



University: University of Pécs (UP)
Country: Hungary

13.3 Environmental education measures

13.3.4. Inform and support government

Inform and support local or regional government in local climate change disaster or risk early warning and monitoring

The University of Pécs (UP) is actively involved in the fight against climate change, participating in the development of the Climate City Contract (CCC), the Sustainable Energy and Climate Action Plan (SECAP), as well as cooperations with the city's water supply provider, and the Hungarian electricity provider.

Climate protection and carbon neutrality: cooperation between the University of Pécs and the city of Pécs

All 27 EU member states have committed to achieving climate neutrality across the continent by 2050, the first in the world to do so. To this end, member states have committed to reducing emissions by at least 55% by 2030 compared to 1990 levels. The municipality of Pécs submitted its application to participate in the European Union's "100 Climate Neutral Cities Mission" program, part of the European Green Deal and to be implemented under Horizon Europe.

With the involvement of experts from the University of Pécs, a professional cooperation between the City of Pécs and the University of Pécs, has resulted in the creation of the Climate City Contract (CCC), which the city of Pécs has submitted to the European Commission.

On behalf of the University of Pécs, experts from the Faculty of Engineering and Information Technology, the Faculty of Natural Sciences, the Faculty of Law and Political Sciences, and the Faculty of Economics are participated in the work, coordinated by the University of Pécs Science and Innovation Park. The experts from PTE were particularly pleased that the city also involved representatives from the civil and corporate sectors in the professional consultations.



The deputy mayor emphasized that the document, developed in collaboration with experts from Pécs, Hungary, and abroad, as well as numerous city companies, service providers, civil society organizations, and the University of Pécs, clearly demonstrates that this project extends far beyond the local government and the entire city. *"We are counting on everyone in Pécs, from civil society organizations to the university and businesses, to help us achieve this goal. We are particularly pleased that, as we hope, the more than thousand-year-old Diocese of Pécs will also join the program"* he said.



In 2023, Pécs has been selected by the European Commission as one of 100 European cities that will be able to achieve their climate neutrality goals by 2030 within the framework of the Horizon Europe Urban Mission, with the professional support of the NetZeroCities platform. As part of this mission, the Municipality of Pécs and the University of Pécs signed a cooperation agreement on climate protection and carbon neutrality.

The goal is ambitious and can only be achieved through extensive, systematic work involving all stakeholders in a spirit of partnership and cooperation. The city administration is in constant consultation with the other two Hungarian cities participating in the project, Budapest and Miskolc.

From now on, the University of Pécs will also be such a cooperative partner, which is not surprising, given that the above endeavour fits in perfectly with the UP Green University Program's aims. In 2024 the UP ranked 25th out of 1,477 universities in the world's "green university" rankings, earning the title of "greenest domestic university" in the country for the fifth time in a row.

In recent years, the University of Pécs has designated research, innovation, and training programs and activities related to both clean technologies (cleantech) and the use of renewable energies as its priority areas of research, training, and third mission. These scientific and thematic areas are currently of key importance in several successful project developments and form one of the potential foundations of the University's long-term development strategy.

→ *"The Greenest University for the Greenest City!"* As a university town, the identity of the city of Pécs and the University of Pécs has somewhat merged over the decades, and in some cases the two can't really be examined separately.

The University of Pécs, along with several other organizations has helped the Municipality of Pécs to develop its Sustainable Energy and Climate Action Plan (SECAP, 2021).

The SECAP is a comprehensive strategic document that outlines the city's climate protection and energy efficiency goals for 2030. The plan is in line with Hungary's and the European Union's carbon neutrality efforts and is linked to the Covenant of Mayors' commitment to reduce CO₂ emissions by 40%. Pécs joined the Covenant in 2013 and made a further commitment in 2021 to meet the 2030 targets.

The city's goals are to reduce its dependence on energy imports, increase the share of renewable energy sources, and enhance local resilience to the effects of climate change. Compared to the 2011 baseline, Pécs has already reduced its energy consumption by 29.4% and its CO₂ emissions by 27.5% by 2020, which means 193,000 fewer tons of carbon dioxide per year. This was made possible primarily by **the development of a biomass-based district heating system, municipal and residential energy efficiency investments, and the modernization of transport infrastructure.** The city's energy supply to a fairly large extent is provided by the **Thermal Power Plant** of Pécs, which has switched entirely to renewable (biomass) fuel.

Pécs has set a target of reducing CO₂ emissions by at least 40%, but up to 50%, by 2030, which could mean an additional saving of 100,000 tons per year. The greatest potential lies in the electrification of



transport, the modernization of building energy systems, and the optimization of residential energy consumption.

The SECAP also emphasizes the circular economy, the development of green infrastructure, and climate adaptation. The city intends to continue implementing integrated, multi-sector development programs in the future to achieve carbon neutrality. Overall, the document sets out the strategic framework for Pécs to become a climate-neutral, sustainable, and liveable city.

Tettye Forrásház Ltd. (the city of Pécs's water utility provider, and wastewater treatment company) and the Hydrogen Center of the University of Pécs are collaborating on an exciting project.

The H2 project is launched – “big step to achieve a small footprint”

In January 2024, Tettye signed a partnership agreement with the University, under which it will work with the UP's Hydrogen Center to investigate the possibilities of cascading hydrogen technologies. For example, experts are assessing the use of pure oxygen obtained from water splitting in wastewater treatment.

"There are currently two areas of development at the forefront of the UP Hydrogen Center's activities, one of which is infrastructure development, which is closely linked to the use of oxygen produced during water splitting.

The H2 project, fits seamlessly into the Tettye's energy strategy, takes the pursuit of low-carbon operations to a new level. If successful, not only will wastewater treatment in Pécs become more economical, but **the project will also greatly contribute to the city's climate neutrality goals; according to its commitment, the city's operations will become net zero carbon by 2030.**

The research and practical implementation of the results are **expected to represent a huge step forward in terms of sustainability.** The goal is to transform the wastewater treatment plant in Pécs into a carbon-neutral, or even carbon-negative facility based on innovative solutions, while also producing green hydrogen.

The **National Energy and Climate Plan** and the **National Energy Strategy** give priority to decarbonization targets. In order for Hungary to become a winner in the "green economy", it is necessary to create a knowledge base and competence centre that will enable domestic economic actors to be competitive in the field of various decarbonisation technologies. A new national laboratory will bring together and stimulate domestic research and development in the field of renewable energies. The University of Pécs has launched a project with nine consortium partners. This is the **National Laboratory for Renewable Energy** [5], which, under the leadership of the University of Pécs, is the third priority national-level organization contributing to Hungary's development after the National Laboratory on Human Reproduction and National Laboratory of Virology. The "National Laboratory for Renewable Energy" project is being implemented under the Széchenyi Plan Plus program, with two main thematic areas: hydrogen technologies and carbon dioxide recovery. The National Laboratory for Renewable Energy will lay the scientific, technological, legal, economic and industrial foundations for low-carbon energy technologies, in particular H2 production, transport, storage, use and CO2 recovery. The two technology clusters can play a significant role in sector integration, strengthening domestic security of supply and achieving decarbonization targets, working in parallel and complementing each other.



The strategy for the Hydrogen Centre, a new, independent organisational unit created through the Laboratory tender, has been developed. The definition of the main development directions and specific objectives has made it possible to direct the work of the research groups towards common goals with new momentum and in an organised manner. When developing the strategy, the UP paid particular attention to defining R&D&I activities that are relevant to industrial needs, practical in nature and support service competence through research and development. Taking into account the specific characteristics of hydrogen technologies and domestic conditions, and exploiting the university's competencies, two main strategic directions emerged.

The University of Pécs also took a pioneering step by becoming a co-founder of the **Pannon Energy Community** in cooperation with UQF. This model allows the university to bypass the traditional electricity grid and purchase renewable energy from external producers, as well as make better use of surplus energy from its own solar energy systems. This decentralised energy supply model supports long-term resilience and makes the university a model for institutional energy transition.

The first strategic direction is the "infrastructure technology development" competence, which includes all projects aimed at the technical and economic modelling, design and integration of hydrogen technology infrastructure into the entire value chain, whether for system balancing or mobility purposes. The second strategic direction is "energy container" product development, which begins with prototype production and aims to develop a scalable, modular hydrogen energy storage system at the product level. The work of the Hydrogen Centre is carried out at three faculties (Faculty of Business and Economics, Faculty of Engineering and Information Technology, Faculty of Sciences) and within several research groups.

MVM Group (Hungarian Electrical Works Private Limited Company) and the UP in cooperation

MVM Group and the University of Pécs have signed a cooperation agreement. This way, Hungary's fourth largest corporate group and "Hungary's greenest university," are working together to promote **effective compliance with and implementation of the strategic objectives of the National Energy Strategy and the National Energy and Climate Plan**, as well as the widest possible dissemination of environmentally friendly energy sources.



The cooperation between MVM and the UP goes back many years, but this agreement takes their joint activities and strategy to a new level. The document that has just been signed covers education, professional training, further training, and scientific research and development.

UP students will also benefit from the cooperation, as MVM provides professional support to departments and laboratories that are particularly important for ensuring the supply of new talent, and provides training programs that fit its activity profile, as well as professional internship opportunities for students.

Climate protection has been a priority among the strategic objectives of the University of Pécs for many years. MVM Group provides professional support for the implementation of the UP's energy efficiency strategy and assists the higher education institution in its intention to create green energy, cleantech, smart research and development, training, and innovation programs, as well as infrastructure



development related to these areas, the UP will create a university background for both institutional and market players that is in line with the principles of the circular economy.

The ideas of architecture students at the University of Pécs are also shaping the 2000-year-old city enhancing sustainability

What still might be unusual in other cities works excellently in Pécs. Architecture students from the Faculty of Engineering and Information Technology at the University of Pécs, have participated on several occasions in shaping various areas of the city with their ideas. They were involved in developing a new concept for the Pécs Water Valley and the university campuses that examine the interconnection between the city and the university, as well as in the reuse of the old market hall building and the development of the Mecsek Park Forest.

Under a recently signed cooperation agreement between the city and the faculty, a project is now underway to rethink a section of road that is heavily used by university students, in which **the city of Pécs is also counting on proposals from the university's architecture students that focus on sustainable development and zero ecological footprint.**

“In the spring semester of 2023/2024, our task will be to rethink Hungária Street, which connects the historic city center and the Szigeti district as a university district. Here, students will also deal with the public community space itself, and the renovation of the buildings connected to it. They will rethink the functioning of the given area according to a complex set of criteria: in addition to the built environment, they will have to consider the natural environment, as well as social and economic processes. Discussions with external actors and urban experts will bring new perspectives and approaches to the design work. For example, an environmental rehabilitation engineer will draw attention to accessibility, but there will also be discussion of how we can promote crime prevention through the design of the built environment. These are topics that students need to reflect on in their designs, thereby introducing real-world challenges into university education.” - explained the docent of the Faculty of Engineering and Information Technology.

Green University Program of the University of Pécs

The University of Pécs launched its Green University Program in 2016. **The mission of the program is the encouragement of all innovations, good practices, initiatives and local policies regarding environmental sustainability;** and furthermore, to shape and strengthen ecological awareness by the means of science and education. The university aspires to mitigate its carbon footprint and **supports technologies, services and consumer habits that reduce the use of natural resources, realizing decarbonisation goals.**

UP has consciously formulated its mitigation efforts, which are in line with the decarbonisation goals of the ‘Second National Climate Change Strategy’. The first main step of the University’s decarbonisation strategy is to exchange fossil fuels with renewable energy resources. The ratio of renewable energy resources used by the UP has been constantly increasing since 2016. More than 50% of the entire energy usage of the University is covered by renewable sources, of which biomass has the largest proportion, followed by geothermal and solar energy.