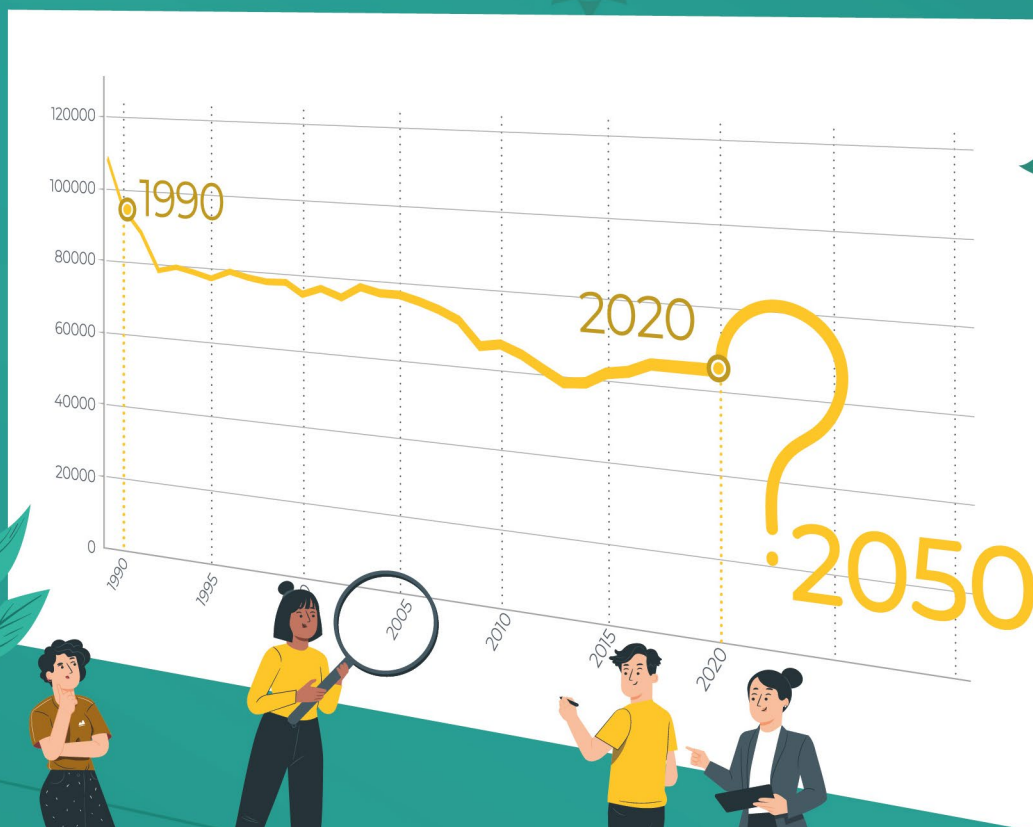


Hungary's First Climate Neutrality Progress Report





Hungary's First Climate Neutrality Progress Report

The analysis of the starting point in 2020

BUDAPEST, 2023

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Introduction



According to its mission statement, the Green Policy Center strives to promote meaningful dialogue on sustainability, climate policy, and other environmental issues in order to achieve Hungary's goal of climate neutrality by 2050. Since the country has enshrined this political goal into law in 2020, now it has legal force. However, achieving this goal cannot be done overnight and requires continuous commitment and action over several decades. Therefore, significant policy measures need to be introduced already today to put the country on a realistic path of greenhouse gas (GHG) emission reduction. One indicator of the effectiveness of policy measures is the measurable annual change in Hungary's GHG emissions. The Hungarian Meteorological Service (OMSZ) prepares and submits Hungary's national

inventory report on greenhouse gas emissions to the Secretariat of the United Nations Framework Convention on Climate Change (UNFCCC) every year, which document analyses the domestic GHG emission processes in detail. The report objectively and quantitatively reflects the emission trends in each sector, reflecting the state of two years prior due to the high time demand of the calculations. To provide adequate policy responses, we need to understand the baseline situation and the ongoing processes. Thus, these reports contain crucial information and should serve as a guideline in Hungary's climate policy planning. However, they receive little reference and hardly any media attention. Therefore, the actual effects, results, and trends of recent policy measures and emissions remain almost unknown to

the public. According to the Green Policy Center, it is high time to talk about the ongoing processes, their causes, and the past results and future goals, and to present this information concisely, comprehensively, and vividly to the public.

But we don't stop here, as achieving climate neutrality requires transforming the entire economic and social system. The transformation of these complex systems can be measured by numerous indicators, ranging from the share of renewable energy to the carbon footprint of the goods consumed by the population, to the ratio of green expenditures in the state budget. Continuous measurement of these indicators and monitoring of trends provide a more complete picture of whether the country is moving towards

climate neutrality and what further policy measures are needed to achieve our goals. Hungary's First Climate Neutrality Progress Report attempts to present all of these. However, this report does not make policy recommendations, it simply reflects current climate policies and their effects objectively, thereby informing decision-makers and society as a whole. Following this, we plan to compile and release such reports annually. We hope that the information contained in the report will become part of the mainstream climate policy planning and provide a suitable basis for further planning. Additionally, such a report can also contribute to shaping climate policy debates, serving as a reference point. With these hopes, we embarked on its preparation.

Key messages

■ In international comparisons, Hungary's climate performance is roughly in the middle range, but in EU context, it ranks lower than average in various rankings. In the Climate Change Performance Index, the most widely recognized ranking worldwide, Hungary is ranked 53rd out of 63 countries, outpacing only Poland in the European Union.

■ The significant and sustained reduction of GHG emissions in Hungary over the past decades has mainly occurred during economic crises. During the intervening periods, emissions showed a rather stagnant trend. A relative achievement, however, is that since 2018, GHG emissions have decoupled from GDP growth, meaning that economic growth did not result in an increase in emissions.

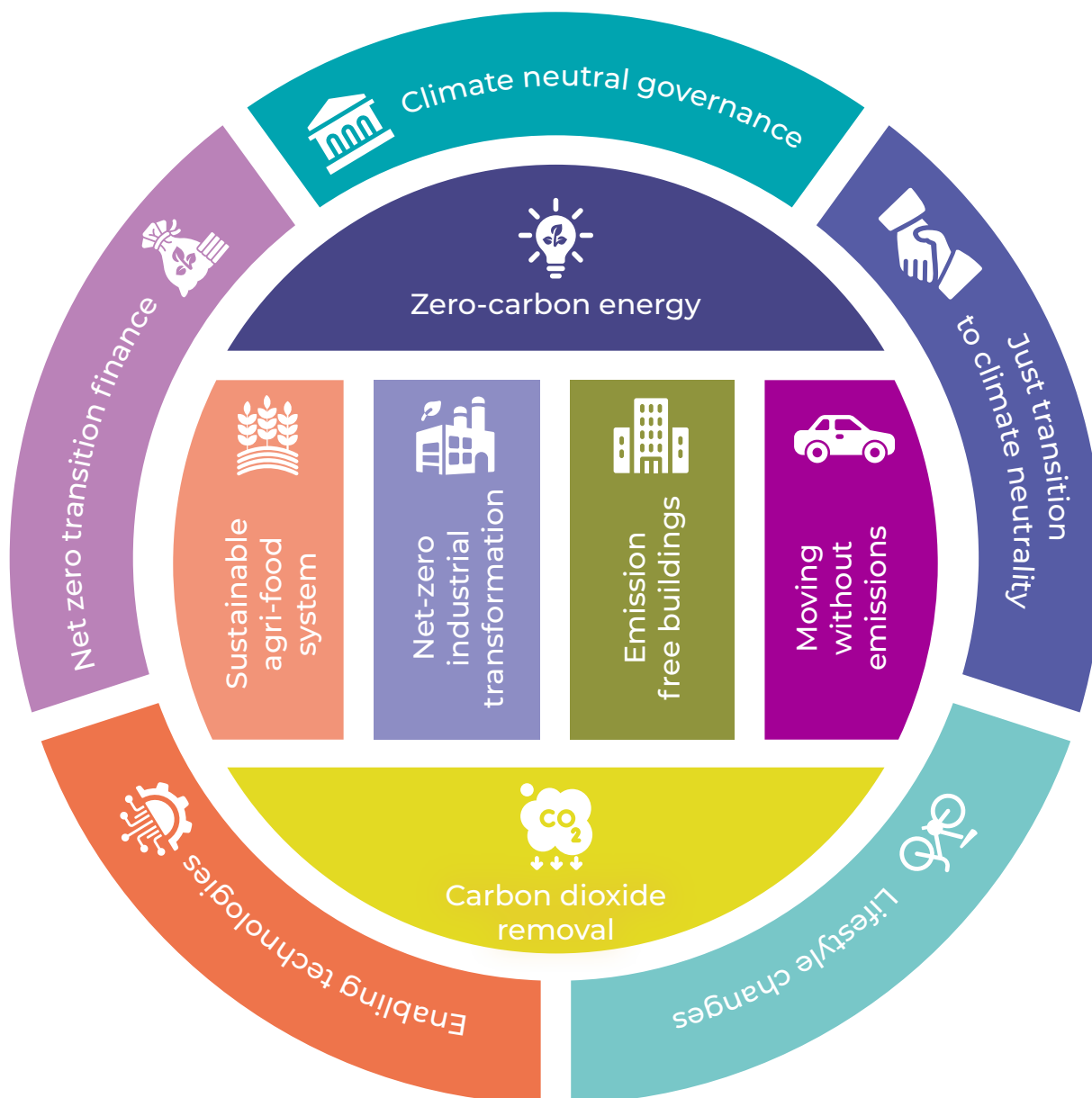
■ The report compares two ten-year periods (2010-2020 and 2020-2030) to illustrate the magnitude of the challenges ahead. Although Hungary's net GHG emissions for 2020 are slightly lower than in 2010, no consistent downward trend can be observed for the entire 2010-2020 period. The current 2030 and 2050 climate targets were adopted in 2020, so the Hungarian climate policy did not have as ambitious goals set in the past decade. Officially, Hungary has met both its national and international climate targets and even exceeded them by 2020. However, the emission data from the past decade clearly shows the need for significant trend reversal in the future, if we take the achievement of the 2030 and especially 2050 targets seriously.

■ Achieving the 2050 climate neutrality goal requires fundamental transformation of current economic operations. In order to objectively and timely assess whether the steps taken towards this goal are effective and the processes are moving in the right direction, there is a need to set sectoral or other sub-goals in various areas, and to measure and evaluate numerous indicators associated with them and integrate the results into policy-making. This also has the advantage of making it clearer for each stakeholder what their role and responsibility is in achieving the common goal.

■ Data could not be found for 32 out of the 108 indicators examined in chapter 3 of the report. This represents a rate of almost 30% and can be considered a significant gap. The dimensions related to industry (6/11), financing (3/8), and climate governance (6/13) were particularly data-deficient. This data gap needs to be reduced in order to measure progress properly.

■ As for the individual sectors and areas examined, Hungary's performance is mixed. There are indicators that show relatively good performance, but many are average or below average. The extremely high societal support for the climate neutrality goal is noteworthy, which could provide a good basis for ambitious action. After recording the baseline state of the individual indicators in 2020, the reports in the coming years will show where we are going from the current situation and at what pace.

► **Figure 1:** Areas for monitoring progress towards the climate neutrality goal.



Note: This figure summarizes the areas examined in detail in chapter 3. In the following reports, this figure will serve to present simply, clearly, and understandably where progress is appropriate and where greater efforts need to be made.

The source of the figure: Duwe, Matthias; Eike Karola Velten, Isabel Haase, Nicolas Berghmans, Nick Evans and Deyana Spasova (2021): Measuring progress towards climate neutrality. Summary. Ecologic Institute, Berlin / IDDRI, Paris. Retrieved from: <https://www.ecologic.eu/18153>



1. Hungary's position in global action against climate change

How does climate change affect Hungary and why do we have to take part in the global efforts?

Climate change directly affects Hungary, as its average temperature has shown a significant increasing trend since the 1980s, even in a higher rate than the global average. The harmful effects on human health are already noticeable: in the past thirty years, the most significant heat waves have increased daily mortality rates by 12-52% due to their impact on the human circulatory system. There have already been sporadic cases in Hungary of a typically tropical disease; the West Nile fever (from 10 cases in 2014 to 225 cases in 2018). Rising temperatures cause severe damage, including droughts, storms, and flash floods, and endanger the water quality of our large lakes. Ensuring safe drinking water, agricultural irrigation water, industrial water supply, and the water needs of ecosystems in various areas can become increasingly challenging.¹ The unanimous forecast is that the damages inflicted on Hungary will rapidly escalate with the worsening of climate change.

Since climate change is a global process, and its impacts do not stop at borders, it is worth examining how we fare globally in terms of climate change mitigation and how Hungary performs compared to other countries. It is important to recognize that Hungary can only avoid the intensification of the aforementioned impacts if collective efforts lead to success and if we jointly achieve the temperature goals of the Paris Agreement. However, we must also actively participate in these efforts ourselves, as we can only expect the same from others. It is worthwhile to monitor how Hungary is perceived in a global context as well.

Monitoring global climate change processes and the policy progress of countries around the world is a massive task, but several international reports address these issues. This chapter provides an international overview based on these analyses, presenting the assessment of Hungary in global rankings.

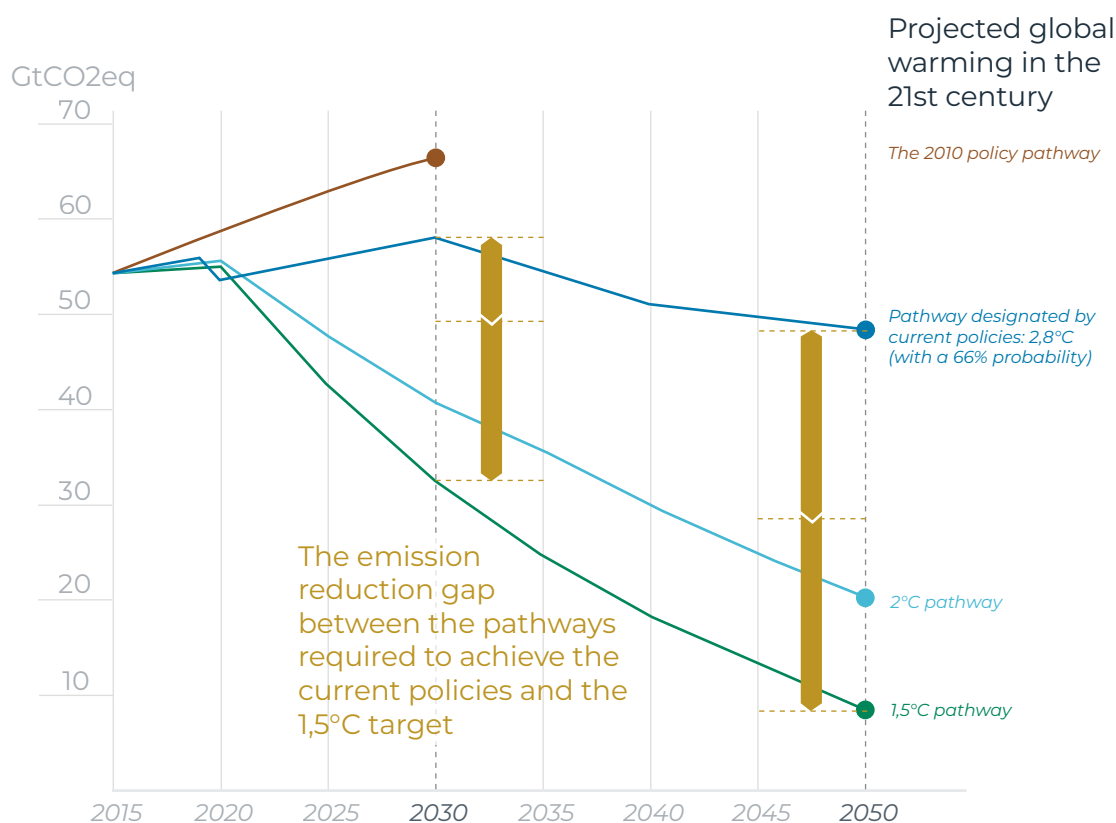
First, it is worth briefly discussing where we stand globally in terms of climate change mitigation. The Framework Convention established the framework for international climate policy in 1992, and the Paris Agreement in 2015 defined long-term temperature goals, stating that the global average temperature increase should be kept well below 2°C compared to pre-industrial levels, with efforts to limit it to 1,5°C. Based on the latest scientific findings, it is now politically accepted that the 1,5°C target is crucial to avoid crossing tipping points. Once these tipping points are triggered, certain negative processes become irreversible, and only by staying within the 1,5°C target can small island nations and numerous coastal communities have a chance to prevent their territories from being flooded by rising sea levels. However, an important characteristic of the Paris Agreement is that countries determine the policy steps they take to contribute to the global climate goals for themselves.

Based on these commitments, the Secretariat of the UN Framework Convention on Cli-

mate Change (UNFCCC) publishes an annual report summarizing the commitments of countries, while the United Nations Environment Programme (UNEP) compares these commitments to the pathways required to achieve the 1,5°C target. According to the UNFCCC's 2022 report, there are currently² 166 commitments available, submitted by 193 UN member states³, covering 94,9% of global emissions. Since 2021, 24 new commitments have been submitted, but only 74% of these new commitments have increased a country's previous emission reduction commitments. The new commitments would only reduce global emissions by 9,5% compared to previous commitments. If all currently valid commitments were fully implemented, global emissions in 2030 could exceed the 2010 level by 10,5%, but would be below the 2019 level by only 0,3%, the report states.

The crucial question is whether these commitments are in line with the pathways necessary to achieve the 1,5°C global temperature target. According to UNEP's 2022 report⁴, even with full implementation of the current commitments, we would exceed the emissions to 23 GtCO₂e for the 1,5°C pathway. This could lead to a global average temperature increase of about 2,8°C, as shown in the figure below.

► **Figure 2:** Projection of global greenhouse gas emissions under different scenarios until 2050, along with indications of emission reduction gaps and their global warming impacts in this century (only median values) (based on UNEP Gap Report 2022).



Countries should therefore adopt and implement more ambitious policy goals. Several international organizations monitor the progress at the national level of countries in this regard.

One of the most well-known reports is the Climate Change Performance Index⁵ (CCPI), which tracks the progress of 59 countries and the EU, covering 92% of global emissions. The CCPI evaluates the development of emissions (with a weighting of 40%), the

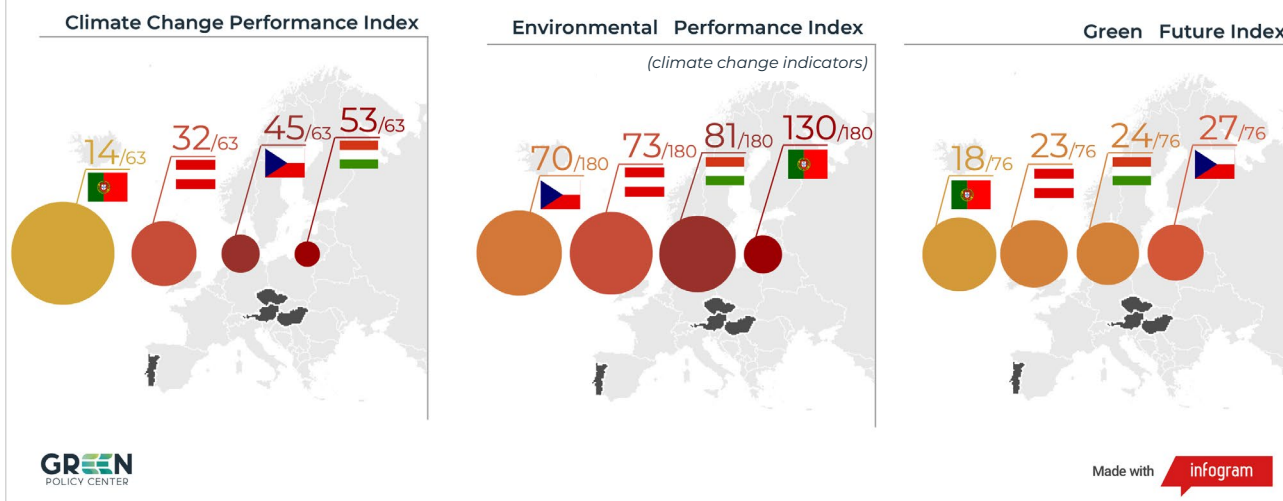
share of renewable energy sources (with a weighting of 20%), energy consumption (with a weighting of 20%), and national climate policies (with a weighting of 20%) on a five-point scale. None of the countries examined received the highest rating, with Denmark ranking the highest and Iran the lowest. Hungary ranked 53rd out of 63 countries on the list, surpassing only Poland within the European Union. Hungary did not move in the rankings compared to the previous year's report.

The Environmental Performance Index⁶ (EPI), developed and managed by Yale and Columbia Universities, ranks 180 countries annually based on 40 indicators across 11 categories of sustainability. The report places Hungary at the 33rd position overall. However, since the EPI considers not only climate policy but also other environmental and sustainability indicators, for the sake of coherence, we will focus on Hungary's rankings related to climate change in this comparison (climate policy: 58th place, emission reduction: 58th place, likelihood of achieving the 2050 climate neutrality goal: 102nd place, energy intensity: 52nd place, agricultural emissions: 93rd place, per capita emissions: 122nd place). Therefore, based solely on cli-

mate change-related indicators, Hungary ranks an averaged 81st out of 180 countries.

The Green Future Index⁷, a report by MIT, examines the efforts of 76 economies towards transitioning to low-emission operations, covering 95% of global GDP. The report follows 22 indicators across five themes (GHG emissions, energy transition, green society, clean innovation, climate policies) through expert interviews. In this ranking, Hungary surpassed five EU member states in 2022 and secured the 24th position out of 76, improving its ranking by 15 places compared to the 2021 report. Denmark emerged as the leading EU member state in this index as well.

Figure 3: Ranking of Hungary and selected reference countries in various reports assessing climate performance.



Considering that government policies alone are not sufficient to achieve climate neutrality, the private sector also needs to transition to climate-friendly operations. The 2022 report by the organization CDP⁸, in collaboration with WWF, examined the commitments of the private sector. The report compared short-term, medium-term, and long-term plans of the private sector and projected

how we would fare with global temperature rise if every company and country had similar levels of ambition.

According to the report, if every company on Earth followed the commitments of Hungarian companies, it would lead to a global average temperature increase of 3°C. This performance by Hungarian companies would place them last in Europe.

(Note: The different rankings for Hungary are justified by various methodological differences among the different lists. These include the use of different indicators and their varying weights, as well as whether the list includes only developed or both de-

veloped and developing countries. However, it can be observed overall, that when considering only developed countries, Hungary generally performs poorly in international comparisons. This is an important signal that requires further investigation.)

Summary

Based on international reports, both globally and nationally, we need to strengthen our efforts to combat climate change in order to achieve the sustainable 1,5°C temperature goal. While Hungary's climate performance is roughly in the middle range globally according to the analysed rankings, we

perform in the lower third in the European Union context. However, it is important to examine the methodology of such reports, including the factors considered in the assessments. It should be noted that the presented reports follow fewer indicators compared to this report.



2. The evolution of greenhouse gas emissions and absorptions in Hungary since 2010

Introduction

One of Hungary's current most important climate goals, enshrined in law, is to reduce its greenhouse gas emissions by at least 40% by 2030 compared to the 1990 level. According to national plans, this target is a significant milestone towards the long-term goal of achieving climate neutrality by 2050, which means balancing the remaining domestic emissions and absorptions of greenhouse gases by 2050. This report does not address whether the 2030 midterm goal represents appropriate midterm ambition. It simply records the current national commitment and compares two consecutive 10-year periods (2010-2020 and 2020-2030) to illustrate the magnitude of the challenge in changing the processes even in the midterm. The objective presentation requires us to acknowledge that Hungary has met and

even exceeded both its national and international climate targets by 2020. This is an important point for evaluation, although it is worth noting that in the preceding years, we did not set ourselves ambitious commitments that could not have been achieved through relatively simple changes. This was true globally as well, but it will no longer be valid for future periods.

This chapter therefore analyses the emission trends between 2010 and 2020 and presents them in a comprehensible manner. The analysis highlights the factors influencing Hungary's GHG emissions and the challenges of transitioning to a trajectory of emission reduction leading to climate neutrality in the next decade(s). The main source of data presented in this chapter is the National In-

ventory Report (hereafter referred to as „Inventory”) prepared annually by the National Meteorological Service (OMSZ) and was last submitted to the Secretariat of the Framework Convention in 2022 as Hungary's international obligation⁹. In addition to the Inventory data, we have used the databases of the

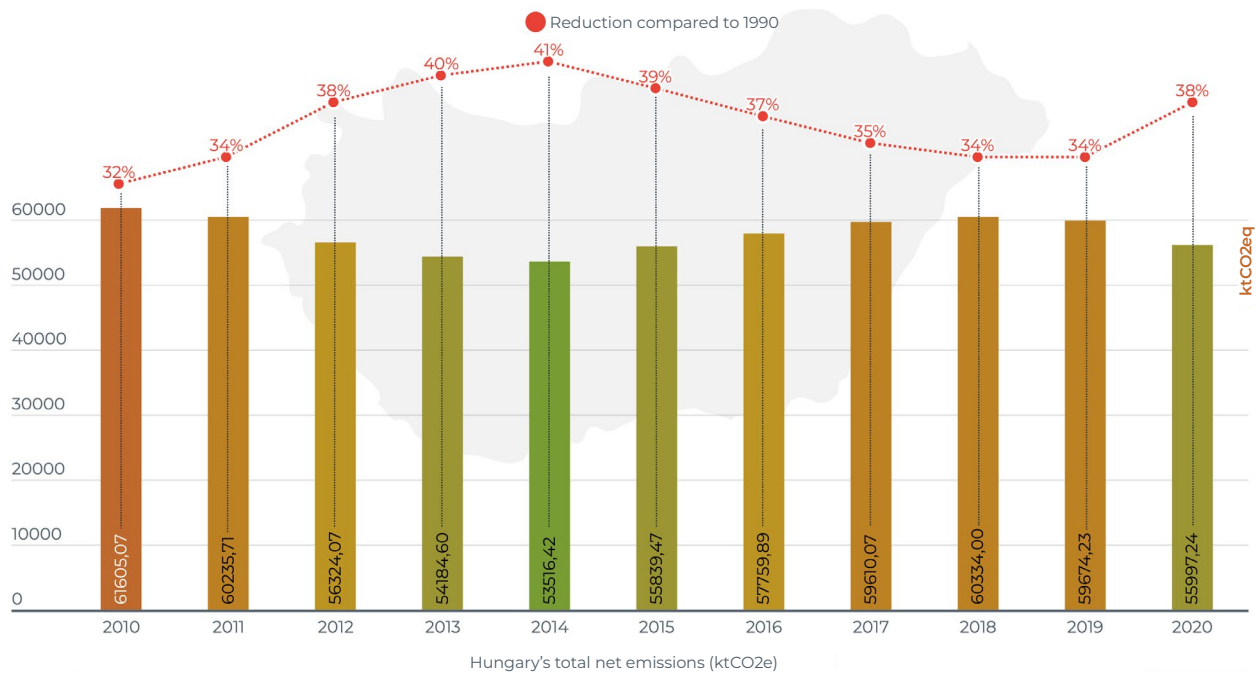
Hungarian Central Statistical Office (KSH) as a source. The choice of the 2020 closing date for this assessment is justified by the fact that the final emission data is always available with a two-year lag, meaning OMSZ published in 2022 the 2020 data and so on.

General evaluation

Based on the Hungarian GHG emissions trajectory observed since 2010 – and by the way, since 1990 - (Figure 4), it can be stated that significant reductions in emissions have only occurred in Hungary when the economy (mainly industrial production) faced severe crises, such as the post-transition period or the 2008-2012 global economic downturn. Prior to or following economic crises, GHG emissions showed a trend of stagnation or slight increases in certain years. Sustained, significant, and deliberate reductions achieved through domestic policy measures have not been observed so far. *(Note: except for the impact of the EU Emissions Trading System (EU ETS) in recent years, which is not a national Hungarian measure but an EU-level measure. This system affects major emitters, including large fossil fuel power plants and district heating plants, industrial facilities, and intra-European Economic Area aviation, through introducing quota prices. This impact is referred to as „quota price” later in the chapter.)* This made it

possible that Hungary was much closer to its current 2030 target in 2013-2014 than in 2020; it almost reached it. The „low point” in emissions in 2013-14 was followed by a rapid rebound in GHG emissions along with accelerated economic growth between 2015 and 2017. During 2018-2019, the only achievement was that GHG emissions no longer mirrored the rapid GDP growth but remained stagnant, which did not represent progress in reducing the absolute quantity of emitted gases. Interestingly, the significant economic downturn caused by the COVID-19 pandemic did not have a substantial impact on the emissions trend in 2020, with noticeable effects mainly observed in the transportation sector and a few industries. Considering the aforementioned observations and the process depicted in Figure 4, it can be concluded that relying solely on the economic performance to guide the GHG emissions trajectory will not at all be sufficient to achieve long-term climate neutrality goals.

Figure 4: Hungary's total net GHG emissions and their reduction compared to 1990 in individual years, 2010-2020 (source: OMSz, GPC calculation).



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Sectoral analysis of GHG emissions

The data in the Inventory reveals that in the last pre-COVID year of 2019, approximately a quarter (23,8%) of Hungary's net GHG emissions could be attributed to the citizens through private-owned buildings and vehicles. *(Note: In this calculation, we took into account the proportion of privately-owned passenger cars and motorcycles based on expert estimation, allocating 80% of the emissions from cars and motorcycles to the residents.)* From the perspective of achieving climate neutrality, this far exceeds the capacity of current and realistic future domestic GHG sinks to absorb. This means that reducing emissions from only the „major polluters” will not be sufficient to achieve climate neutrality; every sector and stakeholder, including the citizens, must contribute. Analysing GHG emissions by sector does not determine responsibilities or possibilities; it

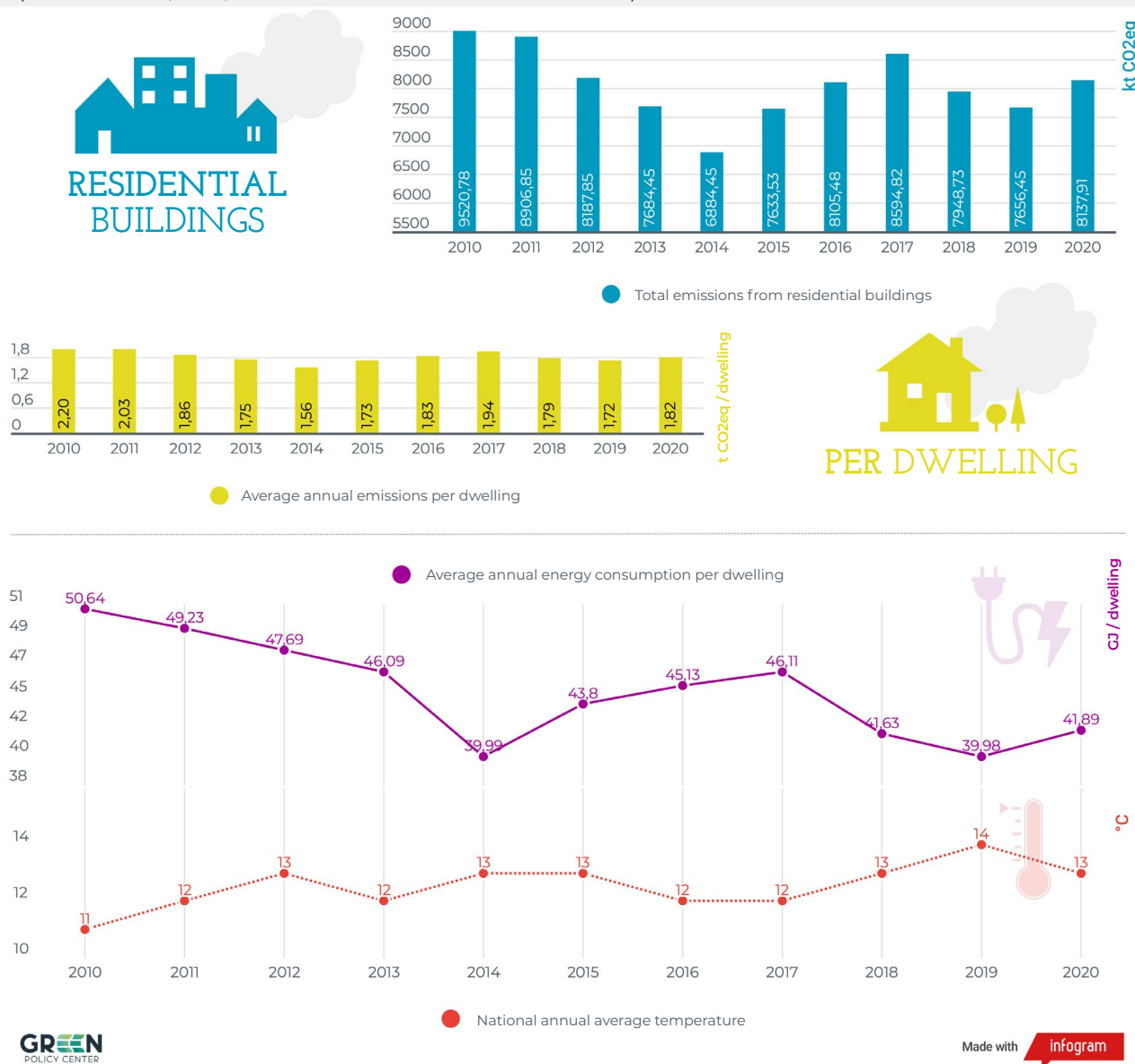
merely illustrates the magnitude of the challenge.

Between 2013 and 2022, residential utility prices were kept at fixed levels regardless of consumption (this is a policy measure commonly referred to as „utility price reduction” in public parlance). *(Note: This applied to electricity, natural gas, district heating, water utility services, and waste collection; however, coal and firewood were not included.)* This measure improved the overall sense of well-being in society but significantly extended the payback period for energy efficiency investments in buildings, reducing the number and depth of interventions. Improving the energy efficiency of residential buildings received relatively little financial support from the government in the 2014-2020 period, primarily in the form

of subsidised loans. Additionally, newly constructed, more efficient properties did not bring about a decisive change in the overall picture. As a result, there does not appear to be substantial progress in the emissions and energy efficiency of residential buildings between 2010 and 2020. Emissions per housing unit fluctuate depending on the weather conditions of a given year, showing

a stagnant trend. For example, when the national average temperature rises, a lower degree of emissions reduction can be observed in residential emissions as well (Figure 5). Since 2013, the dominance of natural gas in residential heating energy mix has been increasing at the expense of firewood consumption which did not fall under the „utility price reduction” measure.

Figure 5: Total emissions from the residential building stock and per dwelling, average annual energy consumption per dwelling, and annual average temperature in the country, 2010-2020 (source: OMSz, KSH, and GPC calculations based on them).



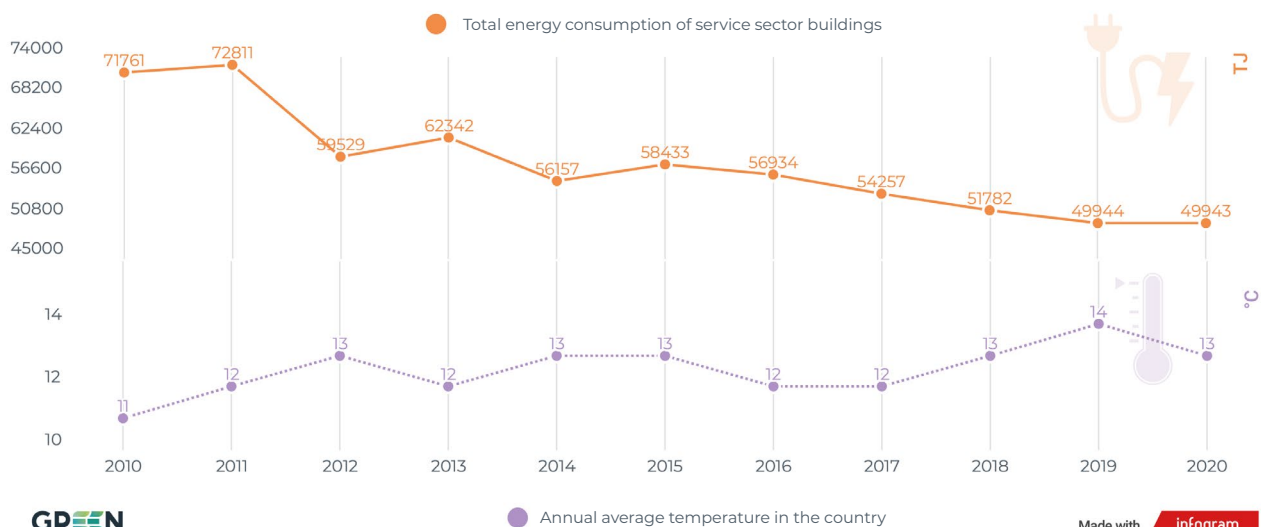
2. THE EVOLUTION OF GREENHOUSE GAS EMISSIONS AND ABSORPTIONS IN HUNGARY SINCE 2010

In contrast, the emissions and energy consumption of service sector buildings (non-residential, i.e., commercial or institutional buildings) show a decreasing trend. In this sector, weather has been less significant as an influencing factor (Figure 6). These

types of buildings were typically not affected by the reduction in utility prices during the examined period. However, state-, municipal-, and church-owned buildings had access to non-repayable support on energy renovations from EU funds.

Figure 6: Total emissions and energy consumption of service sector buildings, 2010-2020, and annual average temperature in the country, 2010-2020 (source: OMSz, KSH).

SERVICE SECTOR BUILDINGS



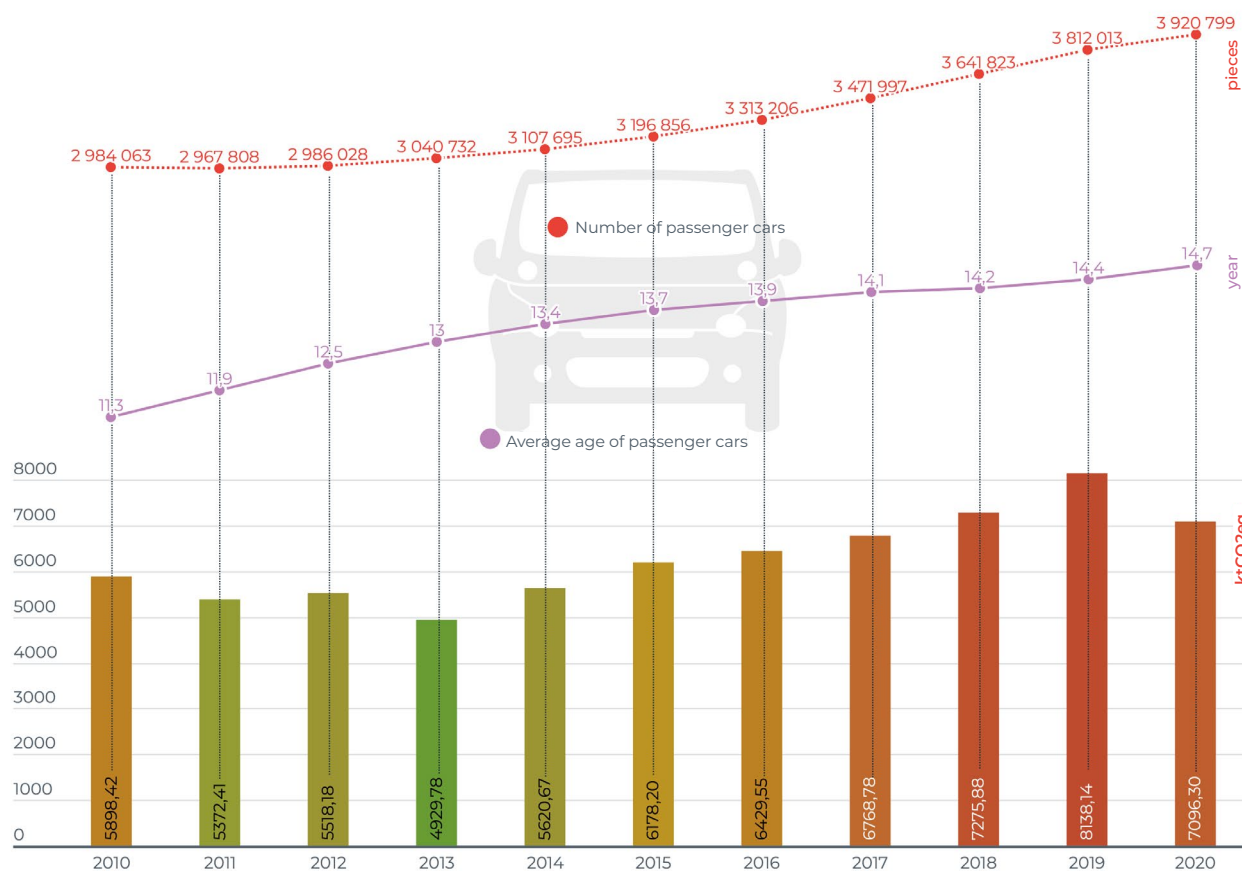
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Looking at the transportation sector, the rapid increase in emissions is striking (Figure 7), which was only halted by the lockdowns due to COVID-19 in 2020, and in this year, the blending proportion of biofuels was increased as well. The main cause of the emission growth was the rapid expansion of the vehicle fleet. The number of buses remained

relatively stable, but the number of passenger cars increased by 31%, motorcycles by 37%, trucks by 30%, and trailers by 69% between the end of 2010 and of 2020. In case of the passenger car fleet, it is especially true that the expansion did not happen with the procurement of new, low-emission cars, but with the import of outdated, used vehicles.

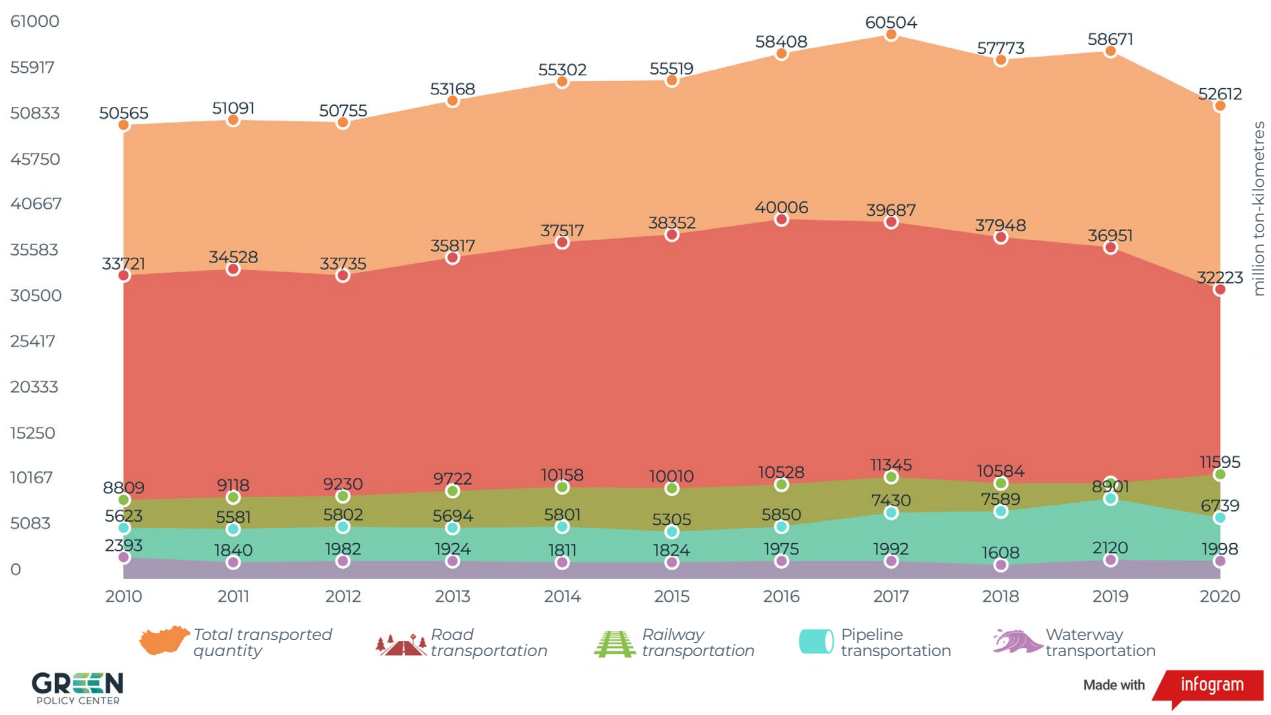
Figure 7: Number average age, and total emissions of passenger cars, 2010-2020 (source: KSH, OMSz).



Examining the share of freight transportation modes (Figure 8), it is evident that the remarkable progress in road freight transportation seen between the fall of communism and 2010 has stopped. Since then, the relative proportions of transportation modes have remained roughly the same. However, the overall amount of freight transpor-

tation (measured in tonne-kilometres) has increased since 2010 until 2017. It remained at a high level in 2018-2019 before experiencing a temporary setback in 2020 due to the COVID-19 lockdowns. Overall, the shift of freight transportation from road to more environmentally friendly modes of transportation such as rail has not yet begun.

Figure 8: The distribution of the total domestic freight transportation volume among different modes of freight transportation, 2010-2020 (source: KSH).



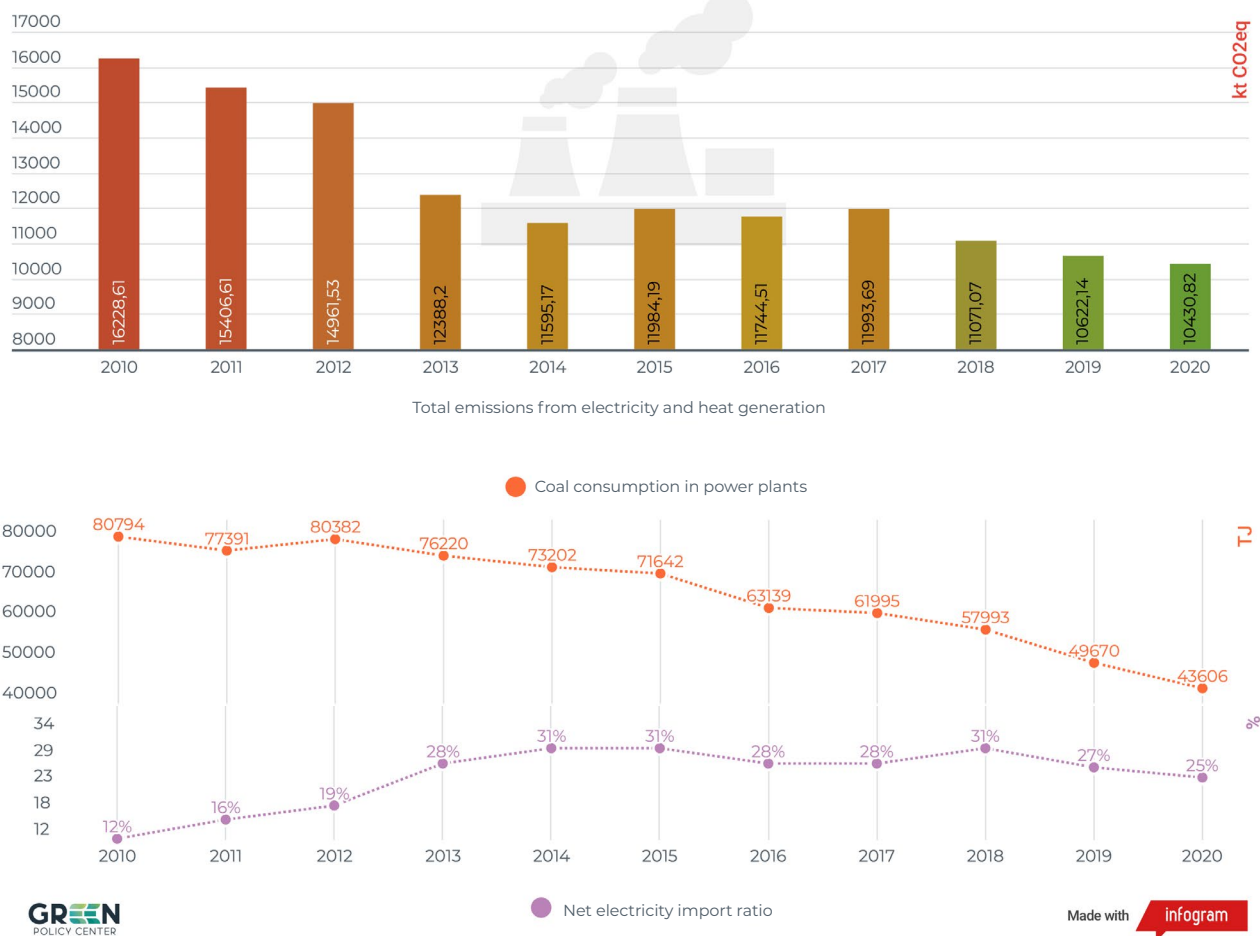
The emissions from electricity and heat generation showed a decreasing trend during the period between 2010 and 2020 (Figure 9). One of the reasons for this is the decrease in coal-fired power generation, primarily

due to the ageing and inefficient operation of power plants, as well as the high price of carbon dioxide quotas. Another reason is the increase in electricity imports.

Emission Offsetting

Reducing a country's national greenhouse gas emissions, if it is achieved by shifting those emissions beyond its borders while still enjoying the benefits, is not true progress. From a global perspective, this is clearly not a step forward and can sometimes result in an overall worse solution due to emissions from transportation. Analyses show that this effect plays a significant role in the reduction of GHG emissions across the entire European Union. National Inventory Reports submitted to the United Nations display emissions trends based on territorial boundaries, making it difficult to precisely track these movements. However, there are already reports that measure emissions of individual countries based on consumption, regardless of the country in which the emissions themselves were generated.

Figure 9: Emissions from electricity and heat generation, coal consumption in power plants, net electricity import ratio, 2010-2020 (source: OMSz, KSH, and calculations based on them by GPC).

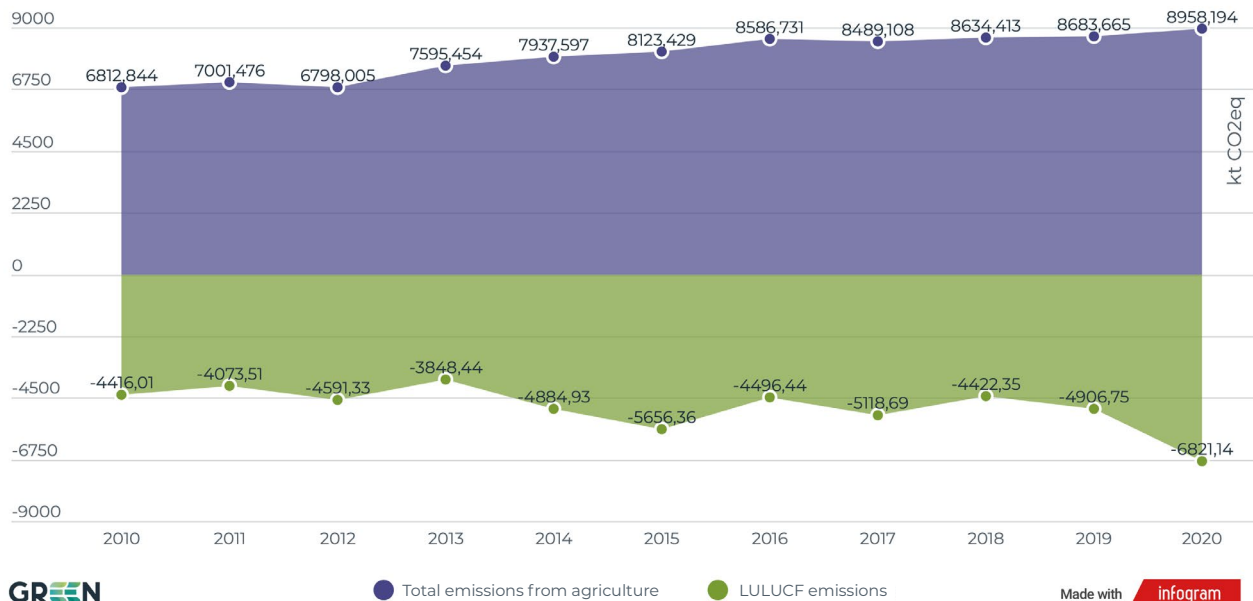


Between 2010 and 2020, emissions related to agriculture (including energy use within the sector and the agricultural activities themselves) showed a slight increase, corresponding to the expansion of livestock and crop production (Figure 10). The growth in cattle population primarily contributed to the increase in emissions from livestock, while the intensified use of fertilisers contributed to emissions from crop production. The

sector of land use, land-use change, and forestry (LULUCF) also experienced an increase in absorbed carbon dioxide, although trends in this sector are challenging to analyse due to significant annual fluctuations. The overall forest area remained relatively stable between 2010 and 2020, but the annual timber harvesting was only 50-60% of the annual growth of trees, resulting in a continuous accumulation of timber in the forests.

2. THE EVOLUTION OF GREENHOUSE GAS EMISSIONS AND ABSORPTIONS IN HUNGARY SINCE 2010

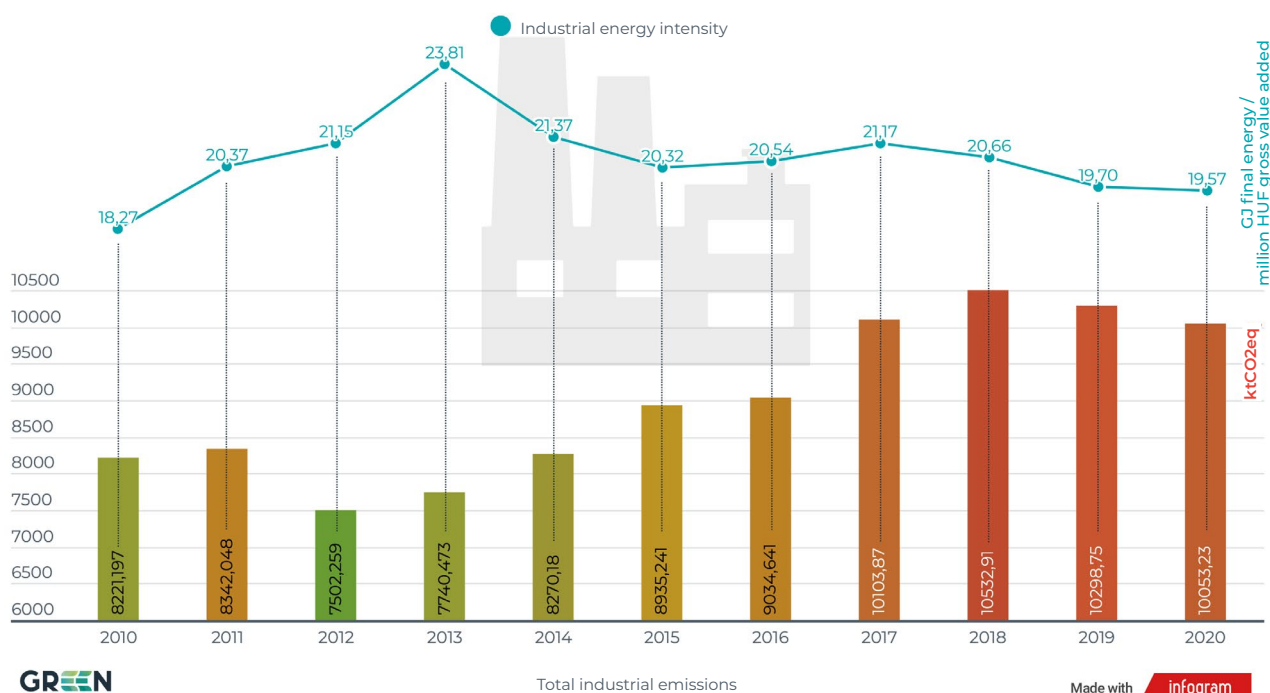
Figure 10: Emissions from agriculture and the carbon dioxide absorption by land use, land-use change, and forestry (LULUCF) sector, 2010-2020 (source: OMSz).



Industrial emissions (including emissions from energy use and manufacturing processes) increased between 2010 and 2018, except for the economically challenging year of 2012 (Figure 11). There was a slight decrease in emissions in 2019-2020, but this can be attributed to individual challenges faced by specific major emitters and the economic disruptions caused by COVID-19. Therefore, it is not yet clear whether a trend reversal has occurred. During the analysed

period, emissions were primarily influenced by the annual production quantity and the current economic situation of the actors involved. However, changes in industrial structure and various investments in energy efficiency improvements also played a role. Considering the changes in energy intensity, which more strongly indicate a decreasing trend, it is reasonable to conclude that gradual improvement has happened, potentially influenced by EU ETS quota prices as well.

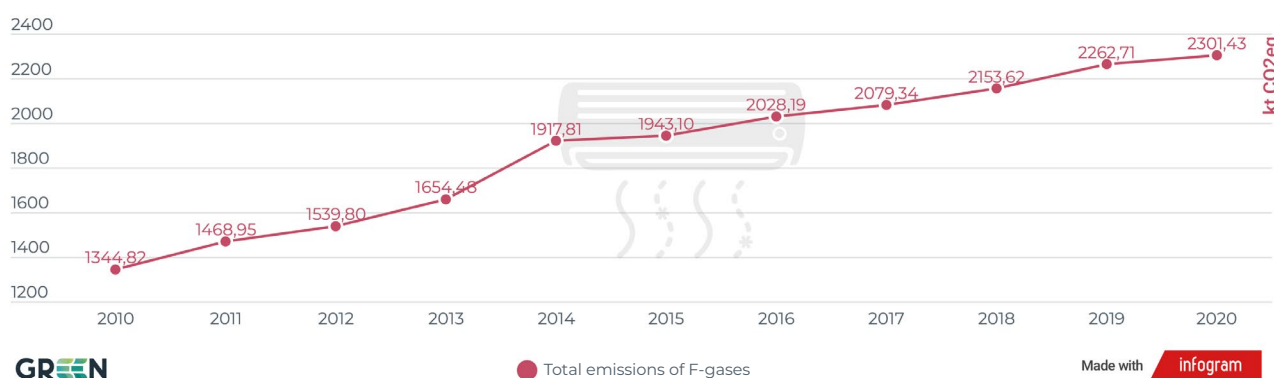
Figure 11: Industrial emissions and energy intensity, 2010-2020
(source: OMSz, KSH, and calculations based on them by GPC).



The emissions of fluorinated greenhouse gases (F-gases), mainly used in refrigeration and air conditioning equipment, have been continuously increasing in our country since the regime change, including the period between 2010 and 2020 (Figure 12). The reason for this is the growing prevalence of equipment using these gases. Previously,

other substances were used, which had to be phased out due to their ozone-depleting effects. The transition to even newer, climate-friendly substances has not progressed sufficiently. This sector is regulated directly by current EU legislation, which limits its national room for maneuver.

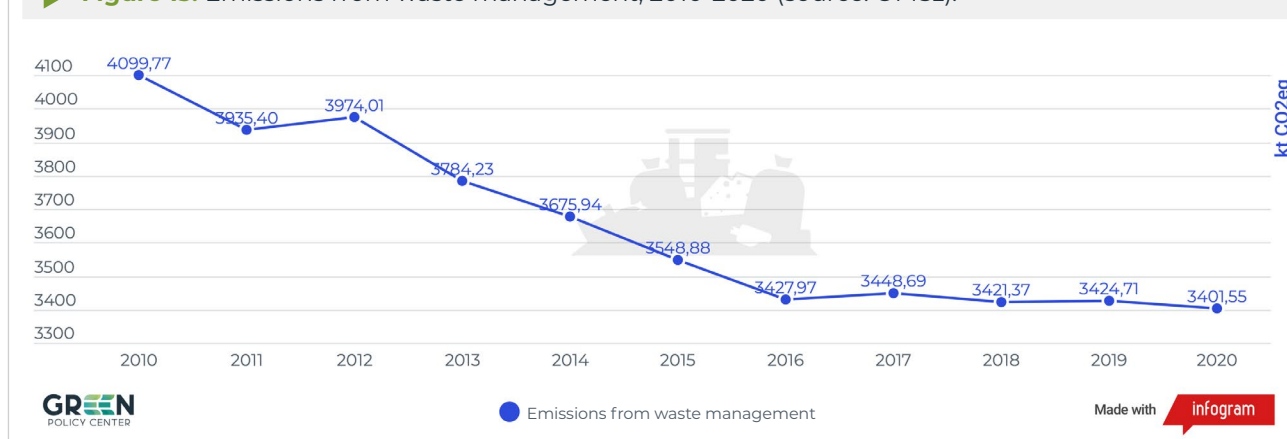
Figure 12: Total emissions of F-gases, 2010-2020 (source: OMSz).



In the field of waste management, the primary sources of emissions (Figure 13) are landfills. The decomposition of organic materials previously deposited there results in emissions that persist over many years, so the sector's emissions change slowly. However, the quantity of newly deposited ma-

terials in landfills has shown a decreasing trend since 2010, leading to a gradual reduction in emissions from waste management. The most significant change occurred during the period of 2013-2016, while further progress has been made only in small steps since then.

Figure 13: Emissions from waste management, 2010-2020 (source: OMSz).



Summary

Examining the latest ten years of known GHG emission data (2010-2020), it is evident that Hungary's net GHG emissions in 2020 were 9% lower than in 2010. However, when considering the entire period from 2010 to 2020, no consistently decreasing trend can be observed. For instance, if we choose 2014 as a baseline instead of 2010, the GHG emissions in 2019 were 11,5% higher, and even the emissions in the COVID-affected year of 2020 exceeded it by 4%. It is important to note that the current climate targets for 2030 and 2050 were only adopted in 2020, so the past ten

years did not have as ambitious goals set by the Hungarian climate policy. However, the data clearly demonstrates the need for significant trend reversal to achieve the current 2030 and 2050 targets. The necessity for accelerated action has been recognized in strategic documents and legislation adopted by the Government and the Parliament, with further measures being planned. It will only be possible to assess whether these measures are effective and achieve the desired results through future analysis based on objectively measurable GHG emission data.



3. Climate neutrality indicators and their evaluation

Introduction

The main indicator of progress towards climate neutrality is the trend in a country's aggregated greenhouse gas (GHG) emissions and removals. The goal is to achieve a balance between these factors, so that by 2050, we do not emit more GHGs than we can neutralise. However, this single indicator is composed of numerous other factors. It is worthwhile to look behind these numbers and understand the processes within sectors and across sectors, as this is the only way we can bring about the necessary changes.

As previously noted, achieving climate neutrality by 2050 requires significant changes in all policy areas and the operations of all

actors. Understanding the necessary changes and their direction cannot be achieved without measuring and monitoring data. In this chapter, based on the methodology developed in a referenced study by the Ecologic Institute and adapted to the Hungarian context, a total of 108 indicators of progress towards climate neutrality are examined. Tracking and interpreting indicators annually can assist in the development of future long-term climate change strategies and sector-specific action plans. It can also be integrated into planning and monitoring processes, such as the review processes of the national energy and climate plans.

Note: The following chapter was prepared by using Ecologic Institute's report: Duwe, Matthias; Eike Karola Velten, Isabel Haase, Nicolas Berghmans, Nick Evans, and Deyana Spasova (2021): Measuring progress towards climate neutrality. Ecologic Institute, Berlin / IDDRI, Paris, available at: <https://www.ecologic.eu/18153>

Additionally, the collected dataset can serve as an objective starting point for discussions on whether we are truly making progress

towards achieving climate neutrality and where and how changes need to be implemented.

Key indicators and selection of reference countries

In each examined dimension key performance indicators (KPI) were selected, and when available, the data for the EU average, as well as Austria, the Czech Republic, and Portugal, were included. The selection of both the KPI's and the reference countries was based on the considerations of the authors. KPIs were chosen as elements that were deemed particularly important in their respective dimensions compared to others. The selection of reference countries was based on the similarity in basic characteristics (population and area) to Hungary, while taking into account their differing levels of development and geographical location.

The collection of the highly diverse data was done with the best intentions and by exploring as many data sources as possible. However, it is possible that some data may be inaccurately represented in the material or that certain data may be available despite not being found by the report authors. In order to improve the quality and comprehensiveness of information in future reports, any identified errors or deficiencies can be reported to info@greenpolicycenter.com via email.

General evaluation

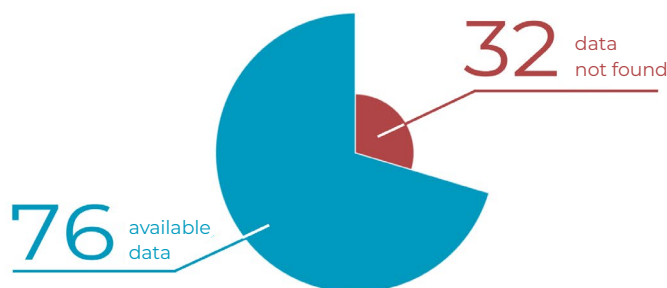
Considering that this is the first report of its kind, the indicators presented in this chapter, mostly for the year 2020, provide more of a situational analysis rather than a progress assessment. It is in the subsequent reports that the direction of progress will become clearer, starting from the year (2020) when Hungary legally established its climate neutrality goal. Nevertheless, based on the collected data, it can generally be observed that there are scarce medium- or long-term goals for specific sectors or subsectors where such goals would be meaningful. Without such (sub)goals, it is quite challenging to evaluate the adequacy of progress since we cannot see the progress components that should make up the „big” goal.

Furthermore, the report authors did not find data for some important indicators, either

because they are not being measured or because they are not accessible. In order to obtain a complete picture, the measurement of these indicators needs to be initiated, and the missing data should be made available to the public. As for the overall assessment, Hungary's performance presents a mixed picture. There are indicators that show relatively good performance, but there are also several that are average or below average. The detailed exploration of the reasons behind this goes beyond the scope of this report and will be addressed separately by the Green Policy Center in dedicated events. After establishing the baseline in 2020, the reports in the following years will demonstrate the direction and pace of progress we embark on from the current situation.

► **Figure 14:** The number of indicators examined in chapter 3 and their availability (collected by GPC).

Total number
of examined
indicators:
108

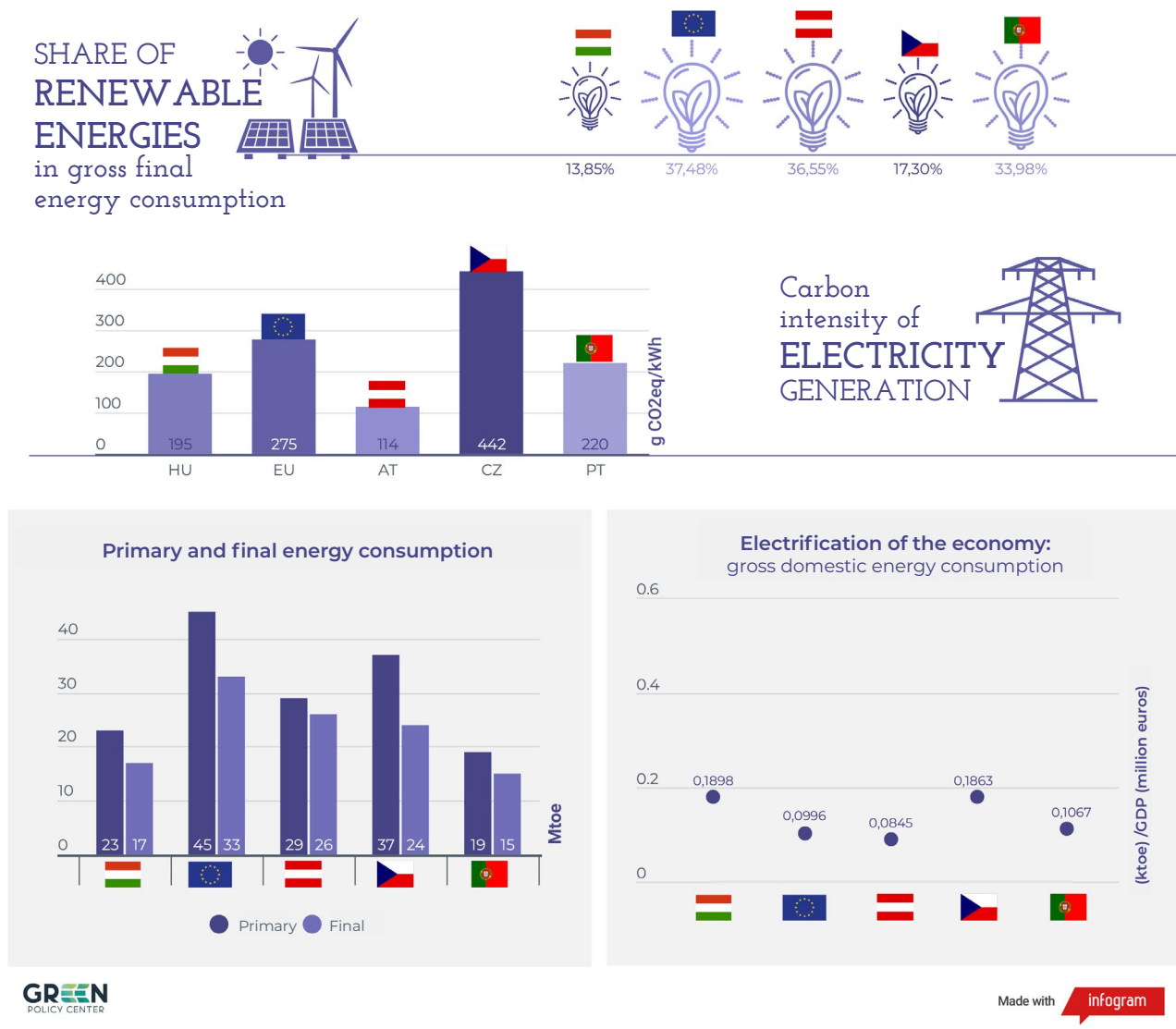


Energy

The decarbonization of sectors related to energy consumption (such as buildings, transportation, industry, electricity and heat generation, agriculture, etc.) is crucial to achieving climate neutrality goals since the current Hungarian GHG emissions are responsible for over 70%¹⁰ of these sectors. The report examined this complex sector through four objectives (share of renewable energies in gross final energy consumption, CO₂ emissions from energy generation captured and used or stored, carbon intensity of electricity generation, and electrification of the economy) and nine enablers. These enablers include the supportive regulatory frameworks, infrastructure to enable a secure transition and indicators related to reducing total energy consumption. The complete dataset is included in Table 1. Regarding the key indicators, the Hungarian energy sector started from a relatively weak position in terms of renewable energy penetration compared to the reference countries, even considering geographical constraints. The carbon intensity of electric-

ity generation (which measures how polluting the electricity production is) started from a relatively good position mainly due to a high proportion of nuclear-based production. Connected to these indicators, the Government committed to producing 90% of electricity without carbon emissions by 2030. This goal requires significant efforts and takes into account the slow progress of the Paks-2 investment and the commissioning of new power plant units alongside the continued operation of Paks-1. Primary and final energy consumption is included as a key indicator because achieving climate neutrality is not feasible or would be much more expensive without significant reductions in these areas. The data shows that Hungary performs well compared to the EU average and the reference countries, with only Portugal ahead. However, the energy intensity of the economy is not as favourable, with Hungary and the Czech Republic having similar unfavourable data compared to the reference countries.

Figure 15: Key indicators related to energy consumption in Hungary and selected reference countries.



Agriculture and land-use

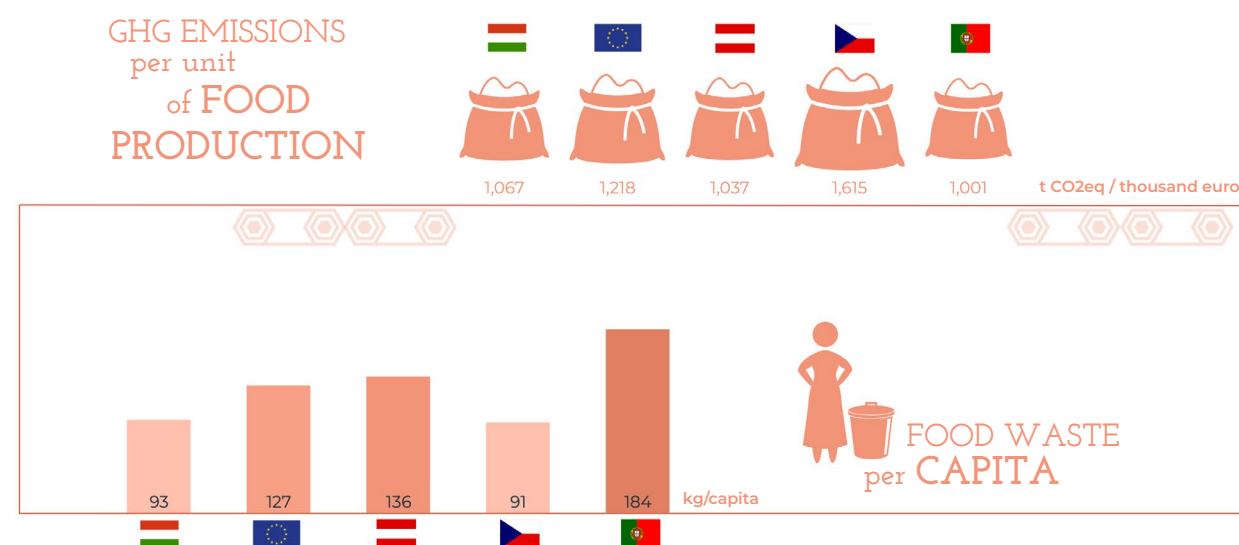
The decarbonization of the agriculture and land use sector (especially the former) poses significant challenges, even compared to other sectors. This sector represents a significant share of Hungarian emissions (11,6% of gross emissions, with agricultural energy consumption adding an additional 2,6%), where a significant portion of emissions is associated with activities (such as livestock farming) where the change in

consumer preferences, rather than technological innovations, can bring about real results. However, in agriculture, innovative and nature-friendly methods can also play a significant role, and there is a need to promote or rediscover such practices. Accordingly, indicators related to fostering new eco-agricultural practices and innovation, reducing emissions and increasing carbon removal in land-use, dietary changes, reduc-

ing and reusing food waste, are presented in this sector. The complete dataset is included in Table 2. As for the key indicators, Hungary's value for GHG emissions per unit of food production is roughly similar to other refer-

ence values, while our performance in terms of food waste per capita is relatively good, which of course does not mean that there is no room for improvement in this area.

Figure 16: Key indicators related to agriculture and land use in Hungary and selected reference countries.



Industry

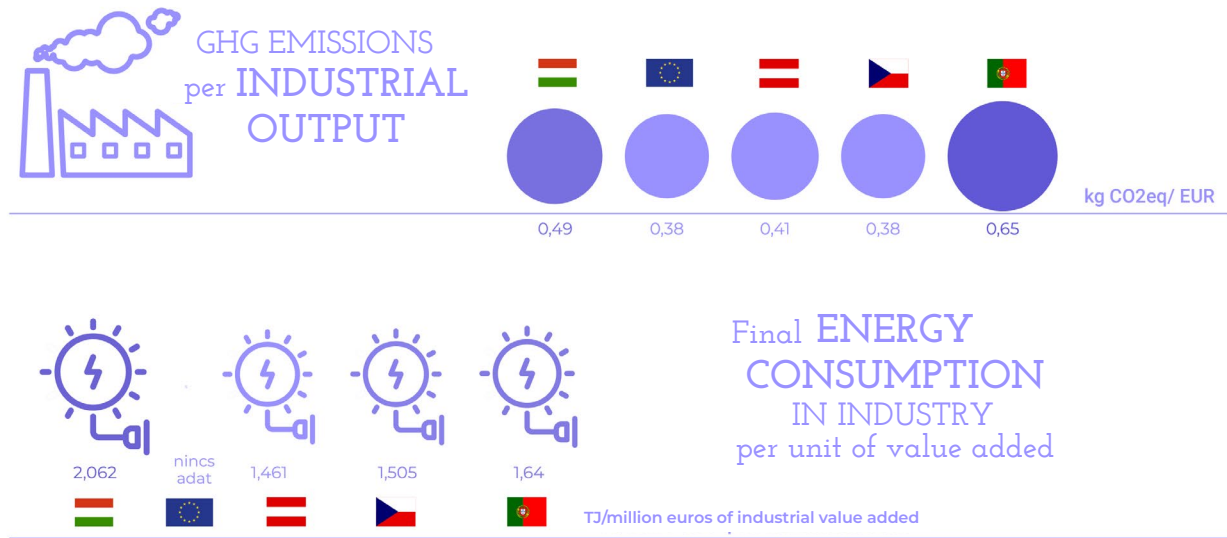
Industrial emissions from energy consumption and manufacturing processes account for 16% of Hungary's gross GHG emissions. Reducing emissions in this sector is particularly challenging, especially in energy-intensive industries or manufacturing processes with high GHG emissions (including activities such as iron and steel production, cement and lime manufacturing, chemicals industry, ceramics industry, glass industry, which fall into both categories). Developing and disseminating innovative technologies may be one opportunity for emission reduc-

tion. Additionally, in line with the concept of a circular economy, it will be necessary to use fewer resources during the production of new products, extend the lifespan of manufactured products, and increase their level of recycling. The report examines indicators and enablers such as creating lead markets for innovative technologies, unlock value chains for material efficiency and circularity to improve material efficiency, and infrastructure to enable the industrial transition. The complete dataset is included in Table 3. Regarding key indicators, Hungary has

the second least favourable value in terms of GHG emissions per industrial output and its final energy consumption in industry per unit of value added is also high and the least

favourable among the analysed countries. This can be attributed not only to high energy consumption (the denominator) but also to low value added (the numerator).

Figure 17: The key indicators related to industry in Hungary and the selected reference countries.



Buildings

It is not an exaggeration to say that there is significant potential for emissions reduction related to buildings, and perhaps in this sector, decarbonization is relatively straightforward from a technological perspective. Approximately 17% of our gross GHG emissions are associated with buildings, almost exclusively from direct emissions resulting from energy use (burning fossil fuels for heating, cooling, hot water production, cooking, etc.). It is important to note that the majority of existing buildings are expected to still be standing in 2050. This means that during the transition to climate neutrality, the focus should primarily be on compre-

hensive energy retrofitting of existing buildings rather than solely on new constructions. Based on the above, we examined indicators related to six objectives (GHG emissions of buildings, share of buildings heating systems using renewable energy sources, share of renewable energy in heating and cooling, final energy consumption in buildings, total number of renovated buildings, and annual renovation rate) and three enablers (facilitating emission-free buildings, raising demand for emission-free buildings and digitalization). The complete dataset is provided in Table 4. Regarding key indicators, in terms of GHG emissions of buildings, we are

not significantly below the EU average but lag behind the Czech Republic to a similar extent compared to the reference countries. However, the number of renovations falls far behind the required quantity for upgrading the existing building stock by 2050. Instead

of the desired annual renovation rate of approximately 3%, we are achieving only about one-third of that rate. With this pace, not only the long-term goal but also the EU's target of achieving an annual 2% renovation rate by 2030 is questionable.

Figure 18: Key indicators related to buildings in Hungary and selected reference countries.

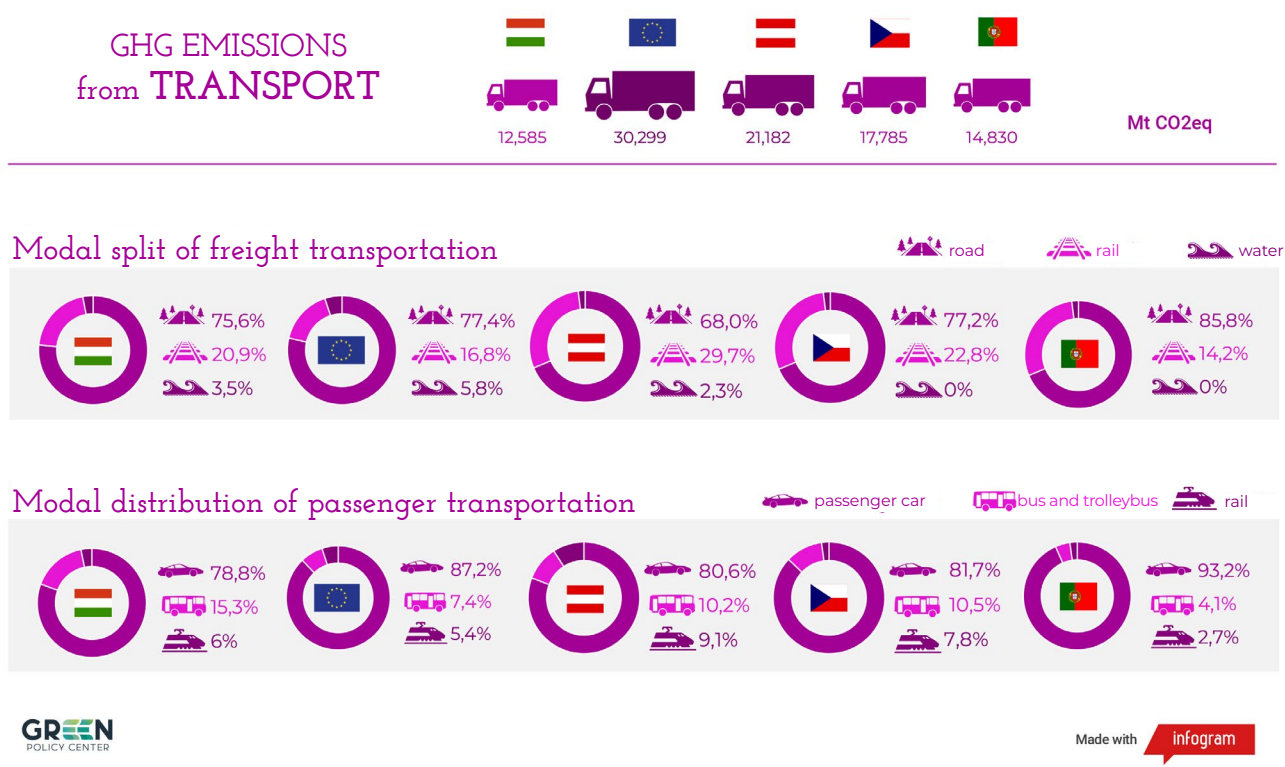


Transport

The increase in emissions from transport is not only a Hungarian phenomenon but a global one as well. It is the only sector in Hungary that shows a steep upward trend in emissions, accounting for 20% of the country's total gross emissions in 2020. In the transport sector, key strategies for achieving climate neutrality include reducing transport demand through rationalisation, shifting between modes of transport, and transitioning to more environmentally friendly vehicles, such as electric and hydrogen-powered vehicles. Therefore, the indicators related to transport focus on two main goals: GHG emissions from transport and

energy consumption of transport. Additionally, three enablers are considered: zero carbon-emission fuels, incentivizing the modal shift, and urban and territorial planning and its implementation. In terms of key indicators, Hungary is still considered a relatively low emitter in absolute GHG emissions from transport compared to reference countries. However, the upward trend in emissions requires intervention. Regarding transport modes, Hungary currently lags below the EU average in terms of passenger cars per household. However, the usage rate of personal cars in personal transport (78,8%) remains high in Hungary as well.

Figure 19: Key indicators related to transportation in Hungary and selected reference countries.



Carbon Dioxide Capture

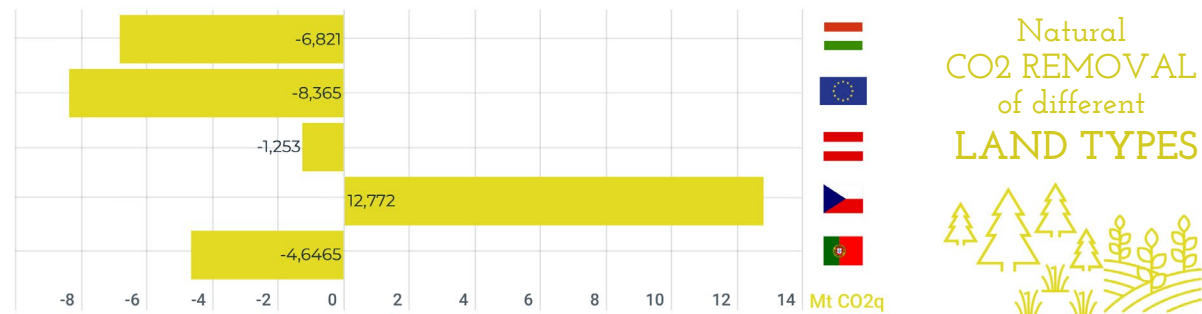
When we talk about climate neutrality, the concept actually refers to achieving a balance between the two sides of the emission balance: GHG emissions and removals. Therefore, the removal of GHGs from the atmosphere is just as important as reducing emissions. If the level of removals, primarily carried out by forests in Hungary, does not remain at least as high as it is now, then logically even greater emission reductions would be required for climate neutrality. Regarding removals, we can distinguish between natural and artificial methods, but currently, the latter is not a realistic alternative at the systemic level as these technologies are still under development. Therefore, they cannot be relied upon at present, but they can be considered as a possibility by 2050. It is

also important to emphasise that ecosystems performing natural removals also fulfil numerous other essential functions for life, so their preservation in the best possible condition is crucial not only for combating climate change. By 2050, Hungary has committed to maintaining the current level of natural GHG removals, which accounts for approximately 5% of the 1990 gross emissions. Based on these considerations, we examined key indicators related to three objectives (natural CO₂ removal of different land types, CO₂ removal of carbon removal technologies, and geological CO₂ storage or utilisation) and two enablers (enhancing natural carbon sequestration and the contribution of CO₂ removal to carbon neutrality). The complete dataset is included in Table 6. In terms of key

indicators, Hungary performs below the EU average in terms of natural CO₂ removal but fares well compared to the reference countries. This value is highly dependent on nat-

ural conditions and the negative impacts of climate change on forests, making it interesting to observe the trends in future changes over time.

Figure 20: Key indicator related to carbon dioxide removal in Hungary and in selected reference countries.



Financing

When discussing climate neutrality, financing that enables emissions reductions and adaptation to the unavoidable impacts is the third key area of climate action. The Paris Agreement also emphasises the need to align financial flows with lower GHG emissions and efforts to enhance resilience to climate change, in addition to the well-known temperature and adaptation goals. This means that public and private resources should finance activities that promote the green transition. Determining what qualifies as such financing is not a simple question, but there are already recommendations in various forums and aspects. The main actors in greening the economy and financial system are governments' public expenditures and the financial flows that drive the economy, particularly commercial banks. It is important to note that according to the Paris Agreement, all expenditures must be aligned with green ambitions. This means that mon-

itoring the magnitude of direct green-supporting expenditures is not enough; it is also crucial to assess their counteracting effects. Based on the above, two objectives (share of EU Taxonomy-regulated sustainable and non-sustainable investments in companies subject to EU reporting obligations, and sustainable investment gap) and one enabler (align the financial system with climate) were examined through indicators. The complete dataset is provided in Table 7. Regarding the key indicator, measuring the „green” expenditures of the central budget would be crucial for monitoring the greening of financing. However, none of the reference countries currently apply the EU-developed „green budgeting methodology” consistently. Therefore, it is not credibly apparent what proportion of expenditures each country allocates to sustainable investments. As for the EU budget, a 30% green commitment is visible for the 2021-2027 cycle.



Technology

Technology undoubtedly plays a crucial role in the transition towards a climate-neutral economy and society. However, it is not appropriate to overestimate this role (techno-optimism). There will certainly be technical advancements that aid the transition to a more sustainable lifestyle. However, it is highly unlikely that these advancements alone will be sufficient to address all problems without changes in production and consumption quantities, methods, and habits. Based on the above, the report examines four indicators related to the enabler „foster climate related research and innovation“. These indicators track the specifically allocated R&D&I expenditures in green areas and the total and per sector climate change

mitigation technologies patents. The complete dataset is provided in Table 8. While no specific key indicator is marked in this section, it is worth noting that Hungary plans to allocate 3% of its GDP to R&D by 2030 (covering all R&D&I activities, not just those related to green topics). In 2020, we allocated slightly over 4% of the total research expenditure, which represented 1,6% of the GDP, specifically to environmental research. This is less than what was allocated, for example, to space research and utilisation. It should be noted that R&D expenditures in other sectors (such as energy) theoretically contribute to environmental benefits as well, but this is not apparent from the statistics.

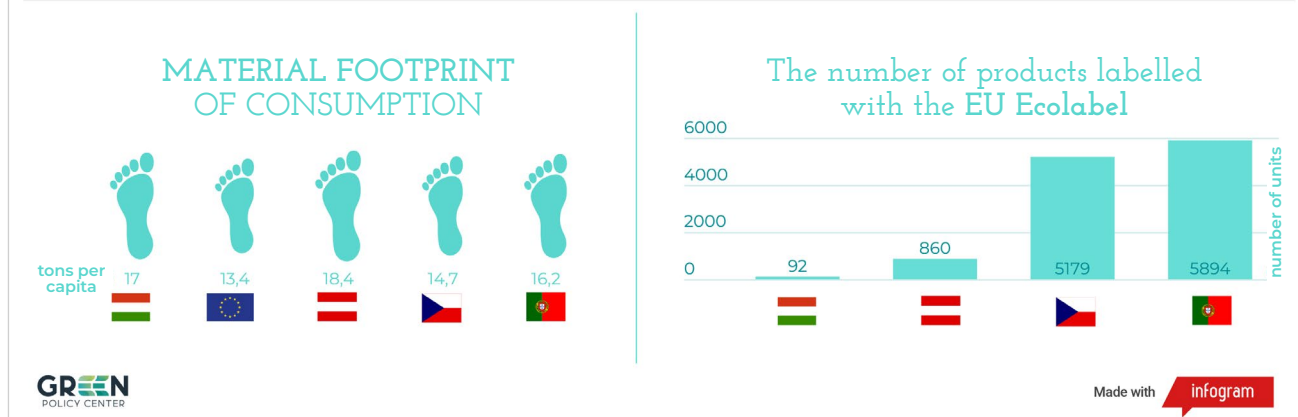


Lifestyle change

The climate-neutral transition is difficult to imagine without lifestyle changes. These are often mistakenly interpreted as sacrifices, but they should rather be seen as a shift in priorities. It is highly likely that the current economic and social functioning, which encourages excessive consumption, cannot be made sustainable and climate-neutral solely by modifying technological conditions. Based on this, the report examines this aspect through two enablers: raising collective knowledge on lifestyle impacts on the environment and systemic changes

that promote low-carbon alternative solutions. The complete dataset is provided in Table 9. As for the key indicator, our material footprint of consumption exceeds the EU average by more than a quarter, making it the second least favourable value among the reference countries, after Austria. The number of products labelled with the EU Ecolabel is extremely low in Hungary, with only 92 products, while in the EU there were a total of 87,485 such products in 2022, and the reference countries had products in the order of thousands.

► **Figure 21:** Key indicators related to lifestyle changes in Hungary and selected reference countries.



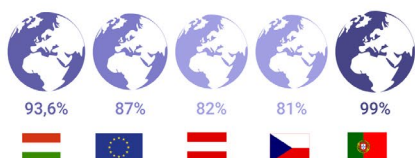
Just transition

It is extremely important to establish the principle that the climate-neutral transition should not result in an increase in social inequalities, neither between countries nor within a country. However, in the short term, the transition will inevitably have „losers” who need to be adequately supported and, if necessary, compensated, and prepared for the expected changes. A conscious and socially managed transition will be required, involving society appropriately so that everyone understands and even feels ownership of this process, ensuring that short-term difficulties do not diminish social support, which would politically impede further progress. Based on these considerations, we examined this aspect using indicators related to the following enablers: meaningful citizens’ and intermediate bodies’ participation,

a proactive structural public policy, ensuring a just environmental pricing, and availability of low-carbon solutions. The complete dataset is provided in Table 10. Regarding the key indicator, the public support for climate neutrality target in Hungary is particularly high (93,6% in 2021), which provides a good foundation for the acceptance of necessary policy measures. However, these surveys do not necessarily imply a clear and specific commitment to „sacrifices” in terms of policy measures, so they can often be misleading. As for environmental tax revenues, their share in Hungary is higher compared to the EU and reference countries when considering the total public revenue. However, if we relate the same value to the GDP, it is closer to the average.

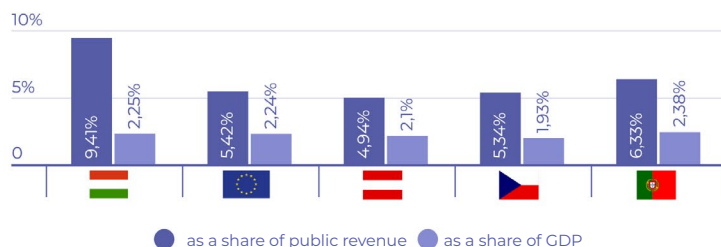
Figure 22: Key Indicators related to a just transition in Hungary and selected reference countries.

The public support for
CLIMATE NEUTRALITY TARGET
in Hungary and reference countries



GREEN
POLICY CENTER

Environmental tax revenues



● as a share of public revenue ● as a share of GDP

Made with **infogram**



Climate governance system

The state (at both central and local levels) has a significant responsibility and opportunity in organising and directing the transition towards climate neutrality. The frameworks designated by international and EU legislation need to be concretized and implemented at the national level. Moreover, Hungary has set its own legally binding target of achieving climate neutrality by 2050, making it obligatory for everyone to contribute to its implementation. In addition to the state, the involvement of other societal actors is necessary, as mentioned above, as the transition requires participation from all stakeholders. A successful green transition cannot be achieved without societal support. In this dimension, the report examines indicators related to four enablers (integrated cycle of policy learning, dedicated institutional arrangements, political and societal support and buy-in, reflexive interface for coordination within the country). The complete dataset is included in Table 11. No key indicator has

been designated because all elements of the system are considered equally crucial. However, the authors of the report were unable to obtain several pieces of information due to their unavailability in the public domain and/or the lack of information received. Two key findings are worth highlighting: firstly, there is considerable societal support for achieving the climate neutrality target, which can serve as a basis for further action. However, this can also be misleading as it does not necessarily imply support for specific policy measures. Secondly, although the climate law establishes the most important objectives, it does not define various essential elements of the climate governance system. For instance, it does not establish a cyclical mechanism for climate policy planning, decision-making, monitoring, and review, nor does it establish an independent scientific advisory institution that could enhance evidence-based decision-making.

Table 1 - Energy

 Key indicator
  Hungary
  EU average
  Austria
  Czech Republic
  Portugal



























	Indicator	2020 value in Hungary and reference countries for the key indicators (year if different from 2020)	National target for 2050 (in parentheses for 2030) and its source	Data sources
Objective	Share of renewable energies in gross final energy consumption (incl. subindicators for electricity, transport and heating & cooling) [%]	<p>Total energy mix:  13,85 % ( 37,48,  36,55,  17,3,  33,98)</p> <p>Electricity generation:  11,9%; ( 22,09;  78,2;  14,81;  58,03)</p> <p>Transportation:  11,57% ( 10,22;  10,28;  9,38;  9,7)</p> <p>Heating and cooling:  17,72% ( 23,09;  35;  23,54;  41,55)</p>	<p>none (minimum 21%)</p> <p>National Energy Strategy 2030</p>	<p>EUROSTAT Shares https://ec.europa.eu/eurostat/web/energy/data/shares</p> <p>https://ec.europa.eu/eurostat/databrowser/view/sdg_07_40/default/table?lang=en</p> <p>https://www.eea.europa.eu/data-and-maps/daviz/countries-breakdown-actual-res-progress-12#tab-googlechartid_chart_21</p>
	CO2 emissions from energy generation captured and used or stored [t CO2]	data not available	<p>With CCUS technology: 6,58 Mt CO2eq (0,35 Mt CO2eq)</p> <p>Based on background calculations carried out for the Early Action Scenario of the National Clean Development Strategy by REKK in 2021</p>	
	Carbon intensity of electricity generation [g CO2 eq/kWh]	 195 g CO2 eq/kWh ( 275,  114,  442,  220)	<p>Gross (without CCUS): 20,8 g CO2eq/kWh (85,5 g CO2eq/kWh)</p> <p>Net (with CCUS): -38,8 g CO2eq/kWh (78,8 g CO2eq/kWh)</p> <p>Based on background calculations carried out for the Early Action Scenario of the National Clean Development Strategy by REKK in 2021.</p>	<p>https://www.statista.com/statistics/1290234/carbon-intensity-power-sector-hungary/</p> <p>https://www.eea.europa.eu/data-and-maps/daviz/co2-emission-intensity-12/#tab-chart_2</p>
	Electrification of the economy (incl. sub-indicators for sectors) [%]	data not available	none (none)	<p>https://energy.ec.europa.eu/2022-report-energy-subsidies-eu_en,</p> <p>https://energy.ec.europa.eu/system/files/2022-11/study_on_energy_subsidies_and_other_government_interventions-MJ0422159ENN.pdf</p>

Table 1 - Energy


	Indicator	2020 value in Hungary and reference countries for the key indicators (year if different from 2020)	National target for 2050 (in parentheses for 2030) and its source	Data sources
E1: Supportive regulatory frameworks	Public money going to fossil-fuels [EUR, as % of GDP]	500 M EUR, 0,35%	none (none)	https://energy.ec.europa.eu/2022-report-energy-subsidies-eu_en , https://energy.ec.europa.eu/system/files/2022-11/study_on_energy_subsidies_and_other_government_interventions-MJ0422159ENN.pdf
	Support mechanisms for renewables (with sub-indicators for electricity, transport, heating & cooling) [scale]	EU support (contracted amount): KEHOP: 1 684 767 176 HUF GINOP: 26 694 043 066 HUF TOP: 2 067 377 362 HUF VEKOP: 1 356 018 130 HUF Domestic support: data not available	N/A	Government data reporting
	Price on carbon (with sub-indicators for different sectors/sources) [HUF or EUR/tCO ₂ eq]	EU ETS annual average price: 24,4 euros / tCO ₂ e; national: none	N/A	https://www.eea.europa.eu/publications/the-eu-emissions-trading-system-2/the-eu-emissions-trading-system
	Levelised costs for battery storage, carbon capture [EUR/tCO ₂], hydrogen [EUR/kgH ₂]	data not available	N/A	
E2: Infrastructure to enable a secure transition	The capacity of electricity interconnectors as a percentage of electricity generation capacity [% of capacity]	64%	none (none)	International Energy Agency: Hungary 2022 Energy Policy Review + http://www.mekh.hu/ujabb-merfoldkohoz-ert-a-hazai-villamosenergia-rendszer-fejlesztese
	Storage capacities for energy (for electricity, heat, gas)	Electricity: 10 MW Gas: 6,63 billion m ³ Heat energy: no data available	none (electricity: 100 MW) <i>National Energy and Climate Plan</i>	https://mfgt.hu/en , National Energy Strategy 2030
	Average outage duration for each customer (SAIDI) for electricity and gas [hour/consumer/year]	2,56 (2019)	none (none)	https://tcdata360.worldbank.org/indicators/h2d96dbda?country=HUN&indicator=42570&viz=line_chart&years=2014,2019

Table 1 - Energy





































	Indicator	2020 value in Hungary and reference countries for the key indicators (year if different from 2020)	National target for 2050 (in parentheses for 2030) and its source	Data sources
E3: Reducing total energy consumption	Primary and final energy consumption (incl. sub-indicators for final energy per fuel type, per sector) [Mtoe]	<p>Primary:  23,9 Mtoe ( 45,8;  29,7;  37,5;  19,5) </p> <p>Final:  17.61 Mtoe ( 33,6;  26,1;  24,5;  15) </p> <p>Industry:  4,42 Mtoe ( 8,56;  7,32;  6,55;  4,5) </p> <p>Transport:  4,46 Mtoe ( 9,33;  7,73;  6,38;  5,01) </p> <p>Trade and services:  2,00 Mtoe ( 4,5;  2,57;  2,99;  2,16) </p> <p>Households:  5,98 Mtoe ( 9,19;  6,68;  7,15;  3,01) </p>	<p>Primary: none (none)</p> <p>Final: If it increases after 2030, the only source can be carbon-neutral energy sources (not exceeding the 2005 level of 785 PJ)</p> <p>National Energy Strategy 2030, with a perspective until 2040</p>	<p>https://www.ksh.hu/stadat_files/ene/hu/ene0002.html,</p> <p>https://www.ksh.hu/stadat_files/ene/hu/ene0006.html</p> <p>own calculations based on: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Energy_statistics_-_an_overview_alapjan</p> <p>https://ec.europa.eu/eurostat/databrowser/view/sdg_07_10/default/table?lang=en</p> <p>https://ec.europa.eu/eurostat/databrowser/view/sdg_07_11/default/table?lang=en</p> <p>https://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do</p> <p>https://ec.europa.eu/eurostat/databrowser/view/ten00124/default/table?lang=en</p>
	Energy intensity of the economy: Gross domestic energy consumption (ktoe) / GDP (million euros)	<p> 0,1898 ( 0,09956;  0,0845;  0,1863;  0,1067) </p>	<p>none (none)</p>	<p>https://www.odyssee-mure.eu/publications/efficiency-by-sector/overview/primary-final-energy-intensities-trends.html</p> <p>gross inland energy consumption/ gross domestic product 1. szám forrása: https://ec.europa.eu/eurostat/web/energy/data/energy-balances 2. szám forrása: https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=nama_10_gdp&lang=en</p>

Table 2 - Agriculture and land-use

 Key indicator
  Hungary
  EU average
  Austria
  Czech Republic
  Portugal







	Indicator	2020 value in Hungary and reference countries for the key indicators (year if different from 2020)	National target for 2050 (in parentheses for 2030) and its source	Data sources
EI: Foster new eco-agricultural practices and innovation	<i>GHG emissions per farmland [tCO₂eq/ha]</i>	1,725 t CO ₂ eq/ha	none (none)	own calculation from the data of the national inventory report: agriculture emissions (both energy and non-energy): 8958,194307 ktCO ₂ e. Regarding farmland (specifically cropland according to the inventory): 5193,234 thousand hectares
	<i>GHG emissions per unit of food production [tCO₂eq/thousand EUR]</i>	 1,067 t CO ₂ eq /thousand EUR  1,218,  1,037,  1,615,  1,001	none (none)	2,9 trillion HUF (exceeded) or 839 470 thousand EUR: https://www.ksh.hu/docs/hun/xftp/idoszaki/mgszlak/2020_2/index.html#atermelsvolumenemrskldtt https://ourworldindata.org/co2/country/hungary , https://ec.europa.eu/eurostat/databrowser/view/aact_eaa01/default/table?lang=en . The emissions of the agriculture sector, including both energy and non-energy emissions: 8958,194307 ktCO ₂ e. https://ec.europa.eu/eurostat/databrowser/view/aact_eaa01/default/table?lang=en
	<i>Fertiliser inputs with sub-indicators for types [kg N/ha]</i>	85,35 kg N/ha	none (none)	own calculation from the data of the national inventory report: inorganic fertiliser 443230000 kg N/year, farmland (specifically cropland according to the inventory) 5193234 hectares.
	<i>Consumption of pesticides [tons]</i>	7827 tons (2019)	none (none)	https://www.ksh.hu/docs/hun/xftp/idoszaki/pdf/kornyhely-zetkep20.pdf
	<i>Share of agricultural land with organic farming [%]</i>	5,96%	none (none)	https://www.ksh.hu/docs/hun/xftp/idoszaki/pdf/kornyhely-zetkep20.pdf
	<i>GHG emissions of agriculture (with subindicators for different emission sources) [tCO₂ eq per year]</i>	8958,1 ktCO ₂ eq	none (none)	OMSz National Inventory Report

Table 2 - Agriculture and land-use







	Indicator	2020 value in Hungary and reference countries for the key indicators (year if different from 2020)	National target for 2050 (in parentheses for 2030) and its source	Data sources
E2: Reducing emissions and increasing carbon removal in land use	Average carbon sequestered in top soil layer [% weight]	data not available	none (none)	
	Share of agricultural land under agroforestry [%]	0,8% (2017)	none (none)	http://publicatio.uni-sopron.hu/1619/1/5VA_210_EMK_IL_u.pdf
	Share of farmed peatlands under partial-total rewetting and paludiculture [%]	data not available	none (none)	https://www.ksh.hu/stadat_files/fo/foI0003.html
E3: Dietary changes	Diet carbon footprint [tCO ₂ /capita per year]	data not available	none (none)	
	Average per-person protein consumption from selected meat, fish, seafood, eggs and dairy products [g/capita per day]	109,6 g/capita per day	none (none)	https://www.ksh.hu/stadat_files/mez/hu/mez0063.html
E4: Reduce and re-use food waste	Food waste per capita [kg/capita]	 93 kg/capita  127,  136,  91,  184	none (none)	https://portal.nebih.gov.hu/-/negyedev-el-csokkent-az-elelmi-szerpazarlasunk https://ec.europa.eu/eurostat/databrowser/view/env_wasfw/default/table?lang=en
	Amount of food waste [tons/year]	municipal waste: 3546000 tons per year food industry waste: 581000 tons per year	nincs (nincs)	https://www.ksh.hu/stadat_files/kor/hu/kor0029.html

Table 3 - Industry

 Key indicator
  Hungary
  EU average
  Austria
  Czech Republic
  Portugal












	Indicator	2020 value in Hungary and reference countries for the key indicators (year if different from 2020)	National target for 2050 (in parentheses for 2030) and its source	Data sources
E1: Creating lead markets for innovative technologies	Share of production from zero carbon industrial processes in gross industrial production and in energy intensive industrial production [%]	data not available	none (none)	
	Jobs created in zero carbon industrial processes in energy intensive industrial production [number of jobs]	data not available	none (none)	
	Annual investments in zero carbon industrial processes [HUF]	data not available	none (none)	
E2: Unlock value chains for material efficiency and circularity	Share of reused or recycled materials in basic material product demand [%]	data not available	none (none)	
	Ratio of primary to secondary production by industrial product [%]	data not available	none (none)	
	Emissions per industrial output [kgCO ₂ eq/EUR]	 0,49 kg CO ₂ eq / EUR ( 0,38,  0,41,  0,38,  0,65)	none (none)	Eurostat (https://ec.europa.eu/eurostat/databrowser/view/ENV_AC_AEINT_R2__custom_4672376/default/table?lang=en - manufacturing and gross value added, current prices)
	Final energy consumption in industry per unit of value added [TJ/million EUR of industrial value added]	 2,062 TJ/million EUR of industrial value added ( data not available,  1,461,  1,505,  1,64)	none (none)	https://ec.europa.eu/eurostat/databrowser/view/hrg_d_indq_n/default/table?lang=en és https://ec.europa.eu/eurostat/databrowser/view/NAIDA_10_A10__custom_4061064/default/table?lang=en
	CO ₂ intensity of gross final energy consumption in industry (sub-indicator for energy-intensive industry) [tCO ₂ /TJ]	26,79 tCO ₂ / TJ	none (none)	own calculation: energy-related industrial emissions (inventory) 4972,51025142305 ktCO ₂ e,, final energy consumption of the industry 185,6 PJ (https://www.ksh.hu/stadat_files/ene/hu/ene0006.html):

Table 3 - Industry


	Indicator	2020 value in Hungary and reference countries for the key indicators (year if different from 2020)	National target for 2050 (in parentheses for 2030) and its source	Data sources
E3: Infrastructure to enable the industrial transition	<i>Share of industrial sites having access to CO2 storage [%]</i>	0%	none (none)	
	<i>Share of industrial sites having access to hydrogen production and storage [%]</i>	data not available	none (none)	
	<i>Length or transport capacity of hydrogen and CCUS infrastructure network (with sub-indicators per infrastructure) [km or volumes per year]</i>	0 km	none (none)	

Table 4 - Buildings

 Key indicator
  Hungary
  EU average
  Austria
  Czech Republic
  Portugal






















	Indicator	2020 value in Hungary and reference countries for the key indicators (year if different from 2020)	National target for 2050 (in parentheses for 2030) and its source	Data sources
Objective	GHG emissions of buildings (incl. sub-indicators for building type, direct and indirect emissions) [tCO ₂ eq] - only direct emissions were included, broken down by residential and service buildings	<p>Residential buildings:  8,1 million t CO₂eq  14,172;  6,728;  8,371;  2,214)</p> <p>Commercial buildings:  2,8 million t CO₂eq  5,021;  1,318;  2,690;  0,970</p> <p>Total:  10,9 million t CO₂eq  19,194;  8,047;  11,061;  3,186)</p>	<p>The reduction of carbon dioxide emissions related to the energy use of buildings by 90% from the average level of 2018-2020 (20% for residential buildings and 18% for public buildings)</p> <p>Long-Term Renovation Strategy for the purpose of fulfilling the eligibility conditions for the payment of cohesion subsidies between 2021 and 2027 based on Directive (EU) 2018/844</p>	OMSz National Inventory Report
	Share of buildings heating systems using renewable energy sources (incl. sub-indicators for type and rented or owner-occupied buildings) [%]	0,3% (2016)	none (none)	https://www.ksh.hu/mikrocenzus2016/docs/tablak/07/07_2_2.xls
	Share of renewable energy in heating and cooling [%]	17,7%	none (28,7%)	EUROSTAT Shares https://ec.europa.eu/eurostat/web/energy/data/shares
	Final energy consumption in buildings (incl. sub-indicators for building type, type of applications and energy carriers) [PJ]	Households: 249,8 PJ, Trade and public services: 83,5 PJ	none (according to the National Energy and Climate Plan WAM scenario, residential buildings: 170,635 PJ; service sector: 105,407 PJ)	https://www.ksh.hu/stadat_files/ene/hu/ene0007.html , https://www.ksh.hu/stadat_files/ene/hu/ene0006.html
	Renovation rate (incl. sub-indicators for deep, medium, light renovations) [%]	<p> 1%</p> <p> deep: 0,2%;  data not available;  data not available;  data not available</p>	<p>none (3%)</p> <p>Long-Term Renovation Strategy for the purpose of fulfilling the eligibility conditions for the payment of cohesion subsidies between 2021 and 2027 based on Directive (EU) 2018/844</p>	2019: European Commission, Comprehensive study of building energy renovation activities and the uptake of nearly zero-energy buildings in the EU https://www.bpie.eu/wp-content/uploads/2021/11/BPIE_Deep-Renovation-Briefing_Final.pdf ,

Table 4 - Buildings







	Indicator	2020 value in Hungary and reference countries for the key indicators (year if different from 2020)	National target for 2050 (in parentheses for 2030) and its source	Data sources
E1: Facilitating emission-free buildings	Amount of One-Stop-Shops for energy renovation [number of OSS]	0	none (at least 1 advisory centre per county)	
	Recovery rate of construction and demolition waste [% of construction and demolition mineral waste recycled]	90,6 %	none (none)	Government information
E2: Raising demand for emission-free buildings	Public money going to building renovation (EU budget and other programmes) [HUF]	data not available	none (none)	
	Share of energy performance certificate (EPC) levels (A and B) (incl. sub-indicators for residential/commercial) or share of nearly zero energy buildings (NZEB) [% of total building stock]	Among all buildings certified in 2020, 5,1% (AA++, AA+, AA, BB combined). Only among residential and accommodation buildings, 4,74%. In the non-residential segment, 10,46%	the percentage of buildings that meet nearly zero energy requirements should reach 90% (20% by 2030)	https://entan.e-epites.hu/?stat_megoszlas , Long-Term Renovation Strategy for the purpose of fulfilling the eligibility conditions for the payment of cohesion subsidies between 2021 and 2027 based on Directive (EU) 2018/844
E3: Digitalisation	Coverage of households with smart metres [%]	 1% in measuring electricity consumption and 0,14% % in measuring gas consumption  35% (2018),  electricity 17% (2019),  data not available,  electricity 25% (2019))	(by 2030, 1 million smart metres in the electricity sector) National Energy Strategy 2030	National Energy Strategy 2030, https://www.parlament.hu/documents/10181/39233854/Infojegyzet_2021_26_energetikai_forradalom.pdf/16c9c042-7b81-557b-0a61-7ca799310656?t=1619161618292 , The smartEn Map (https://smarten.eu/wp-content/uploads/2019/12/the-smarten-map_2019.pdf), Benchmarking smart metering deployment in the EU-28 (https://op.europa.eu/o/opportal-service/download-handler?identifier=b397ef73-698f-11ea-b735-01aa-75ed71a1&format=pdf&language=en&productionSystem=cellar&part=)

Table 5 - Transport

 Key indicator
  Hungary
  EU average
  Austria
  Czech Republic
  Portugal





































	Indicator	2020 value in Hungary and reference countries for the key indicators (year if different from 2020)	National target for 2050 (in parentheses for 2030) and its source	Data sources
Objective	GHG emissions from transport (incl.sub-indicators for road, rail, water, air) [Mt CO ₂ eq]	<p>Total domestic transport:  12,585 Mt CO₂eq  30,299;  21,182;  17,785;  14,830</p> <p>Road transport:  12,329 Mt CO₂eq  28,860;  20,570;  17,412;  14,338</p> <p>Railway:  0,116 Mt CO₂eq  0,189;  0,087;  0,260;  0,029</p> <p>Domestic water transport:  0,009 Mt CO₂eq  0,739;  0,026;  0,012;  0,205</p> <p>Domestic air transport:  0,004 Mt CO₂eq  0,318;  0,023;  0,010;  0,261</p> <p>International air transport:  0,311 Mt CO₂eq  2,605;  1,053;  0,352;  1,582</p> <p>International shipping:  0 Mt CO₂eq  4,857;  0,046;  0;  2,214</p>	<p>Total domestic transportation: 2,131 Mt CO₂e (7,791 MtCO₂e)</p> <p>According to the background calculation performed by REKK in 2021 for the Early Action scenario of the National Clean Development Strategy.</p>	<p>OMSZ national GHG inventory, national inventories (EU average: GPC calculation based on EU inventory),</p> <p>national inventories (EU average: GPC calculation based on EU inventory)</p>
	Energy consumption of transport (incl. sub-indicators for fuel types) [PJ]	186,7 PJ	<p>Total: 189,0 (177,1) Crude oil: 31,08 (109,3) Natural gas: 1,9 (8,7) Electricity: 111,4 (40,3) Biomass (co-firing): 28,4 (17,5) Hydrogen: 16,3 (1,3)</p> <p>According to the background calculation performed by REKK in 2021 for the Early Action scenario of the National Clean Development Strategy.</p>	<p>http://www.mekh.hu/download/e/0e/01000/7_4_orszagos_eves_%20Eurostat_%20tipusu_%20reszletes_%20energi-amerleg_2014_2020.xlsx</p>

Table 5 - Transport

	Indicator	2020 value in Hungary and reference countries for the key indicators (year if different from 2020)	National target for 2050 (in parentheses for 2030) and its source	Data sources
EI: Zero carbon fuels	Share of low-emission fuels (with sub-indicators for electricity, biofuels, synthetic fuels and hydrogen) [%]	11,57% electricity: 33,6 ktoe, biofuel: 278 ktoe	none (by 2030, biofuel will account for 53% of renewable energy sources in the transportation sector, electricity will account for 21%, and hydrogen will also emerge. Source: https://www.europarl.europa.eu/RegData/etudes/BRIE/2021/698060/EPRS_BRI(2021)698060_EN.pdf)	https://ec.europa.eu/eurostat/web/energy/data/shares
	Average GHG emissions of new vehicles (incl. sub-indicators for vehicle types) [kgCO ₂ eq/km]	0,133 kgCO ₂ eq/km (2021)	none (none)	http://co2cars.apps.eea.europa.eu/?source=%7B%22track_to-tal_hits%22%3Atrue%2C%22query%22%3A%7B%22bool%22%3A%7B%22must%22%3A%7B%22bool%22%3A%7B%22must%22%3A%5B%7B%22constant_score%22%3A%7B%22filter%22%3A%7B%22bool%22%3A%7B%22must%22%3A%5B%7B%22bool%22%3A%7B%22should%22%3A%5B%7B%22term%22%3A%7B%22year%22%3A2019%7D%7D%5D%7D%7D%2C%7B%22bool%22%3A%7B%22should%22%3A%5B%7B%22term%22%3A%7B%22scStatus%22%3A%22Provisional%22%7D%7D%5D%7D%7D%5D%7D%7D%7D%7D%2C%22filter%22%3A%7B%22bool%22%3A%7B%22should%22%3A%5B%7B%22term%22%3A%7B%22MS%22%3A%22HU%22%7D%7D%5D%7D%7D%7D%7D%2C%22display_type%22%3A%22tabular%22%7D
	Number of vehicles (incl. sub-indicators for vehicle types and fuel types) [number]	4756537 units passenger cars: 3 920 799, buses: 16 979, motorcycles: 194 594, trucks: 542 848 ; tractor units: 81 317	none (none)	https://www.ksh.hu/stadat_files/sza/hu/sza0069.html
	Electric charging points (incl. sub-indicators for different charging types) [number]	Out of 1,407 electric charging stations, the electric connection points were distributed as follows (out of a total of 2,889 units): • Type2 (AC): 2 141 • Other AC: 15 • CCS2 (DC): 328 • CHAdeMO (DC): 269 • Other DC: 36	none (35 000 electric charging points, out of which 26 200 are below 22 kW and 8 800 are above 22 kW in power)	The source of the target number is the „Report on alternative fuels infrastructure development in Hungary 2020” policy report. The source of the 2020 data for charging points is the data provided by the Hungarian Energy and Public Utility Regulatory Authority.

Table 5 - Transport







	Indicator	2020 value in Hungary and reference countries for the key indicators (year if different from 2020)	National target for 2050 (in parentheses for 2030) and its source	Data sources
E2: Incentivising the modal shift	Modal split of passenger and freight transport (according to type) [%]	 Freight transport (excluding pipeline transport and air transport): road 75,6%, rail 20,9%, water 3,5%. Passenger transport (excluding air transport and active modes of transport): cars 78,8%; bus and trolley 15,3%, rail 6%.	none (none)	https://www.ksh.hu/stadat_files/sza/hu/sza0002.html https://ec.europa.eu/eurostat/databrowser/view/t2020_rk310/default/table?lang=en ; https://www.ksh.hu/stadat_files/sza/hu/sza0021.html és https://www.ksh.hu/stadat_files/sza/hu/sza0017.html https://ec.europa.eu/eurostat/databrowser/view/t2020_rk310/default/table?lang=en
		 Freight transport (excluding pipeline transport and air transport): road 77,4%, rail 16,8%, water 5,8%. Passenger transport (excluding air transport and active modes of transport): cars 87,2%; bus and trolley 7,4%, rail 5,4%.		
		 Freight transport (excluding pipeline transport and air transport): road 68,0%, rail 29,7%, water 2,3%. Passenger transport (excluding air transport and active modes of transport): cars 80,6%; bus and trolley 10,2%, rail 9,1%.		
		 Freight transport (excluding pipeline transport and air transport): road 77,2%, rail 22,8%, water 0%. Passenger transport (excluding air transport and active modes of transport): cars 81,7%; bus and trolley 10,5%, rail 7,8%.		
		 Freight transport (excluding pipeline transport and air transport): road 85,8%, rail 14,2%, water 0%. Passenger transport (excluding air transport and active modes of transport): cars 93,2%; bus and trolley 4,1%, rail 2,7%.		
E3: Urban and territorial planning and its implementation	Passenger transport (incl. sub-indicators for mode and purpose) [passenger-km]	21,596 million passenger-km (interurban passenger transport: 16,179 million, local passenger transport: 5,417 million)	none (none)	https://www.ksh.hu/stadat_files/sza/hu/sza0001.html
	Freight transport (incl. sub-indicators for mode and type of goods) [tonne-km]	52,612 million tonne-km (road: 32,223 million, rail: 11,595 million, water: 1,998 million, pipeline: 6,739 million)	none (none)	https://www.ksh.hu/stadat_files/sza/hu/sza0002.html
	Infrastructure updates and additions (incl. roads, rail, bike-lines etc.) [km and/or as HUF invested]	8,280 million HUF (ONLY FROM R&D BUDGET) - no other data available	none (none)	https://www.ksh.hu/stadat_files/tte/hu/tte0002.html
	Congestion and delays [hours spend in road congestion annually]	data not available	none (none)	https://www.ksh.hu/stadat_files/tte/hu/tte0002.html

Table 6 - Carbon Dioxide Capture

Key indicator
 Hungary
 EU average
 Austria
 Czech Republic
 Portugal


	Indicator	2020 value in Hungary and reference countries for the key indicators (year if different from 2020)	National target for 2050 (in parentheses for 2030) and its source	Data sources
Objective	Natural CO ₂ removal of different land types [MtCO ₂]	<p> The total emissions from the LULUCF sector: -6,821 Mt CO₂eq;</p> <p style="padding-left: 40px;">forests -6,611 Mt CO₂eq, croplands -0,058 Mt CO₂eq, lgrasslands -0,102 Mt CO₂eq, wetlands 0,064 Mt CO₂eq, settlements 0,220 Mt CO₂eq, wood products -0,336 Mt CO₂eq</p> <p> The total emissions from the LULUCF sector: -8,365 Mt CO₂eq</p> <p> The total emissions from the LULUCF sector: -1,253 Mt CO₂eq</p> <p> The total emissions from the LULUCF sector: 12,772 MtCO₃</p> <p> The total emissions from the LULUCF sector: -4,6465 MtCO₃</p>	none (none)	national inventories (EU average: GPC calculation based on EU inventory)
	CO ₂ removal of carbon removal technologies (incl. sub-indicators for types of removal technologies) [MtCO ₂]	0	none (none)	
	Technical CO ₂ storage (incl. sub-indicators for different storage options) [MtCO ₂]	0	none (none)	

Table 6 - Carbon Dioxide Capture

	Indicator	2020 value in Hungary and reference countries for the key indicators (year if different from 2020)	National target for 2050 (in parentheses for 2030) and its source	Data sources
E1: Enhancing natural carbon sequestration	<i>Restoration of ecosystems (incl. sub-indicators for different ecosystems) [Mha and/or %-increase, additional trees]</i>	<i>data not available</i>	<i>none (none)</i>	
	<i>Change in land coverage (incl. sub-indicators for types) [change in kha compared to the previous year]</i>	<i>managed forest area: +2,72 kha, croplands: -3,39 kha, grasslands (managed and unmanaged): -0,78 kha, wetlands: +0,01 kha, settlements: -0,2 kha, other areas: +1,63 kha</i>	<i>none (none)</i>	OMSz national GHG inventory
	<i>Soil organic carbon (SOC) in the topsoil [%-share]</i>	<i>1-2% (2010)</i>	<i>none (none)</i>	https://www.eea.europa.eu/data-and-maps/figures/vari-ations-in-topsoil-organic-carbon
	<i>Annual felling [m3/ha/year] and net annual increment of forests [m3/ha/year] (and their long term ratio)</i>	<i>6580 thousand m3 specific annual increment: 6,3 m3/ha, specific annual timber production: 3,2 m3/ha</i>	<i>none (none)</i>	own calculation (data source for annual increment and timber production: https://www.ksh.hu/sdg/3-26-sdg-15.html , data source for forest area: national inventory https://www.ksh.hu/stadat_files/kor/hu/kor0059.html
E2: Contribution of CO2 removal to carbon neutrality	<i>Contributions of GHG reductions and removals to an overall GHG net reduction target [% share]</i>	<i>7,2%</i>	<i>~5% (none)</i>	National Clean Development Strategy, national inventory

Table 7 - Financing

 Key indicator
  Hungary
  EU average
  Austria
  Czech Republic
  Portugal

	Indicator	2020 value in Hungary and reference countries for the key indicators (year if different from 2020)	National target for 2050 (in parentheses for 2030) and its source	Data sources
Objective	Share of EU Taxonomy-regulated sustainable and non-sustainable investments in companies subject to EU reporting obligations [%]	data not available	none (none)	
	Investment gap (lack) [HUF]	The estimated value of sustainable investment volume between 2020 and 2030: 2,642-3,700 billion HUF (2022)	N/A	Deloitte: Recommendations Report – Designing Recommendations for a Sustainable Capital Markets Strategy and Action Plan for Hungary (2022) Source: https://www.mnb.hu/letoltes/recommendations-report-deloitte-sustainable-capital-market.pdf
EI: Align the financial system with climate	Share of financial market assets labelled as Green / consistent with EU taxonomy (loans, primary market transactions, secondary market portfolios) [HUF]	Green capital market instruments portfolio in 2021: approximately 1190 billion HUF; of which, green loan portfolio: 218 billion HUF	none (none)	MNB Green Finance Report May 2022
	GHG intensity of Corporate loan and bond portfolio	data not available	none (none)	
	Ratio of green and brown loans/bonds (including net-zero compatible ones)	data not available	none (none)	
	Green investment and insurance funds, ration of pension funds (including net-zero compatible ones)	ESG investment funds: 1,8% of the total market; domestic green asset funds in the insurance sector: 8,66% based on net asset value (2021)	none (none)	MNB Green Finance Report May 2022
	Proportion of banks with established green transition plans	Completed: 0%; In progress: 5%; Plans exist: 18%; No plans: 77% (2021)	none (none)	MNB Green Finance Report May 2022
	„Green” expenditures of the state budget	 Data not available  30% (2021-27)  Data not available  Data not available  Data not available	none (none)	https://commission.europa.eu/strategy-and-policy/eu-budget/performance-and-reporting/mainstreaming/climate-mainstreaming_en

Table 8 - Technology


	Indicator	2020 value in Hungary and reference countries for the key indicators (year if different from 2020)	National target for 2050 (in parentheses for 2030) and its source	Data sources
EI: Foster climate related research and innovation	<i>R&D expenditure in Hungary [% of GDP]</i>	1,61%	<i>none (3%)</i> <i>Hungary's research, development, and innovation strategy (2021-2030)</i>	Hungary's research, development, and innovation strategy (2021-2030) https://ec.europa.eu/eurostat/databrowser/view/RD_E_GERD-TOT_custom_1637912/bookmark/table?lang=en&bookmarkId=999ebe67-78b5-4e71-910e-29166b557063
	<i>Environmentally related public R&D budgets [% of total R&D]</i>	4,32%	<i>none (none)</i>	https://www.ksh.hu/stadat_files/tte/hu/tte0002.html
	<i>Renewable energy R&D&I [% energy R&D&I]</i>	26,6%	<i>none (none)</i>	National Energy and Climate Plan
	<i>Total and per sector climate change mitigation technologies patents [number]</i>	no data available	<i>none (none)</i>	

Table 9 - Lifestyle change

 Key indicator
  Hungary
  EU average
  Austria
  Czech Republic
  Portugal












	Indicator	2020 value in Hungary and reference countries for the key indicators (year if different from 2020)	National target for 2050 (in parentheses for 2030) and its source	Data sources
E1: Raising collective knowledge on lifestyle impacts on the environment	Material footprint of consumption (with sub-indicators per materials) [tonnes of raw materials]	 17 tonnes per capita(2019),  13,4,  18,4,  14,7,  16,2	none (none)	https://www.eea.europa.eu/data-and-maps/figures/eu-member-states2019-material-footprint EU source: https://ec.europa.eu/eurostat/web/products-eurostat-news/-/ddn-20210713-2 többi ország forrás: https://data.oecd.org/materials/material-consumption.htm
	Waste per household [kg per capita]	381 kg per capita (2018)	none (none)	https://www.europarl.europa.eu/news/hu/headlines/priorities/society/20180328STO00751/hulladekkezes-az-eu-ban-trendek-es-statisztikak-infografika
	GHG footprint of consumption products and services [tCO ₂ e]	no data available	none (none)	
	Total calories consumption per capita per year [kCal per capita]	1224940 kCal per capita	none (none)	https://www.ksh.hu/stadat_files/mez/hu/mez0066.html
E2: Systemic changes that promote low-carbon alternative solutions	Average distance travelled per year [km]	no data available	none (none)	
	Average distance travelled for holiday/leisure (according to type) [km]	no data available	none (none)	
	Commuting travel time [average time of commute per minutes per day]	28 minutes per day (2011)	none (none)	https://www.ksh.hu/docs/hun/xftp/idoszaki/nepsz2011/nepsz_18_2011.pdf
	The number of products labelled with the EU Ecolabel [number]	 92,  total: 87485,  860,  5179,  5894 (2022)	none (none)	https://environment.ec.europa.eu/topics/circular-economy/eu-ecolabel-home/business/ecolabel-facts-and-figures_en

Table 10 - Just transition

 Key indicator
  Hungary
  EU average
  Austria
  Czech Republic
  Portugal







	Indicator	2020 value in Hungary and reference countries for the key indicators (year if different from 2020)	National target for 2050 (in parentheses for 2030) and its source	Data sources
E1: Meaningful citizens' and intermediate bodies' participation	Existence of Citizen Assemblies for climate policy [yes or no]	At the local level, yes (e.g., Budapest), but not at the national level	none (none)	https://d3n8a8pro7vnm.cloudfront.net/sortitionfoundation/pages/835/attachments/original/1643809378/KGY_nemzetkozi_peldak.pdf?1643809378
	Public support for climate neutrality target [percentage of surveyed sample]	 93,6% (2021),  87%,  82%,  81,  99%	none (none)	https://kormany.hu/hirek/hagy-siker-a-kornyezetvedelmi-konzultacio_en.pdf , Portugal: https://climate.ec.europa.eu/system/files/2021-06/pt_climate_2021_en.pdf Austria: https://climate.ec.europa.eu/system/files/2021-06/at_climate_2021_en.pdf Czech Republic: https://climate.ec.europa.eu/system/files/2021-06/cz_climate_2021
E2: A proactive structural public policy	Employment rate (with sub-indicators for type of industry [% of population aged 20-64])	industrial sector: 31,5% services sector: 63,8%	none (none)	https://www.ksh.hu/stadat_files/mun/hu/mun0009.html
	Share of public budget to support regions in transition [% of total budget]	EU: 0 national: 0	none (none)	

Table 10 - Just transition


	Indicator	2020 value in Hungary and reference countries for the key indicators (year if different from 2020)	National target for 2050 (in parentheses for 2030) and its source	Data sources
E3: Ensuring a just environmental pricing	Per capita consumption emissions by income groups [tCO ₂ /year]	no data available	none (none)	
	Population unable to keep home adequately warm (sub-indicators for poverty status and gender) [% of population]	4,2%	none (none)	https://ec.europa.eu/eurostat/statistics-explained/images/5/56/Share_of_the_population_unable_to_keep_home_adequately_warm_2017-2020.png
	Share of households' expenditure on electricity and gas and other housing fuels for average and poor households [%]	22,2%	none (none)	https://ec.europa.eu/eurostat/cache/infographs/hhexpcofog/hhexpcofog_2020/?lang=en
	Environmental tax revenues as a share of public revenue or GDP [%]	ratio to total taxes: 🇭🇺 9,41%, 🇪🇺 5,42; 🇩🇪 4,94; 🇧🇪 5,34; 🇵🇹 6,33) ratio to GDP: (2019) 🇭🇺 2,25% (🇪🇺 2,24; 🇩🇪 2,1; 🇧🇪 1,93; 🇵🇹 2,38)	none (none)	https://www.ksh.hu/stadat_files/kor/hu/kor0036.html relative to taxes: https://ec.europa.eu/eurostat/databrowser/view/env_ac_tax/default/table?lang=en GDP-hez viszonyítot: https://ec.europa.eu/eurostat/databrowser/view/env_ac_tax/default/table?lang=en
E4: Availability of low carbon solutions	Income distribution of deep energy retrofits beneficiaries [% of beneficiaries per decile]	no data available	none (none)	
	Income distribution of electric car users [% of users per decile]	no data available	none (none)	
	Air pollution exposure (with sub-indicators for local exposure) [% of population]	BaP: 2,2% NO ₂ : 0% O ₃ : 0% PM _{2.5} : 0% PM ₁₀ : 0%	none (none)	https://www.eea.europa.eu/themes/air/country-fact-sheets/2021-country-fact-sheets/hungary

Table 11 - Climate governance system

 Key indicator
  Hungary
  EU average
  Austria
  Czech Republic
  Portugal



	Indicator	2020 value in Hungary and reference countries for the key indicators (year if different from 2020)	National target for 2050 (in parentheses for 2030) and its source	Data sources
E1: Cyclical integrated policy process	Existence of a full formal climate policy learning cycle (target setting, strategic planning, policy formulation, progress monitoring) [yes/partially/no]	no data available	There is no publicly available information regarding this	
	A long-term climate strategy not older than five years with adequate level of detail [yes/partially/no]	Partially	There is a long-term strategy available, but it is quite general, and the desired emission reduction pathway to be followed is not clear.	National Clean Development Strategy 2020-2050, available: https://cdn.kormany.hu/uploads/document/5/54/54e/54e01b-f45e08607b21906196f75d-836de9d6cc47.pdf
	Regular and sufficiently detailed progress monitoring of necessary structural changes towards climate neutrality [yes/partially/no]	no data available	There is no publicly available information regarding this	
	Achievement of cohesion between short-term actions and long-term climate goals (net zero for the EU) [e.g., scoring system]	-	There is no publicly available information regarding this. The authors of this report did not examine this aspect; it will be addressed in future reports.	
E2: Dedicated institutional arrangements	Proliferation of framework climate laws with integrated policy cycle [yes/no]	Partially	While there is a climate protection law in place, it is extremely short and does not include other important provisions beyond the goals. It also does not address the policy cycle.	The 2020 XLIV Act on climate protection, available: https://net.jogtar.hu/jogszabaly?docid=A2000044.TV
	Quality of climate policy coordination mechanisms among EU institutions [e.g., scoring system]	no data available	There is no publicly available information regarding this	
	Existence of a dedicated institution for independent scientific advice on climate policy [yes/no]	No	There is no specifically dedicated independent institution that deals with climate policy scientific advisory.	

Table 11 - Climate governance system

	Indicator	2020 value in Hungary and reference countries for the key indicators (year if different from 2020)	National target for 2050 (in parentheses for 2030) and its source	Data sources
E2: Dedicated institutional arrangements	Formal and regular role for Parliament [e.g., scoring system]	10/5 points	The Hungarian Parliament adopted the Climate Protection Act and the National Climate Change Strategy. In addition, it operates the Sustainable Development Committee, which is responsible for reporting the government on the results achieved in the field of climate protection. However, this oversight role is largely formal and lacks real impact.	
	Existence of dedicated institution for climate policy related stakeholder engagement [yes/ no]	No		
E3: Political and societal support and buy-in	Existence of mechanism for continuing engagement with citizens on climate policy (such as Citizen Assemblies) [yes/no]	No		
	Public perceived legitimacy of participation channels for climate policy [percentage of surveyed sample]	no data available	There has been no such survey conducted	
E4: Reflexive interface for coordination within the country	Existence and quality of a mechanism for coordination between country on climate neutrality policy planning and – and with subnational level [e.g., scoring system]	no data available	There is no publicly available information regarding this	
	Degree of follow-through with country-specific recommendations under EU climate governance processes (European Semester, NECPs, EU Climate Law) [e.g., scoring system]	no data available	There is no publicly available information regarding this	

Notes

¹ Note: The source of the section on the impacts concerning Hungary is a document titled „Report on the scientific assessment of potential impacts of climate change on the Carpathian basin” prepared for the Government.

² https://unfccc.int/sites/default/files/resource/cma2022_04.pdf

³ The difference arises from the fact that the EU and its member states, including Hungary, submit a joint commitment to the United Nations.

⁴ <https://www.unep.org/resources/emissions-gap-report-2022>

⁵ <https://ccpi.org/download/climate-change-performance-index-2023/>

⁶ <https://epi.yale.edu/>

⁷ <https://mittrinsights.s3.amazonaws.com/GFI22report.pdf>

⁸ <https://www.cdp.net/en/research/global-reports/missing-the-mark>

⁹ <https://unfccc.int/ghg-inventories-annex-i-parties/2022>

¹⁰ Compared to gross emissions, without subtracting the carbon dioxide absorbed by forestry, which was 62.8 million tCO₂e in Hungary in 2020.

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