

Széchenyi István University

CLIMATE ACTION PLAN

2022-2035

(outlook to 2050)



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Foreword

Széchenyi István University is at the service of innovation, sustainability and the future. Our institution has recognised the importance of climate protection, as we are aware that we are responsible for shaping our future.

Our activities are carried out in the model of the knowledge pentagon, which is based on Széchenyi István University's close relationship with industry, government, civil, ecclesiastical and media stakeholders, with a strong emphasis on the aspects of harmonious coexistence with the natural environment from the point of view of sustainable development. Our priority is to ensure that our University is not only an outstanding higher educational institute, but also meets sustainability criteria in all its aspects.

We believe it is important to contribute to mitigating the effects of climate change through our teaching and scientific work, and to play an active role in the international fight against global warming. We do this by raising public awareness, developing and publishing new methods and technologies, and by consciously building our own environment. We are also implementing exemplary investments and projects that focus on sustainability, energy efficiency and the protection of our natural environment.

In order to take this work to a strategic level, we have developed the Széchenyi István University Climate Action Plan, which sets out our long-term vision and the steps needed to achieve it.

We are truly fortunate, as the campuses of our institution in Győr and Mosonmagyaróvár are surrounded by a scenic landscape that we must protect, respect and develop. We strive to preserve and enrich this landscape, so that its values can be shared and enhanced by future generations.

January 2022



Dr. Bálint Filep
President



Dr. Péter Zoltán Baranyi
Rector



Dr. Zsolt Kovács
Chancellor

1. The importance of climate protection

The impact of climate change is becoming increasingly apparent at global, regional and local level. This can cause major problems for elements of society, the economy and the environment. The recent increase in climate variability and extremes and the steady rise in mean annual temperatures are all signs of this change. Preparing for this and managing the impacts can only be achieved through concerted action, for which appropriate planning and strategy are essential.

Széchenyi István University, as a centre of knowledge and innovation, feels a responsibility for climate change, recognises its own responsibility in this regard and considers it a strategic priority to promote climate change activities both within the institution and beyond, in relation to society as a whole. To frame this objective, it has developed a Climate Action Plan, which form part of the University's strategic documents and provides the basis for the institution's medium and long-term action on climate change.

The Climate Action Plan has been guided by EU and national climate change strategies.

In response to the challenges of climate change, the European Commission adopted the European Green Deal on 11 December 2019, which sets the goal of *"making the EU the first climate neutral continent by 2050, protecting, preserving and enhancing the EU's natural capital and protecting citizens' health and well-being from environmental risks and impacts."*¹ This strategy document currently sets the framework for Europe's climate objectives.

The EU has already made legislative changes in a number of policy areas in order to meet its international commitments to fight climate change. EU countries have set binding emission reduction targets for key sectors of the economy for the future to significantly reduce greenhouse gas emissions. Against this background, the European Commission published the so-called "Fit for 55" EU climate package in July 2021, in line with the above document. The package sets out the requirements for achieving a 55 percent reduction in greenhouse gas emissions by 2030. In parallel, the EU aims to achieve full climate neutrality by 2050. While climate mainstreaming across all policy areas is a key objective, it also requires a transformation of EU industry, with a number of benefits, including:

- > promotes sustainable economic growth;
- > creates jobs;
- > brings health and environmental benefits for EU citizens; and

¹ Brussels, 14.10.2020 COM(2020) 652 final 2020/0300 (COD). Proposal for a DECISION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL laying down the EU's Environment Action Programme 2030

> contributes to the long-term global competitiveness of the EU economy by promoting innovation in green technologies.

In the case of Hungary, the strategic objectives related to climate change are summarised in the National Climate Change Strategy (NCS), which covers the period 2008-2025.

The NCS identifies three main lines of action for Hungary's medium-term climate policy:

- > **mitigation**: reducing emissions of climate-changing gases;
- > **adaptation**: to protect against the adverse ecological and socio-economic impacts of climate change, which are already unavoidable, and to improve the capacity to adapt to the consequences of climate change; as well as
- > **awareness raising**: raising social awareness of climate change and promoting climate consciousness.

The second National Climate Change Strategy for the period 2018-2030, which also looks ahead to 2050 (Annex to the Decision of the Hungarian Parliament No.23/2018 (X. 31.), hereinafter referred to as NÉS-2), identifies and delimits specific areas of connection within the National Adaptation Strategy, where it also assigns a prominent role to awareness-raising and R&D&I activities.

Achieving the objectives requires both mitigation and adaptation to unavoidable impacts. The need to start planning for adaptation worldwide is justified by the fact that the Intergovernmental Panel on Climate Change (IPCC) reports that warming will continue in the coming decades and that we need to respond to this. The key to adaptation planning, i.e. adapting before the change occurs, is the magnitude of the global change and how local climate in different regions will evolve during each phase of the change.

In recent years, a climate strategy for Győr-Moson-Sopron County and the City of Győr for the period 2021-2030 has been developed. The documents of the climate strategy include the most important climate challenges for the county as a whole and for the city of Győr in particular, as well as the greenhouse gas assessment. Based on this, the climate strategies identify the most important areas of intervention in the fields of environment, sustainability and climate change, as well as the strategic objectives and measures that can be linked to these, which define the most important lines of action to prepare the county as a whole, including the city itself, to effectively address the challenges of climate change, to help local residents adapt to climate change and to actively reduce its own carbon footprint. Both documents emphasise the importance of awareness raising and education/learning and place a strong emphasis on their role in climate protection in the future.

Preventing and mitigating the adverse effects of climate change and improving adaptive capacity must be a fundamental objective. In order to achieve this objective, it is necessary to create a plan based on voluntary commitments, which is already a step towards climate protection. Cooperation with the organisations and institutions involved at this level must also be developed. It is also necessary to develop a knowledge base to support adaptation to climate change and the prevention of natural disasters, and to increase society's awareness of climate change by promoting activities and patterns of behaviour for adapting to climate change.

In addition, it is of particular importance to raise awareness and raise the sensitivity of decision-makers and the general public to climate change and related mitigation and adaptation issues, so that these principles can be incorporated as effectively as possible into the roles and responsibilities of local authorities.

The Climate Action Plan of Széchenyi István University, based on international and national strategies, identifies the institution's climate change situation and its involvement, analyses good practices and identifies medium and long-term climate change plans, through the implementation of which it can actively contribute to measures to combat climate change.

2. Situational analysis from a climate change perspective

Széchenyi István University's mitigation situation analysis identifies the factors that primarily influence the direct and indirect environment of the Campus, its quality and future state from a climate protection perspective. The central campus building of Széchenyi István University, together with several other external educational facilities, is located on the territory of the city of Győr, the county seat of Győr-Moson-Sopron County. Exceptions to this are the Faculty of Agriculture and Food Sciences, based in Mosonmagyaróvár, and the University's external education centre in Budapest. Due to the complexity of the activities, the geographically separated sites and the indirect impacts generated by the University, the institution's climate change emission role is highly complex.

The aim of the climate assessment is to analyse the environmental indicators specific to the University that have an impact on the institution's carbon footprint and to collect and assess the specific greenhouse gas emission sources. Therefore, in this section of the strategy document, the main GHG emission points and their trend rates, as well as some of the University's vulnerabilities, are illustrated and assessed.

2.1 Environmental Impacts of Széchenyi István University

Energy consumption

Regarding the electricity consumption of the Széchenyi István University in 2018, the total consumption of the University's building stock was 10,030,806.0 kWh. Consumption data have shown a decreasing trend in recent years, which is partly due to the energy efficiency improvements in the buildings. Of all the building units, the largest consumer are those of the central Campus at Egyetem tér 1, followed by the building at Budai út 4 - 6 and the building unit at Vár utca 4, in Mosonmagyaróvár.

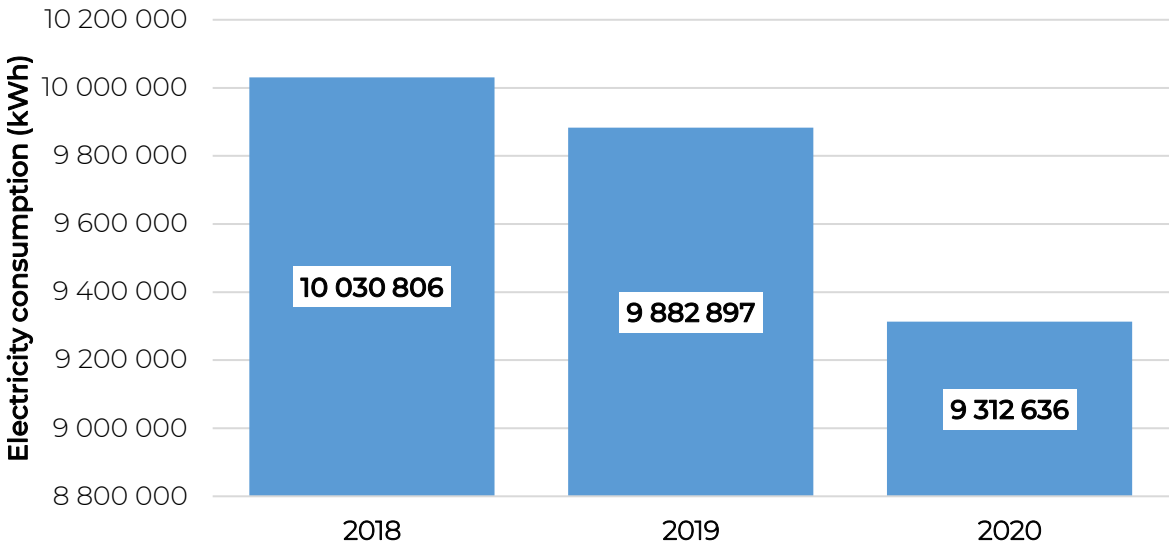


Figure 1: Electricity consumption of Széchenyi István University (kWh)

Natural gas consumption

In 2018, the total natural gas consumption of the University exceeded 31 838 377 MJ. The peak year was 2019, with a consumption of 33,041,193 MJ (Figure 2). By 2020, this value had dropped to 30,552, 356 MJ, which is an indirect effect of online education due to the COVID-19 pandemic. The evolution of natural gas consumption is strongly influenced not only by the mode of education but also by the prevailing external temperatures. Among the building units, the largest consumer is the building at 42 Liszt Ferenc utca, followed by the building at 17 Liszt Ferenc utca and then the building unit at 18 Cuha utca.

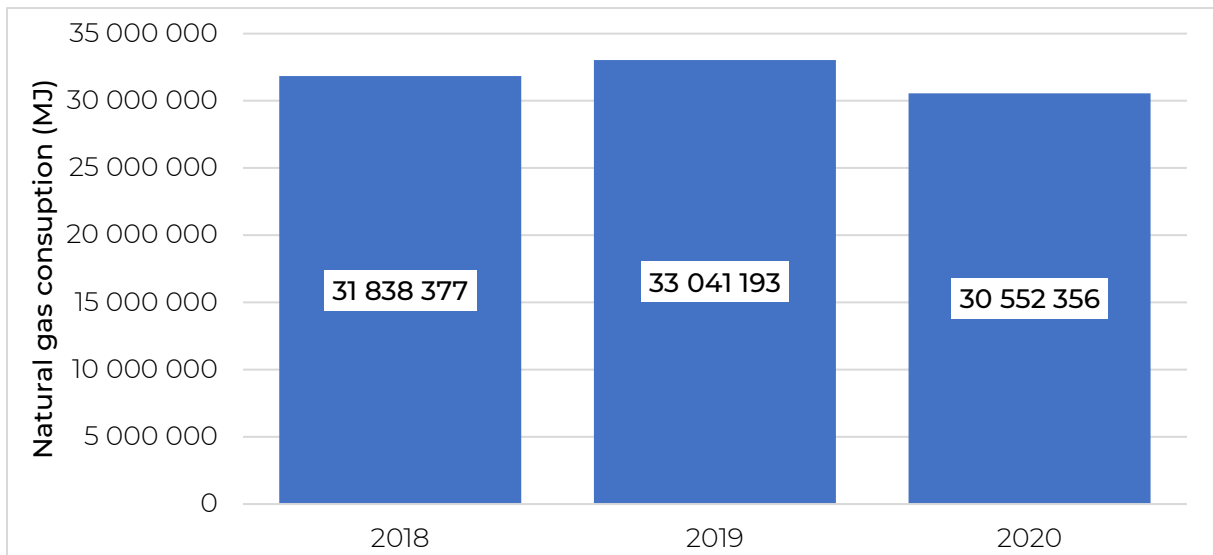


Figure 2 : Natural gas consumption of Széchenyi István University (MJ)

District heat consumption

Unlike the previous two categories of data, district heating consumption does not refer to each individual building unit. Figure 3 illustrates the aggregated consumption data for the building units of Széchenyi István University connected to district heating.

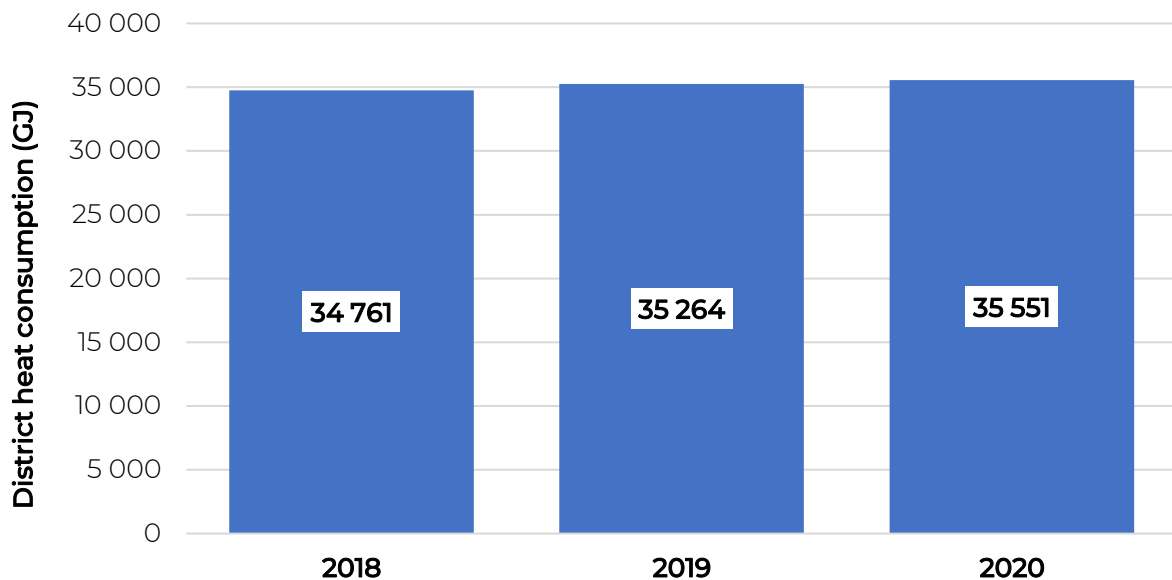


Figure 3: District heat consumption of Széchenyi István University (GJ)

In 2018, the total consumption of district heating was 34,761 GJ, which by 2020 had increased to 35,551 GJ. In contrast to the previous two parameters, this rate has increased. Among the building units, the largest consumer is the central Campus building at 1 Egyetem tér, followed by the building at 12 Áldozat u. and then the building unit at 26-28 St. István u.

Air pollutant emissions

Data from the National Environmental Information System, Air Pollution Control Information System Module are summarised in Table 1. In addition to educational activities, laboratory, economic and research activities are also carried out on the University campus, so air pollutant emissions are typically composed of the latter activities. Between 2014 and 2020, a total of 3,741,145.56 kg of air pollutants were emitted, with a peak year in 2018 (746,247.94 kg) and a minimum year in 2020 (249,966.02 kg). The same phenomenon can be observed for all air pollutants. The minimum value for the University's direct carbon dioxide emissions was also in 2020 (249,559.99 kg), a decrease of 57.7% compared to 2014.

The quantification of the University's total GHG emissions can be found in chapter 2.2.

Table 1: Air pollutant emissions of Széchenyi István University

| Air pollutants (kg) | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|--|--------------|--------------|--------------|--------------|--------------|--------------|
| Sulphur oxides (SO ₂ and SO ₃) as SO ₂ | 0 | 1,98 | 2,05 | 2,06 | 0 | 0,89 |
| Nitrogen oxides (NO and NO ₂) as NO ₂ | 582,7 | 683,96 | 704,8 | 709,5 | 381,5 | 263,4 |
| Carbon dioxide (CO ₂) | 407 107,4 | 665 113,9 | 683 330,2 | 745 189,0 | 395 049,5 | 249 559,9 |
| Carbon monoxide (CO) | 302,4 | 332,96 | 343,4 | 345,4 | 185,5 | 141,8 |
| Solid matter | 0 | 1,85 | 1,92 | 1,93 | 0 | 0 |
| Total air pollutants emitted | 407 992,6 | 666 134,7 | 684 382,4 | 746 247,9 | 395 616,5 | 249 966,0 |

Source: National Environmental Information System

2.2 Greenhouse gas emissions inventory of Széchenyi István University

The elements analysed in the identification of indirect greenhouse gas emissions are: electricity consumption, natural gas consumption and district heating consumption. In the latter case, the local district heating provider in the city of Győr has a very good emission factor, with at least 32% of its energy needs coming from geothermal energy (emission factor in this case 0.00 t CO₂/MWh) and 66% from natural gas. The CO₂e emissions associated with district heating consumption are included as part of the emissions associated with natural gas consumption (Figure 4).

The figure clearly shows that the overall GHG emissions have shown a decreasing trend in recent years, partly due to the energy efficiency measures implemented. The values also show that the direct emissions (i.e., the emissions actually generated on the sites) are much lower than the indirect emissions. This also shows that the future climate protection development directions of Széchenyi István University should pay considerable attention to energy procurement from renewable energy production.

Offsetting greenhouse gas emissions can be achieved both through direct intervention (e.g., energy efficiency measures, reduction of energy consumption) and by increasing the proportion of green areas, green spaces and wooded areas to absorb greenhouse gas emissions.

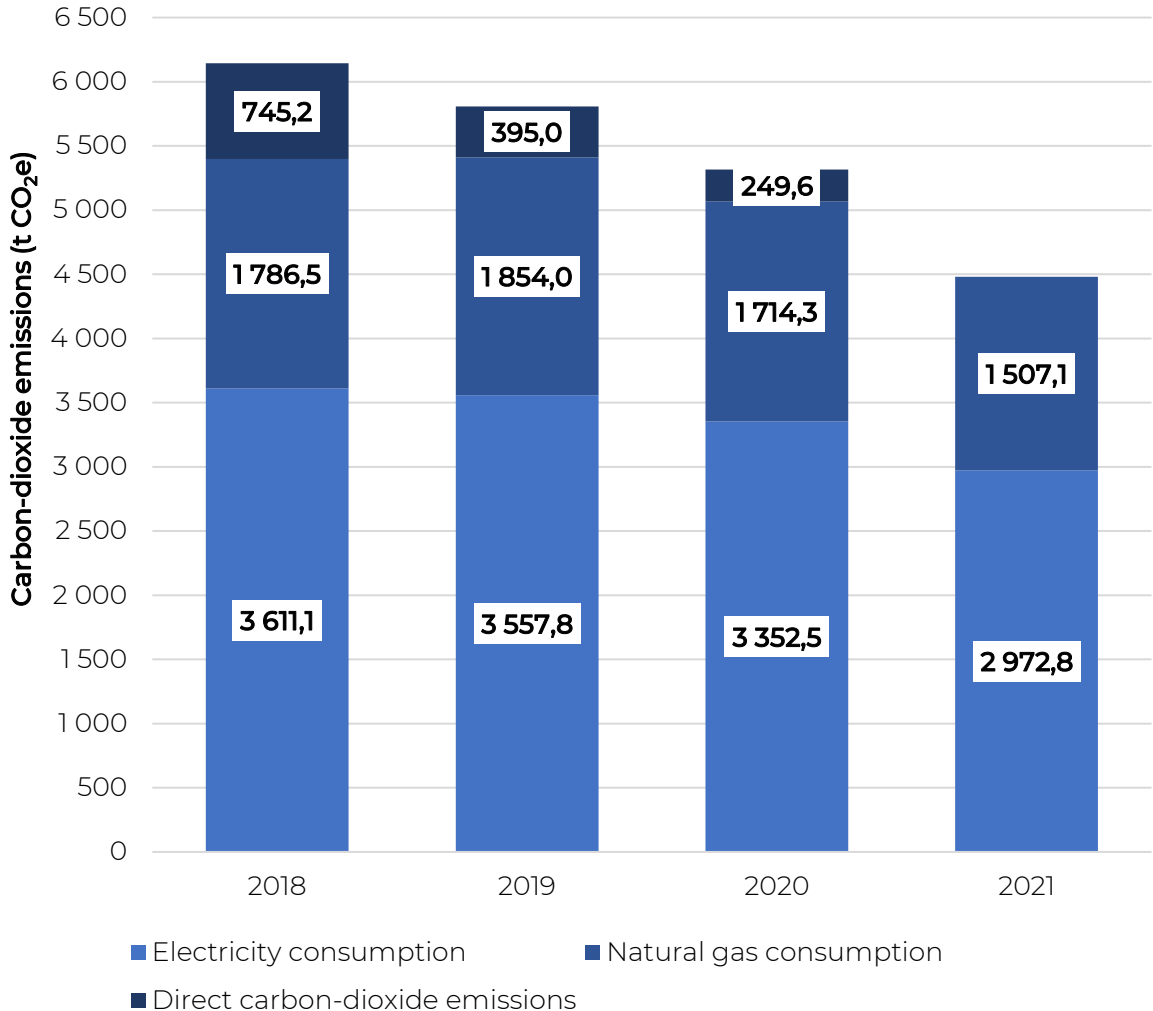


Figure 4: Indirect greenhouse gas emissions of Széchenyi István University (t CO₂e)

The maintenance of the green areas on the University campus is continuous and regular. The University favours/prefers native plant species and compositions of species appropriate to the landscape area in the design of the green space. Following construction works during

the institutional development, re-parking has been carried out in the necessary places. A total of 4,137 m² of green roofs have been created on the roofs of the new buildings constructed during the upgrading process.²

2.3. Indirect climate change impacts of Széchenyi István

University

The climate change impacts associated with the activities of Széchenyi István University cannot be limited to direct and indirect greenhouse gas emissions, as a centre of knowledge and competence centre, the impacts of the institution are much more diverse and at the same time more significant.

The University's educational activities are fundamentally driven by the need to promote sustainability and environmental education to younger and, of course, older generations. This is reflected in the institution's training structure, in the courses taught, and in the research and publications produced by colleagues at the University.

The University provides or requires environmental education for a number of degree courses, in most cases provided by the Audi Hungaria Faculty of Automotive Engineering, Department of Environmental Engineering. In addition, every year Széchenyi István University launches a BSc in Environmental

Engineering, training future professionals to solve the problems of climate change, mitigate damage and protect the environment.

Through its teaching and research activities, Széchenyi István University can make a significant and long-term contribution to raising awareness of the importance of environmental awareness and climate protection and to embedding it in society.

In addition to its educational and research activities, the University has implemented and is implementing a number of projects that are fundamentally interwoven with environmental protection. To give a few examples:

- The H2020 DANUBIUS project, a pan-European cooperation project, which investigated the sensitivity of river-sea systems and their environmental and climate change exposure

² Széchenyi István University (2015): Institutional Environmental Sustainable Development Strategy

- Insula Magna - Complex Water Management and Sustainable Development Programme
- Regional Waste Awareness and Innovation Pilot Project

A number of other projects implemented or in progress have focused on strengthening sustainability or reducing the causes and impacts of climate change. The projects also contribute directly to improving the performance of the above-mentioned target areas through the exploitation of their results.

2.4 Climate vulnerability of Széchenyi István University

In terms of natural endowments, the City of Győr, home to Széchenyi István University's central campus, has favourable natural endowments, among which surface watercourses play a very important role. The overall environmental situation of the city is good, with air quality being mainly affected by emissions from transport, industry and heating. In those parts of the city with the highest levels of built-up areas and minimal green spaces, significant temperature surpluses can occur.

The factors most likely to affect the city and its inhabitants in the context of climate change are: an increase in the frequency of heat waves; an increase in the frequency and intensity of extreme weather events; the resulting human health risks and damage to property; an increase in flood risk; negative developments in tourism potential and an increase in the vulnerability of the available drinking water supply. The emergence of all these problems, their increasing frequency and severity, makes it necessary for the city of Győr and Széchenyi István University to actively prepare for mitigation and adaptation to climate change.³

Consequently, the expected impacts of climate change may affect almost all areas of life. Thus, cooperation and action are needed at the local level, in the immediate vicinity of Széchenyi István University, to mitigate possible future damage. One such future impact may be an increase in the risk of health problems caused by heat waves, the frequency of extreme weather events (extreme rainfall, damage caused by high winds, flash floods).

Despite all these problems, the climate exposure of the city of Győr, and thus of Széchenyi István University, is expected to remain moderate in the future. Nevertheless, it is necessary to be consciously prepared to protect the vulnerable assets located on the University's territory and exposed to the effects of climate change.

³ Climate Strategy of the City of Győr 2021-2030

3. Past efforts to protect the climate

In addition to its internationally high-quality education, Széchenyi István University has long striven to organise its operations in the most environmentally and climate-friendly way possible. To this end, a number of developments have been carried out on the Campus and at other educational sites in recent years, aiming at more sustainable, energy-efficient and thus climate-neutral operations.

One of the University's priority goals is to renovate all its buildings in a sustainable and climate-friendly way, also bearing in mind its social responsibility. In 2014, a large-scale building energy project was completed at Széchenyi István University. In the framework of the Environment and Energy Operational Programme (KEHOP), the building of the Institute of Mechanical, Computer and Electrical Engineering of the institution was renovated with the support of the European Union and the Hungarian government. The project included the installation of new thermal and water insulation, the replacement of windows and doors and the modernisation of the heating system. A photovoltaic solar panel and solar collector system was installed.

The primary and secondary heating system of the building has not been fundamentally changed in terms of design, but in the case of the façade walls affected by the architectural renovation, the old, outdated fin tube radiators were replaced by controllable panel radiators, mainly in the corridors. The new radiators were equipped with return throttle valves and thermostatic control valves, which were missing until that time. The heating system of the institution is separated in a north-south orientation per wing with each circuit being equipped with weather-tracking automation and temperature limitation. During the development, the lighting system of the institute was partially controlled by installing motion sensors in the corridors.

A solar inverter system with a total peak power of 330 kW, consisting of three subsystems, a so-called "Small Solar Power Plant", was installed as part of the project. The first subsystem was installed on the roof of the Laboratory building, the second subsystem on the roof of the former Jedlik Institute and the third subsystem on the south façade of the former Baross Institute as well as on the sloping shades of the buildings.

The University has carried out a major improvement programme over the last decade, including the construction of new facilities and the energy-saving renovation of the Halls of Residence buildings and the education building on the Győr campus. Another milestone in this process is the fact that the institution, as a member of a consortium led by the National Development and Strategy Institute Nonprofit Ltd., has been awarded HUF 1.82 billion in EU funding for the energy efficiency upgrading of five of its buildings in Győr.

The direct objective of the renovations is to reduce heat loss, insulate and modernise building structures, increase the lifetime of the buildings and increase the use of renewable energy. The project started in 2017. As the first in a series of investments, the modernisation of the Administration Building was completed by the beginning of 2018, while the energy renovation of Building E, which houses almost 2,300 m² of heated floor space for classrooms, was recently completed. The flat roof of the E building has been insulated against heat and water and the facades have been insulated against heat. The external doors and windows were replaced and the heating system made controllable. A 23.6 kilowatt solar panel system was installed to reduce electricity costs.

Following the renovation of the Mosonmagyaróvár Castle, the home of the Széchenyi István University's Faculty of Agriculture and Food Sciences, the immediate surroundings have also been updated. Reducing the environmental impact, sustainable landscaping and improvement of the building's energy performance were key aspects of the project. In the future, an environmental and energy efficiency project will also renew the Constable's Building and the practice kitchen building.

Major renovation work has been ongoing on the University buildings since then. In all cases, the investments are aimed at improved building energy performance, lower energy consumption and better controllability. As far as possible, façade renovations and energy efficiency investments in buildings typically include the development of renewable energy generation (solar panels). As a result of these activities, the University now has a solar panel system with a peak capacity of almost 1 MW.

In addition to the energy efficiency of buildings, the University's management makes the importance of the proportion of green space a priority in every major investment and construction project. Green areas are continuously improved as far as possible, and green roofs have been installed on the roofs of several buildings as an innovative solution, which, in addition to reducing heat losses, also contributes to increasing absorption capacity.

As regards the supply of notes for educational activities, the SZE has partially switched to the use of electronic notes. Almost all teaching materials and notes are now available online, thus reducing the use of raw materials, waste and related greenhouse gas emissions.

3.1 Future investments and developments

Among future development projects, the renovation of three educational buildings - the Centre of the Deák Ferenc Faculty of Law and Political Sciences in Áldozat utca, Teaching

Centre No.2 of the Apáczai Csere János Humanities Faculty at 17 Liszt Ferenc utca and the Bridge Students and Staff Club - is still to be completed. Project works have already started for these buildings.

The Law Faculty is being upgraded in the same way as Building E, except that the roof of the Law Faculty is already equipped with solar panels. The building in Liszt Ferenc utca, a listed building, will receive a thermal insulation plaster system, partial stone wool insulation and new windows and doors. The replacement of the windows and the insulation of the façade will also be carried out at the Bridge Students and Staff Club, where the improvement will include the prevention of water leaks in the ground floor walls, the waterproofing of the flat roof and the replacement of the cladding in the ground floor block.

The goal of Széchenyi István University is to renovate all University buildings in Győr by the end of 2024. This will create a modern campus with advanced energy and environmental features that will provide a liveable space for students and staff, while consuming as little energy as possible.

4. Széchenyi István University's Climate Protection Vision

The key to successful action against the impacts of climate change is the reduction of greenhouse gas emissions and the development of a coherent approach to climate change adaptation, its integration into sectoral and territorial planning, decision-making and implementation mechanisms, and the adoption of concrete measures in this regard. Providing the basis for cooperation between experts and decision-makers at different disciplines and territorial levels, the Second National Climate Change Strategy and its complementary Climate Change Action Plans, will enable these objectives to be achieved.

There are two main areas where progress is needed in the fight against climate change. On the one hand, reducing carbon emissions and mitigating their effects is essential to slowing climate change and protecting the climate, but there is also a need to take and implement appropriate adaptation measures, because the effects of climate change are already being felt today in the form of an increasing number of extreme weather events and other worrying trends. Mitigation and adaptation will only be effective if they are implemented in an integrated and mutually reinforcing way.

The expected impacts of climate change may affect almost all aspects of life, and therefore require the cooperation of different disciplines, organisations and institutions to address them. The capacities of the different actors and stakeholders in the field of both mitigation

and adaptation differ significantly. Individuals and families can make a significant contribution to reducing their carbon footprint through their consumption, lifestyle and everyday choices as well as preparing themselves individually for the likely impacts of climate change. However, individual institutions also have an important role to play in mitigation, adaptation and awareness-raising efforts, both by climate-proofing their own activities and by raising the awareness of their employees.

Széchenyi István University, as a socially responsible institution with a sense of responsibility for the environment, considers environmental and climate protection a high priority, recognises and accepts its role in this area and is actively working to reduce its impact on climate change and contribute to the success of adaptation measures.

Accordingly, the strategic objective is by 2035 to:

Make Széchenyi István University a climate-friendly, resilient and liveable university.

To achieve this, it aims:

- > by 2030, to become a leader among Hungarian higher education institutions in terms of environmental and climate protection
- > by 2035 to achieve CO₂-neutrality in its operations
- > actively share this knowledge with students, staff and society

The University's Climate Action Plan provides the basis and framework for all of these:

- > prevention and mitigation of the adverse effects of climate change
- > improvement of adaptive capacity
- > creation of the data and knowledge base required to facilitate all these
- > increase in knowledge on climate change
- > awareness-raising of climate change adaptation activities and behaviours
- > incorporation of these into the thinking of planners, decision-makers, regulators, operators and society

5. Specific climate objectives

In order to improve the environmental and climate protection situation of the University and to achieve its climate protection vision, it must undertake commitments to preserve, prevent further deterioration and, where possible, improve the quality of the environment, and in addition, to sensitise it. To this end, the Climate Action Plan sets out specific objectives that

support the achievement of the climate vision and help to achieve the mitigation, adaptation and awareness-raising objectives of Széchenyi István University.

The timeframe for the planned actions is basically set at three deadlines:

- > short-term measures: by 2027;
- > medium-term measures: by 2035;
- > long-term measures: by 2050.

5.1 Targets to 2027

1. Comprehensive energy assessment of the buildings and institutions owned by Széchenyi István University performing educational and other functions

Comprehensive energy assessment of the buildings and institutions owned by Széchenyi István University performing educational and other functions, identification of energy efficiency improvement and renewable energy utilisation options, conceptual design for improving the energy performance of buildings.

2. Complex energy loss mapping of the operation of Széchenyi István University

Energy loss mapping-based screening of Széchenyi István University's entire operational spectrum and all processes, identification of optimisation options, development of action plan.

3. Introduction of an environmentally oriented management and energy management system

Introduction and operation of a certified environmental management system and energy management system at the University to increase the efficiency of environmental and climate protection processes.

4. Establishment of a centralised environment and climate protection organisation, assignment of responsibilities

Establishment of a centralised organisation at Széchenyi István University with the primary responsibility for the University's environmental and climate protection functions, including the assignment of specific environmental tasks and roles.

5. Renovation of buildings on the Central Campus not yet renovated in terms of energy efficiency

Renovation, modernisation and complete energy upgrading of the buildings of Széchenyi István University's Central Campus, located at Egyetem tér 1, which have not undergone reconstruction processes in recent years and where energy upgrading is justified and possible.

6. Development of a roadmap for achieving CO₂ neutrality

A structured analysis of climate neutrality options and, based on this, the development of a strategy document and a climate neutrality roadmap, which will define the necessary steps and a timetable to achieve Széchenyi István University's goal to become CO₂ neutral by the year 2035.

7. Climate and environmental awareness raising among the University's staff and students

Launching of a series of thematic presentations for employees and students of Széchenyi István University, which will illustrate the causes, risks, current and expected impacts of climate change, and encourage the development of climate-conscious consumer habits. Compulsory environmental education for all students at the University.

8. Organising a sensitisation media campaign, forums and training courses on climate protection

Attendance at events on climate change issues; organisation of workshops with practical and useful presentations and interactive sessions, public forums and presentations by experts on a given topic at set intervals. Cooperation with other higher and public education institutions on climate change issues.

9. Development of publications and methodology collections to support climate change education

Development of a thematic publication and methodology collection supporting climate change education, which present the causes of climate change and ways of tackling them in a clear and understandable way, topic by topic.

10. Lecture series on environmental and climate change in other institutions

Organisation and delivery of a series of presentations on climate and environmental issues in public education institutions, business organisations, chambers of commerce and for other cooperation partners.

5.2 Targets to 2035

1. **Develop a comprehensive, automated building management system**

Development of an innovative building management system and a comprehensive energy management system that ensures optimal energy use and system operation efficiency through smart building services equipment and control, contributing to smart buildings with minimum energy consumption.

2. **Complex modernisation of indoor and outdoor lighting systems**

Development of a comprehensive lighting concept with energy efficiency in mind, including a detailed assessment of the current network, installation of modern, low-power and long-life LED luminaires, intelligent street lighting, traffic-based control, optimisation of illuminated areas, integration of additional services in street lighting columns (e.g., charging points for electric cars). Mitigation of light emission problems on the campus and optimisation of indoor visibility.

3. **Achieving CO₂ neutrality**

In line with the CO₂ neutrality roadmap, the aim is to achieve full carbon neutrality at Széchenyi István University by 2035.

4. **Comprehensive review and modernisation of heating systems on the central Campus**

In addition to the reconstruction of every single element of the buildings on Széchenyi István University's central campus, a further objective is to carry out a comprehensive review of the heating system in the buildings. The optimisation and modernisation of the heating system is a high priority in the achievement of climate protection objectives.

5. **Establishment of a Climate Competence Centre and infrastructure**

The aim of Széchenyi István University is to establish a Climate Change Competence Centre, which will provide added market value to both the private and public sectors, while guaranteeing the achievement of the strategic climate change objectives. The aim of the Competence Centre will be to launch and carry out R&D&I developments leading to the development of new methods, tools, processes and innovations in key

infrastructure areas that will increase climate and environmental efficiency and security.

5.3. Targets to 2050

1. **Developing a climate-positive operation**

Through the GHG reduction and climate protection measures implemented by Széchenyi István University, the amount of GHG neutralized by the University exceeds the actual emissions, thus the University generates additional savings for society in comparison to its own activities.

2. **Innovative expansion of absorption capacities**

Establishment and maintenance of green spaces, integrating all these tasks into the University's mission. Examining the suitability of university green spaces to future climatic conditions, integrating them into urban planning and consciously taking green space issues into account in planning and design decisions. Continuous expansion of green spaces and expansion of absorption capacity to balance and mitigate greenhouse gas emissions. Conscious implementation of a university tree planting programme with a focus on new tree planting. In the selection of tree species, particular attention should be paid to planting non-allergenic or less allergenic tree species, adventitious tree species and tree species well adapted to the foreseeable climate.

3. **Developing a zero-emission building stock**

By 2050, the aim is to make every single element of the building stock of Széchenyi István University climate-neutral, i.e. zero-emission buildings. In addition to a complex energy assessment of the University's building stock by 2025 and their modernisation and energy upgrading by 2035, these buildings should become fully self-sufficient and zero-emission by 2050. Accordingly, the life-cycle resource use of buildings should be no greater than the natural resource use of the buildings, while achieving net zero carbon emissions.

6. Implementation framework and monitoring

The implementation framework of the Climate Action Plan of Széchenyi István University is basically composed of four interdependent and overlapping elements:

- > identification and concretisation of the institutional framework
- > stakeholder analysis and stakeholder engagement
- > defining the financing context
- > monitoring and review

Identifying and specifying the institutional framework: this step should identify the organisational/institutional framework that will support the implementation of climate change objectives and the translation of measures into action. The coordination tasks included in the Climate Action Plan can be implemented by the University with the support of the Audi Hungaria Faculty of Automotive Engineering, Department of Environmental Engineering, by extending its scope and responsibilities, and by creating a Climate and Environmental Officer post.

Stakeholder analysis and involvement: for each climate change task, it is necessary to identify and develop ways to reach and involve relevant stakeholders (social, economic organisations, NGOs, citizens, etc.), to ensure permanent contact with them and to develop a partnership plan.

Determination of the financial background: identification of the amounts involved in each of the planned activities, mapping of funding opportunities, identification of its own resources and any grants available to Széchenyi István University. In addition, the University pays particular attention to ensuring that environmental and climate protection aspects and requirements are met and enforced in each budget planning process, so that adequate funds are created to perform these tasks and achieve the goals set.

Monitoring and review: the aim of Széchenyi István University is to have an environmental performance assessment system in place, within which a monitoring system can operate that provides a suitable basis for the regular collection of the various indicators set for each target. In addition, the University's immediate objective is to implement a validated environmental management system as soon as possible.

The measures planned for each of these points are described in detail below.

6.1 Institutional cooperation frameworks

The prevention, mitigation and successful adaptation to the problems caused by climate change are in the interest of all institutions, companies, NGOs, and indeed all individuals, whether public or private, and are a common concern. Consequently, climate protection measures can only be implemented in partnership with the other stakeholders. The responsibility for carrying out and coordinating these cooperation tasks should be allocated

either to a coordinating body specifically set up for this purpose or to a department of Széchenyi István University. The coordinating body can guarantee the implementation of the commitments contained in this document. Consequently, this coordinating unit must have the authority, powers and resources to do so.

All the measures and commitments summarised and set out in this document are of considerable complexity, both by field of expertise and by sector and by professional competence. The implementation of this wide range of tasks will therefore require a framework for cooperation and a partnership plan that brings together all the actors concerned.

6.2 Stakeholders, partnership plan

Efforts to promote values and attitudes that are environmentally and climate friendly can only be successful if they are taken beyond the individual to the community level. Climate protection is one of, if not the most important, areas of environmental protection where consensus based on common understanding and good communication is a prerequisite.

Consequently, one of Széchenyi István University's most important objectives is to promote these climate protection endeavours through joint efforts, involving direct and indirect stakeholders in the region. The first and most important step, therefore, is to identify and involve the various stakeholders in the planning and implementation of climate action in a structured way. Széchenyi István University should develop partnerships with the following stakeholder groups:

- > the public
- > other higher education institutions
- > public education institutions
- > professional organisations for the environment
- > NGOs
- > economic operators (including agricultural organisations)
- > associations of economic operators (e.g., County Chamber of Engineers)
- > representatives of culture
- > all other organisations and businesses that can play a role in combatting climate change

The second most important task in this area is to correctly reach out in the most appropriate way to the identified stakeholders and interest groups and to formalise the framework for cooperation.

The final and most impactful step is to involve the “citizens” of Széchenyi István University, including the teachers, researchers and staff who make everyday teaching possible, as well as the students of the University.

6.3. Funding

The implementation of the climate protection measures included in the Climate Action Plan of Széchenyi István University is in most cases accompanied by a need for funding. In order to make the planned measures feasible, it is necessary to identify possible sources of funding. This step is therefore considered as part of the implementation framework. In Hungary, climate change measures are basically supported by several sources:

- on the one hand, funding is available through the national operational programmes to support community and business development
 - on the other hand, revenues from international quota sales can be used for this purpose, mainly through the promotion of energy efficiency and building energy investments
 - there is also the possibility of attracting direct EU grant funding
- > The range of resources available is essentially as follows:
 - > Operational programmes
 - > European Territorial Cooperation (ETC)
 - > Direct European Union support programmes (e.g., Horizon Europe, InvestEU programmes)
 - > LIFE Programme
 - > EBRD-ELENA Facility
 - > Domestic funds
 - > Self-funded

6.4. Monitoring and review

One of the most important aspects of the commitments and measures contained in the Climate Action Plan is their monitoring, the development of a monitoring system for the planned endeavours and the indicators on which it is based, and their continuous collection.

The development and operation of the monitoring system will contribute to the success of the Climate Action Plan in the following areas:

- > provide a comprehensive picture of the achievement of the commitments
- > provide a snapshot of the progress of individual actions
- > provide an opportunity to identify emerging problems and negative changes
- > provides a basis for planning and implementing corrective actions
- > provides an opportunity for the most efficient use of capital, material and human resources
- > provides an information base for the University management
- > provides an opportunity to refine and rethink climate protection measures

The effective operation of the monitoring system requires the establishment of two pillars:

- > development of the monitoring system's operational process and structure
- > the definition of the specific set of indicators (target and output indicators) to be collected.

Both of the above-mentioned issues need to be defined in order for the monitoring system to be effective and to deliver the information expected of it.

The collection of indicators will be the responsibility of the department designated for climate protection tasks, involving all local and regional public and private institutions that may have relevant information to determine the value of each indicator as accurately as possible. The development of the data collection system will create the conditions through which the data collection can be most effectively implemented. This includes the department responsible for carrying out the tasks, the range of indicators to be collected, the timing of the collection and as accurate a range of data holders as possible.

Széchenyi István University will provide a summary of the development of the values of the indicators on request, but at least annually.