEA) (2021a) "European Air Quality Index" (https://www.eea.europa.eu/themes/air)
IV UN environment programme (2021) "Actions on Air Quality in Europe and Central Asia, Executive Summary", Air Pollution Series (https://wedocs.unep.org/bitstream/handle/20.500.11822/36700/AAQECA_ES.pdf)
V European Environment Agency (EEA) (2019a) "Air quality in Europe — 10/2019 report, 68" (https://www.eea.europa.eu/publications/air-quality-in-europe-2019)
VI European Environment Agency (EEA) (2021b) "Hungary - Air pollution country fact sheet" (https://www.eea.europa.eu/themes/air/country-fact-sheets/2021-country-fact-sheets/hungary)
VII N1 Belgrade (2020) "Belgrade most polluted city in the world – again" (https://n1info.rs/english/news/a582617-air-visual-belgrade-most-polluted-world-city/)
VIII The vast majority of pollutants with a direct impact on human health originate from local or peri-urban emission sources, despite the communication of the Hungarian government according to which much of ambient air pollution comes from abroad.

through better regulation that seeks to reduce NO_2 and PM pollutants and we will zoom into the biggest sectors where air pollution needs to be addressed in Hungary: industrial emission, heating and transport. Looking for solutions to the problem of plastic pollution, we will explore the opportunities for better regulation of plastic production, packaging and retailers and development of waste management and recycling. To improve energy efficiency of buildings, we propose to financially support individuals and businesses and launching large-scale renovation programs. We will also explore how incremental changes in our lifestyles and structural changes of our energy mix could bring us closer to carbon neutrality. These proposals will serve as the basis of our qualitative focus group research.

2.1. Air pollution

In this section we provide data about air pollution in the EU and in Hungary and offer ways in which the air quality in Hungary could be improved. The proposals introduced here have been developed together with civil society professionals renowned for their expertise in the field of air pollution. Air pollution is measured and addressed both outdoors and indoors. In this paper we will focus on ambient (outdoor) air quality, as it is well beyond the control of individuals and it demands concerted action by local, national and regional level policy-makers working in different sectors that cause air pollution, such as energy, transport, waste management, urban planning and agriculture.

Data about air pollution in the EU and Hungary

Below we will outline the state of air pollution in the EU and Hungary, detailing what the biggest air pollutants are and what sectors and what sort of activities are mainly responsible for the air pollution in these geographies.

Air quality

There are certain air quality standards to highlight the health hazards of air pollution and to signal the way forward to decrease and end air pollution. From the different air pollutants that are measured by them, we will focus here on two air pollutants that most commonly exceed air quality standards: NO_2 and PM (Table 2).

Sectoral contributions to air pollution

Below, we will provide a deeper insight into the sectors whi ch have the biggest impact on ambient air pollution in the EU and Hungary, which are heating and transport (Table 3).

How to improve the quality of air in Hungary?

There are different guidelines that Hungary needs to follow to guarantee the safe level of the different air pollutants. These include guidelines defined by the WHO (global), legislation from the EU (regional), as well as national provisions. Although numerous laws, regulations and decrees exist both on a European and a national level, air quality in Hungary is still the second worst in the EU.[15] There are ongoing EU infringement proceedings against Hungary as the action plan submitted by the Hungarian government to the European Commission has not been effective enough to reduce PM10 and NOx concentrations.

A key issue is that the National Air Pollution Control Programme (NAPCP),[16] which is to define how Hungary aims to reduce the emissions of air pollutants to the level required by the EU by 2030, lacks the indication of costs, schedules and responsibilities, along with the clarification of the objectives to be achieved, which could guarantee implementation. In addition, it also fails to effectively address the root causes of air pollution, such as burning of household waste or the import of old second-hand cars. At the same time, residential heating (e.g. burning lignite, wet wood, illegal burning of waste, and to a lesser extent, burning garden waste) is still responsible for the death of nearly 13,000 Hungarians annually. Regarding transport, the average age of vehicles in Hungary, as well as the share of NOx emitting diesel cars among all cars, are increasing, although it is clear that NO_2 emissions from polluting vehicles are largely responsible for the air pollution of Hungarian cities. The EU also calls for radical emission reduction of transport and pushes for the uptake of zero- and low-emission vehicles.

To improve air quality in Hungary, the focus should be on how to reduce NO_2 and PM pollutants in the two biggest sectors where air pollution needs to be addressed: heating and transport.

Measures need to be taken primarily on a systemic level (e.g. the Hungarian government, municipalities regulating the automobile industry, public transport companies, and so on) as their effect has the greatest potential impact. In addition, the government and municipalities also need to take steps to foster change in individual transport and heating modes.

We have identified three major areas where measures need to be taken in Hungary to tackle air pollution. These are the following:

- Green transition of industry (heating and transport) and freight transport (e.g. banning polluting vehicles).
- Green transition of personal transport (e.g. encouraging the use of public transportation as opposed to individual car use in urban transport).
- Tackling air pollution generated by households (e.g. banning the use of garden waste, residential waste, wet wood or lignite for residential heating purposes).

TABLE 3: SECTORAL CONTRIBUTIONS TO AIR POLLUTION IN THE EU AND HUNGARY

	EU	Hungary
Heating	In the EU, solid fuel for household heating only accounts for 2.6% of total energy use, but 46% of the most harmful air pollutant, PM2.5, comes from this source.[I] Domestic heating was an important source driving exceedances of standards for PM10 in southern and eastern Europe between 2014-2020.[II]	accounts for 4% of total energy use, and 74% of PM2.5 comes from this source.[III] The vast majority of PM emissions in Hungary comes from wood combustion.[IV] In Hungary, solid fuel for household heating accounts for 4% of total energy use, and 74% of PM2.5 comes from this source. The vast majority of PM emissions in Hungary comes from wood combustion. According to an opinion poll, one in four Hungarian households burns waste in stoves or boilers, and one in five in the open air.
Transport	Transport accounts for a significant proportion (around 10% or more) of the total emissions of other pollutants,[V] and it is responsible for more than two thirds of all NOx emissions. Emission trends in road traffic are not promising: emissions of primary PM2.5 from road transport have increased by 22% since 2000; non-exhaust emissions increased from 18% in 2000 to 46% of emissions from the road transport sector by 2017.[VI] Between 2014-2020, road traffic was a key source of air pollution mainly in western and northern Europe.[VII]	The average age of vehicles in Hungary is increasing: the average age of cars has increased from 11.9 years in 2011 to 15 years in 2021.[VIII] The number of cars has also been increasing steadily, as well as the share of NOx emitting diesel cars. In addition, the overall number of vehicles in the country also increased. While in 2005 there were 2,888,735 cars on Hungarian roads, 447,854 of which were diesel, by 2021 there were 4,020,159 cars in Hungary, 1,272,218 of which were diesel.

I Data source: International Institute for Applied Systems Analysis (IIASA)
II European Environment Agency (EEA) (2022a) "Emissions from road traffic and domestic heating behind breaches of EU air quality standards across Europe" (https://www.eea.europa.eu/highlights/emissions-from-road-traffic-and). Countries that reported domestic heating as a significant driver of exceedances include Croatia, Cyprus, Bulgaria, Italy, Poland, Romania, Slovakia, and Slovenia.
III Data source: International Institute for Applied Systems Analysis (IIASA)
IV Data is based on information acquired from the Ministry of Agriculture by the Hungarian Clean Air Group. Source: https://www.levego.hu/egyeb/futes-szennyezese/
V European Environment Agency (EEA) (2019b) "Emissions of air pollutants from transport, indicator assessment" (https://www.eea.europa.eu/data-and-maps/indicators/transport-emissions-of-air-pollutants-8/transport-emissions-of-air-pollutants-8)
VI Emissions of other sectors, such as residential cooking or, waste management, play a less significant role in the air quality of Europe. Agricultural emissions of ammonia are still increasing or remaining stable in all parts of Europe, despite being regulated by both the Air Convention and the EU National Emission reduction Commitments Directive.
VII European Environment Agency (EEA) (2022a) "Emissions from road traffic and domestic heating behind breaches of EU air quality standards across Europe" (https://www.eea.europa.eu/highlights/emissions-from-road-traffic-and). In Austria, Denmark, Finland, the Netherlands, Portugal, and the United Kingdom, road traffic was the only reported source of air pollution exceedance.
VIII HCSO (2022)

In addition, the government should also take steps to improve air quality measurement in both sectors so that up-to-date data that is necessary to address air pollution effectively and to measure progress is continuously available.

Policy proposals

Clean air actions must be improved in Hungary to protect people's health and to fight climate change. For that to happen, it is important to earn strong public support for clean air actions. The Hungarian public needs to be aware of the health hazards of air pollution and its relevance to the climate crisis. Currently, however, public support for clean air actions is quite low, and Hungarian politicians have been failing to address air pollution effectively.

To support effective implementation of clean air actions, we propose to check the public perception and the level of preference of certain policy proposals that we believe are easy to comprehend for the general public, while they also have the potential to bring about effective change. The policy proposals that were designed for this purpose are grouped into the three major areas identified above.

Green transition of industry and freight transport:

- Phase out coal from electricity generation and transition to electricity production from renewable sources for heating to reduce air pollution.

- Make transport cleaner:
  - By 2030, all newly procured trucks and buses should be zero-emitting vehicles.
  - Impose laws that shift long-distance freight from road to rail.
  - Introduce obligatory emission reductions for freight ships.
  - Incentivise the use of freight bicycles in city centre.
  - Impose deterrent fines on all polluting freight vehicles.

Green transition of personal transport:

- Ban the sale of new petrol, diesel and conventional hybrid cars (all vehicles using internal combustion engines (ICE)) from 2028.

- Phase out all ICE vehicles by 2040 (besides abiding to the EU's 2035 ban on new ICE vehicles).

- Set financial incentives to encourage the purchase of electric cars, develop electric car infrastructure, encourage the use of public electric cars. Increase the number of free parking spaces with electric charging stations, which can only be used by public electric cars.

- Encourage primarily electric, but also ICE car sharing schemes and develop public transport so that the culture of every household having at least one car will diminish.

- Make the air healthier in our cities by introducing car-free zones: support public bicycle sharing, provide wider cycle lanes, redistribute urban space from cars to bicycles and pedestrians and develop clean public transport.

- To reduce traffic, make car driving less attractive: reduce the number of parking spaces, increase parking fees, narrow car lines, and impose distance- and pollution-based tolls on all motor vehicles on all Hungarian roads.

- Start banning polluting vehicles from city centres (polluting diesel cars, vehicles older than 10 years), starting with the most polluting ones as soon as possible, and gradually extending the ban on to less polluting ones so that air pollution can decrease.

Tackling air pollution generated by households:

- Immediate ban on the burning of grass and garden waste across the country.

- Strict measures against the burning of waste by the public: the police should take strong action against illegal burning of waste and municipalities should have the legal possibility to sanction illegal burning. Parallel to this, poor people should get financial support to transition to clean heating.

- Municipalities should be empowered to prohibit solid fuel heating (e.g. coal) where heating can be provided by other means. Wood burning should be gradually phased out to protect forests.

- Residential coal burning (lignite) should be banned immediately as it is very polluting and also harms the climate.

- Support those in need to insulate their houses and modernise their heating.

2.2. Plastic pollution

In this section we provide data about plastic waste in the EU and in Hungary. Based on the current situation, we provide policy proposals to reduce plastic pollution tailored specifically to Hungary. The proposals have been developed together with civil society professionals renowned for their expertise in the field of waste management.

Data about plastic waste in the EU and Hungary

Although plastic pollution is a huge global problem that needs to be addressed globally, there are also important regional differences, both in the ways plastic waste is produced and how it is treated.

Where does plastic waste come from in the EU and in Hungary?

When mapping plastic waste, it is important to look at which industries use plastics in what proportions and what kind of industries produce what proportion of plastic waste (Table 4). Different industries use different kinds of plastics. The material's durability and the lifetime of the different kinds of plastic products all influence plastic waste production. Globally, the packaging industry is responsible for almost half of the total global plastic waste with its often short in use lifetime of its plastic products. In the EU this proportion is even higher. In Hungary, the exact amount and distribution of plastic waste is difficult to define. The most accurate data available for plastic waste in Hungary is what becomes waste as packaging material, as it is subject to a product fee, which is recorded by the National Tax and Custom Office (NAV).

Single use plastics (SUP)

The packaging industry typically uses single-use plastics (SUP) that are often being used only for a few minutes before they are disposed of. 50% of all plastics are produced for single-use purposes.[17] Most of them are single use bottles, wrappers, straws, and bags although their reusable alternatives already exist.

A big proportion of SUP is made up by PET bottles.[18] Today, the majority of soft drinks and mineral water are sold in PET bottles, the rest comes in glass, aluminium cans and cartons. Although many PET bottles were refillable in the past, today the majority of them are single-use, and despite the fact that all PET bottles are recyclable, a great proportion of them does not get recycled. To meet the targets set in the EU Single-Use Plastics Directive, these current trends need to change significantly.[19] SUP products often do not get collected and recycled as they are used away from home or bins. They typically end up in nature, frequently in the sea or in rivers, either as a whole or broken into pieces (microplastics), lasting for decades and causing huge environmental problems.

In 2017, Hungary had the highest amount of single-use beverage packaging waste per capita[20] in the EU (8.9% in 2019)[21]. At least one and a half billion PET bottles[22] are put on the market in Hungary every year. This is about 4 million plastic bottles per day and 180,000 per hour. The share of PET bottles is increasing significantly[23] in the consumption of all types of plastic in Hungary. About 87,000 tonnes of PET bottles produced in Hungary are sold every year.

Several NGOs and citizens' initiatives are working on eliminating plastic waste from the natural environment in Hungary,. One of the best known is the PET Cup, which has removed 119 tonnes of waste[24] from the Tisza river and its floodplain since 2013. Clean Tisza Map project,[25] a citizens' initiative, maps the pollution of the Tisza river. Greenpeace Hungary also regularly organises plastic waste collection combined with brand audits to highlight the root causes of plastic waste. Their assessment makes it clear that the products of soft drinks and mineral water distributors (Coca-Cola, Pepsi, Szentkirályi mineral water[26]) account for the bulk of plastic waste in nature.

In addition, microplastics in Hungarian rivers have been researched.[27] Results show that some Hungarian rivers have rather high levels of microplastic

contamination. This is primarily due to contamination from abroad but a significant amount of the pollution also stems from local sources[28] (e.g. washing synthetic fibre clothes show).

State of plastic recycling in Hungary

Plastics products have different life spans, ranging from 1 to 50 years or more, therefore postconsumer plastic waste collection figures do not match the demand or consumption figures of plastic. Furthermore, not all data about the collection and recycling rates of plastic and about the demand side of plastic recycling in Hungary is available, but trends are apparent.

In 2015, around 300,000 tonnes of plastic packaging waste was generated in Hungary, which was 30.5 kg per person. Around 27.5% of this was recycled (82,000

TABLE 4: USE OF PLASTICS BY SECTORS AND THE ROLE OF THE PACKAGING INDUSTRY IN THE EU AND HUNGARY

	EU	Hungary
Use of plastics by sectors	Proportions of the use of plastics by sectors in Europe in 2018[I]: packaging 39.9%, construction 19.8%, automotive 9.9%, electrical and electronic equipment - 6.2%, agriculture 3.4%, household, leisure and sports 4.1%, other (machinery, medical devices, furniture, etc.) 16.7%.	The top four sectors where plastic is used: packaging (40%), construction (15%), automotive (11%), electrical and electronic equipment (9%).
The role of the packaging industry	The packaging industry accounted for 61%[II] of plastic waste generation in Europe in 2018, which is approximately 18 million metric tonnes. The generation of plastic packaging in the European Union[III] has been climbing steadily. Between 2006 and 2018, the quantity of plastic packaging waste has increased by 19%[IV] (from 14.9 million tonnes to 17.8 million tonnes). In 2019, each person living in the EU generated 34.4 kg of plastic packaging waste[V], which is 24% higher than in 2009 (+ 6.7 kg). Out of the 34.4 kg, 14.1 kg were recycled. Although the recycling volume of plastic packaging waste increased by 50%, the amount of plastic packaging that wasn't recycled increased, too.	The amount of plastic waste per capita has increased in Hungary between 2009-2019 by roughly 10%.[VI] In 2018, 340,621 tonnes[VII] of packaging waste were generated in Hungary. As communicated by the Ministry of Innovation and Technology in 2021,[VIII] 18 million tonnes of waste are generated in Hungary annually, and much of it is municipal waste (waste generated in households, and similar waste that can be treated together with it). Around 14% of this mixed municipal waste[IX] is plastic waste, but in many cases this is contaminated, cannot be separated into separate packaging waste and cannot be recycled.

I European Parliament (2018) "A műanyaghulladék mennyisége és újrahasznosítása az EU-ban (infografika)", 19. December (https://www.europarl.europa.eu/news/hu/headlines/society/20181212STO21610/a-muanyag-hulladek-mennyisege-es-ujrahasznositasa-az-eu-ban-infografika)
II Tiseo, I. (2020) "Distribution of plastic waste generation in Europe in 2018, by sector", Statista (https://www.statista.com/statistics/986584/distribution-of-plastic-waste-collected-in-europe/)
III Statista Research Department (2022) "Production of plastic packaging waste in the European Union (EU-27) from 2005 to 2019", Statista (https://www.statista.com/statistics/882051/plastic-packaging-waste-generated-per-capita-eu/)
IV European Recycling Industries' Confederation (EuRIC AISBL) "Plastic Recycling Factsheet" p.7 (https://circulareconomy.europa.eu/platform/sites/default/files/euric_-_plastic_recycling_fact_sheet.pdf)
V Eurostat, the Statistical office of the European Union (2021) "EU recycled 41% of plastic packaging waste in 2019" (https://ec.europa.eu/eurostat/web/products-eurostat-news/-/ddn-20211027-2)
VI Qubit (2022) "'A műanyagszennyezés problémáját nem lehet pusztán azzal megoldani, hogy visszatérünk az üveghez'", Qubit, 17 May 2022. (https://qubit.hu/2022/05/17/a-muanyagszennyezes-problemajat-nem-lehet-pusztan-azzal-megoldani-hogy-visszaterunk-az-uveghez)
VII Hungarian Ministry of Innovations and Technology (ITM) (2021) "National Waste Management Plan 2021-2027, 185" (https://cdn.kormany.hu/uploads/document/9/92/921/921c2f798773d4336ee3f45884a662d3018bb3d7.pdf). Based on the conclusions of the National Waste Management Plan 2020-27, the amount of packaging waste generated for metal and plastic packaging is significantly higher than the amount calculated based on the declarations of producers.
VIII Pénzcentrum (2021) "'Na, ezért önti el Magyarországot a szemét: kézenfekvő a megoldás, de macerás bevezetni'", Pénzcentrum, 1 November 2021. (https://www.penzcentrum.hu/otthon/20211101/na-ezert-onti-el-magyarorszagot-a-szemet-kezenfekvo-a-megoldas-de-maceras-bevezetni-1118919)
IX Hungarian Ministry of Innovations and Technology (ITM) (2021) National Waste Management Plan 2021-2027 (https://cdn.kormany.hu/uploads/document/9/92/921/921c2f798773d4336ee3f45884a662d3018bb3d7.pdf)

tonnes). In 2019, 33% of plastic packaging waste was recycled in Hungary.[29] For 2021, the forecast was to recycle 39.3% of plastic packaging waste.[30]

From the 4 million PET bottles used in Hungary per day, only 33% are collected selectively.[31] The majority of them get recycled (around 20,000-25,000 tonnes of PET bottles per year). However, 70% of all PET bottles do not get recycled. In Hungary, there are 50-100 companies that are able to recycle plastics, including companies that only do grinding (the first step of recycling after collection). The most commonly recycled product types are PE/PP/PET.

A key player in the Hungarian plastics recycling industry is MOL, Hungary's leading oil company. Following a target acquisition in 2022, the company can recycle 40,000 tonnes of plastic per year. It manufactures products for the automotive and packaging industries. The national licensed plastic recycling capacity is 242,000 tonnes per year,[32] which is currently under-utilised.

How to decrease plastic pollution in Hungary?

Although trends in the reduction of plastic waste are encouraging, the pace of progress remains insufficient. The wasteful management of plastic waste is alarmingly harming the climate, the natural world, and is potentially hazardous to human health. Single use plastics are still used a lot instead of refillable, reusable alternatives. SUP PET bottles are striking examples of this as they get used a lot more than refillable PET bottles today.[33] The rate of recycling also needs to increase substantially. As part of the Green Deal,[34] 55% of plastic packaging waste should be recycled by 2030. In 2019, this was only 41%[35] in the EU and 33% in Hungary. Although numerous laws, regulations, and decrees exist both on a European and a national level, they are still not sufficient to tackle plastic waste in Hungary.

On a general note, EU directives are well reflected in Hungarian legislation. Hungary sometimes requests derogation (e.g. 50% rate of reuse and recycling of municipal waste by 2025 instead of 55%) but other times Hungary seems to act more progressively than the EU (e.g. the Hungarian adaptation of the EU's SUP directive covers plastic bags, which the EU directive does not). However, guarantees of national implementation of EU directives are often missing, and the waste hierarchy, adopted in the Hungarian Law on Waste, does not seem to be prioritised in real life. Furthermore, the deposit-fee system is not yet put into practice, although it could definitely bring positive changes to the system. Reuse and refill should be encouraged or required as the preferred method next to recycling, based on the added environmental value they hold.

To effectively address plastic waste management, it is not enough to support and encourage consumers to buy and throw out less plastic waste. First and foremost, system-level measures need to be implemented. For that to happen, we have identified three areas where policy measures should be taken to achieve significant change in reducing plastic waste in Hungary. They are the following:

- Regulating plastic production and packaging of products to produce less plastic (e.g. by banning SUPs, making refillable packaging compulsory).
- Regulating retailers (groceries, supermarkets) to introduce refilling stations in shops and have less plastic packaging.
- Modernising waste management and improving recycling.

As a golden rule, "the best kind of waste is the kind of waste that is not produced" should be implemented and priority should be given to prevention and the enforcement of the "polluter pays principle."

Policy proposals

Although plastic waste is a global problem, local action is also key to effectively address plastic pollution globally. By reducing plastic waste and addressing plastic production and consumption in Hungary, the environmental impact of plastic can be reduced locally and beyond. However, measurements that aim to reduce plastic consumption and waste need strong public support that is currently lacking in Hungary, while Hungarian politicians also fail to address plastic waste management effectively.

To support effective implementation of measures that tackle plastic waste, we designed certain policy proposals to check for public perception and level of preference. The proposals offered are communicable to and comprehensible for the general public, while they also have the potential to bring about effective change. The proposals are organised into the three major areas we have identified above.

Regulating plastic production and packaging of products to produce less unnecessary plastic:

- Products with deposit for refill, reuse should be exempt from corporate taxation to encourage reuse, refill for the industry.
- Impose a higher tax on all single use plastic packaging so that they are more expensive for the industry to use than refillable packaging.
- It should be mandatory to maintain a deposit system to ensure that beverage packaging is returned and reused, instead of thrown away after one use.
- At least 70% of all beverage containers should be refillable by 2026 at the latest.
- Standardise refillable beverage bottles.
- From 2025, no product can be marketed if it does not contain at least 20% recycled plastic.

Regulating retailers (groceries, supermarkets) to introduce refilling stations in shops and have less plastic packaging:

- Enable packaging-free shops through economic incentives.
- A law should ensure that environmentally harmful single-use bags cannot be given to consumers free of charge, and this should be checked via regular official controls.
- 90% of products should be available in packaging-free form in supermarkets by 2025. Possible solutions: products packaged in reusable material, in-store refill systems, reliance on concentrated liquids/tablets (washing tablets instead of liquids).
- Require supermarkets to run deposit schemes for reusable bottles and other refillable containers.

Modernising waste management and developing recycling:

- The government should support the construction, development and operation of reuse and refill infrastructure (collection, washing and return).
- Full recycling of all disposable (single-use) beverage containers should be achieved by 2024 at the latest.
- Penalise single use packaging by imposing a high tax on them, impose a special tax on mixed plastics and composite packaging materials (e.g. tetra pack packaging should be more expensive than plastic or refillable packaging), because recycling them is more difficult.
- Develop the infrastructure for selective collection in public institutions (government buildings, schools, hospitals, and so on) and make selective collection compulsory at all public events.
- Improve the efficiency of recycling by developing selective, on-street recycling collection.

Currently, the awareness level about plastic pollution is quite high in society but it does not necessarily pair up with conscious consumer or business choices that would support the implementation of the policy recommendations above.

2.3. Energy efficiency of buildings

In this section we provide data about energy efficiency in the EU and in Hungary. We will show that the energy efficiency of buildings is a key area in tackling the climate and biodiversity crisis, as well as the current energy crisis. Based on the analysis of the current situation, we offer policy proposals on how the energy efficiency of the Hungarian building stock could be improved. The proposals have been developed together with civil society professionals renowned for their expertise in the field of sustainable energy.

Data about energy efficiency in the EU and in Hungary - zooming into the building stock

To deliver on the EU's climate objectives, the European Green Deal gives priority to renovating both public and private buildings to drive energy efficiency. The European Commission (EC) strategy "A Renovation Wave for Europe – Greening our buildings, creating jobs, improving lives",[36] published in 2020, has been designed especially to boost renovation in the EU.

With increasing energy prices and shortages of energy supply that resulted from Russia's invasion of Ukraine, there is a further need for the EU to quickly reduce its energy demand. In addition, the European Commission (EC) has proposed a set of measures,[37] in line with its longer-term decarbonisation strategies, to achieve independence from Russian fossil fuels well before 2030. In its REPowerEU[38] we find that "energy savings are the quickest and cheapest way to address the current energy crisis, and reduce bills."

According to the European Commission's assessment in Good Practice in Energy Efficiency, the refurbishment of buildings has the biggest available energy saving potential in Europe.[39] For this reason, this paper will put the focus on the energy efficiency of buildings,[40] and we will provide policy proposals on how to improve the energy efficiency of buildings in Hungary.

Energy efficiency of buildings in the EU

The building sector is responsible for around 40% of energy consumption and 36% of the energy-related greenhouse gas emissions in the EU which makes the building stock the single largest energy consumer in Europe. Currently, about 35% of the EU's buildings are over 50 years old and almost 75% of the building stock is energy inefficient, while only about 1% of the building stock is renovated annually.[41]

According to the revised Energy Performance of Building Directive[42] (EPBD), at least 60% emission reductions should be accomplished by 2030 in the building sector in comparison to 2015 and climate

TABLE 5: ENERGY EFFICIENCY OF THE HUNGARIAN BUILDING STOCK

Share of final energy used by buildings from Hungary's total final energy:	Around 27% of total final energy use is in residential buildings, and about 6% in public buildings.[I] Buildings are among the largest domestic emitters of CO_2 and energy in Hungary.
Share of heating and cooling from final energy of Hungary:	40% of final energy[II] is used for heating and cooling.
What primary energy is used for heating and where does it come from?	Fossil gas (the main primary energy source in Hungary) provides 76% of the heating energy source of the residential building stock and 80% of the heating source of the public building stock.[III]

Sources: Hungarian Ministry of Innovations and Technology (ITM) (2021) Long-Term Renewal Strategy Directive

I Hungarian Ministry of Innovations and Technology (ITM) (2021) "Long-Term Renewal Strategy Directive" p.7 (https://energy.ec.europa.eu/system/files/2021-07/hu_2020_ltrs_0.pdf)
II Hungarian Ministry of Innovations and Technology (ITM) (2021) Long-Term Renewal Strategy Directive (https://energy.ec.europa.eu/system/files/2021-07/hu_2020_ltrs_0.pdf)
III Hungarian Ministry of Innovations and Technology (ITM) (2021) Long-Term Renewal Strategy Directive (https://energy.ec.europa.eu/system/files/2021-07/hu_2020_ltrs_0.pdf)

neutrality should be achieved by 2050. Some of the measures the directive proposes are the following (the list is not exhaustive):

- By 2030 all new buildings must be zero emissions; new public buildings must be zero emissions already by 2027.
- The worst performing 15% of the EU building stock will have to be upgraded.
- Obligation to have an energy performance certificate for buildings.
- National Building Renovation Plans need to be fully integrated into National Energy and Climate Plans.

According to a study published in summer 2022,[43] which focuses on eight EU member states, on average 45% of the final energy consumption can be saved by renovating the residential building stock. As a significant amount of the CO_2 emissions generated over the life-cycle of a building occur before the building is completed, the renovation of an existing building is almost always more beneficial[44] than constructing a new building. The Commission's goal is to double renovation rates to at least 2% annually.

Since the energy efficiency of buildings is influenced by many factors, among which local climate is just one, the EU placed the responsibility of setting minimum requirements for the energy performance of buildings on the Member States, and only requires the MSs to calculate the energy performance of buildings on the basis of a methodology that takes into account existing European standards.[45]

Energy efficiency of buildings in Hungary

In order to show why it is important to improve the energy efficiency of the Hungarian building stock, the most relevant data will be outlined below (Table 5).

Source of final energy consumed by the Hungarian building stock

In the light of the Russian-Ukrainian war and REPowerEU, reducing our dependence on Russian gas needs to be prioritised. The table below shows what kind of energy is currently used (i.e. final energy[46]) by households and commercial and public buildings in Hungary (Table 6).

Residential building stock in Hungary

Residential buildings in Hungary use one of the highest amounts of energy for heating in the EU (72%).[47] The data below helps to understand what lies behind this statistic (Table 7).

In Hungary, the worst buildings have an energy demand of more than 500 KWh/m²/year and the best buildings less than 40 KWh/m²/year. **Two-thirds of the residential buildings in Hungary are outdated regarding their energy efficiency.**

TABLE 6: ENERGY CONSUMPTION OF HOUSEHOLDS AND COMMERCIAL AND PUBLIC BUILDINGS IN HUNGARY

	The distribution of the final energy consumption of the households is the following:[I]	Final energy consumption of commercial and public buildings (average values of the years 2014-2020) is the following:[II]
Fossil fuels	53% (fossil gas,[III] oil, coal)	57% (fossil gas, oil, coal)
Renewables	22%	3%
Electrical energy	18%	33%
District heating	8%	8%

I MEKH "Éves adatok" http://www.mekh.hu/eves-adatok
II "7.2 Országos egyszerűsített IEA típusú energiamérleg (éves) 2014-2021", further information: http://mekh.hu/eves-adatok
III Fossil gas represents 51% percent of the final energy consumption of households in Hungary. http://www.mekh.hu/eves-adatok

How to improve the energy efficiency of buildings in Hungary?

Although numerous laws, regulations and decrees exist both on a European and a national level, 72% of the final energy consumption of Hungarian households is still used for heating, which is one of the highest in the EU, while two-thirds of the residential buildings in Hungary are outdated regarding their energy efficiency. Hungary's building stock is not energy efficient enough and uses lots of fossil fuels that continuously worsen the impact of climate change.

First and foremost, gas consumption of residential buildings needs to be reduced as fossil gas, much of it imported from Russia, represents 51% of the final energy consumption of households in Hungary. Renovation of the national buildings stock should take place as quickly as possible and in high quality. By making the building stock more energy efficient, Hungary can become less reliant on imported gas. This would help Hungary not only to meet more ambitious climate goals, but it would also assist the country to become less reliant on energy from outside of the country (e.g. from Russia) and to tackle energy insecurity.

Improving the energy efficiency of residential buildings cannot take place only on an individual level. To achieve improvement at the necessary scale and in a short term, energy efficiency of all buildings, needs to be tackled on a systemic level. In addition, households, businesses, and public institutions need to be encouraged to use less energy and carry out the necessary energy efficiency investments.

In order to effectively address the improvement of the energy efficiency of the Hungarian building stock, we suggest that policy makers take measures primarily in the following two areas:

- Financially support individual households and businesses to effectively boost energy efficiency of buildings (e.g. energy-saving heating and cooling systems).
- Launch a large-scale renovation program for all buildings.

Policy proposals

Improving the energy efficiency of buildings properly will make Hungary less vulnerable to international energy prices and energy imports. Energy efficiency is also the quickest way to reduce our impact on the climate.

TABLE 7: PRIMARY ENERGY USE, INSULATION AND RENOVATION RATE OF RESIDENTIAL BUILDINGS IN HUNGARY

Primary energy use of residential buildings	It varies considerably depending on the building type, between 100-550 kWh/m^2/a. Residential buildings use on average 215 kWh/m^2/a final energy.[I]
State of insulation of residential buildings	Only 33% of single-family houses and 44% of panel buildings are insulated. This ratio is 26% for apartment buildings with more than 10 apartments and 16% for apartment buildings with less than 10 apartments.[II]
Renovation rate of residential buildings	The renovation rate among residential buildings is low, only 1 percent annually. Based on data from 2012-2016, 0.9% of residential renovations were medium building renovations (30-60% energy consumption reduction) while only 0.1% were deep renovations (>60% energy use reduction).[III] The number of new residential developments completed every year corresponds to 0.3% of the total residential building stock.[IV]

Sources: Hungarian Ministry of Innovations and Technology (ITM) (2021) Long-Term Renewal Strategy Directive.

I https://ec.europa.eu/energy/sites/default/files/documents/hu_2020_ltrs.pdf. For comparison: buildings in the service sector (public buildings, offices, etc.) consume above 200 kWh/m2/a final energy on average.
II Hungarian Ministry of Innovations and Technology (ITM) (2021) Long-Term Renewal Strategy Directive (https://energy.ec.europa.eu/system/files/2021-07/hu_2020_ltrs_0.pdf)
III E3G (2021) "Renovate 2 Recover" https://www.renovate-europe.eu/wp-content/uploads/2018/09/Renovate2Recover_Full-Study-1.pdf
IV Hungarian Ministry of Innovations and Technology (ITM) (2021) Long-Term Renewal Strategy Directive (https://energy.ec.europa.eu/system/files/2021-07/hu_2020_ltrs_0.pdf)

Still, energy efficiency investments are often abstract and/or expensive and they do not enjoy a strong enough public support in Hungary. The principle of "The cheapest energy, the cleanest energy, the most secure energy is the energy that is not used at all" must gain public support. Without that, it is very challenging to cut Hungary's dependence on Russian gas and oil substantially in the near future, and substantially cut back on Hungary's energy demand. The Hungarian government needs to start to not only raise public awareness about the benefits of energy efficiency, but also launch direct support schemes that make energy efficiency investments financially advantageous.

We believe the proposals below are comprehensible for the general public while they also have the potential to bring about effective change. The proposals are organised into the two major areas we have identified above.

Financially support individual households and businesses to effectively boost energy efficiency of buildings:

- Offer energy efficiency audits and advice to household and small businesses (SMEs) to identify building's energy efficiency measures that can save energy quickly and effectively.
- Introduce annual maintenance checks of gas boilers to ensure hot water boilers in homes are set at a temperature that optimises efficiency, no higher than 60°C.
- Support households financially with the upfront costs of efficiency improvements.
- Introduce extra penalty fees for companies for lack of energy efficiency and wasteful energy usage. Introduce rationing of energy for large industries.
- Put legislation in place to encourage the use of passive solutions (e.g. prioritising natural ventilation, shading, green and blue infrastructure over mechanical ventilation and cooling).

Launch a large-scale renovation program for all buildings:

- Support cities and regions in their renovation programmes so renovation of public buildings takes place across the country and city councils can help their citizens effectively throughout the renovation journey.
- Launch a radical building energy programme to renovate and decarbonise 100,000-130,000 properties annually, including public buildings.
- Set up information centres and run wide ranging awareness raising and information campaigns about the renovation of residential buildings. This could entail helping with applications for permits and incentives, providing referrals to skilled, reliable professionals.
- Introduce energy use reduction requirements for all buildings.
- Prescribe eco-friendly materials and the installation of renewable energy systems in renovation projects.
- Decrease the share of votes necessary for a positive renovation decision in multifamily buildings.
- Only provide financial support for renovation projects that meet energy efficiency improvement targets and energy use reduction requirements.

2.4. The Hungarian energy mix

In this section we will discuss the Hungarian and the EU energy mix, and compare it to a desirable energy mix necessary to tackle climate change. The current energy mix will also be examined in view of the war Russia started against Ukraine that massively aggravated the energy crisis we are facing in Europe. At the end of the section, we will offer policy proposals for Hungary that would contribute to achieving real energy security and energy independence for Hungary. The proposals have been developed together with civil society professionals renowned for their expertise in the field of sustainable energy.

Data about the energy mix of the EU and Hungary

The issue of the energy mix in the EU and in Hungary is currently not only influenced by climate change, but also by an energy crisis. Energy prices started to rise even before Russia invaded Ukraine in early 2022, a tendency that was only exacerbated by the uncertainty about the oil and gas supply from Russia caused by the war.

The war in Ukraine drew attention to Europe's dependence on fossil fuels, especially fossil fuels imported from Russia. This is especially a relevant problem for Hungary which depends greatly on Russian oil and gas. The selected data below shows the level of reliance on fossil fuels and the state of energy independence both regionally (EU) and in Hungary (Table 8).

The current energy crisis could be seen as an opportunity for both Europe and Hungary to cut their energy dependence on Russia, and on fossil fuels

TABLE 8: KEY DATA ABOUT THE ENERGY MIX IN THE EU AND HUNGARY

	EU	Hungary
What is the energy mix made up of?	In 2020, the energy mix in the EU (energy available) was mainly made up of five different sources[I]: petroleum products (including crude oil) (35%), fossil gas (24%), renewable energy (17%), nuclear energy (13%) and solid fossil fuels (12%).	In 2020, Hungary's energy mix[II] was the following: petroleum products (including crude oil) (28.6%), fossil gas (33.5%), renewable energy (11.3%), nuclear energy (15.5%) and solid fossil fuels (7.2%), and others (3.9%). Fossil gas is the main primary energy source in Hungary.[III]
What is the share of energy import and the share of domestic energy production?[IV]	In 2020, the EU produced around 42% of its own energy and imported 58% of the energy. Compared to 2019, there is a 2% increase in own production. The decrease in imports is partly linked to the COVID-19 economic crisis.	Hungary is an energy importer, the level of its energy dependence varied between 50-70%[V] in the last decade, with an increasing trend. Hungary is especially dependent on imported oil and fossil gas, as imports reach 85-90% of the consumption. As most of the imported hydrocarbons are supplied by Russia (around 85% of gas and 64% of oil[VI]), the war in Ukraine affects the deliveries.[VII] In the field of electricity, Hungary imported some 26%[VIII] of its demand.
What primer energy is used for electricity generation?[IX]	More than half of the net electricity came from clean energy (nuclear power 24.3%, renewables 34%) in the EU in 2020. Within renewables: the highest share was from wind turbines (14.7%), followed by hydropower plants (13.8%) and solar power (5.3%).[X]	The mix of the produced electricity in 2021 was the following: nuclear power (44.6%), fossil gas (26.2%), coal (8.6%), solar (10.6%), wind (1.9%), other renewables (6.4%) and others for the remaining 1.7%.[XI]

I Eurostat, the Statistical office of the European Union (2020) "Where does our energy come from?" (https://ec.europa.eu/eurostat/cache/infographs/energy/bloc-2a.html)
II Ibid.
III According to thea data collected by FGSZ Natural Gas Transport Ltd. (https://fgsz.hu/a-foldgazrol/a-foldgaz-szerepe/statisztikai-adatok)
IV REPowerEU aims to make Europe independent from Russian fossil fuels well before 2030.
V The data of the Hungarian Central Statistical Office on the Hungary's energy import dependence (https://www.ksh.hu/sdg/3-35-sdg-7.html)
VI "EU-csúcs - Orbán Viktor elutasította az ukrán elnök követeléseit fegyverek küldéséről és az orosz energiahordozók betiltásáról" Hvg, 25 March 2022. (https://hvg.hu/vilag/20220325_EUcsucs_Orban_Zelenszkij_fegyverszallitas_szankciok_haboru)
VII According to Eurostat data for Hungary for 2020, imports from Russia in gross available energy amounted to 54.2% percent considering natural gas, oil and coal. 95% percent of all fossil gas imports originated from Russia and only 20% percent is domestic production. Fossil gas imports reach Hungary through Serbia, Ukraine, Austria, Slovakia, Romania and Croatia. The ""Brotherhood"" pipeline used to be the most important out of all but after the Turkish Stream was built, it became the main direction of the imported fossil gas. In addition, Russian gas comes from Austria and Slovakia, too. Oil arrives in Hungary through Ukraine, through the pipeline "Druzhba".
VIII Hungarian Energy and and Public Utility Regulatory Office (MEKH) (2021) "Yearly Report", p.51 (http://mekh.hu/download/d/ca/11000/vill_eves_2021.pdf)
IX The term is used interchangeably with electricity production.
X Eurostat, the Statistical office of the European Union (2022) "Electricity production, consumption and market overview" (https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Electricity_production,_consumption_and_market_overview#Electricity_generation)
XI Hungarian Energy and and Public Utility Regulatory Office (MEKH) (2021) "Yearly Report", p.11 (http://mekh.hu/download/d/ca/11000/vill_eves_2021.pdf)

and nuclear in general, and instead, pave the way towards a safer and cleaner future with reduced energy use and renewables.

How does the current energy mix contribute to meeting the EU's climate targets?

In order to become climate neutral by 2050, the EU's 2030 Climate Target Plan proposes to cut greenhouse gas emissions by at least 55%.[48] Hungary accounts for 1.7% of total EU greenhouse gas (GHG) emission.[49] The country achieved the 20% CO_2 emission reduction target of the EU for 2020 as early as 2006 (actual value was 33.8% in 2020),[50] largely thanks to the collapse of the energy intensive heavy industry of the Socialist era. However, since 2005, the country has been reducing its emissions at a slower pace than the EU average. The carbon intensity of the Hungarian economy decreased by 35%, at a faster rate than the EU-27 average between 2005 and 2019.

Hungary is in the mid-range of Europe's clean electricity ranking with 63% of the electricity production coming from clean electricity (renewables and nuclear energy) in 2021 (data from 2020).[51] In 2020, it became one of the first countries in Central Europe to put a carbon neutrality goal for 2050 into law and it is aiming for 90 percent of its electricity generation to come from low-carbon sources by 2030. What poses a significant challenge to further CO_2 reductions in Hungary are the poor conditions of buildings, which consume 37% more energy[52] than the EU average (as detailed in the previous section), and the transport sector whose emissions are increasing, making the sector the biggest CO_2 emitter in Hungary by 2018.[53]

How to make the Hungarian energy mix sustainable and resilient?

Although the share of renewables is rising in Hungary, certain emissions are increasing (see transport) and a lot of energy is still wasted (see energy efficiency of the buildings detailed in the section above). At a time of climate and energy crises, the Hungarian government needs to do everything in its power to maintain a quick transition to a system where less energy is used, and where most of the energy used is produced locally and from renewable sources to achieve true energy independence and energy security.

In the future energy mix of Hungary, solar energy should play a key role in electricity generation, with wind energy complementing it on a daily and seasonal basis. In order to do so, the government should prioritise the upgrading of the national grid so that it can integrate a rapidly growing electric capacity generated by the weather-dependent renewable energy sources instead of creating barriers to them. Currently, the share of renewable energy sources in gross final energy consumption is below Hungary's 2030 ambition of 21 percent (it was 13.9 percent at the end of 2020).[54] There is still a lot of untapped potential in the southern and eastern part of the country, however, any harmful impact on wildlife, wildlife habitat, soil and water resources must be avoided to prevent the acceleration of the biodiversity crisis. The use of biomass for energy purposes should also be handled with utmost care due to its ecological impact. Geothermal energy could also play a key role in heating buildings in Hungary. This is unlike nuclear energy, which would further strengthen Hungary's energy dependence on Russia, and could risk Hungary's competitiveness if prioritised above renewables, which are becoming the cheapest form of power.[55] By investing in Paks II, the weight and dominance of nuclear energy in the Hungarian energy mix and the central energy model sustained by it would have a displacement effect on renewables.

In order to improve security of supply, regional cooperation could be encouraged, too, to balance energy supply from renewables, building on the comparative advantages of each country.

As energy is a complex and abstract issue, we are proposing to address the issue of changing Hungary's energy mix to a more sustainable one on two levels: on a systemic level and on a personal level to help to bring the issue closer to people. The two areas we identified for this purpose are the following:

- Reach energy independence and at the same time increase Hungary's climate targets (including the transition to climate-neutral

renewables with the necessary regulations to be passed, the development of the national grid, support schemes to households and incentives to businesses).

- Reduce the personal carbon footprint by changes in everyday lives.

Policy proposals

Policies that encourage energy saving and investments in energy efficiency and transitioning from climate or nature harming energy, such as coal or wood, to clean renewable energy are crucial for the resilience of the Hungarian society. It is important for policy makers to provide meaningful support in both areas on all levels to the Hungarian public, and also to run strong public awareness campaigns to advocate for renewables and energy saving. Energy saving measures such as reducing speed limits or mandatory indoor maximum temperatures need to earn public support or acceptance way beyond the individual level so that system level change can be achieved via companies and public institutions.

TABLE 9: ELECTRICITY PRODUCTION IN HUNGARY

Type of energy	Facts and figures	Lifetime/Future prospects
Gas power plants	Installed capacity of gas power plants is over 4000 MW, which gives some 40% of the capacity of Hungarian power plants, but this aggregate number covers a wide range of power plants. The most used power plants are the most modern ones (CCGT): Gönyü (433 MW, ~60%) and Csepel (410 MW, ~25%), while the outdated Dunamenti (793 MW) and Tisza II. (900 MW), though listed as "operating", practically do not work. The remaining production is especially given by combined power plants (CHP), a series of various power plants with different capacity, technologies (e.g. gas turbine, gas motors), age and load factor, that provide heat for district heating systems.	While CHPs are expected to remain in use for decades to come, the government envisions new CCGT gas power plants. Plans for constructing a 500-650 MW unit at the site of the Mátra coal) power station, and two 500 MW units at the site of Tisza II. have been published. A public procurement process has been launched by MVM. However, the process is conditional, as it is apparently the subject of the ongoing negotiations with the European Commission concerning the Recovery and Resilience Facility.[I] While the recent gas crisis questions the feasibility of the plans, the projects possibly aim to fulfil the expected energy demand of the battery factories (which could reach 15 TWh, the amount corresponding to the production of the Paks nuclear power station), that are proposed by the Hungarian government.
Paks Nuclear Power Plant - nuclear energy	Hungary's biggest power plant with 2000 MWe capacity. It is a state owned plant.	Its four units have been licensed to work until mid-2030s and the units are planned to be shut down between 2032-2037 but according to government communication,[II] the lifetime of the power plant could be extended for a further 10-20 years.[III]

I Magyarország Kormánya "ELINDULNAK A KÖZBESZERZÉSEK A KELET MAGYARORSZÁGI ERŐMŰVI BLOKKOK MEGÉPÍTÉSÉRE" (https://kormany.hu/hirek/elindulnak-a-kozbeszerzesek-a-kelet-magyarorszagi-eromuvi-blokkok-megepitesere)

II Napi.hu (2022) "A kormány Paks I. üzemidejének 10-20 éves meghosszabbítására készül", Napi.hu, 24 June 2022. (https://www.napi.hu/magyar-vallalatok/palkovics-kormany-paks-atomeromu-uzemido-hosszabbitas.754960.html)

III The lifetime of the power plant was licensed to be extended already by 20 years between 2012-18. This new lifetime extension would happen in addition to that.

To achieve clean and real energy independence, it should be clearly communicated to the public that financing the Paks II project or further gas infrastructure development slows down Hungary's clean energy transition and risks the resilience of the country. In the midst of the climate and ecological crisis, it is also important to help the Hungarian public understand that wood burning for heating is a fake solution, which could make Hungarians even more vulnerable to the multiple crises we are facing.

To support changes in the Hungarian energy mix, we selected certain policy proposals to cross-check with the general public to explore their level of preference and perception. We believe the proposals selected for this purpose below are easy to comprehend for the general public, while they also have the potential to bring about effective change. The proposals are organised into the two major areas we have identified above.

TABLE 9: ELECTRICITY PRODUCTION IN HUNGARY

Type of energy	Facts and figures	Lifetime/Future prospects
Paks II - nuclear energy	An extension (two new reactors) to the already existing Paks nuclear power plant is planned to be built. It is to be supplied by Rosatom without tendering. The contracts were signed in 2014, and the target date for commissioning the two reactors was originally 2025-26.	The project has been delayed by different factors which required the postponement of the target date for operation to 2030. Russia's invasion of Ukraine also affects the project through the sanctions of the EU as they also apply to Vnesheconombank, which is supposed to finance the project.
Coal power plant - Mátra	The second biggest power plant of the country with 950 MWe[IV] capacity. It is the last remaining coal power plant, over fifty years old.	The government has already announced plans to shut it down by the end of 2025, which would reduce Hungary's CO_2 emissions by 38 percent.[V] On its site, the government plans to construct a 500-650 MW power plant based on fossil gas (along with two further 500 MW units at a different site.
Biomass - renewables	Renewables historically entailed biomass. It is mostly firewood, burned mainly in old, former coal power plants and in residential housing.	According to the government's communication, biomass in the form of burning wood for heating is expected to rise in the next years as a result of the insecure gas supplies and soaring gas prices due to the war between Russia and Ukraine.
Photovoltaic (PV) solar energy - renewables	It started to develop in the late 2010s. Now it is the most important renewable energy source in Hungary with around 3000 MW capacity (power plants and residential scale combined).[VI] The share of solar power plants in total electricity production increased to 11.1%.	It is expected to continue to increase. However, in Autumn 2022 the Hungarian government suspended new connections to the grid of future solar energy installations.
Wind energy - renewables	Development of wind power started in 2006 with a state tender. 332 MW of wind power was commissioned but despite vast interests from the industry, the next tender was withdrawn in 2010 and was never relaunched.	In 2016, legislation was modified, which made the construction of new wind power plants practically impossible without any detailed explanation.[VII]

IV MVM Private Limited Company, Mátra Energy (https://mert.mvm.hu/Rolunk/Tevekenyseg/Technologia)
V Installed capacity of solar plants was 1933 MW at 1st April 2022, while capacity in the residential sector was 1124 MW at 31 December 2021. https://www.portfolio.hu/uzlet/20220412/napenergia-oriasi-merfoldkonel-magyarorszag-tovabb-gyorsulhat-a-novekedes-539079
VI Installed capacity of solar plants was 1933 MW at 1st April 2022, while capacity in the residential sector was 1124 MW at 31 December 2021. https://www.portfolio.hu/uzlet/20220412/napenergia-oriasi-merfoldkonel-magyarorszag-tovabb-gyorsulhat-a-novekedes-539079
VII The decree does not ban the construction of new wind power plants but sets 12,000 metres as the required distance between wind power plants and inhabited areas. https://net.jogtar.hu/jogszabaly?docid=A1600277.KOR&timeshift=20160923&txtreferer=00000001.txt

Reach energy independence and at the same time increase Hungary's climate targets:

- Radically decrease CO_2 emissions to meet the EU's and Paris climate agreement's targets (at least 65% reduction compared to the 1990 levels).
- Gradually replace our current fossil gas usage with renewables and get independent of Russian gas by next winter.
- Close Mátra Power Plant, operated by coal, by the end of 2025 at the latest, when its licences expire and provide training for its workers in renewable and energy efficiency sectors.
- Do not allocate a budget for new nuclear power plants, such as Paks II, which is reliant on imported nuclear fuel.
- Protect our forests from clearcutting and replace wood-burning with other heating solutions that are climate and biodiversity friendly.
- Governments should encourage (financial incentives) and financially support solar energy developments regarding both power plants and residential sectors significantly.
- Change regulation that currently makes it impossible to build wind farms, and utilise wind energy much more than currently.

Reduce our carbon footprint by changes in our everyday lives:

- Introduce financial incentives, financial support, regulations, and potential penalty fees to prioritise energy saving and energy efficiency.
- Reduce speed limits in traffic (100 or 110 km/h on motorways instead of 130 km/h) to cut oil consumption.
- Encourage the use of public transport by introducing a cheap season ticket, which passengers could use for all public transport companies (MÁV, Volán, BKK, local transport companies).
- Introduce mandatory maximum temperatures for heating (20 degrees) and minimum temperatures for cooling (26 degrees) in public buildings (hospitals, schools, municipality and government buildings, etc.).

> *To achieve clean and real energy independence, it should be clearly communicated to the public that financing the Paks II project or further gas infrastructure development slows down Hungary's clean energy transition and risks the resilience of the country.*

RESEARCH DESIGN AND METHODOLOGY

3. Research design and methodology

Based on the policy analyses of key green issues presented in the previous section of this study, we designed a scheme for an in-depth qualitative research. We carried out six focus group discussions in cooperation with Závecz Research. We aimed to collect a diverse sample of participants to gain insights from small, middle-sized and big cities geographically spread across the country (western, central and eastern Hungary). The focus groups took place in five Hungarian cities (Budapest centre, Budapest suburbs, Szeged, Miskolc, Veszprém, Dunaújváros) between 3-7 October 2022. This study aims to answer the following research questions:

RQ1: How do Hungarians perceive the state of environmental protection in general and related to the examined green topics?

RQ2: Which green policies are Hungarians most and least open to?

RQ3: Which communication strategies are the most efficient in Hungary to advocate for green proposals?

We analysed focus groups following a pre-set structure to answer these questions. Two of the authors analysed all 6 focus group discussions and cross-validated each other. This analysis involved a summary of the discussions, collection of quotes from participants and a numeric evaluation of the differently framed messages' reception by the focus groups. The detailed description of our research questions and our empirical strategy can be found in the Annexes.

3.1. Communication frames

To test different communication strategies, we formulated communication panels for each examined subtopic based on four communication frames. These communication frames were based on two dimensions. The first dimension shows whether the message is more positive (and primarily focuses on the positive results of a proposed solution), or more negative (hence it focuses on the problem and the adverse effect of not acting). We developed a similar distinctive feature of our messages, namely whether they focus on tangible values (of short-term relevance) or symbolic values (more distant, both temporally and regarding level of abstraction). This second dimension of our communication frames was inspired by Ronald Inglehart's distinction between survival and self-expression values.[56] The dimensions and the four communication frames are presented in Table 10.

Economic benefits frames primarily address existential concerns and try to convince people that green policies would actually benefit household budgets (e.g. by creating new green jobs, reducing energy prices, saving money by changing our lifestyles). **Quality of life frames,** on the other hand,

TABLE 10: CONCEPTUAL DIMENSIONS OF THE ANALYSED COMMUNICATION FRAMES

	Positive (solution) frames	Negative (problem) frames
Tangible values (short-term factors)	Economic benefits	Harm
Symbolic values (long-term factors)	Quality of life (liveable future)	Anti-elite

highlight the possibility of a clean environment and a green future as a result of present action. The difference between the two negative (problem) frames is that **harm frames** focus on the imminent danger the given phenomenon carries for people (mostly directly), as opposed to **anti-elite frames,** which emphasise a moral injustice linked to the elites' (politicians, polluting companies, wealthy people) irresponsible behaviour and their role in environmental degradation. While the distinction between different frames is not always clear-cut (e.g. anti-elitist messages usually involve the presentation of "harm" to a certain extent, and economic benefits frames sometimes include positive impacts on the environment), the central part of the messages is characterised by the given communication frame.

3.2. Segmentation

The Talking Green in Europe[57] policy brief published by FEPS outlines the importance of targeting people outside the base of the green movement instead of "preaching to the choir". Engaging with people who are more concerned about their physical and financial security than other, seemingly distant issues like environmental protection is unavoidable in order to build a wide coalition. It is especially true in Hungary, where material issues (e.g. living costs, wages, healthcare, pensions etc.) have been leading the problem list of the society for several years. Therefore, we targeted those sociodemographic groups, which care less about post-material issues, but do not necessarily reject green proposals. Furthermore, we selected certain locations (both from western, central and eastern

TABLE 11: CHARACTERISTICS OF THE FOCUS GROUPS

Location	Socio-economic segmentation	Local experience of pollution
Budapest city centre	Urban people of mixed age and education level	• Air pollution due to traffic • Groundwater pollution • History of polluting heavy and light industry, chemical waste • Pollution of the Danube River
Szeged	Urban/suburban people of mixed age and education level	• Air pollution due to traffic • Pollution of the Tisza River
Budapest suburbs	Suburban/middle town young working class (younger than 40, secondary education)	• see: Budapest city centre
Miskolc	Middle town/rural young working class (younger than 40, secondary education)	• Air pollution due to industry • History of polluting heavy industry • Present ecological catastrophe of the Sajó River • Recent forest fire in the Bükk Hills
Veszprém	Middle-aged and old, middle town/rural conservatives (over 40)	• History of extensive mining and deforestation in the Bakony Hills and Balaton Uplands • 2010 red sludge disaster of Kolontár, Veszprém County
Dunaújváros	Middle town/rural, middle-aged and old working class (people with secondary education, over 30)	• Air pollution due to industry • History of polluting heavy industry • Pollution of the Danube River

Note: All participants belonged to middle class/lower middle class (based on their self-identification)

Hungary) for the focus groups, where communities have the experience or history of local pollution and environmental degradation (Table 11). Pre-selection of the focus group members was based on a questionnaire applicants filled in. Besides the selection criteria described above, both strong and uncertain climate change deniers and those who showed no interest in environmental protection were excluded from the focus groups. We assumed that these people do not belong to the target groups of possible future green campaigns. Furthermore, we did not want climate change deniers and strong critics of the green thought to disrupt the dynamics of the focus group discussions.

> *Engaging with people who are more concerned about their physical and financial security than other, seemingly distant issues like environmental protection is unavoidable in order to build a wide coalition.*

HOW TO COMMUNICATE GREEN POLICIES? RESULTS FROM QUALITATIVE RESEARCH

4. How to communicate green policies? Results from qualitative research

In this chapter, the lessons of the six focus group discussions are presented. The aim of this research was, to gain a deeper understanding of individuals' attitudes towards the environmental issues and the proposed policy recommendations outlined in Chapter 2, as well as to examine various green communication narratives. Within each thematic section, we start with introducing the local perception of the given environmental issue. Following this, an evaluation of policy proposals and messages relevant to the given subtopics is presented. Each chapter concludes with a summary of the key takeaways and recommendations for green communication.

4.1. How to communicate about air pollution?

Local perception of the problem

At the beginning of the focus group discussions, we asked the members of the group what they considered to be the biggest local environmental problem. All but one group spontaneously mentioned some form of air pollution. In the two medium-sized industrial cities, Miskolc and Dunaújváros, the air pollution from factories was primarily brought up.

Air pollution was considered the most serious problem in Dunaújváros, where the city's ironworks plant was blamed for it. They said that they "do not ensure the requirements that would be important for the city", such as putting the necessary filters on chimneys. They also said that due to air pollution, there is a need for constant dusting and that cars should be washed daily. In Dunaújváros, people thought that the solution would be to install air filters on the chimneys of the ironworks, while in Miskolc it was said that it would be worth moving the factories several kilometres outside the city.

Only in Veszprém air pollution was not spontaneously mentioned as one of the most important local environmental problems. People in this group said that air pollution is not as serious in Veszprém as in other cities. However, when asked about local air pollution, Veszprém residents mentioned pollution from factories and increased traffic.

> *"10-20 years ago, [the traffic in] the city centre did not look like the traffic in Budapest. Now it does. (Veszprém)"*

Significant car traffic was also reported in the Budapest centre, Budapest suburbs, Szeged and Dunaújváros groups. In Budapest centre, the poor quality of the car fleet was highlighted, as well as the problem of unnecessary car use: "many people even drive to the grocery store". The Budapest group believed that the completion of the M0 bypass and the renovation of the underground railway system (M3 metro line) could significantly reduce traffic congestion and car-made smog in the city.

Several groups reported on the serious health problems caused by air pollution at a local level. Air pollution-related diseases were most often reported in Dunaújváros. Participants in this group mentioned the high incidence of cancers in the city, which they linked to emissions from the ironworks. It is striking that half of the group reported that their children have some kind of respiratory disease (asthma, croup). In Budapest, it was mentioned that it is not worth cycling on the boulevard, as it is highly unhealthy. In Szeged, smog from cars was mentioned as a problem, and some complained about the health effects of air pollution, while others said that air pollution is not a big problem in the city as there are no polluting factories. It is surprising that air pollution in Szeged is not perceived as a very serious problem, despite the fact that the city (similarly to Miskolc) is measured to have exceptionally high levels of air pollution.[58]

> *My little boy is one and a half years old and he has croup. And the doctor's response was: 'Oh mommy, don't worry, there are a lot of kids in town with croup!' (Dunaújváros)*

Evaluation of policy proposals

In relation to air pollution, we have listed three major themes of policy recommendations for our research participants: the green transition of personal transport, the green transition of industry and freight transport, and household air pollution.

Regarding the green transition of personal transport, the participants of our research were rather sceptical. Across all groups, the majority rejected bans and negative incentives (fines for polluting cars, banning them from cities, traffic diversion, speed limits on motorways). In Miskolc, it was said that "we should not be penalised for this, but for example if someone littered". A recurring view was that the replacement of polluting cars could be achieved if people were given financial support to this end.

> *This has been introduced in Western Europe, but in Hungary people cannot afford to replace their old cars. (Veszprém)*

Electric vehicles (EVs) do not enjoy unanimous support. There was a recurring view that these cars are not necessarily less polluting than conventional vehicles (battery production is harmful, electricity comes from fossil fuels). Other objections to EVs were that electricity is more expensive, the infrastructure is not ready for this technology, and these cars are less viable options for long journeys.

> *Electric cars' battery demand and their replacement is much more polluting than CO_2 emissions, it just doesn't pollute locally. (Szeged)*

The development and green upgrading of public transport is the most widely supported direction for the green shift in passenger transport. It was mentioned in several groups that there is no alternative to driving cars because of the scarcity of bus services (especially when it comes to suburban transport in Budapest), and many also pointed out that public transport takes much longer and it is less convenient. In Budapest and Szeged, objections were expressed to cycling on urban roads and new cycle lanes. However, the development of public transport is seen as a good policy in all groups.

> *You cannot make an ageing society adapt to cycling. Szeged is trying, but I don't like the idea of cyclists being squeezed between cars. It's dangerous. I would support it, but not like this. (Szeged)*

Across all groups, they were much more positive about the green transformation of industry and freight transport than about the transformation of passenger transport. This is linked to the fact that many people see industry and freight transport as the main sources of air pollution, rather than individuals and people with cars. The proposal to shift freight transport to rail received strong support in the majority of the groups. The proposal for bicycle freight transport was mostly laughed at and considered frivolous in all focus groups. The popularity of rail and the ridicule of cargo bicycles indicate that, in essence, participants could imagine greening long-distance freight transport, while changing intra-city transport was not considered realistic.

> *I would watch someone trying to bring a couple of pallets of Coke into a Penny store on a bicycle (…) It works for Foodpanda [food delivery company], otherwise it doesn't. (Veszprém)*

There were conflicting views on proposals to reduce household air pollution. The issue of burning grass and garden waste was of concern to small town groups. People disagreed with the proposal in Veszprém, while the issue was a matter of debate in Dunaújváros. Opponents of the proposal pointed out that they could not compost all garden waste and that they did not receive adequate assistance in the removal of green waste. Many people thought that it is a huge problem that people heat with their waste, and several said they feel suffocated because of people burning their rubbish (in Dunaújváros and Érd). However, not everyone agreed with the idea of fines. Random police checks on household's heating systems aroused strong feelings of resentment and reminded some people in the Budapest groups of bad historical events.

> *It's very disgusting. We are a country of housekeepers. Every day my neighbour would report me. Do you want the '50s back? That the AVH [communist secret police] would take someone away because they burned something? (Budapest suburbs)*

> *I have a very bad feeling about the police going into homes to carry out random inspections. It makes me think that this is the Gestapo. (Budapest)*

In almost all groups, it was stressed that residential air pollution is a problem linked to poverty, so the solution is not to punish people but to support them in modernising their heating. Many highlighted that most households cannot make the green transition on their own, and that public pre-financing of these investments was considered a very good idea.

> *But as long as people don't have money, they'll heat with what they have. Especially while the economy remains like this, people will not choose to freeze. (Dunaújváros)*

Evaluation of communication frames

We also asked the groups to evaluate different messages related to air pollution reduction in passenger transport, industry and freight transport and households. These panels were formulated

TABLE 12: MESSAGES ON AIR POLLUTION TESTED IN THE FOCUS GROUPS

	Economic benefits frame	Quality of life frame	Harm frame	Anti-elite frame
Green transition of personal transportation	Oil is going to be more and more expensive, that's why we need a green transition in transportation. After the green transition, transportation would not only be cleaner, but cheaper as well!	For a long, quality life, we must give up polluting vehicles. It provides us with a healthier environment and also addresses climate change as we phase out fossil fuels by phasing out polluting vehicles.	Smog hurts both our health and our climate! We will pay a high price, if we don't stand up to car-made air pollution!	Making transport green would be easy if politicians and corporations, and also the privileged (e.g. people with SUVs) did their part!
Green transition of the industry and freight transport	Green transition of the economy (carbon neutral freight transport and energy production) would create new industries and boost the economy!	Clean air and healthy life outweigh short-term economic benefits.	Don't let polluting power plants and trucks make our children sick! Polluted air is more dangerous for their health than for adults.	Air polluting industries make profit on everyday people's health. It's not fair, we must stop it!
Household emission of air pollutants	Modernization of households' heating (energy efficient heating systems, renewable energy sources, e.g. installing solar panels) reduces utility costs and creates new jobs!	By helping people to modernize their heating, we help the whole community by eliminating household-made smog and at the same time mitigate the effects of climate change!	Those who heat with coal, wet wood or waste, do not only hurt themselves, but others' health as well. Breathing polluted air is just like passive smoking!	Energy companies and global powers prevented the modernization of Hungarian households' heating in order to sell people their gas, coal and wood! We should fight against the fossil fuel lobby!

based on the communication frames described earlier and are presented in Table 12.

The evaluation of each message is summarised in Table 13. Messages about green personal transport were the least popular. Several groups said they disliked these messages because they blamed drivers for air pollution, when they are not the real big polluters. In particular, many people rejected our green message saying that "after the green transition, transportation would not only be cleaner, but cheaper as well!" The role of household pollution was downplayed in several groups, but the messages on this were still better received by the focus group participants compared to the messages about transforming personal transport. Messages on the green transition of industry and freight transport were the most positively evaluated in the discussions.

> *"The world's largest container ships have the same emissions as all European cars. (Budapest suburbs)"*

> *"I'm not so convinced that if you heat properly with dried wood, it's such a big pollution. (Veszprém)"*

> *"Cars are not the cause of smog." (Dunaújváros)"*

Overall, the quality of life and harm frames proved to be the most popular frames within the air pollution topic. Many felt it was effective to link the problem to the health and future of children. This is shown by the fact that the slogan "Don't let polluting power plants and freight transport make our children sick" was positively received by the vast majority of groups (5 out of 6 groups). The Dunaújváros group could relate most personally to this message, where many participants reported that their children had respiratory illnesses. Many also resonated with the message that household air pollution is "like passive smoking". In this context, it was pointed out that "cigarette smoke is very palpable" (Budapest). Most groups liked the slogan saying that "clean air and healthy life outweigh short-term economic benefits". The message about the benefits of heating modernisation going beyond individual benefits ("By helping people to modernize their heating, we help the whole community…") was also generally well received.

The quality of life and harm frames, however, did not evoke enthusiasm when it came to the green

TABLE 13: EVALUATION OF MESSAGES ON AIR POLLUTION

	Economic benefits frame	Quality of life frame	Harm frame	Anti-elite frame	Total
Green transition of personal transportation	-4	1	0	5	5
Green transition of the industry and freight transport	1	5	3	3	12
Household emission of air pollutants	4	4	5	-3	10

The table summarises the "evaluation scores" for the messages of the six focus groups. During the analysis of each messages' evaluation by each focus group, we gave a score of +1 for predominantly supportive opinions, -1 for predominantly negative opinions and 0 for messages that received neutral evaluation. In some cases, we also coded a message's reception 0 if positive and negative reactions were balanced, hence it was "too close to call".

transition of personal transport. This was the only theme where anti-elitist framing proved to be particularly successful, with five out of six groups supporting the message "Making transport green would be easy if politicians and corporations, and also the privileged (e.g. people with SUVs) did their part!" This is also striking because in general, many people expressed strong objections to the anti-elitist messages. These communication panels were considered to be divisive, similar to war rhetoric and the Hungarian government's propaganda. The key to the positive reception of the anti-elitist message regarding the green shift in passenger transport may have been that it was not about stopping an enemy, but about positive change. Furthermore, on this issue, the majority of groups felt their own way of life and livelihood was threatened by a problem for which they did not feel responsible. In other words, while they rejected the demonisation of corporations and big powers in relation to air pollution, the majority could identify with the idea that big players, rather than small people, should take the main responsibility.

> *"The little man never likes to have things aimed at him. Because we are not in a position to do anything, it's up to the decision-makers to act." (Veszprém)*

> *"The population is fed up with scaremongering, the constant fight against everything." (Budapest)*

Messages highlighting economic benefits were rejected in relation to personal transport, while economic messages on the green transition of industry and freight transport were received neutrally, and the economic framing of reducing household air pollution was evaluated positively. In relation to transport, participants were negative on the economic messages because many did not think it credible that green transport would be cheaper. They also stressed that greening transport is important for the sake of protecting the environment and "not because oil is expensive" (Budapest). Regarding the transition of industry and freight transport, the focus group participants had mixed views on the messages about the economic benefits, as they disagreed about how much economic opportunity and how much risk the green transition would bring. However, they took it for granted that it pays off to modernise household heating.

> *"The green transition lifts some up, pushes some down. (Szeged)"*

Key takeaways

- People primarily linked air pollution to industry and freight transport. The problem is perceived to be worse in industrial cities. Among the elderly and those with children, more people think that smog is also seriously damaging their personal health and the health of their children.
- Accordingly, when it comes to addressing air pollution messages framed in terms of quality of life and harm seem to be the most effective.
- Household air pollution and heating with waste are perceived as a problem mainly in smaller cities and suburbs. The social dimension of the phenomenon is considered to be important and it is thought that financial support for energy modernization, rather than bans and controls, could be the main solution. Framing based on economic benefits also works well in this sub-topic.
- Electromobility faces serious societal constraints in Hungary. This is reflected in the poor reputation of electric cars, which are often considered to be more dangerous and even more polluting than conventional cars. Many people emphasize the importance of renewable or nuclear energy as a source of energy for electric vehicles. At the same time, it is not seen as a credible message that green transport would be cheaper.
- Regarding the green transition of personal transportation, people feel that green policy proposals affect their personal way of life and livelihood. As a result, it is difficult to communicate about these policies, but the kind of anti-elitist approach that promotes the responsibility of the big players rather than the "little people" appears to be effective.

- Among the anti-elitist messages, those portraying polluting industries, fossil lobbies and big powers as the enemy and calling for action against them work poorly. These messages often remind Hungarians of the government's populist rhetoric.

Recommendations for green communication

- It is important to build messages about reducing air pollution that emphasize the importance of clean air, the health impacts of smog and the responsibility of industry and freight transport. It is worth building communication campaigns at a local level aimed at modernizing polluting factories and power plants in industrial towns.

- The green shift in passenger transport should be based on a broad educational process to dispel misconceptions about electric cars and to provide examples of efficient alternative modes of transport (car-sharing applications, safe cycle paths). Green communication should build on the widespread demand for the development of public transport.

- Household air pollution should be approached with complex messages. It is important to draw attention to the fact that the phenomenon is fundamentally linked to (energy) poverty, but that the problem has serious health consequences and affects local communities collectively. It is important to stress that public support for heating modernization pays off for both the individual and the community.

4.2. How to communicate about plastic pollution?

Local perception of the problem

The second topic of the focus group discussions was plastic pollution. Participants were asked how the problem is related to climate change, who is responsible for tackling the situation, and to evaluate various policy solutions. Every group spontaneously mentioned the harmful effects of microplastics, and participants also linked the problem of plastic pollution to climate change or environmental protection.

They also highlighted the sometimes unnecessary packaging of products, the single-use nylon bags and plastic bottles, which they encounter in their daily lives, either on the shelves of supermarkets or thrown away at the side of the road.

> *"Nowadays everything is already portioned and shrink-wrapped because pre-packaged goods are much cheaper for companies."*
> *(Szeged)*

Many people felt that they could no longer buy many products without packaging in their everyday lives, and they thought that it was not not the consumers' or the shops' fault, but that of big businesses. In the outer and inner districts of Budapest and in Dunaújváros, inadequate waste management was cited as a problem, while the importance of education campaigns on selective waste collection was highlighted in Szeged. In Miskolc, Dunaújváros and Veszprém, plastic pollution in the seas and oceans was also raised as a global problem.

> *"As long as we don't have a waste management system that actually separates paper, municipal solid waste, etc., nothing will change."*
> *(Dunaújváros)*

Evaluation of policy proposals

On plastic pollution, participants were able to choose their most preferred policy solutions from three broad themes: regulating plastic production and packaging, regulating supermarkets and retailers, and improving waste management and recycling.

With regards to regulating plastic production and packaging, there was overwhelming support for the introduction of deposit schemes. Several groups highlighted the lack of returnable bottles, which worked well in previous years and have now been largely replaced by pet bottles. The responsibility companies bear for plastic pollution was also raised, as they believe that "it is not the supermarkets' fault that the product is packaged".

> *"If deposit fees are working on beer bottles, why not on everything else?"*
> *(Dunaújváros)*

In retail regulation, the standardisation of recycled packaging was also a popular proposal. In the Dunaújváros group, it was considered a good solution if the consumer were to pay a higher price for plastic bags available in shops, as alternatives were considered to be easily available (buying paper bags or bringing their own bags instead).

Most groups rejected punitive taxes on businesses. In Miskolc, Dunaújváros and the agglomeration of Budapest, participants stressed that the fines would eventually fall on consumers. They argued that companies should be encouraged positively to think about more environmentally friendly solutions. Instead of fines, participants suggested tax incentives to encourage product manufacturers and supermarkets to use recyclable packaging and deposit schemes.

> *"The penalty tax is completely unnecessary because it will put the burden on consumers and will not encourage them [companies]. (Dunaújváros)"*

On waste processing and recycling, participants supported the development of waste management in the public sphere and highlighted the importance

TABLE 14: MESSAGES ON PLASTIC POLLUTION TESTED IN THE FOCUS GROUPS

	Economic benefits of framing	Quality of life framing	Harm framing	Anti-elite framing
Regulating plastic production and packaging of products	Phasing out single-use plastics would open more doors for the economy than it would close as developing and running returnable packaging schemes provides many new jobs.	Everybody deserves a clean and healthy environment, that's why single-use plastic should be phased out from the economy and instead, we should use reusable packaging!	We are drowning in plastic litter. It affects both humans and their environment. It is time to stop single-use plastic production!	Greedy corporations produce a lot of unnecessary plastics, instead of using reusable packaging, which they see much less profitable. Stop them and ban single-use plastics!
Regulating retailers	Retailers should provide plastic-free products, so consumers should not pay extra for unnecessary packages in the price of a product.	The first step for a clean and green future is removing single-use plastic packages from the stores.	Packaging of everyday goods unnecessarily pollutes our environment, leading to the death of innocent animals and microplastic pollution, which can even hurt human health. These packages should be removed from the shelves of stores	Supermarkets pollute the environment and incentivize consumption with the plastic packaging of their products. The interest of humans and nature should be more important than providing profit for big corporations! The era of single-use plastics must end!
Waste management and developing recycling infrastructure	Recycling and reuse pay off if the government invests in them, as it boosts the economy and creates new green jobs.	We should invest in recycling and reuse of products and packaging for a clean environment and a liveable future for our grandchildren!	Without developing recycling and reuse, we will irreversibly destroy our ecosystem, ruin our living environment and pollute our drinking waters with plastic pollution.	Don't let politicians and economic interest groups stop the transition to a circular economy based on reuse and recycling

of information campaigns on local selective waste collection. In Miskolc and Szeged, the lack of proper waste processing is seen as a serious problem, while in Budapest the government is expected to introduce comprehensive waste management regulations. Penalty taxes were still generally dismissed, but the withdrawal of single-use plastics from the market was supported.

Raising public awareness and encouraging separate waste collection were also seen as important in reducing plastic waste pollution. In Veszprém and Miskolc, it was noted that the selective bins are not accessible to everyone, and in Szeged, participants said that people collect waste in vain, but the waste management system does not work properly.

> *"The problem is that when they take away the separated waste, they are pouring each bin together. At home, I wonder why I am collecting it separately when I see the garbage truck putting it together. (Budapest suburbs)"*

Evaluation of communication frames

As in the previous chapter, we have also composed different messages on plastic pollution related to each issue. The messages were framed in terms of economic benefits, harm, quality of life, and anti-elitism (Table 14). Participants were asked to choose which argument most effectively emphasized the severity of the problem.

As before, we coded and aggregated the ratings of each message (Table 15). Messages on improving waste processing and recycling were the most supported. However, in this area, the emphasis on economic benefits performed particularly poorly. The least supported economic message was the one that says "recycling and reuse pay off, if the government invests in them, as it boosts the economy and creates new green jobs." Many considered the promise of new jobs unrealistic, and pointed out that such an investment would cost a fortune for the state, which would only be recouped over decades.

> *"Green jobs can only be created if other [non-green] jobs disappear. (Veszprém)"*

TABLE 15: EVALUATION OF MESSAGES ON PLASTIC POLLUTION

	Economic benefits of framing	Quality of life framing	Harm framing	Anti-elite framing	Total
Regulating plastic production and packaging of products	2	4	3	-1	8
Regulating retailers	2	3	3	-2	6
Waste management and developing recycling infrastructure	0	4	5	2	11

The table summarises the "evaluation scores" for the messages of the six focus groups. During the analysis of each messages' evaluation by each focus group, we gave a score of +1 for predominantly supportive opinions, -1 for predominantly negative opinions and 0 for messages that received neutral evaluation. In some cases, we also coded a message's reception 0 if positive and negative reactions were balanced, hence it was "too close to call".

Out of all the different types of messages, arguments focusing on harm and quality of life were the most popular, which can be linked to fears of the harmful effects of microplastics. The harm framed message that says "without developing recycling and reuse, we will irreversibly destroy our ecosystem, ruin our living environment and pollute our drinking waters with plastic pollution" was particularly popular. Participants felt that the cleanness of their own living space was important, which is why highlighting the harmful effects of plastic pollution can be effective. The members in our focus groups also noted that they believe people respond positively to messages which emphasize the (not essentially economic) benefits of going green. This can be proven by the popularity of messages such as "everybody deserves a clean and healthy environment" or "we should invest in recycling and reuse of products and packaging for a clean environment and a liveable future for our grandchildren!" On the topic of waste management and recycling, the responsibility towards future generations was mentioned in Veszprém. "Our grandchildren learn from us", participants said.

> *"It is worrying, that according to recent studies, new-born babies already have [microplastics] in them. (Budapest)"*

Anti-elitist framing was not popular in the topics of plastic production and retailing, where the message blamed companies and retailers for the problem. In Dunaújváros and Veszprém, participants also stressed that they believed "it is not the supermarkets to blame for plastic, but the producer". They therefore do not see the retail chains as responsible for this problem and do not want to punish them.

> *"A company's job is to be profitable. Why should we expect factories to operate as a charity? (Szeged)"*

Messages emphasizing corporate responsibility e.g. "Profit-hungry companies produce a lot of unnecessary plastic..."; "Supermarkets are serious polluters..." - also triggered negative attitudes. Participants reject blaming companies, as they believe that they are driven by pure market logic therefore they need to be given a legal environment where it pays off to invest in recycling. On the issue of waste recycling, politicians and economic interest groups have been included in the anti-elitist message: "Don't let politicians and economic interest groups stop the transition to a circular economy based on reuse and recycling." This resulted a slightly more positive response, that is to say participants tended to believe that the solution to the problem lies in regulation, and therefore politicians have more responsibility.

Key takeaways

- People are sensing the global and the local effects of plastic pollution. Most of all, they fear microplastics, which have been mentioned spontaneously in all groups.
- PET bottles and nylon bags, as well as the unnecessary packaging of products in shops, are perceived as a problem in their daily lives. Therefore, they support the standardisation of deposit systems and recyclable packaging to make the environmentally friendly choice worthwhile for the consumer.
- However, our focus group participants are against the penalty taxes on companies, which they say would be passed on to consumers anyway. The groups argued that companies should be positively encouraged in green transition with tax reductions and other economic incentives.
- Several groups highlighted the problems of their local waste management system. Many of the participants felt that people would be willing to separate waste but they are often constrained by the infrastructure (e.g. not enough bins). An information campaign on the topic would help to promote a more conscious lifestyle.
- The groups surveyed were sceptical about the economic benefits of the green transition. They argued that green jobs can only be created if other jobs disappear, and the transition does not automatically ensure the need for new jobs.

Recommendations for green communication

- The issue of plastic pollution can be most effectively communicated to the Hungarian people through messages focusing on harm and quality of life. Society is very interested in how their local environment is affected by the harmful effects of plastic pollution. They are more receptive to messages that link problems to their daily lives.

- Anti-elitist messages only work against decision-makers. Hungarians are more forgiving with economic actors, they do not hold them responsible for the problems they face and do not believe regular people have any influence on their actions. Messages calling out the political elite are slightly more effective, but the majority of respondents took a more passive stance against anti-elite messages.

- For Hungarians, the benefits of the green transition, both at an individual and a global level, are of utmost importance. Messages that focus on the benefits are far more effective than blaming particular groups.

- There is a strong demand for information campaigns about waste management and recycling.

4.3. How to communicate about energy efficiency of buildings?

Local perception of the problem

Participants also gave their opinion on the energy efficiency investments of buildings. The focus group discussions showed that the topic is a personal one; people shared their own experiences with their homes. Many highlighted the rising energy prices, the need for proper insulation and the importance of passive solutions in buildings.

> *A large part of Hungarians lives in con dominiums and [Socialist-era] prefab panel blocks. For them, it is more difficult to find the money to renovate units.*
> *(Veszprém)*

Participants also highlighted that rural and urban residential properties face different problems in terms of energy efficiency. Upgrading ageing properties is a problem in all regions, but in condominiums it is often difficult to get adequate support from all the residents to apply for investment support, while common costs are rising at the same time. Respondents also mentioned the already existing renovation programmes.

> *In prefab panel blocks, older people in middle flats always vote down renovations because other residents are keeping them warm while the rest are freezing.*
> *(Miskolc)*

Most participants linked the issue of energy efficiency in buildings to climate change. In Budapest, they also mentioned that a lot more emissions are produced by an old-build home than by diesel cars on the roads. Many people complained about skyrocketing energy prices and highlighted the fact that a well-insulated property can save significantly on utility bills.

> *With the end of price fixing, the growing market prices of utility costs are falling on our heads all at once. Moreover, because of this, renovations that could have been done by now and would have saved us more money, have not been carried out.*[59]
> *(Budapest suburbs)*

Evaluation of policy proposals

On the topic of energy efficiency, two broad policy proposals were suggested to participants: financial support for individual households and businesses to improve the energy efficiency of buildings (e.g. energy efficient heating and cooling systems), and a major renovation programme for all buildings.

On the first issue, all groups supported legislation to encourage passive solutions. Financial support for households was also a popular suggestion, but most groups did not support penalty taxes on "energy wasters". Opinions were divided on the annual maintenance check of gas boilers.

At the launch of the large-scale renovation programme, many people referred to already existing support forms such as the family home creation subsidy (CSOK)[60] and the panel programme (renovation programme of Socialist-era, prefabricated panel blocks), which they said were not working properly. In Veszprém and Dunaújváros, participants noted that such renovation programmes already exist and therefore they do not see the need to introduce new ones.

Participants stressed the importance of state support, as old buildings are usually occupied by lower-class people who cannot afford to renovate their homes on their own. In Szeged, the role of municipalities was mentioned, but they said that due to government's budget cuts, local institutions do not have sufficient resources to support them.

> *"Since budget cuts, the municipalities have not had the money [to launch renovation programmes]. (Szeged)"*

> *"Why is it always only those who have 1-2-3 children who are supported? I can't even afford 3 million Hungarian Forint because my child is studying in Budapest and lives there, even though we wanted money to install solar panels. (Dunaújváros)"*

In Veszprém and Miskolc, it was noted that it is difficult to gather the support of the residents of the apartment buildings for energy-efficient investments. The participants therefore supported the idea of decreasing the share of votes necessary for a positive renovation decision in multifamily

TABLE 16: MESSAGES ON ENERGY EFFICIENCY OF BUILDINGS TESTED IN THE FOCUS GROUPS

	Economic benefits of framing	Quality of life framing	Harm framing	Anti-elite framing
Financially support individuals and businesses to effectively boost energy efficiency of buildings (e.g. energy-saving heating and cooling systems)	The current energy crisis made it clear that state-controlled energy prices can lead to energy waste that is harmful economically. However, state-supported energy efficiency investments would result in using less energy, which would lead to a permanent reduction of utility bills.	We can contribute to the fight against climate change and to our personal wellbeing as well by insulating our homes.	There is an energy and a climate crisis: saving energy has never been more important. So everybody who is still wasting energy should be punished!	The government should oblige industries, companies and the rich to invest in energy efficiency on their own. They waste the most energy so they should start saving it first.
Launch a large-scale renovation program for public buildings, block houses and other multi-family buildings	Large-scale renovation programmes would not only reduce the utility bills of everyday people and public institutions, but create thousands of new green jobs!	Large-scale renovation programmes are the best ways to save energy and save our future!	Everybody needs a heated home, but nobody needs an overheated Earth. Without properly insulating our buildings, we will make life on Earth unbearable by not only heating our homes, but also heating our planet	The government's energy policy has failed, and everyday people are punished by the increase of their homes' utility costs. If the government wants people to save energy, it should help them supporting their homes' insulation, replacement of windows and doors

buildings. Participants in Szeged and Miskolc supported information centres about available renovation programmes, while Budapest suburbs and Dunaújváros refused the proposal.

Evaluation of communication frames

As in the other chapters, messages on energy efficiency were framed in terms of harm, economic benefits, anti-elite and quality of life in each topic (Table 16).

According to our analysis (Table 17), the most effective communication strategy on energy efficiency was the emphasis on quality of life, highlighting the liveability of personal living space and the contribution to the fight against climate change. In messages about major renovation programmes, energy saving was linked to saving our future. People care about the integrity of their own environment and are sympathetic to the idea that they can do something for a global cause simply by protecting their homes. As with other frames, several groups highlighted that the most powerful messages are those that emphasise the individual benefits of people.

On economic benefits, there was again scepticism about how large-scale renovation programmes create green jobs. Participants did not understand what the term "permanent reduction of utility costs" referred to, and several groups explained that the concept of utility cost reduction had become too entwined with the failed policy of the government's price fixing. The term 'energy waste' was also not understood, as it was not clear who was wasting energy.

> *"[Green job creation] concerns skilled workers, such as electricians. They are already in a good occupation. (Budapest suburbs)"*

The harm frame was particularly unsuccessful on the topic of energy efficiency: "There is an energy and climate crisis: saving energy has never been more important. So everybody who is still wasting energy, should be punished!" The groups consistently rejected punishment on most issues, so it is not surprising that the message on this topic received a negative rating. Participants could not comprehend the notion of energy waste, some of them linked it to the government's unpopular measures (e.g. maximizing temperatures in public buildings) and felt that their personal freedom would be restricted by such an initiative.

> *"There was a climate conference a couple of years ago where everyone went with their private planes, and they had as many emissions as half of Hungary in a year. (Budapest suburbs)"*

TABLE 17: EVALUATION OF MESSAGES ON ENERGY EFFICIENCY OF BUILDINGS

	Economic benefits of framing	Quality of life framing	Harm framing	Anti-elite framing	Total
Financially support individuals and businesses to effectively boost energy efficiency of buildings (e.g. energy-saving heating and cooling systems)	3	4	-4	2	5
Launch a large-scale renovation program for public buildings, block houses and other multi-family buildings	0	2	1	3	6

The table summarises the "evaluation scores" for the messages of the six focus groups. During the analysis of each messages' evaluation by each focus group, we gave a score of +1 for predominantly supportive opinions, -1 for predominantly negative opinions and 0 for messages that received neutral evaluation. In some cases, we also coded a message's reception 0 if positive and negative reactions were balanced, hence it was "too close to call".

The anti-elitist framing of energy efficiency has proved to be ambivalent. While some groups emphasized that rich people should pay more, others saw this communication strategy as hostile. In Veszprém, they felt that average people like them were already saving money, while industries and companies are not, even though they are responsible for the majority of the emission. At the same time, they were also dismissive of the 'anti-rich narrative'. In Szeged, Budapest and the Budapest suburbs, the anti-elite framing was also divisive.

> *"Why do you think the rich waste the most? It's so stupid. I know rich people who live normally, and I know people who don't. (Budapest suburbs)"*

> *"We don't need more stadiums, we need insulation! (Budapest)"*

Key takeaways

- Energy efficiency in buildings is an issue that concerns everyone, which is why people are interested in policy proposals in this area. Respondents to our survey stress the importance of financial support. They also highlight that current home building and renovation programmes are not working properly or little information is available on them.

- The focus group participants support legislation that encourages passive solutions, but strongly oppose punitive taxes and fines. They associate the notion of energy waste and cutting utility bills with unsuccessful government policies, which has triggered negative attitudes among the groups.

- Hungarian society is extremely ambivalent towards the economic elite. Some people feel that the rich should pay more of the utility bills than an average person, while others believe that they should not be blamed for the problems that have occurred.

Recommendations for green communication

- The most effective way to get messages about energy efficiency across is to emphasize the effect on quality of life. Hungarians care about the safety and cleanliness of their environment, especially if it benefits them. It is important to show them that they are not only saving money, but also helping the planet.

- Framing the economic elite is not an effective communication strategy, as people are divided on who is responsible for the issue. Instead, messages urging policy makers to change legislation can be successful.

- New renovation programmes and energy investment subsidies should be introduced with broad information campaigns, which also highlight the disadvantages of the already existing subsidy system.

4.4. How to communicate about Hungary's energy mix?

Local perception of the problem

Our last focus group topic was the energy mix of Hungary. The discussions revealed that people are most concerned about the energy dependency of the country, which they see as a problem not only as a matter of fossil fuels but also for renewables. They argue that the installation of wind farms and solar panels would use technology and equipment from other countries, which they believe would also create an energy dependency. The groups identified the lack of renewables in the energy mix as a problem. They therefore supported energy diversification and the usage of more green energy. Several participants highlighted the lack of wind farms and solar panels in the country.

> *"Here in Veszprém the wind blows all the time. I don't understand why there shouldn't be wind farms here. When we go to Austria, all we see before Vienna is wind turbine after wind turbine. (Veszprém)"*

When it comes to nuclear energy, people are more concerned about the Russian influence than about the harmful effects of a nuclear power plant. Participants in Miskolc and Budapest believe that nuclear energy is not fundamentally harmful, but the Russian construction methods which are used at power plants in Mátra and Paks are not up to certain standards.

> *"It is so frustrating that Putin is shutting off the gas, then not shutting it. But even Paks II [new nuclear plant] is coming from the Russians. (Veszprém)"*

In Budapest and the capital's agglomeration, the government was to blame for the country's energy dependency, while in Szeged it was the international powers and the European Union, and in Miskolc they blamed fossil industries. The people in the Dunaújváros focus group believed that people are responsible for the problem. In the industrial towns of Miskolc and Dunaújváros, participants stressed the need for global cooperation to tackle the problem and for developed countries to support the green transition in developing countries. It shows that there is no clear consensus on who is responsible for the country's energy dependency, however, it was clear that research participants felt that an urgent change is necessary. Although the country's energy policy is a topic of recurring political debates, the diverging opinions suggest that there was no clear winner in the competition of narratives about the energy crisis.

Evaluation of policy proposals

On the topic of energy independence, all groups supported the introduction of green, renewable energy sources and the diversification of Hungary's energy mix. However, in Szeged and in the outskirts of Budapest, many people doubted the feasibility

TABLE 18: MESSAGES ON HUNGARY'S ENERGY MIX TESTED IN THE FOCUS GROUPS

	Economic benefits frame	Quality of life frame	Harm frame	Anti-elite frame
Reach energy independence by increasing Hungary's climate targets	Instead of expensive and unreliable foreign gas, we need cheap, Hungarian renewable energy!	Fighting climate change is key to have a safe, green future so efforts need to be made by all to reduce Hungary's CO_2 emissions to use less energy and boost renewable energy use.	There is a war and an energy crisis. We won't have enough energy or affordable energy and our future will be in danger, if we don't replace gas, oil and coal with renewables as soon as possible!	Climate change is primarily caused by the big companies and global powers. These very same interest groups hamper the transition to renewables and prevent radical cuts in energy use. This can't be allowed to continue, they must start acting responsibly to make things better for ordinary people!
Reduce our carbon footprint by incremental changes in our lifestyle	We can save money for ourselves and contribute to saving the planet by a few simple changes to our lifestyle!	Using less energy is the best way to protect our climate, which if we protect, it will protect our children!	If we, everyday people, won't reduce our energy use and carbon footprint, we'll have a very dark future.	Oil companies and rich people are primarily responsible for climate change, but they are making profit out of it, and encourage wasting energy so that they can get even richer. It is time to stop them and force them to save the planet!

of carbon neutrality and the green transition. Some argue that the current political climate and legislative environment is not up for the task, while others fear the financial impact of the green transition. In Dunaújváros, the participants highlighted the importance of financial support for families in the transition.

> *"We cannot turn off the gas pipelines overnight (Szeged)."*

In Szeged, participants linked energy dependency to fossil fuels: "as long as we are dependent on fossil fuels, we are dependent on imports, it could be beneficial if we also used renewables" (Szeged). They stressed, however, that the switchover cannot be achieved in the short term. Diversifying the energy mix will require significant resources and many years. It is noteworthy that the Miskolc group was the only one that was opposed to the shutdown of the nearby Mátra Power Plant - mainly pointing out that the plant employs many people who would not be easy to retrain.

Our second set of policies introduced changes in people's everyday lives in order to reduce their carbon footprints. All groups supported proposals to improve public transport, with a focus on cheap and accessible public transport passes for everyone. In Dunaújváros and Veszprém, participants highlighted the need of improvement in infrastructure, as bus delays are common, and several places are not accessible by public transport. Many people would gladly travel by public transport, but instead they choose their car because it's convenient, fast and cheaper: "If a bus ticket costs 500 Hungarian Forint and we travel as a group, I'll take the car" (Veszprém). Speed limits and maximizing household temperature proved to be the least popular suggestions. Based on the previous topics, Hungarians do not support solutions that reduce individual comfort levels.

Evaluation of communication frames

On the topic of the energy mix, we also framed our messages in four different ways, under two sub-themes: energy independence and lifestyle change (Table 18). In both areas, the economic benefits frame has been proven to be the most effective communication strategy (Table 19), with messages on reducing our carbon footprint: "We can save money for ourselves and contribute to saving the planet by a few simple changes in our lifestyle!" Unlike the other themes, the energy mix issue emphasized individual savings rather than overall state economic benefits. This communication strategy proved to not

TABLE 19: EVALUATION OF MESSAGES ON HUNGARY'S ENERGY MIX

	Economic benefits framing	Quality of life framing	Harm framing	Anti-elite framing	Total
Reach energy independence by increasing Hungary's climate targets	4	4	-1	0	7
Reduce our carbon footprint by incremental changes in our lifestyle	5	1	-1	-2	3

The table summarises the "evaluation scores" for the messages of the six focus groups. During the analysis of each messages' evaluation by each focus group, we gave a score of +1 for predominantly supportive opinions, -1 for predominantly negative opinions and 0 for messages that received neutral evaluation. In some cases, we also coded a message's reception 0 if positive and negative reactions were balanced, hence it was "too close to call".

only be more comprehensive but also more effective among participants. On the sub-theme of energy independence, we also highlighted cheap renewable energy and compared it to the cost of wood and gas. The popularity of the message confirmed once again that solutions that contribute to individual benefits and align with global climate goals at the same time resonate well with Hungarians.

> *"We should not talk about reducing comfort levels, but improving technology. (Veszprém)"*

The quality of life framing was also popular in the topic of energy independence, but did not perform well for lifestyle change. The former emphasized a safe and green future, the latter underlined the future of children. People don't like being told how much energy they can use, so the second message, which aimed at this, was perceived as a restriction on their personal freedom. There were some who stressed that their children's future was a too distant goal. They said that messages highlighting direct consequences are more effective.

Both harm and anti-elitist framing have performed poorly on the energy mix. In the former, the message which included war elicited explicitly negative emotions from people. Some linked it to the government's communication slogans, while others noted that they believe the current war has little to do with current energy prices and that government policies are more responsible for rising utility bills.

> *"Even when people in Yugoslavia were killing each other, there was no war crisis here. Bombs were hitting 30 kilometres away from us. (…) Somewhere 1,800 kilometres away from us, people are at war but, that's not what's driving up energy prices. It puts the icing on the cake, but energy prices have been rising for a very long time. (Szeged)"*

Our anti-elitist framing has primarily blamed corporations and global economic interest groups for the problems that have arisen, but this failed to resonate with people. Many felt that ordinary people have no say in how a company is operated. In Szeged, participants held the oil lobby responsible for energy dependency, but did not think they could stop it. In Dunaújváros, on the other hand, it was pointed out that "if companies were encouraged to change, average people would change quicker".

> *"We, as ordinary people, have no saying in the businesses of global superpowers. (Szeged)"*

Key takeaways

- The majority of our focus group members support the diversification of Hungary's energy mix and the expansion of renewable, green energy. They are, however, sceptical about the feasibility of increasing climate targets and the reality of green transition, as they believe that this would entail significant costs.
- Regarding the green transition, they call for financial support for families so that lower-class people could also afford the costs.
- Only the group in Miskolc, which is close to the Mátra Power Plant, voiced objections to the proposed shutdown of the facility.
- Hungarians consider it important to achieve energy independence, and do not want to expose the country to fossil fuel exporters or foreign solar or wind power companies.
- Although the participants feel the responsibility of the oil industry and economic interest groups for energy dependence and emissions, they believe that ordinary people cannot influence their actions.

Recommendations for green communication

- As with most of the previous topics, messages focusing on personal benefits resonate most with people about the energy mix. Saving money with renewable energy and burning bills with expensive wood and gas proved to be powerful messages.
- It is important to emphasize the benefits of energy independence, indicating that by switching to renewable energy we reduce our exposure to energy imports from neighbouring countries.
- People doubt the feasibility of a green transition. It would be effective to communicate messages which illustrate how much more fossil fuels cost the economy, compared to supporting the public in the transition.
- Information campaigns needed to raise people's awareness of renewable energies and explain the harmful effects of nuclear and fossil fuels.

> *People don't like being told how much energy they can use, so the second message, which aimed at this, was perceived as a restriction on their personal freedom.*

OVERALL ASSESSMENT OF GREEN COMMUNICATION STRATEGIES

5. Overall assessment of green communication strategies

The four environmental topics, ten policy orientations and 40 messages discussed by the six focus groups enabled us to carry out a comparative analysis across themes. This aimed to draw general lessons for green communication in Hungary. In this chapter, we seek to provide evidence-based answers to the following three questions.

1 ***What to talk about?*** *More precisely, what could be the most attractive topics for campaigns of progressive parties and civil society in Hungary?*

2 ***How to communicate?*** *What communication frames might work in general, and specifically for different green issues and for different target groups?*

3 ***What are the best and worst messages?*** *What are the specific messages and phrases that work well and what are the ones to avoid in green communication?*

5.1. What to talk about? Evaluation of different green policies

A common point in the evaluation of policies on the different topics was that the majority of our research participants tended to reject negative incentives, penalties and controls – regardless of whether they affect the general public, industry or retailers. A recurring view was that measures to penalise economic actors would ultimately be paid for by ordinary people, as punitive taxes would be passed on to consumers by companies anyway. There is more support for systemic reforms, regulatory change and the use of new technologies as opposed to penalties, but many are sceptical about the feasibility of such measures.

A key factor in the reception of any green measures, particularly in smaller cities, was how much individuals felt their individual livelihoods were threatened. This is not only reflected in the rejection of penalties, but that many people feel that ordinary people cannot afford to take personal responsibility (e.g. buying an electric car, installing solar panels). The policies that provide support to individuals during the green transition turned out to be the most popular.

We also summarised the numeric evaluation of the messages we tested. While this is not a perfect measure of which theme engaged participants the most, it does give us an idea of how each sub-topic was received in terms of the response to our policy-related communication panels. Overall, the messages that received the most positive ratings were those related to the green transition of industry and freight transport, improving waste management and recycling, and reducing household-made air pollution (Figure 1). Regarding these issues, the focus group participants felt close to the problems and saw the solutions as feasible, not burdensome for the individual and paying off. Our qualitative research confirmed that Hungarians' top environmental concerns are air pollution and plastic pollution, which aligns with the results of previous public opinion polls. Regarding these problems, participants were particularly concerned about the harmful effects of microplastics on health and the impact of smog on health in general and on children's health in particular. These specific threats are worth to be addressed in future green campaigns.

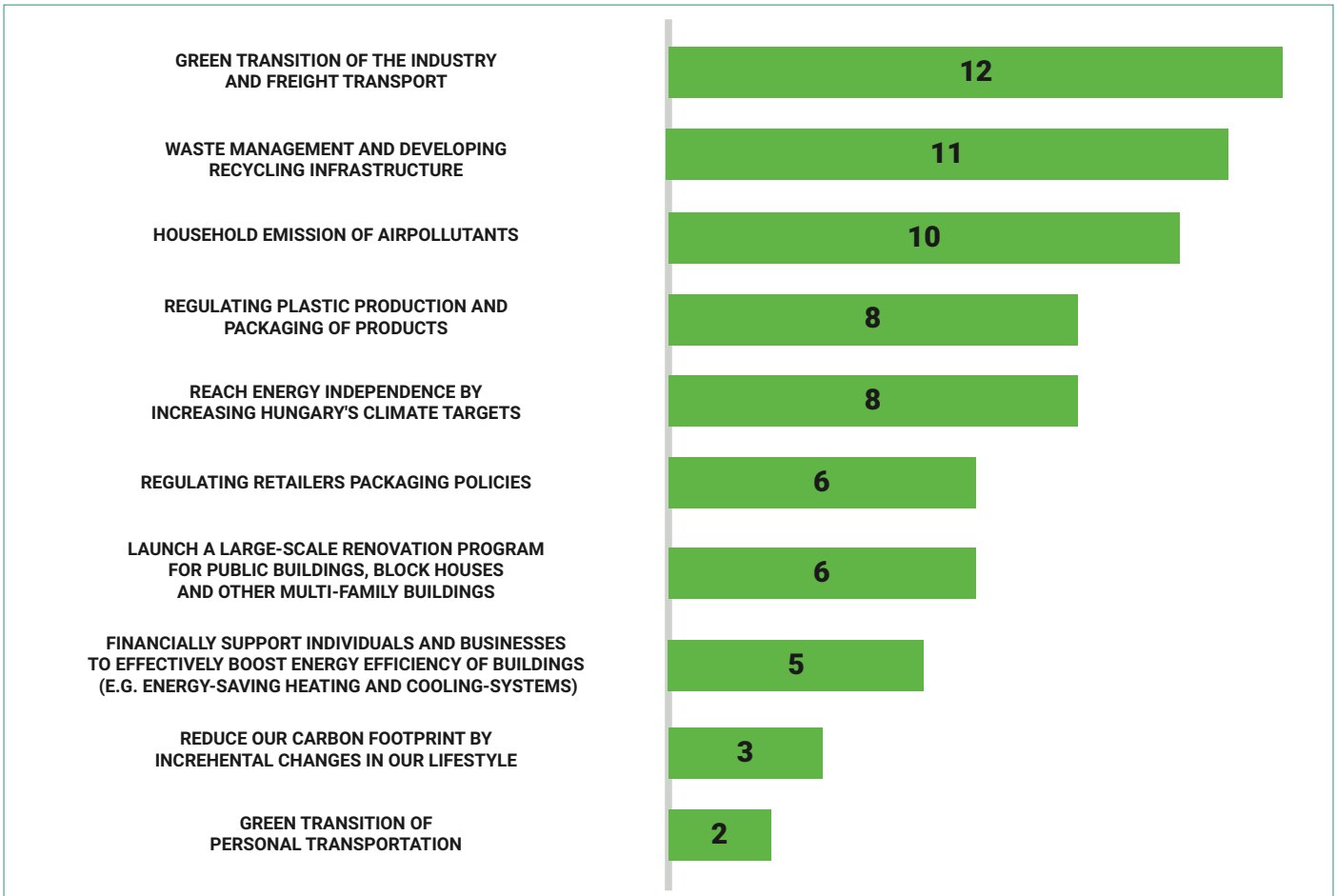
It is clear that messages promoting lifestyle changes to reduce our carbon footprint and the green transition in personal transport were the least effective. These were the messages that participants felt most threatened by in relation to their personal lifestyle and financial situation. A recurring view was that individuals' own emissions are minimal, especially compared to the emission of the big players, so the research participants did not see why they should be the ones who take responsibility. Another recurring argument against replacing conventional cars was that electric vehicles are expensive, dangerous, the infrastructure is not ready, and they may not

actually be less polluting. Other alternative means of transport were not particularly popular either, with the impracticality and infrequency of public transport and the dangers of cycling in the city being repeatedly mentioned. In other words, the emphasis on individual responsibility and greening of transport are not likely to be the basis for successful campaigns, and policies perceived as "anti-car" are not appreciated either.

5.2. How to talk? Assessment of communication frames

In each of the six focus group discussions, respondents rated 40 different messages. As we formulated 10-10 messages with each framing, we were able to compare what the most popular frames were in general and within each topic (Table 20). The table below summarises our numerical scores for the messages we coded for each frame, and mean scores for each of the overarching topics.[61]

It is clear that quality of life messages were generally very popular. These were the slogans and arguments that linked the importance of solving specific environmental problems to personal health, a clean environment and ensuring a liveable future. This framing worked exceptionally well in almost all thematic areas compared to the other frames – the only area where economic framing was more effective was the energy mix of Hungary. The message "Clean air and healthy living are more important than short-term economic benefits" was particularly popular (five out of six groups responded positively). The wide popularity of messages



The figure summarises the "evaluation scores" of the six focus groups for the differently framed messages belonging to the same sub-topic. During the analysis of each messages' evaluation by each focus group, we gave a score of +1 for predominantly supportive opinions, -1 for predominantly negative opinions and 0 for messages that received neutral evaluation. In some cases, we also coded a message's reception 0 if positive and negative reactions were balanced, hence it was "too close to call".

emphasising quality of life and a liveable future can be explained by the assumption that many people have already encountered this type of communication. Statements framed in terms of quality of life were often seen by participants as a general truth that 'everybody knows', and therefore few challenged these messages' validity. In addition to a generally positive assessment, however, a number of critical comments were made about these communication panels. Many felt that the "quality of life" messages were "tepid" and "vague" and lacked specifics on solutions. It was also said that saving the distant future is not motivating enough and that these messages should be brought closer to the people, stressing that we can already experience the positive effects of environmental protection in the present. Not everyone agreed with this criticism - some resonated well with the emphasis of responsibility towards future generations ("our grandchildren").

> *"Honestly, are we building the future for ourselves now? I'm over 60, I don't care what happens in the next 10 years, if I live to see it (…) What matters is the next 50 years and how much change it will bring, so that my grandchildren, my great-grandchildren can say 'wow, what a great, golden life we have!'"*
> *(Budapest)*

> *"One can appreciate a closer goal more than the future of our grandchild. That's a bit more elusive. What I'll be able to feel first-hand in ten years' time is more inspiring."*
> *(Szeged)*

The messages emphasising the economic benefits of green initiatives proved to be more divisive among research participants. These messages were judged to be the worst on the topic of air pollution, while communication panels highlighting economic benefits worked best on the topic of Hungary's energy mix. Most groups agreed that economic benefits were the easiest way to influence people, but many of these messages were not considered credible. Many were sceptical about the potential of the green transition to boost the economy and create new jobs. This is shown by the rejection of the message (in four out of six groups) that "after the green transition, transportation would not only be cleaner, but cheaper as well". At the same time, the economic framing was effective in the topics of achieving energy independence, reducing our carbon footprints and modernising household heating. In other words, people believed that the above mentioned green measures would pay off financially for the individual and the country. A particularly popular message (supported by five out of six groups) was that "We can save money for ourselves and contribute to saving the planet by a few simple changes in our lifestyle!"

TABLE 20: EVALUATION OF COMMUNICATION FRAMES BY GREEN TOPICS

		Economic benefits frame	Quality of life frame	Harm frame	Anti-elite frame
Mean points	Air pollution	0,3	3,3	2,7	1,7
	Plastic waste	1,3	3,7	3,7	-0,3
	Energy efficiency of buildings	1,5	3,0	-1,5	2,5
	Energy mix	4,5	2,5	-1,0	-0,5
Total points		**17**	**32**	**14**	**8**

The table presents the mean of the "evaluation scores" of messages of a given frame belonging to the same topic and the aggregation of the "evaluation scores" of all messages belonging to the same topic.
During the analysis of each messages' evaluation by each focus group, we gave a score of +1 for predominantly supportive opinions, -1 for predominantly negative opinions and 0 for messages that received neutral evaluation. In some cases, we also coded a message's reception 0 if positive and negative reactions were balanced, hence it was "too close to call".

> *Think about the industrial revolution, jobs were lost then too. Maybe the green transition would create new jobs, but that wouldn't be tomorrow.*
> *(Miskolc)*

> *People will always get the message when it's about [a proposal] not costing them too much and benefiting them.*
> *(Dunaújváros)*

Messages emphasising harms worked somewhat less well than arguments about economic benefits. On the energy efficiency of buildings and the country's energy mix, the messages stressing harms were neutrally or negatively perceived. Participants saw it as unnecessary scaremongering to use the current Russian-Ukrainian war, the energy crisis and the climate crisis as arguments for the need forenergy measures. However, stressing the harms of air pollution and especially plastic pollution proved to be effective. Two communication panels particularly appealed to the participants (five out of six groups): the slogan that stated that "Breathing polluted air is just like passive smoking!" in relation to household-made air pollution, and the message that justified the recycling of plastics by saying that without it, "we will irreversibly destroy our ecosystem, ruin our living environment and pollute our drinking waters with plastic pollution". There was an exception within the topic of air pollution: harm framing did not work for the sub-topic of transition of personal transportation, as people often considered the health-damaging smog as a phenomenon unrelated to car traffic.

TABLE 21: EVALUATION OF COMMUNICATION FRAMES BY FOCUS GROUPS

	Economic benefits frame	Quality of life frame	Harm frame	Anti-elite frame
Budapest city center (urban, mixed age and education level)	3	4	0	1
Szeged (urban/suburban, mixed age and education level)	3	7	2	-4
Budapest suburbs (suburban/middle town, young people with secondary education, under 40)	7	7	1	-2
Miskolc (industrial middle town, young people with secondary education, under 40)	2	6	3	2
Veszprém (middle town/rural, middle-aged and old conservatives, over 40)	-1	3	5	6
Dunaújváros (industrial middle town/rural, middle-aged and old people with secondary education, over 30)	3	5	3	5
Standard deviation	**2,56**	**1,63**	**1,75**	**3,88**
Total	**17**	**32**	**14**	**8**

The table presents the "evaluation scores" for the messages belonging to the same communication frames. Aggregation by focus groups, standard deviation of these cross-group aggregation, and total aggregation are presented. During the analysis of each messages' evaluation by each focus group, we gave a score of +1 for predominantly supportive opinions, -1 for predominantly negative opinions and 0 for messages that received neutral evaluation. In some cases, we also coded a message's reception 0 if positive and negative reactions were balanced, hence it was "too close to call". All participants belonged to middle class/lower middle class (based on their self-identification).

> *There are very shocking films for example about animal cruelty. When you see something concrete that happened not a hundred million miles away, but in a Hungarian company, that's when you start thinking… (Budapest suburbs)*

Anti-elitist communication proved to be the least effective framing of green messages. These messages were thought by many to be based on an unnecessary inflammatory incitement to deflect blame. Research participants often associated green messages with an anti-elitist framing with communication panels of the Hungarian government's propaganda. An important finding of this research is that we gained a more nuanced understanding of participants' perceptions of different elite groups. Many acknowledged that there is polluting big business, but it was often suggested that the responsibility lies with regulators rather than business. The narrative of 'profit-hungry corporations' making money out of plastic pollution and the climate crisis was proven to be mostly ineffective. On this point, many have pointed out that profit is not a bad thing, but a natural part of market competition. Messages emphasising the responsibility of the wealthy were considered to be 'anti-rich' and were also rejected in the focus groups. Panels highlighting the responsibility of politicians worked somewhat better. Anti-elitist messages on energy efficiency in buildings and air pollution had limited success. The communication panel that "the government's energy policy has failed, and everyday people are punished by the increase of their homes' utility costs" was positively received in half of the focus groups. Furthermore, half of the groups agreed that "air polluting industries make profit on everyday people's health". The most popular anti-elite message was (5 out of 6 groups supported) the following: "Making transport green would be easy if politicians and corporations, and also the privileged (e.g. people with SUVs) did their part!"

TABLE 22: THE LEAST POPULAR MESSAGES

Economic benefits frame	Harm frame	Anti-elite frame
• Oil is going to be more and more expensive, that's why we need a green transition in transportation. After the green transition, transportation would not only be cleaner, but cheaper as well! (-4 points)	• There is a war and an energy crisis. We won't have enough energy or affordable energy and our future will be in danger, if we don't replace gas, oil and coal with renewables as soon as possible! (-1 point) • If we, everyday people, won't reduce our energy use and carbon footprint, we'll have a very dark future. (-1 point) • There is an energy and climate crisis: saving energy has never been more important. So everybody who is still wasting energy, should be penalised! (-4 points)	• Greedy corporations produce a lot of unnecessary plastics, instead of using reusable packaging, which they see much less profitable. Stop them and ban single-use plastics! (-1 point) • Supermarkets pollute the environment and incentivize consumption with the plastic packaging of their products. The interest of humans and nature should be more important than providing profit for big corporations! The era of single-use plastics must end! (-2 points) • Oil companies and rich people are primarily responsible for climate change, but they are making profit out of it, and encourage wasting energy so that they can get even richer. It is time to stop them and force them to save the planet! (-2 points) • Energy companies and global powers prevented the modernization of Hungarian households' heating in order to sell people their gas, coal and wood! We should fight against the fossil fuel lobby! (-3 points)

> *The problem is that the word 'war' is used very incorrectly in Hungarian politics. War against Brussels, war against migrants, war against everyone. Whereas war doesn't mean that, it means that people kill each other. (Szeged)*

> *It is not the same whether we are talking about Joe, the successful entrepreneur down the street, or the Saudi king. (Veszprém)*

We also aggregated the perceptions of the differently framed messages by focus groups (Table 21), which allowed us to explore whether there were differences between groups by geography and socio-demographic characteristics. It is clear that the biggest differences were in the assessment of anti-elitist messages. In two urban/suburban groups (Szeged and Budapest suburbs), anti-elitist messages were typically rejected. In contrast, in two small-town groups with members of older age groups (Veszprém and Dunaújváros), participants in our research were mostly open to anti-elitist framing. Messages on economic benefits tended to perform better in the urban groups, while harm-centred panels tended to perform better in the smaller town groups. However, it is important to highlight that there were smaller differences between groups regarding the evaluation of these frames compared to the reception of anti-elitist messages. Reactions to the quality of life framing varied the least between groups and was the only communication style that was rated rather positively across all groups.

Although we did not measure the partisan preferences, we selected participants who self-identified as conservatives in one focus group (Veszprém). This group (middle-aged and elderly small-town conservatives) showed a unique pattern in several respects. In this group, it was a dominant view that heated, strong messages were needed. This is also reflected in that "economic benefits messages" were the least popular in Veszprém, while "anti-elitist" and "harm messages" were the most positively received in this group.

From the 40 messages tested in the focus groups, we selected the least liked (Table 23) and the most popular ones (Table 22). For the popular messages, several common words indicate a positive tone (clean, renewable, healthy) and climate change is a recurring phrase. This essentially reflects the fact that the most popular messages are framed as highlighting the quality of life. For unpopular messages, the most striking pattern is the very frequent use of the word energy and its various forms (energy waste, energy crisis, energy use) and the recurring element of fossil fuels (coal, gas).

> *For the popular messages, several common words indicate a positive tone (clean, renewable, healthy) and climate change is a recurring phrase. This essentially reflects the fact that the most popular messages are framed as highlighting the quality of life.*

Three of the unpopular messages were framed in a harm frame, raising awareness on the Russia-Ukraine war, the energy crisis and the climate crisis. Four of the anti-elitist messages were poorly received. The common characteristic of these messages was that they emphasised some form of corporate responsibility (for plastic pollution and climate change). The distribution of popular messages across frames was more even, with each of the frames producing messages that appealed to the majority of people in the majority of groups (Table 23).

TABLE 23: THE MOST POPULAR MESSAGES

Economic benefits frame	Quality of life frame
• We can save money for ourselves and contribute to saving the planet by a few simple changes in our lifestyle! (5 points) • Modernization of household heating (energy efficient heating systems, renewable energy sources, e.g. installing solar panels) reduces utility costs and creates new jobs! (4 points) • Instead of expensive and unreliable foreign gas, we need cheap, Hungarian renewable energy! (4 points) • The current energy crisis made it clear that state controlled energy prices can lead to energy waste that is harmful economically. However, state-supported energy efficiency investments would result in using less energy, which would lead to a permanent reduction of utility bills (3 points)	• Clean air and healthy life outweigh short-term economic benefits. (5 points) • By helping people to modernize their heating, we help the whole community by eliminating household-made smog and mitigate the effects of climate change! (4 points) • Everybody deserves a clean and healthy environment, that's why single-use plastic should be phased out from the economy and instead, we should use reusable packaging! (4 points) • We should invest in recycling and reuse of products and packaging for a clean environment and a liveable future for our grandchildren! (4 points) • We can contribute to the fight against climate change as well as to our personal wellbeing by insulating our homes. (4 points) • Fighting climate change is key to have a safe, green future so efforts need to be made by all to reduce Hungary's CO_2 emissions to use less energy and boost renewable energy use. (4 points) • The first step towards a clean and green future is removing single-use plastic packages from the stores. (3 points)
Harm frame	**Anti-elite frame**
• Those who heat with coal, wet wood or waste, do not only hurt themselves, but others' health as well. Breathing polluted air is just like passive smoking! (5 points) • Without developing recycling and reuse, we will irreversibly destroy our ecosystem, ruin our living environment and pollute our drinking waters with plastic pollution. (5 points) • Don't let polluting power plants and trucks make our children sick! Polluted air is more dangerous for their health than for adults. (3 points) • We are drowning in plastic litter. It affects both humans and their environment. It is time to stop single-use plastic production! (3 points) • Packaging of everyday goods unnecessarily pollutes our environment leading to the death of innocent animals, and microplastic pollution can even hurt human health. These packages should be removed from the shelves of the stores. (3 points)	• Making transport green would be easy if politicians and corporations, and also the privileged (e.g. people with SUVs) did their part! (5 points) • Air polluting industries make profit on everyday people's health. It's not fair, we must stop it! (3 points) • The government's energy policy has failed, and everyday people are punished by the increase of their homes' utility costs. If the government wants people to save energy, it should help them by supporting their homes' insulation, replacement of windows and doors. (3 points)

GENERAL CONCLUSIONS AND RECOMMENDATIONS

6. General conclusions and recommendations

6.1. Research methods and goals

In our research, we analysed in detail four key environmental issues in Hungary. These were air pollution, plastic pollution, energy efficiency of buildings and Hungary's energy mix. To provide the basis for our research, we first conducted a detailed background analysis on these topics. The global, European and Hungarian state of the problems were presented, and on this basis general guidelines and specific policy recommendations were formulated. These recommendations served as the basis for our qualitative focus group research.

The aim of our research was to explore everyday people's perceptions of the above mentioned green issues. We also tested the reception of green policy proposals and differently framed messages on green issues. Within each focus group, participants expressed their opinions on a total of ten sub-themes and forty different messages. For each set of policy proposals, messages were formulated using four different communication frames. These frames emphasised the economic benefits of green measures, their positive impact on quality of life, the harm caused by pollution and climate change, and the responsibility of elites.

Six focus group discussions were conducted in partnership with Závecz Research between 3-7 October in five cities in Hungary (Budapest city centre and suburbs, Szeged, Miskolc, Veszprém, Dunaújváros). Our research involved people who are potential supporters of green causes, but who are not likely to be dedicated members of the green movement, based on their demographic profile and economic situation. Based on the lessons drawn from the focus groups, we present below who to talk to, what to talk about and how to communicate in future green campaigns in Hungary, if the aim is to increase the social support base for green causes.

6.2. What to talk about?

- It is particularly effective for green communication to promote policies that prepare individuals for the green transition. At the same time, it is counterproductive to emphasise the various negative incentives and penalties – regardless of whether they apply to industry or consumers.

- Hungarians are interested in a safe and clean environment, especially if it personally benefits them. In communicating green messages, it is therefore worth stressing short-term, individual interests that can be linked to the global fight against climate change.

- Green communication should focus on the topics of industrial and household-made air pollution and policies to improve waste management and recycling. In this context, the importance of human health preservation should be stressed. Effective communication should emphasise links between climate policies and lived experiences of people.

- Green communication should avoid stressing policies that emphasise individual responsibility and that can be seen as 'anti-car'.

- The need for broad information campaigns on several issues has been repeatedly raised in the focus groups. People are poorly informed and even misinformed about certain green policies and technologies. Educational materials on electromobility, cars' fuel consumption, selective waste collection, green renovation programmes, and the harmful effects of nuclear and fossil fuels would increase interest and engagement in these issues in Hungarian society.

6.3. How to communicate?

- Future green campaigns should focus on developing messages with quality of life framing. At the same time, it is important to formulate achievable goals and concrete solutions for the near future, beyond stressing the importance of a liveable future and saving the planet.

- Our research, already carried out during the energy crisis, shows that communication based on economic benefits works for energy-related policies. In contrast, the general messages about "new green jobs" are hardly understandable for many people in Hungary, while for others it is just an empty promise.

- Emphasising harm can play an important role in green communication, but it is important that communication should focus on threats that directly affect people (e.g. air pollution, plastic pollution). Long-term and abstract images of threats (climate crisis, "dark future") are less effective communication tools.

- Anti-elite framing of green messages works the least, especially when they create schematic negative portrayals of big business and rich people, or simply call for a fight against elites. Messages that stress the responsibility of politicians and regulators work better, as do claims that suggest the possibility of some positive change. What green communication really needs is not anti-elitist messaging per se, but messages that underline the responsibility of elites and the needs of 'ordinary people'.

- It is difficult to communicate well about the energy crisis. The words energy waste, energy use, coal, oil have rather negative connotations. Positive, forward-looking messages about the green transition tend to work, while negative, blame-seeking statements are poorly received. In other words, it makes sense to emphasise the importance and benefits of renewable, clean energy instead of blaming the fossil lobby, coal and gas.

6.4. Geographic and demographic patterns

- Although the qualitative nature of our research does not allow us to draw clear causal inferences about the socio-demographic and political determinants of perceptions of messages and policies, the results allow us to make the following assumptions. Emphasising quality of life and a liveable future seems to be the least divisive communication that is acceptable to a wide range of people. In other words, these messages are worth communicating to all target groups.

- Our analysis suggests that older age groups living in smaller cities are more responsive to anti-elitist messages. Highlighting economic benefits may work better in urban areas, while emphasising harm may work better in small and medium-sized cities.

- Focus groups suggest that people are not necessarily aware of local pollution. In Szeged and Miskolc, air pollution measurements show that air quality is exceptionally bad, yet these groups were not more involved in the topic of air pollution. This suggests that future campaigns should raise awareness of pollution at local level.

- Older participants in our study and people raising children were most receptive to the health hazards of environmental pollution (air pollution, microplastic pollution). Sensitivity to the effects of air pollution was strong in Dunaújváros, where many of the focus group participants mentioned the role of the local Ironworks. Related to the problem, participants reported that there is a high number of cases of cancer and also that their children suffer from respiratory diseases (asthma, croup).

- At the same time, some people in the industrial cities see health effects as a cost to be borne in exchange for economic development and employment. It is striking that the only group that opposed the proposed shutdown of the Mátra power plant was the Miskolc group, which is the closest to the facility. This suggests that more emphasis should be placed on developing feasible and credible solutions that offer new opportunities for workers in industries that will disappear during the green transition.

ANNEXES

7. Annexes

7.1. Detailed research goals and empirical strategy

RQ1: How do Hungarians perceive the state of environment protection in general and related to the examined green topics?

We aimed to discover how those Hungarians who potentially belong to target groups for green communication campaigns perceive the problems of plastic waste, air pollution, energy efficiency and the energy mix of Hungary. We were interested in how the group members evaluate the state of the given problem in their region and in the country, furthermore how they would solve these issues. We measured the answers in two ways: (1) by summarising the respondents' perceptions of the state of green problems; (2) by looking at which topics evoke the formation of strong emotions and opinions and collecting quotes from these discussions. We were interested in whether respondents could recall any of the local problems we identified a priori, and whether their insights could shed light on further local problems that may be out of the focus of green organizations and policy experts.

RQ2: Which green policies are Hungarians most and least open to?

Our research also aimed to explore how people react to policy proposals recommended by experts and NGOs. We selected a long list of proposals and categorized them into 10 subtopics (see Table 1). The proposals belonging to a given subtopic were introduced to the groups together, and participants were asked which policies they could recall and have an opinion about. Furthermore, respondents were also asked which policies they liked or disliked the most. We wrote summaries of the participants' reactions to each policy packages separately for each focus group. We also collected quotes from participants' reactions – sentences which either resonated well with the overall evaluation of policies, arguments from both sides of debates and unexpected insights.

RQ3: Which communication strategies are the most efficient in Hungary for advocating green proposals?

Based on the policy packages, we formulated 40 messages (4 different messages for all 10 subtopics of our research), which we tested with the focus groups. We developed a simple numeric system for the coding of the evaluation of the given messages. The coding was carried out by two analysts who cross-validated each other's evaluation. Each communication frame received a score according to the following system for each focus groups.

- -1: Rejected by majority
- 0: Neutral reaction or "too close to call"
- 1: Supported by majority

We gave a 0 score primarily to those messages that did not trigger any meaningful reaction from the vast majority of the given focus group. In some cases, we also coded a message's reception 0 if it was "too close to call", meaning that positive and negative reactions were balanced. Although we acknowledge the limitations of quantification of focus group discussions, we believe that it is necessary to use a structured analytical strategy for the evaluation of our six focus groups. The combination of this quantitative approach with qualitative analysis enabled us to gain a better understanding of the reception of the 40 messages we tested in our research.

7.2. Relevant policies and legislation on air quality

- **Global Air Quality Guidelines (AQGs) of the World Health Organisation (WHO):** they are recommended air quality levels to protect the health of populations, by reducing levels of key air pollutants. They are based on expert evaluation of current scientific evidence. They are stricter than the EU's Air Quality Standards (AQSs, see below) but they are not binding.
  The most recent updates to WHO's air quality guidelines were made in 2021, and most of the values have been reduced: the annual PM2.5 exposure was halved from 10 µg/m^3 to 5 µg/m^3, while the EU guideline remains 25 µg/m^3. The annual NO_2 exposure was reduced by 75% from 40 µg/m^3 to 10 µg/m^3.
  Hungarian municipalities regularly exceed the WHO health limits (both 2005 and 2021) which are stricter than the EU and Hungarian limits. According to a report about air pollution in 2019, there were no Hungarian municipalities where the annual WHO health limit for PM2.5 was not exceeded.

- **EU legislation on Ambient Air Quality Directives (AAQDs), Directive 2008/50:** a fundamental part of EU law focusing on reducing harmful effects of polluted air on human health and the environment as a whole. It sets binding Ambient Air Quality Standards (AAQSs) for many pollutants, entailing "limit values" and "target values," and providing specific measurements for the location and number of monitoring stations.
  Individual EU Member States can be held accountable, and financial sanctions could be imposed on them for persistent non-compliance. The legislation is subject to the common interpretation of the Court of Justice of the European Union (CJEU).
  They are binding standards for Hungary. As the European Commission considered that the action plan submitted by the Hungarian government was not effective in reducing air pollution, as PM10 and NOx concentrations exceed the limit values, it launched infringement proceedings against Hungary in 2009. In proceedings that have been going on for more than 10 years, the European Court of Justice ruled on 3 February 2021 that Hungary had breached EU law by failing to take adequate air quality measures to reduce PM10 pollution. Hungary is also facing infringement proceedings for exceeding the annual limit value for nitrogen dioxide, which could end in a similar judgement as for PM10 pollution if the government fails to take action on NO_2 pollution.

- **National Emissions reduction Commitments (NEC), EU Directive:** It is a replacement of an earlier legislation, (Directive 2001/81/EC). This new NEC Directive sets 2020 and 2030 emission reduction commitments for five main air pollutants, NOx and PM2.5 are two among them. It is a binding EU directive for Hungary. It requires Hungary to draw up National Air Pollution Control Programmes to support successful implementation of air quality plans established under the EU's Air Quality Directive. Hungary's National Air Pollution Control Programme (NAPCP) published in Spring 2020 is not sufficient to substantially reduce air pollution, and it lacks guarantees of implementation. (see later)

- European Green Deal and the Fit for 55 package: both the Green Deal and the Fit for 55 package include parts that are relevant for clean air. Below, parts that are the most relevant regarding the transport sector will be listed. Parts relevant to the heating sector will be detailed in sections that deal with the energy efficiency of buildings and the energy mix.
  Certain policy initiatives of the Green Deal target sustainable transportation and thus influence air pollution. These include the following targets for 2019-2024: 55% CO_2 emissions reduction for cars by 2030; a 50% CO_2 emissions reduction for vans by 2030; and zero CO_2 emissions for new cars by 2035. The CO_2 emissions trading scheme is planned to be extended to road transport from 2026.
  The Green Deal places an EU-wide payment burden on polluters, encourages the use of cleaner fuels and reinvest the proceeds in clean technologies. Specifically for transport, the Fit for 55 package sets the objective to reduce greenhouse gas emissions by 90 percent by 2030 compared to 1990 levels. The emphasis is on alternative fuel infrastructure, renewable

fuel and sustainable air transport. The European Union also agreed to end the sale of vehicles with combustion engines by 2035. Fit for 55 is an EU legislative package that is binding for Hungary.

- **Relevant parts of Act LIII of 1995 on general rules for the protection of the environment:** it is a Hungarian Act. It sets out the institutional and legislative framework for a range of measures to reduce air pollution, and it also provides a framework for air protection. It states that air must be protected from all artificial influences that could affect its quality or harm health. It gives priority to prevention, that is minimising emissions of air pollutants, and focuses primarily on the improvement of air quality of agglomerations. It is only a prescriptive frame that lacks guarantees of implementation.

- **306/2010 (XII. 23.) Government Decree on Air Protection:** It is a Hungarian governmental decree. The law prohibits air pollution, demands meeting environmental requirements, and aims to prevent exposure of the population to stinking air. The law also defines the cases of non-compliance with air protection requirements, designates the competent authority and sets the level of air pollution fines.
  The decree bans the burning of garden waste nationwide from 1 January 2021. However, according to a government decree of December 2021, as long as the epidemic emergency persists, it remains the responsibility of municipalities (as it was before the decree) to decide whether and under what conditions to allow the burning of garden waste.
  In general, the law lacks guarantees of implementation. In addition, originally, one of its aims was to provide a response to the infringement procedure launched by the EU. So far, its effectiveness is questionable as the EU infringement procedure is still ongoing.

- **National Air Pollution Control Programme (NAPCP):** This is the Hungarian government's plan submitted to the EU on how to reduce the emissions of air pollutants to the required level by 2030. It specifies, among others, improvement of the energy efficiency of buildings, upgrading of combustion equipment, expanding district heating, limiting the use of certain solid fuels by the population, and reducing transport emissions by technical means and supporting more environmentally friendly modes of transport.
  The NAPCP does not include a budget and a detailed action plan with an indication of costs, schedules and responsibilities, and clarification of the objectives to be achieved which could guarantee implementation. The programme also fails to take substantive measures against several root causes of air pollution, such as burning of household waste, import of old second-hand cars or increase in the number and mileage of petrol and diesel vehicles.

- **4/2011. (I. 14.) VM decree on air pollution level limits and emission limit values for stationary sources of air pollution:** It is a regulation of the Ministry of Rural Development of Hungary. The decree includes: a) the air pollution level and the limit values; b) stationary sources of air pollution point sources, their operators and emissions from point sources. It is a secondary legislation to embed AAQSs, which generally entails the risks of AAQSs not being linked to legal obligations on the State to achieve these standards, monitoring requirements, or sanctions for non-compliance with AAQSs. Its aim was to provide a response to the infringement procedure launched by the EU, along with 306/2010 (XII. 23.) Government Decree on Air Protection. So far, its effectiveness is questionable as the EU infringement procedure is still ongoing.

- **292/2015. (X. 8.) Government Decree on air pollution:** it is a Hungarian governmental decree. The decree makes it an unlawful activity to incinerate waste, with the exception of untreated wood waste and a very limited amount of household paper waste that is not considered hazardous, which is incinerated in a household appliance. Illegal burning is investigated by the district offices of the regional government office. If they can prove an infringement, they can ban the activity and impose fines of up to 300,000 Hungarian Forint.
  The current legislative environment is suitable for the authorities to identify and sanction infringements, but the legislation should be

applied consistently, rigorously and much more frequently than at present to curb harmful activity. The authorities practically have no capacity to take measures against illegal household burning, and for this reason such burnings are extremely widespread.

7.3. Relevant policies and legislation on plastic pollution

- **EU directive 2018/851 on waste:** by 2025, the preparation of municipal waste for re-use and recycling needs to be a minimum of 55%; by 2030, a minimum of 60%; by 2035, a minimum of 65%. The directive is binding for Hungary.

- **Single-Use Plastic Directive:** certain SUP items are banned from Member States' markets from July 2021, and others must be marked with a view to reducing their environmental impact. Plastic cups with their caps are banned from January 2023. By 2025, member states (MSs) need to collect 77% of plastic bottles separately, and 90% by 2029. By 2025, PET bottles need to be made of a minimum 25% of recycled plastic, and 30% by 2030. The directive is binding for Hungary.

- **New Circular Economy Action Plans and European Strategy for Plastics in a Circular Economy:** the goal is to reduce plastic pollution and ensure that all plastic packaging is recyclable by 2030.

- **Waste Framework EU Directive:** it sets the basic concepts and definitions related to waste management, including definitions of waste, recycling and recovery. This has been adopted in Hungary's national waste law (Waste Act).

- **Green Deal:** it includes specific parts about plastic waste management, while it also has parts that indirectly affect plastic waste management, such as the requirement of CO_2 emission reduction, and of the accelerated use of renewable energy, are not detailed here. They are discussed in other papers that deal with air pollution, energy efficiency of buildings and energy mix.

- Green Deal specifically demands 50% of all plastic packaging to be recycled by 2025 and 55% by 2030. This is binding for Hungary.

- **Relevant parts of Act CLXXXV of 2012, Law on Waste:** this Hungarian law has adopted the EU's Waste Framework Directive which includes the "waste pyramid" or waste hierarchy, which presents the options for managing waste from the most environmentally beneficial to the least beneficial. Its preamble states that the polluter pays principle should be applied in the waste sector. However, the "polluter pays principle" and "extended producer responsibility" of the EU's Waste Framework Directive are not applied in practice properly. In addition, prevention of waste is not given proper priority either.

- **The 2020 package of laws "Amending certain laws on energy and waste management (T/13958)":** it provides for the mandatory return of beverage packaging; the details of the deposit-fee system (e.g. the exact scope of packaging materials) will be set out in a government decree following the law, which is expected to enter into force on 1 July 2023. The bill only encourages recycling and introduces a concessionaire with a monopoly on the market who buys the right to trade both public and industrial waste from the state. There is a risk that the private waste management sector, which currently operates on a market basis with high efficiency, would become impossible to operate without compensation or indemnification.

- **Government Decree on the Rules for the Application of the Deposit Fee [301/2021 (VI. 1.)] on restriction of the placing on the market of certain single-use (single-use) and certain other plastic products:** this Hungarian legislation goes beyond EU requirements and covers plastic bags: it partially bans them and imposes a strict tax on them. The regulation on "degradable" plastic bags, however, is environmentally problematic, as most of them only decompose under special industrial conditions.

- **Relevant parts from the National Waste Management Plan 2021-2027:** for beverage

bottles with a capacity of 3 litres or less, it requires separate collection of waste from plastic products equivalent to 77% by weight of products placed on the market in 2025 and 90% by weight of products placed on the market in 2029, to ensure recycling (mirroring EU's Single-Use Plastic Directive). Targets for the preparation for reuse and recycling of municipal waste is 55% by 2025, 50% with derogation; 60% by 2030, 55% with derogation; 65% by 2035, 60% with derogation (mirroring EU directive 2018/851 on waste). Recycling targets for plastic waste is 50% by 2025 and 55% by 2030, with a maximum deviation of 15% between one or two sub-targets (mirroring EU's Green Deal). The National Waste Management Plan lacks guarantees of implementation.

- **Climate and Nature Action Plan, announced in February 2020:** It foresees a return scheme for glass and plastic bottles and cans to achieve a circular economy, however, it lacks guarantees of implementation.

7.4. Relevant policies and legislation on the energy efficiency of buildings

- **Sustainable Development Goal 7: Affordable and clean energy:** The UN Sustainable Development Goals (SDGs) are recognized as a global guide to "achieve a better and more sustainable future for all." Related to energy, SDG 7 covers universal access to energy, and more concretely 7.3 aims to double the global rate of improvement in energy efficiency by 2030. However, energy intensity improvements continue to remain below this target. Initially, the UN recommended an annual improvement rate of 2.6% between 2010 and 2030 to achieve the target, but since global progress has been slower than that, the rate now required is at least 3.2%.

- **Nationally Determined Contributions (NDCs):** Several countries have considered the improvement of buildings' energy efficiency in their national strategies and long-term plans. However, while 136 countries mention buildings in some form in their Nationally Determined Contributions (NDCs), the majority do not include specific actions for the buildings and construction sector (GlobalABC/IEA/UNEP, 2018)

- Relevant parts of the **FitFor55 Package:**
  - achieve at least -55% net greenhouse gas (GHG) emissions by 2030 and climate neutrality by 2050;
  - lower Europe's gas consumption by 30%, which is equivalent to 100 billion cubic metres (bcm) by 2030;
  - reduce gas demand in buildings by 45 bcm per year compared with today (detailed in the EU's Energy Efficiency Directive and Energy Performance of Buildings Directive within the Fit for 55 Framework, discussed below).

- Relevant parts of the **REPowerEU Plan:** It calls for an increase from 9% to 13% of the binding Energy Efficiency Target (EFT) in the Energy Efficiency Directive (EED). Builds on the full implementation of the Fit for 55 proposals.

- Relevant parts of the **EU 'Save Energy' Plan:** Heating is among the key sectors the plan points out where significant short-term savings could be achieved. The concrete target mentioned in the plan: an increase from 9% to 13% of the binding EET under the 'Fit for 55' package of European Green Deal legislation.

- As part of the "Fit for 55" package, proposals for a revision of the **Energy Performance of Buildings Directive (EPBD)** and the **Energy Efficiency Directive (EED)** have been set in order to meet the new EU targets of a 55% minimum reduction in GHG emissions by 2030. **Energy Efficiency Obligation Schemes (EEOSs)** were also put in place with the EED.

- **Energy Efficiency First Principle:** One of the key principles of the EU energy policy intended to ensure secure, sustainable, competitive and affordable energy supply in the EU.

- **Smart Finance for Smart Buildings Initiative:** It aims to help finance renovation and retrofitting in Europe's largely inefficient housing stock. The initiative builds upon the Investment Plan for Europe and the European Structural and

Investment Funds and seeks to help unlock private financing to renovate and retrofit in Europe's largely inefficient housing stock. It combines private investments with public financing to leverage private investments and support a more effective use of public funds.

- **Long-term Renovation Strategy:** to be detailed below with the Hungarian legislation

- **Act on Energy Efficiency** (Act LVII of 2015 on Energy Efficiency): It provides the basis to achieve the national energy efficiency targets in Hungary:
  - It lays down provisions to implement several important EU directives e.g. EPBD, EED, etc.
  - It defines the key terms regarding energy efficiency; the duties of the government, the Hungarian Energy and Public Utility Regulatory Authority (MEKH) and public institutions;
  - It provides definitions for the role of energy specialists and energy audits.

- **Hungarian government decree on the delivery of energy efficiency** (Government Decree no. 122/2015. (V. 26.)): It provides additional technical details on the implementation of the Act LVII of 2015 on Energy Efficiency.

- **Hungarian government decree on the certification of the energy performance of buildings** (Government Decree no. 176/2008. (VI. 30.): It presents the requirements regarding the building energy performance certification.

- TNM Decree no. 7/2006. (V. 24.): It provides the definitions and basis for calculations to determine the energy performance of buildings in Hungary.
  - Legal requirements for envelope thermal properties, requirements for heating demand, primary energy use and energy efficiency requirements of building systems (e.g. ventilation systems, etc);
  - The decree defines the term "significant renovation": this applies when the renovation affects more than 25% of the building envelope. In this case the building's heating and ventilation systems must comply with several requirements that apply to new buildings, and need to comply with the cost-optimal level of the heating demand requirements and primary energy use requirements.

- **Hungarian decree on determining the energy performance of buildings** (7/2006 TNM decree): It defines the energy efficiency of buildings: after 30 June 2022 the new constructions must comply with the nearly-zero energy building requirements to receive the building permit.

- **Long-term Renovation Strategy in Hungary: It aims to**
  - increase the annual renovation rate of residential buildings to 3% and decrease the energy consumption of residential buildings by 20% until 2030;
  - decrease the final energy consumption of the public buildings by 60% until 2050 (the reference is the average of years between 2018-2020);
  - reduce CO_2 emissions from building energy-related activities by 90% by 2050 and have 90% of the buildings meet the nearly-zero energy requirements until 2050.

- **Hungarian National Recovery and Resilience Plan (NRRP) and its assessment**
  One of the best ways to see what energy efficiency investments are likely to be implemented in Hungary is to look at what EU money has been requested by the Hungarian government for the purpose and how it is planned to be spent. Hungary requested money from the EU's Recovery and Resilience Facility (RRF) programme. The grant aims to overcome the impacts caused by the coronavirus pandemic. The Hungarian National Recovery and Resilience Plan (NRRP) was submitted to the European Commission in May 2021. The NRRP was evaluated by the Hungarian Energy Efficiency Institute (MEHI) with the following findings:
  - renovation of day nurseries, public educational buildings, universities, vocational training, and health institutions' buildings is planned, however, energy use reduction

requirements are not linked to the funding in the majority of the cases. Energy related requirements are mentioned only for health institutions' buildings (20% lower than 'nearly zero levels') and university buildings (30-60% primary energy use reduction)
  - no specific funding for improvements in energy efficiency is assigned. The existing 'KEHOP plus' operative program will provide some funding for the residential sector, however this program does not include specific targets. This risks the implementation of deep renovations over measures with shorter payback time.

Therefore, MEHI recommended the following improvements for the NRRP:

- to reduce energy consumption, dedicated objectives for energy renovation should be set that are measurable;
- implement measures aimed at upskilling existing professionals for deep renovations;
- apply the Energy Efficiency First Principle: renovate buildings first to avoid waste of resources.

7.5. Relevant policies and legislation on the energy mix

- **The Paris Agreement:** It is a legally binding international treaty on climate change, adopted by 196 parties at the 21th Conference of the Parties (COP 21) in Paris, on 12 December 2015 and entered into force on 4 November 2016. Its goal is to limit global warming to well below 2, preferably to 1.5 degrees Celsius, compared to pre-industrial levels. To achieve this, countries agreed to aim to reach global peaking of GHG as soon as possible and to achieve a climate neutral world by mid-century. The Paris Agreement is a landmark in the multilateral climate change process as it is the first binding agreement that brings all nations into a common cause to undertake ambitious efforts to combat climate change and adapt to its effects.
- **Nationally Determined Contributions (NDCs):** NDCs are at the heart of the Paris Agreement and the achievement of its long-term climate goals. It is the climate action plan of each country who signed the Paris Agreement about how the country plans to cut its national emissions and adapt to climate impacts.
- **Sustainable Development Goal 13: Climate action:** It states "Take urgent action to combat climate change and its impacts"
- **Sustainable Development Goal 7: Affordable and clean energy:** It states "Ensure access to affordable, reliable, sustainable and modern energy for all"
- **REPowerEU Plan:** Its aim is to make Europe independent from Russian fossil fuels well before 2030. It proposes a set of measures, in line with EU's longer-term decarbonisation strategies.
- **FitFor55 Package:** Its aim is an ambitious and accelerated rollout of energy savings and sustainable renewable energy, for a fossil-free EU by 2040, driven by bold short-term actions. The package includes goals, such as
  - achieving at least -55% net greenhouse gas (GHG) emissions by 2030 and climate neutrality by 2050;
  - lowering Europe's gas consumption by 30%, which is equivalent to 100 billion cubic metres (bcm) by 2030.
- **EU's climate and energy targets for the year 2030:**
  - GHG emission reduction by at least 55% compared to 1990 to reach climate neutrality by 2050;
  - energy efficiency target of 32.5% compared to 2007;
  - renewable energy target of 32% share of renewable energy sources in gross final energy consumption
- **Renewable Energy Directive (RED) of the EU:** The directive sets a common target – currently set at 32% – for the amount of renewable energy in

the EU's energy consumption by 2030. However, it is currently under revision to better align it with the increased climate ambitions. The proposed revision of the Commission from July 2021 includes an increased target of 40%, while the REPowerEU plan, presented in May 2022, suggests a further increase of this target to 45% by 2030.

- **Effort-sharing Regulation (2021-2030)** of the EU: According to the legislation, Hungary must reduce its emissions by 7% compared with 2005.

- **EU 'Save Energy':** It states as a driving principle that saving energy can often be the cheapest, safest and cleanest way to reduce our reliance on fossil fuel imports from Russia. According to the Commission's EU 'Save energy' communication, the greatest savings in Europe can be achieved in gas and oil consumption. The main reductions in oil use are likely to be achievable by reducing private car use and air travel, as well as more efficient driving for trucks.

- **Climate and Nature Action Plan of Hungary:** The plan, announced in 2020, is considered to be a political programme. It is a collection of a few measures that differ substantially in terms of their weight and timeframe (e.g. eradication of illegal landfills, ban on single-use plastics, support for renewable energy production by SMEs, six-fold increase in solar power capacity in 10 years, etc).

- **Hungarian Act on climate protection:** The 2020 law sets a target of net carbon neutrality by 2050, with a target of 40% by 2030, but does not set mandatory periodic targets for 2030 to 2050, so the envisaged emissions reduction pathway is not visible.

- **Hungarian Act on climate protection: National Energy and Climate Change Plan:** The plan required by the EU, submitted in early 2020, sets a low ambition of 40% climate target and a 20% renewable target for 2030. These can nearly be met with very little effort, with the closure of the Mátra power plant and the ramped-up solar developments alone.

- **National Energy Strategy of Hungary:** It is prepared at the same time as the National Energy and Climate Change Plan, with the same objectives.

- **National Clean Development Strategy of Hungary:** The strategy adopted in 2021 raises the issue of harmonisation of Hungarian (40%) and EU (55%) climate targets for 2030 but this has not yet happened.

- **Second National Climate Change Strategy of Hungary:** The document addresses both mitigation and adaptation issues but contains little substance, and lacks ambition. It was already outdated when it was adopted at the end of 2018.

END NOTES

8. End notes

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30 Exact data from 2021 National Collection and Recovery Plan: 351,000 tonnes of plastic packaging waste was foreseen, of which 138,000 tonnes (39.3 %percent) is planned to be recycled (85,000 tonnes for industry and 53,000 tonnes for consumer collection) and 75,300 tonnes for energy recovery. The collection target for PET bottles was 33,000 tonnes. For comparison, the National Collection and Recovery Plan 2020 envisaged 360,000 tonnes of plastic packaging waste, of which 75,000 tonnes (26.9%) were destined for energy recovery (mixed plastics) and 97,000 tonnes (23,000 tonnes) for recycling (residential and industrial), of which 23,000 tonnes were PET bottles.

31 This is according to the National Association for Packaging and Material Handling (CSAOSZ). According to UNESDA, the PET collection rate in Hungary is 42 percent.

32 ITM (2021) 187

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61 The calculation of averages was necessary because the air pollution and plastic pollution topics had 3-3 messages for each frame, while the energy efficiency of buildings and energy mix topics had 2-2 messages for each frame.

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