



The Greenest Hungarian University for the Greenest Hungarian City – the University of Pécs in the light of sustainability

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Abstract. Five years ago, the University of Pécs (UP) stated in its Green University Program mission, that every useful practice, innovation, management in the environment tend to help sustainability and sustainable administration has to be encouraged, with the aid of education and science aiming to strengthen ecological consciousness.

In 2020 the University of Pécs participated for the fifth time in the international “UI GreenMetric World University Rankings”. Thanks to its conscious, disciplined environmental ambitions and related efforts, UP has been able to move forward year after year in ever-expanding rankings. 2020 UP made it to the 59th place worldwide and reaching the 1st place in Hungary, earning the Greenest Hungarian University title. The university started to build a network both on the national and international level. The University of Pécs, together with the University of Szeged, plays the role of national coordinator in the UI GreenMetric World University Rankings Network.

The Green University Program is playing a more and more important role in the university life and helps to further develop the visibility of the UP brand both nationally and internationally contexts. Complex sustainability efforts provide an opportunity to address responses to challenges holistically. UP is involved in a harmonic and sustainable relationship with the environment, balancing the university and environmental interests. Besides the traditional roles of teaching and research UP is focusing on its third mission together with its stakeholders.

UP as a green university is a catalyst of innovation aiming at reaching sustainable development goals. “Green thinking” is present in all aspects of life, so it is important to exploit the synergies that reinforce and shape the thinking of individuals to make “green acting” part of their everyday lives.

The existence and life quality of future generations largely depend on our success in transforming our views on the world, environment, and attitude towards life. Are we ready to change our habits and save the environmental resources, to protect our environment and maintain biodiversity, to live in a sustainable way? The University of Pécs is a leader in Hungary in this mission. Due to its collaborative work together with its partners Pécs won the Greenest City of Hungary title in 2020.

Keyword:

sustainability, eco awareness, partnering, innovation, green university, responsibility, third mission, University of Pécs (Hungary)

1. Introduction

The University of Pécs with its 20000 students, with 2000 lecturers and researchers, with its 10 faculties is one of the largest higher education institutions in Hungary and the centre of knowledge within the Transdanubian region. Its roots date back to 1367. The UP represents classical values, while the challenges of present and future times are being adapted successfully as well. Covering a wide range of educational areas, it reaches out far beyond the city of Pécs. The UP operates an independent faculty in Szekszárd and runs significant training programmes in the towns of Kaposvár, Szombathely and Zalaegerszeg and even abroad in Zombor (Fig 1).

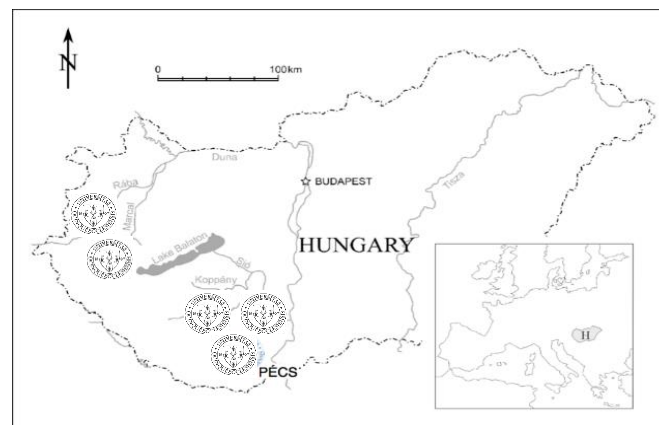


Figure 1. Campus locations of the University of Pécs, Hungary

The more than 300 training programmes cover almost every field of science and art. The reputation and popularity of the university is enhanced by the great number of foreign students attracted to us by the courses held in foreign languages, the various exchange programmes and the 17 colleges for advanced studies. The PhD/DLA programmes are representing the highest level of education. The University of Pécs set the

internationalization of the institution as a strategic and development priority. As part of this the UP offers more than 70 full and several short training programmes in English as well as in other foreign languages. Beginning in June 2016, short training programmes await foreign students in the framework of a unique summer “trimester”. One of the main objectives of internationalization is to duplicate the number of foreign students studying at the University of Pécs before 2020, so the city of Pécs can become an even more pulsating intercultural centre in Eastern-Central Europe. Thanks to its extensive networks of partnership and exchange programmes with excellent universities in Europe, the United States and Asia, at the moment there are approximately 4500 foreign students studying at the University of Pécs, coming from more than 114 countries.

Due to the successful implementation of the Bologna education system, students can get involved in a dynamic, interoperable European higher education system. Instead of taking the traditional college and university courses, students first acquire an undergraduate (BA or BSc) degree, and then a Master's degree (MA or MSc). Those students who decided to dedicate some more years to science may apply for a doctoral training (PhD or DLA) as well.

The University of Pécs is one of the leading research universities in the country with a huge professional research background. The Szentágothai Research Centre is home to a number of medical and scientific researches. The university has 21 doctoral schools which cover a broad spectrum of science and arts. The University of Pécs puts a lot of emphasis on talent management. There are several academic colleges and student circles to support the academic work of UP students.

The University of Pécs is one of the five higher education institutions that bears the title of „Excellent University”. Several high-quality research projects representing international standards are being implemented at its ten faculties and the Clinical Centre. Owing to the different profiles of its faculties, the scientific activities of the university are exceptionally extensive, multi-layered and diverse. One can find these activities in the fields of medicine, life sciences, natural sciences, humanities and social sciences as well as fine art, applied arts and music.

The UP Clinical Centre is one of the largest health care providers in Hungary. With its 29 health care units, nearly 3000 staff members the centre has provided health care for several decades in Pécs and in the surrounding region. The Centre also plays an active role in the practical education of medical students and health care professionals. Working in close collaboration with the Medical School and the Faculty of Health Sciences, it combines high-level knowledge with modern medical techniques.

The University of Pécs will continue to operate according to a new model, supported by the decision of the Senate of UP. The registration of the Foundation is another milestone in change of ownership on 1 August. The Foundation provides higher education, talent management, research and other public services in a private form, independent from the government. The state, as a strategic partner, provides long-term funding guarantees to ensure that these public tasks are carried out in a modern way.

The educational and health services related to the activities of the University of Pécs (UP) have a significant impact on the environment. In order to reduce the magnitude of the effects and to adapt to environmental changes, the UP has aimed to strive for the sustainability of education and health services and to ensure sustainable operation. UI GreenMetric World University Rankings gives the framework for university's aspirations. The

achieved results and the ongoing university infrastructure developments provide an opportunity for the UP to achieve sustainability not only in its operations and university-related services, but also in its internal and external natural, social and economic environment. In this article, the University of Pécs presents its aspirations for sustainable development in the natural, social and economic environment, the results achieved, and visions for the future.

2. Results

2.1. Results of Environmental responsibility

Five years ago, the University of Pécs stated as the mission of the Green University Program that they are going to support every good practice in all aspects of sustainability in its environment, innovation and management for sustainable economy, shape and strengthen ecological awareness with the help of science and education.

In the spirit of this mission, the 30.5 billion HUF “Modern Cities Program (2016-2022)” announced and supported by the Hungarian government will be used to develop the current infrastructure of the UP and to expand its modern equipment. The developments that have already taken place and are still in progress will make it possible to strengthen the university’s competitiveness, develop its education and service portfolio, increase the number of foreign students, and provide the necessary infrastructural conditions.

The university’s expanding infrastructure further increases the close interaction of environmental spheres within Pécs in a highly transformed metahemerobic [1] environment. To reduce the environmental impact, the university wants to reduce its carbon footprint, keeping in mind the environmental interests and the university benefits. Recently, the university has consciously articulated its mitigation efforts which are in line with the national “The Second Climate Change Strategy of Hungary (NCCS-2)” decarbonization goals [2].

The first pivotal point in decarbonization roadmap of the university is the replacement of fossil fuels with renewable energy sources. The share of renewables in the total energy sources used at the UP has been steadily increasing since 2016. More than 50% of the total energy used by the university comes from renewable energy sources. The largest share of renewable energy sources is biomass due to the transition to biomass-based district heating. On that list biomass is followed by geothermal and solar energy. The operation of the university’s car fleet also managed to reduce the proportion of fossil fuels by increasing the number of electric cars.

The second point in the university’s decarbonization roadmap is to increase energy efficiency and energy savings. In 2019, the University of Pécs became the first Hungarian university to join the Virtual Power Plant Program (VPPP) [3], which was selected among one of the three best energy efficiency programs by the European Commission. The essence of VPPP is to achieve real energy savings through attitude formation. In the same year, the UP, together with several regional partners, established the Baranya Virtual Power Plant Program (BAVPPP) as a founding member, with the aim of contributing to the development of regional consensus on sustainability, encouraging individuals, families, businesses, NGOs to follow such values in their day-to-day decisions and initiatives that ensure the achievement of a sustainable region in the long run, thus facilitating the implementation of the responsibilities set out in the National Framework Strategy for Sustainable Development. As a result of the BAVPPP cooperation, the issue of sustainable development

and climate protection in Pécs has made great progress. Based on the competition of the Virtual Power Plant Program, Pécs became the Greenest City in Hungary in 2020. The UP's practice school has won the Energy Efficiency School Award 2020. BAVPPP's mentoring role has been expanded with two more areas, the University of Pécs has been invited to operate the Virtual Health Centre as a mentoring organization in the field of waste management and the Virtual Landfill Program as a mentoring organization in the field of health preservation.

The UP's mitigation, adaptation, and attitude forming efforts at corporate, local, and regional levels have received national and international recognition.

The UP joined the UI GreenMetric World University Rankings in 2016, announcing the Green University Program. Thanks to the university's increasingly conscious sustainability aspirations and achievements, the UP in 2020 ranked 59th in the forefront of the world's "green universities", while it ranked 1st among Hungarian universities, earning the title of the greenest Hungarian university (Fig. 2) [4].



Figure 2. Positions of University of Pécs in the UI GreenMetric World University Rankings

The UP has begun the process of national and international networking. The University of Pécs together with the University of Szeged play the role of national coordinator in the UI GreenMetric World University Rankings Network.

The University of Pécs Green University Program, as the coordinator of the V4 Green Universities (V4GU) project supported by the International Visegrad Fund, aims to promote closer professional relations and international cooperation between the universities of Hungary, three Visegrad countries and two neighbouring countries that are participating in the project, in the development and implementation of their climate protection programs. In connection to this cooperation, an international online conference was held on 22 September 2020, with more than 200 participants registered from 30 different countries with high-quality presentations enriching the event. The aim of the cooperation of the jointly ranked universities is to implement knowledge sharing and joint efforts in Central Europe through the UI GreenMetric World University Rankings network in the fight against climate change [5].

In 2020, the Chamber of Commerce and Industry of Pécs-Baranya awarded the efforts of the University of Pécs Green University Program in the field of sustainability with the

Baranya County Environmental Award.

Among the participants of the European Week for Waste Reduction 2020 program series announced by the Ministry of Innovation and Technology, in the category of Educational Institutions, the University of Pécs earned the most outstanding action organizing award.

The UP supports the promotion of those technologies, services and consumer habits that seek to reduce the use of natural resources while achieving decarbonisation goals. The “Lungs of the City” project, the competition work of the University of Pécs, at the Solar Decathlon Europe 2021 international university competition for innovation in house-building, which aims to create an environment-positive urban living space [6].

The university is also making mitigation efforts in the field of waste management; in order to reduce the amount of waste generated at the university, it has stopped purchasing and distributing pet-bottled beverages on its premises for 2 years and 82 water filling stations have been installed at university sites. Another important goal is to further reduce the amount of municipal waste, which is served by the selective waste collection implemented at all sites. A unified image of selective waste collection is emerging, which is an integral part of the institutional waste management policy.

During the pandemic, the need for paperless administration intensified even more and the university provided innovative responses to the situation. It has mobilized tremendous energies to ensure that digital and hybrid education and examinations, the home office system, are introduced and run smoothly. In order to achieve the set goals, the institution implemented the previously planned conferences, festivals, courses, actions and programs by switching to online events.

To enhance the decarbonization results of the UP, the capacity of natural carbon sinks in the environment of the university will be increased. In case of infrastructural developments, “greening” is as important as possible, thus during the construction of the new theoretical block of the Medical School, the 10,000 m² park was renewed, increasing the rate of carbon dioxide absorption in urban space.

Sustainability efforts at the university take place within the framework of the Green University Program. The Green University Program is led by the UP Chancellery. The staff of the different UP departments help to implement the program on a voluntary basis in addition to their work.

There is an increasing focus on integrating sustainability topics into university courses. Without wishing to be exhaustive, here are a few examples: such as smart environmental technologies; 3D technology; renewable energy and climate-conscious architecture subjects; the circular economy; sustainable materials and energy management.

The University of Pécs is particularly active in research in the fields of health sciences and medicine, natural sciences, humanities, social sciences, and art, but there is an increasing emphasis on sustainability-related research. A couple of key research topics: root zone wastewater treatment system; extensive green roof technologies; rainwater retention; examination of building energy and acoustic comfort aspects; the production of secondary fuel from municipal solid waste; development of hydrogen technologies and fuel cell equipment suitable for the storage of weather-dependent renewable electricity.

2.2. Results of Social Responsibility

The University of Pécs considers social responsibility to be important to create

sustainable operation to increase the social acceptance of the environmental results achieved so far and the increase in oikophilia [7]. UP's social responsibility extends to the citizens of the university and to the urban population outside the university. In addition to the "Responsible Employer of the Year 2019" award (2020 results not yet announced), the university not only won the "Family-Friendly Workplace" title in 2020 again, but also earned the title of "Disability-Friendly Workplace 2020", which means great feedback that represents and reflects the importance of efforts to achieve the UN 17 Sustainable Development Goals SDG5 Gender Equality, SDG8 Decent Work and Economic Growth, and SDG10 Reducing Inequalities.

The University of Pécs is committed to the health and safety of the university citizens and the population (SDG3 Health and Well-being). Accordingly, UP continuously monitors and follows the international and domestic professional recommendations issued on the topic of coronavirus and consults with the competent authorities. In addition, it has set up an operational professional staff involving the professions concerned, so that it can act quickly and efficiently in line with the current situation.

A Coronavirus Care Centre has been established at the Clinical Centre of the University of Pécs (SDG3 Health and Welfare; SDG9 Industry, Innovation, and Infrastructure). To manage the epidemiological situation as efficiently as possible, one of the national working groups is the coronavirus research group, headed by the director of the Virology Research Group of the János Szentágothai Research Centre (JSRC) of the University of Pécs. The National Virology Laboratory was established under the leadership of the University of Pécs. Based on a representative sample of almost 18,000 people, the four Hungarian medical schools (including the University of Pécs, SDG17 Partnership for Achieving the Goals) conducted a comprehensive screening to get an accurate picture of the extent of the epidemic and the actual number of people infected with the coronavirus.

The situation caused by the COVID-19 virus creates a lot of uncertainty in people. Adequate answers to their questions that arise in this regard can be answered from a scientific point of view. This is how the online UP Open University Mini was born, and its episodes answer exciting questions for both the average person and interested students.

University citizens have been and will continue to be informed by e-mail of relevant information on corona virus, and a corona virus information web page has been set up [8]. The UP experts also provided good advice during quarantine to university students, home office staff, the elderly, on how to treat and get the most out of "confinement". How to preserve mental health during a coronavirus, in this uncertain and a vulnerable position? How can cohabitation be resolved if one family member becomes infected with a corona virus, what to look out for when returning home, what and how to disinfect? What is life going to be like post-Covid? In addition, an online preventive curriculum on coronavirus has been developed for UP citizens with basic, practical information. The aim of the University of Pécs was to equip all its citizens with adequate knowledge to fight the coronavirus epidemic. University experts familiar with COVID-19 from the "front line" also answered the most frequently asked questions about vaccinations, and a Vaccination Guideline was published.

The University Student Union of the University of Pécs has established a scholarship from the university's own revenues for the students who participate in the UP's health volunteer programs to prevent the coronavirus and to eliminate its consequences.

The management of the university constantly monitored the epidemiological situation

and took measures accordingly. The continuity of education and examinations was ensured by the university in the framework of online digital education based on special provisions specified in the study and examination regulations (SDG4 Quality Education). In addition to online education and examinations, there have been facilitations in education for students: possibility for state scholarships, reduction of prime costs, and extension of payment deadlines. In the administration of studies, there was a transition to online administration. The home office work was regulated by a joint instruction of the Rector and the Chancellor. **There is a growing demand for short-cycle mobility programs in the international higher education market, such as the European Digital UniverCity short-term mobility program. Within the framework of the Pécs Summer School, two-week online courses were organized.**

“Everybody wants to be a Pécs citizen!” says the rhyme in Hungarian, not by accident. The atmosphere of the University of Pécs is intertwined with the city, and the university community easily captivates anyone who visits here. However, the coronavirus has also forced the enrolment campaign of the UP exclusively into online space. The university responded to the radically changed circumstances with an enrolment campaign featuring an application, an online festival, interactive drone sightseeing, and a strong social media presence, which won the IPRA Golden World Awards in the digital creativity category [9].

The UP takes responsibility for students, staff, and the public, by exploiting all educational and other practical ways, even during a pandemic. The UP, as the greenest Hungarian university, organized programs, challenges, and actions related to sustainability to form individual and community attitudes. The challenge launched under the name MOON BIKE, encouraging joint movement, a healthy, environmentally conscious, and sustainable lifestyle, and cycling - forming a virtual community - showed that the University of Pécs can adapt to the new situation and keep in touch with its students, partners, alumni and diaspora, who all contributed to spreading the word about the challenge from the United States through India to Australia. Participants covered a total of 937,531 km in 80 days during their daily cycling. The popularity of the project is confirmed by the fact that more than 600 active cyclists at the international level “encouraged” everyone to lead a healthy and environmentally conscious lifestyle on behalf of the University of Pécs [10].

In a unique series of photos titled “You’re cool in a mask too!”, the UP Dance Team presented the correct way of wearing face masks and the observance of epidemiological rules. The aim was to raise awareness of mask-wearing closed spaces, bus stops, how to keep distance, hygiene rules, and prevention options such as healthy diet, outdoor exercise, and relaxation.

The UP photo contest entitled “PosiTivE - What has the changed life situation given you?” aimed to draw attention to the moments and events that, despite the period of ordeal, meant a short-term or lasting positive change in everyday life. The topicality of the photo contest and the joy of sharing PosiTivE experiences are well exemplified by the hundreds of pictures received, each of them featuring soul-inspiring minutes from the changed life situation.

Within the framework of the Green University Program, the university has initiated several awareness-raising actions in numerous sectors, such as in the energy use, transport, waste management, and water management areas. The actions are partly related to university initiatives, national and global actions. The largest and most significant university awareness-raising programs and their results are available on the Green University Program

website and Facebook page [11].

Beyond its institutional social responsibility, the UP initiated the cooperation of Hungarian universities participating in the UI GreenMetric World University Rankings. The UP believes that universities can work together effectively for the conscious and sustainable development of the environment. Therefore, in 2021 the UP organized a Green Workshop for the fourth time, with the aim of discussing the climate protection aspirations of Hungarian universities and to identifying cooperation opportunities. 33 representatives of 12 Hungarian universities attended the online event where they had the opportunity to share good practices in the field of sustainability and to map the organization of joint actions. The UP, as one of the national coordinating universities in the UI GreenMetric World University Rankings, intends to integrate the network of domestic universities into the network of universities in the international rankings for the purpose of good practice and knowledge sharing [12].

2.3. Results of Economic Responsibility

The University of Pécs wishes to play the role of a reinterpreted knowledge centre, an excellent research university, and an innovation centre. The natural outcome of scientific research is innovation. In addition to strengthening its position as a research university, the University of Pécs aims to become a key innovation centre in the wider region. Therefore, it seeks to extend its international and domestic network of contacts not only to scientific institutes and partner universities, but also to as many actors in economic life as possible.

With its extensive knowledge base, the UP is a committed supporter of environmental aspirations. Due to the lessons learned from Covid crisis, the UP also wants to seize the opportunity to become an even more dynamic part of the economic recovery through the enforcement of sustainability considerations. Within the framework of the Cleantech program, it supports innovative technological solutions that contribute to climate adaptation and mitigation efforts, achieving the decarbonisation goals of the region. It cooperates with local businesses to implement developments that promote carbon neutrality, including hydrogen technology, geothermal energy, energy-efficient architecture, water management, electric transportation, waste management, and the conservation of biodiversity.

The Pécs Wine Region, with the city of Pécs at its centre, its viticulture traditions and its culture that has always been successfully renewed in the storms of history, has been the economic and cultural centre of Southern Transdanubia for two thousand years. Despite its built-up vineyards, it is still an international city of grapes and wine. The Research Institute of Viticulture and Enology of the University of Pécs (RIVE) strives to spread this reputation far beyond, and the professional work of RIVE will further enhance the reputation of the institute, the university and Pécs. The grape variety collection, which now consists of more than 1,800 lots, is the sixth largest in the world, and the second largest grape gene bank in Europe, with several grape *Hungaricum*s. The research institute conducts research on grape breeding, genetics, viticulture technology and oenology. In Hungary, world-class resistance breeding is taking place only and exclusively in Pécs, with the aim of creating and strengthening an environmentally conscious, more sustainable grape and wine sector. The Institute has 26 state-recognized grape varieties and 29 clones.

In addition to education and research, the University of Pécs recognized years ago that the preservation and utilization of university knowledge assets is an important task of a university, therefore, they have already developed the necessary framework for it back in

2005. It has won a tender to build and strengthen a university-centred innovation ecosystem [13]. In the innovation ecosystem, the university plays a central catalytic role, but besides the city, they are indispensable parts of the micro-, small-, and medium-sized enterprises in the region, as well as large companies that can play a role in this. Transfer organizations that help innovation are also important stakeholders, and the UP cooperates with industrial chambers in the region as well as venture capital companies that may provide the resources needed for projects. The aim is to develop a culture of innovation at the university. There are plenty of research groups, researchers, PhD students working at the UP, they need to be shown how to connect scientific results with the world of market innovation. Therefore, trainings, events and professional forums are being organized

3. Summary

The sustainability results achieved by the UP are significant. The results provide motivation for the UP to create and implement further operational action plans. The results so far apply to the entire operating area of the UP and its wider environment. Complex sustainability efforts provide an opportunity to address responses to the challenges in a holistic approach. In the UI GreenMetric World University Rankings, knowing the sub-results of the UP-ranking outlines sectors such as the energy and climate protection, transport, education and research, where further fine-tuning and knowledge sharing can lead to further results in deepening environmental awareness. Progress is needed in the fields of water management and waste management.

Achieving further results in water management already exceeds the corporate level of the UP, so projects that can be implemented jointly with economic, municipal, and governmental actors can help to achieve sustainable results in the field of mitigation or adaptation to environmental impacts. By applying the already established system of social and economic relations, for example the sustainable municipal water management in Pécs jointly together with the UP is feasible.

Today, the traditional function of the University of Pécs, which focused on education and research, has been significantly transformed and expanded. The activities of the institution, the significant expansion of the range of users of its services, as well as the appreciation of the competitiveness and social and business success of knowledge require the expansion of the traditional range of basic activities. The factors arising from open global competition and perceived responsibility for local, regional affairs must be connected and coordinated with our teaching and research activities at the same time.

The UP intends to boost its sustainability efforts in the future and will do its utmost to ensure that the promotion of eco-conscious attitudes, energy-saving and sustainable solutions spreads vertically and horizontally in the natural, social, and economic environment of the South Transdanubia region.

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