

Smart Specialisation Strategy of Central Transdanubian Region (2023-2029)



**Central Transdanubian
Regional Innovation Agency**

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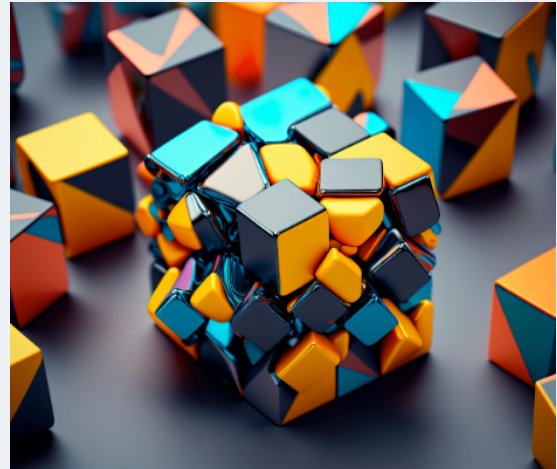
INTRODUCTION

The development opportunities of Central Transdanubian Region (CTD) is highly connected to its innovation performance, as main source of economic growth and social progress. Being a moderate innovator region with above average performance in knowledge-intensive employment, product innovation and business-related R&D, innovation-led economic growth has been increasingly centred on digital and green twin transition.

CTD is one of the most developed and fastest growing regions in Hungary, however the transition towards new growth opportunities are still an issue. Regional productivity and innovation gaps highlight that digital adoption, knowledge diffusion and sustainable growth are by no means ready.

The current development challenges on innovation are addressed by the EC developed concept for innovation policy, namely Smart Specialisation, that is used as a core concept of the current strategy (CTS3). As such, it promotes broader benefits, including innovation driven growth in regions and the promotion of sustainable growth models. Additionally, CTRIA is a member and contact point for Smart Specialisation Platform, that assures the transnational integration and smooth implementation of the defined development directions.

The current Smart Specialisation Strategy for Central Transdanubia is the core policy framework in promoting the economic and social development of the region. The main objective of this strategy is to respond to rapidly changing economic conditions, technological advances and societal expectations. Additionally, it acts as the core strategy for implementing innovation projects and initiatives on the one hand, and wider transnational integration of the innovation ecosystem on the other.



By the given framework conditions, CTS3 is aimed at defining policy framework, together with all relevant priorities for the period of 2023-2029, with the following key objectives:

- 1. Exploiting innovation potential: the new strategy aims to assess and exploit the region's innovation potential, stimulating the growth and competitiveness of local businesses.*
- 2. Rethinking Sector Priorities: the aim is to review the region's key sectors to support those with the greatest growth potential.*
- 3. Social and Economic Integration: the strategy aims to integrate social and economic aspects, ensuring sustainable development and social inclusion.*
- 4. Regional and European Alignment: CTS3 2023-29 aligns regional priorities with the EU frameworks and Hungarian national strategies.*

From a strategy management perspective, the Central Transdanubian Regional Innovation Agency (CTRIA) plays a key role in the preparation and implementation of CTS3. CTRIA – as the relevant policy body for CTS3 - is responsible for defining the strategy's guidelines, coordinating cooperation and achieving its objectives. CTRIA is also responsible for promoting the economic and social development of the region by supporting innovation and technological development through the implementation of CTS3.

By the given framework and key objectives, this document is acts as the regional innovation strategy for Central Transdanubian Region in the period of 2023-2029, grounded on the S3 strategy of the previous EU programming periods.

POLICY FRAMEWORK

The Central Transdanubian Regional Strategy for Smart Specialisation (KDRIS) aims to promote the economic development of the region, maximise innovation potential and exploit local strengths. This chapter of the strategy focuses on the relevant frameworks that underpin regional specialisation and innovation activities. This chapter is essential to understand the full context of the strategy and to derive the subsequent regional linkages.

A key element of the EU framework is the New European Innovation Agenda (NEIA), which aims to create a dynamic, inclusive and sustainable innovation ecosystem across the European Union. NEIA's objectives include strengthening research and innovation, improving the business environment and responding to societal challenges. In addition, the European Institute of Innovation and Technology (EIT) and the European Digital Innovation Hubs (EDIH) play an important role in developing the innovation ecosystem, in the integration of education, business and digital technologies.

The European Green Deal is also essential to make Europe climate neutral by 2050, promoting sustainable development and innovation in different sectors. These initiatives are particularly important for the development of green technologies and sustainable solutions.

In the Hungarian framework, the Smart Specialisation Strategy (S3), which supports smart specialisation of local economies, the Johann von Neumannn Program, which aims to better link universities and the economy, and the Operational Programmes, which aim to use Structural Funds efficiently and promote economic growth, will play a prominent role.

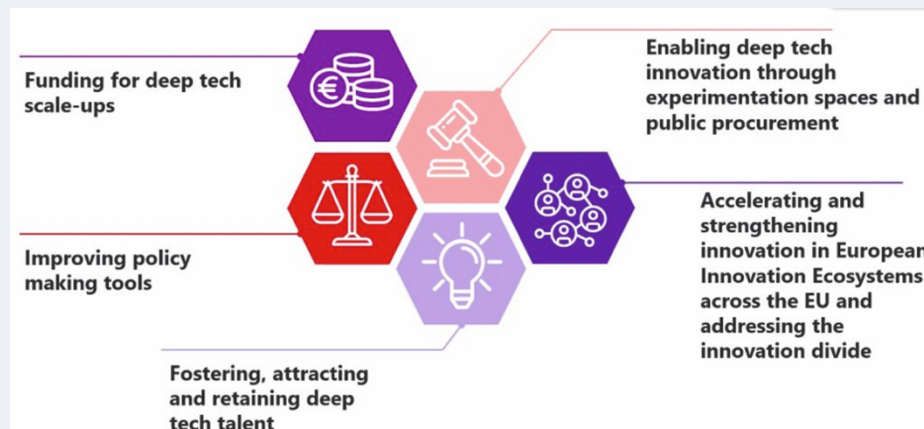
The main policy frameworks governing CTS3 are:

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- *New European Agenda for Innovation*
 - *European Green Agreement*
 - *European Institute of Innovation and Technology*
 - *National Strategy for Smart Specialisation (S3)*
 - *Johan von Neumannn Program*
 - *Operational Programmes*
-

New European Innovation Agenda (NEIA)

The European Union's new initiative, the New European Agenda for Innovation¹ (NEIA), is a key strategic step to fully exploit the Union's innovation potential. This initiative is essential for Europe's economic growth, social well-being and global competitiveness. The NEIA aims to create a dynamic, inclusive and sustainable innovation ecosystem across the Union that responds effectively to the challenges of the modern age.

NEIA's five main flagship projects focus on strengthening research and innovation. This includes the development of research infrastructures, the promotion of research collaborations and the creation of research centres of excellence, with the aim of making Europe a leader in scientific research and innovative technologies.



NEIA also pays particular attention to improving the business environment. Key objectives include creating a more business-friendly regulatory framework, increasing business finance opportunities and promoting an entrepreneurial culture and innovation. Through these measures, the NEIA aims to support small and medium-sized enterprises (SMEs) and the growth of new businesses.

Responding to societal challenges is also a priority area for NEIA. It addresses global issues such as climate change, social inequalities and the digital divide, with the aim of fostering innovations that directly contribute to improving social well-being and environmental sustainability.

¹ Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions - A New European Agenda for Innovation Com/2022/332 Final

https://eurlex.europa.eu/legalcontent/HU/TXT/?uri=CELEX%3A52022DC0332&lang1=EN&from=EN&lang3=HU&lang2=HU&_csrf=fe4e7554-5cb6-4b44-a86e-d032e367ed6e

Flagship initiatives of NEIA:

- *Enabling deep tech innovation*
 - *Accelerating innovation ecosystem*
 - *Fostering, attracting and retaining talent*
 - *Improving policy making*
 - *Funding for deep tech scaleups*
-

The integration of NEIA into regional strategies is key to developing the innovative capacity of European regions. By implementing the objectives of the NEIA, regional innovation strategies can ensure that innovation activities at local level are in line with wider EU objectives. This could include areas such as education, research, technological development and strengthening entrepreneurial culture.

Use of support schemes and instruments *the support schemes and instruments provided by the New European Innovation Agenda (NEIA) are of paramount importance in promoting local innovation. These schemes are available in different forms, such as financial support, research and development funds, and technical and professional assistance. These instruments enable local businesses and research institutions to access new technologies, develop their capacities and participate in innovation processes.*

Financial support and funds *The European Union offer a range of financial instruments, such as Horizon Europe, the European Structural and Investment Funds and various support programmes for small and medium-sized enterprises. These funds help to finance regional innovation projects, particularly research and development and the market introduction of new technologies.*

Professional and Technical Assistance *NEIA also offers professional and technical assistance, including innovation advice, mentoring and training. These tools help local businesses and researchers to improve their skills, develop their innovation strategies and meet market needs.*

Networking and Partnerships *NEIA promotes networking and partnerships between actors in the European innovation ecosystem. This includes cooperation between different sectors and regions, as well as strengthening international links. This type of cooperation helps to share knowledge and best practices and to identify innovation opportunities.*

Conclusions *NEIA is a key tool in the EU's innovation strategy, offering huge opportunities for Member States and regions. Integrating NEIA objectives into local and regional level strategies not only stimulates innovation, but also contributes to economic growth, improved social well-being and environmental sustainability. Making use of the support schemes and instruments provided by NEIA is key to the success and effectiveness of local innovation activities.*

The importance of the EU's role The EU has a key role to play in making the NEIA framework accessible and applicable to Member States and regions. This includes providing policy guidance, legal and regulatory frameworks, funding and technical assistance. The EU's role is critical in ensuring that regional innovation strategies are consistent with European-level objectives and priorities.

The future success of NEIA will depend on its ability to adapt to a rapidly changing global environment and to support the EU in addressing the ever-changing economic, social and environmental challenges. The New European Agenda for Innovation needs to be proactive in anticipating technological developments, market trends and societal changes, and in providing new opportunities and solutions for regions.

European Institute of Innovation and Technology (EIT) and European Digital Innovation Centres (EDIH)

The following professional initiatives do not directly provide the policy basis for the Regional Innovation Strategy. However, they play a key role in terms of their linkages to the regional and international innovation ecosystem and their sectoral orientation.

The European Institute of Innovation and Technology (EIT) and the European Digital Innovation Centres (EDIH) play a vital role in developing the innovation ecosystem in the European Union. Together, the EIT, as a facilitator of the integration of innovation, education and entrepreneurship, and the EDIH, as a promoter of the dissemination and take-up of digital technologies, contribute to increasing Europe's competitiveness.

The European Institute of Innovation and Technology (EIT)

The European Institute of Innovation and Technology² (EIT) is an important organisation in the innovation ecosystem of the European Union. The EIT aims to stimulate innovation and technological development in Europe. It does this by bringing together different actors - such as universities, research institutes, companies and start-ups - to work together to develop new technologies and solutions.

The EIT community has a significant knowledge base, both at European and national level. EIT organisations can be important players in the innovation ecosystem, where they can provide feedback on the latest developments and achievements in their field, both at home and globally and in Europe. The EIT's involvement is particularly important in the work of the various innovation networks and in information sharing.

Projects supported by the EIT are often based on international collaborations that can help to bring developments closer to business needs. The EIT KICs (Knowledge and Innovation Communities) play a particularly important role in this process, as they can align their operations with the innovation policies of Member States and regions. These communities can provide services such as funding for innovative start-ups, business development training and help SMEs to exploit innovative solutions through European distribution channels.

² Regulation (EC) 2021/819 of the European Parliament and of the Council of 20 May 2021 on the European Institute of Innovation and Technology (recast)

The EIT and regional innovation

The EIT contributes to diversifying the European economy and reducing regional disparities by supporting regional innovation activities. The EIT's regional innovation agencies and programmes enable different European regions to participate in the innovation process and to access the resources and networks offered by the EIT.

The EIT directions that determine the sectoral orientation of CTS3:

- *EIT Food*
- *EIT Cultural and Creative Industries*
- *EIT Health*
- *EIT Energy*



European Digital Innovation Hubs (EDIH)

The European Digital Innovation Hubs³ (EDIHs) are one-stop shops set up by the European Commission to help businesses and public sector organisations respond to digital challenges and increase their competitiveness. EDIHs help companies to develop business/production processes, products or services using digital technologies by:

<https://eur-lex.europa.eu/legal-content/HU-EN/TXT/?from=EN&uri=CELEX%3A32021R0819> European Parliament And Council (Eu) Decision 2021/820 (20 May 2021) on the European Institute of Innovation and Technology (EIT) Strategic Innovation Agenda 2021-2027 'Boosting Europe's innovation talent and capacity' and repealing Decision No 1312/2013/EU <https://eur-lex.europa.eu/legal-content/HU-EN/TXT/?from=HU&uri=CELEX%3A32021D0820>

³ Regulation (EU) No 2021/694 of the European Parliament and of the Council of 29 April 2021 establishing the Digital Europe Programme and repealing Decision 2015/2240/EC (Text with EEA relevance) PE/13/2021/INIT <https://digital-strategy.ec.europa.eu/hu/activities/edihs>

1. *Providing access to technical expertise and testing: EDIHs give companies the opportunity to access the technical knowledge and tools they need to help with their digital transformation.*
2. *Providing innovation services: EDIHs offer advice, training and skills development, which are key to successful digital transformation.*
3. *Funding: the centres help businesses to find funding opportunities for the use of digital technologies.*
4. *Addressing environmental issues: EDIHs support companies in using digital technologies to create a sustainable and circular economy.*

The connection of CTS3 to EDIH:

- *Knowledge sharing*
- *Innovation services*
- *Prototyping*
- *Finance*
- *Circular Economy*

EDIHs combine the benefits of a regional presence with the opportunities available to a pan-European network, providing local companies with the services they need. The European coverage of the network facilitates the exchange of best practices between different countries and the provision of specialised services in different regions where the necessary skills are not available locally.

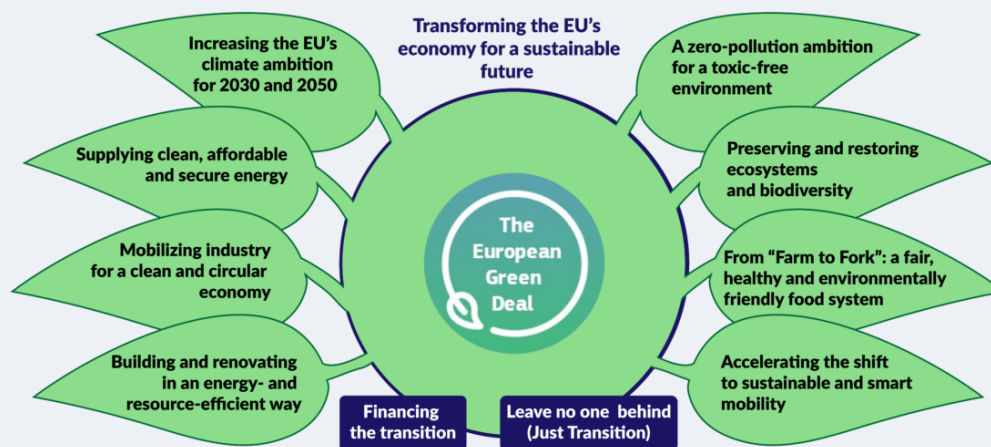
EDIHs not only support local economies, they are part of a global network, linking regional centres to the international knowledge base and innovation networks. This allows local businesses to participate in global innovation trends and access international markets and technologies.

The EIT and the EDIH play a key role in the European Union's innovation strategy. The EIT supports innovation through the integration of education, research and entrepreneurship, while EDIH promotes the diffusion and use of digital technologies. Harnessing the resources and services provided by these institutions will enhance innovation capabilities at regional and local level, contributing to Europe's economic growth and social development. Taking advantage of the opportunities and tools offered by the EIT and EDIH is vital to develop the innovation capabilities of European regions and businesses. These institutions provide platforms and resources that facilitate the generation of new ideas, knowledge transfer and the practical application of innovative solutions.

European Green Deal and related Initiatives

The European Green Deal⁴ aims to make Europe the world's first climate-neutral continent. It is a response to the existential threat of climate change and environmental degradation that will transform the EU economy into a modern, resource-efficient and competitive economy. The Green Deal will ensure that net greenhouse gas emissions are reduced to zero by 2050, economic growth is decoupled from resource use, and that no people or regions lose out in the transition.

The objectives of the European Green Deal include transforming the EU economy, achieving climate neutrality by 2050 and reducing net greenhouse gas emissions by 55% by 2030 compared to 1990 levels. Achieving these targets is linked to several initiatives such as REPowerEU, the Green Deal Industrial Plan and EU action to tackle the energy crisis.



Integrating the objectives of the European Green Deal into regional strategies is key. This includes aligning local and regional policies and economic and social structures with the objectives of the European Green Agreement.

Linking sustainability and innovation in the framework of the European Green Deal is essential to achieve long-term economic growth and environmental sustainability. This includes developing clean technologies, increasing resource efficiency and protecting ecosystems.

The European Green Deal addresses future challenges such as climate change, biodiversity loss and sustainable use of resources. It aims to find effective and innovative solutions to these challenges, while maintaining Europe's economic competitiveness and ensuring social justice.

⁴ Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions - A European Green Deal COM/2019/640 Final https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal_hu <https://eur-lex.europa.eu/legal-content/HU/TXT/?uri=COM%3A2019%3A640%3AFIN>

The link between the European Green Deal and NEIA/EIT/EDIH

The European Green Deal is closely linked to the initiatives of the European Institute of Innovation and Technology (EIT) and the European Digital Innovation Hubs (EDIH). These networks support innovation and technological development, which are essential to achieving the objectives of the Green Agreement.

Together, the European Green Deal, NEIA, the EIT and EDIH have a major role to play in shaping the EU's future sustainable and innovative economy. Integrating the objectives of the European Green Deal into regional strategies, linking innovation and sustainability, and harnessing the opportunities and tools provided by the EIT/EDIH are key steps towards a green and innovative future for the EU. A comprehensive and coordinated approach, combining sustainability objectives with innovation efforts, will ensure that Europe is able to face the challenges of the future and lead global sustainability efforts.

Smart Specialisation Strategy (S3)

The primary objective of the Smart Specialisation Strategy⁵ (S3) is to promote the industrial and economic diversification of regions, focusing on local strengths, capabilities and international trends. Under S3, particular attention is given to the smart specialisation of local economies, which is a harmonious combination of innovation, knowledge-based development and building on local assets. In this way, the strategy will contribute to increasing the competitiveness of the economies of the region and promoting sustainable development.

The Smart Specialisation Strategy (S3) is a policy tool introduced in the European Union in the 2014-2020 programming period. S3 aims to help regions to exploit their strengths, competitive advantage and potential in research, technological development and innovation. In doing so, it contributes to economic growth, job creation and social cohesion.

The strategy's principles include strengthening cooperation between businesses, research institutes, universities and the government sector, and diversifying and modernising local and regional economies. S3 emphasises the need to identify and exploit innovation potential at local level and to align regional innovation strategies with European and national policies.

The Smart Specialisation Strategy plays a particularly important role in regional development policies, where research and innovation priorities are developed considering the specificities and strengths of regions. This approach allows regions to specialise in specific areas with the greatest potential for growth and competitiveness.

In implementing the S3 strategy, particular attention will be paid to areas where regions have strengths and opportunities. This includes local economies, scientific and technological infrastructure and human resources. The strategy aims to promote the emergence and implementation of innovative ideas and to support knowledge-based economic growth.

A key part of the strategy is to support close cooperation between local businesses, research institutions and educational organisations. This will harness local know-how, innovation capacity and resources to enable regional economies to adapt to global challenges and take advantage of new market opportunities.

In implementing the strategy, it is important to ensure coherence with initiatives at European level. Integrating the objectives of the New European Innovation Agenda (NEIA), which aims to create a dynamic, inclusive and sustainable innovation ecosystem across the European Union, is a key element in this. The use of the support schemes and instruments available under NEIA will allow strengthening local innovation initiatives and increasing the competitiveness of regional economies.

The strategy will also focus on exploiting the opportunities offered by the European Institute of Innovation and Technology (EIT) and the European Digital Innovation Centres (EDIH). The EIT's education programmes and innovation networks, as well as the digital transformation support services offered by EDIH, will contribute to the diffusion and take-up of digital technologies in the regions.

Finally, the integration of the objectives of the European Green Deal is an integral part of the strategy. The European Green Deal aims to make Europe climate neutral by 2050, promoting sustainable development and innovation in energy, transport, agriculture and other sectors. Under S3, promoting innovative solutions at local level that contribute to the achievement of the European Green Deal targets is essential for the future sustainability and prosperity of regions.

In summary, the Smart Specialisation Strategy (S3) is closely linked to initiatives and support schemes at European level, while exploiting local strengths and potentials, thus ensuring that regional economies can develop in a dynamic, inclusive and sustainable way.

National Smart Specialisation Strategy (S3) 2021-2027

The National Smart Specialisation Strategy is the key document of the Hungarian policy framework, setting out the main development directions and priorities.

The National Strategy for Smart Specialisation⁶ (S3) 2021-2027 in Hungary is an important policy tool, which is an enhanced version of the strategic approach used in the European Union from 2014-2020. The S3 aims to contribute to the EU's policy objective "Smarter Europe", as well as to the development of regional economies and to the strengthening of structural adjustment to industrial transformation and digitalisation.

Hungary belongs to the group of emerging innovators according to the European Innovation Scoreboard (EIS), which is established annually by the European Commission. The Government's goal is to become one of Europe's major innovators by 2030. To achieve this, a complex economic development approach is needed, including a strong boost to the value creation capacity of the innovation ecosystem and the productivity of the business sector.

⁵ Regulation (Eu) No 1303/2013 Of The European Parliament And Of The Council (2013.December 17.) <https://eur-lex.europa.eu/legal-content/HU-EN/TXT/?from=EN&uri=CELEX%3A32013R1303>

⁶ Government Decision 1428/2021 (VII. 2.) <https://nkfih.gov.hu/hivatalrol/nemzeti-intelligens/nemzeti-intelligens-szakosodasi-strategia-2021-2027>

The development of the National Smart Specialisation Strategy for the period 2021-2027 started at the end of 2019, under the professional supervision of the Ministry of Innovation and Technology (MIT) and coordinated by the NRDI Office. In addition to the innovation department, the government department responsible for ICT and enterprise development also actively participated in the planning of the new S3. The S3 priorities were selected in line with the EU methodological recommendations, using the so-called "entrepreneurial discovery process" (EDP) and involving a wide range of stakeholders.

The National Strategy for Smart Specialisation (S3) aims to promote the economic and social development of Hungary by stimulating knowledge-intensive economic activities. The selected priorities of the S3 Strategy are of paramount importance for the future growth prospects and innovation capacity of the Hungarian economy.



- **Cutting-edge Technologies:** this priority focuses on the development and application of new, innovative technologies, including artificial intelligence, robotics, Industry 4.0 technologies and new materials technologies. Bringing cutting-edge technologies to the fore will enable Hungary to participate in global technological competition and promote high value-added industrial production.
- **Health:** this priority focuses on innovation in the health sector and the development of medical technologies. The aim is to improve the quality of patient care, develop health technologies and support the pharmaceutical industry, which will contribute to improving the health of the population and the efficiency of health services.
- **Digitisation of the Economy:** this priority focuses on the use of digital technologies and the development of the information society. The aim is to ensure that all sectors of the Hungarian economy exploit the potential of digital technologies to increase productivity and competitiveness.

- **Energy and Climate:** the priority on sustainable energy and climate protection highlights energy efficiency, the use of renewable energy sources and environmentally friendly innovations. This approach contributes to increasing the country's energy independence and combating climate change.
- **Services:** to develop the services sector, the focus will be on quality, innovative services, including financial, educational, tourism and IT services. This approach aims to increase the competitiveness of the services sector and maximise added value.
- **Resource-efficient economy:** the priority of the resource-efficient economy focuses on increasing sustainability and efficiency in industry. The aim is to optimise production processes, reduce waste and use resources more efficiently.
- **Agriculture and Food:** The main objectives are to promote innovation in the agri-food sector, sustainable agricultural practices and food safety. This will enable Hungary to strengthen its position as a producer and exporter of quality food.
- **Creative industries:** the aim is to develop creative industries such as design, media and entertainment, while preserving cultural values and exploiting the economic potential of the creative industries.

Two horizontal priorities should also be highlighted:

- **Training and Education:** to modernise the education system and help it adapt to the needs of the labor market.
- **Public Sector and University Innovation:** strengthening the innovation ecosystem and encouraging cooperation between universities and the public sector.

Taken together, these priorities will contribute to increasing Hungary's economic competitiveness and social well-being.

Johan von Neumann Program

The core objective of the Johan von Neumann Program⁷ (NJP) is to foster closer links between universities and the economy, to strengthen the knowledge economy and to support innovation activities. The programme gives priority to research, development and innovation (RDI) and aims to ensure that scientific results reach the market and society more quickly and efficiently. In this way, the programme contributes to economic growth, employment and the country's competitiveness.

ASSOCIATION - closer collaboration between knowledge-producing systems (universities, research institutes) and economic operators,

IMPACT - meaning economic impact, social impact and intellectual/scientific impact,

MEASUREMENT - the continuous and adequate measurement and impact assessment of relevant outcome and impact indicators (e.g. quality publications, revenue-generating patents, product, sales revenue, etc.) in RDI funding.

The NJP is a key element of Hungary's new innovation strategy, which focuses on linking universities, research institutions and the economy. It aims to strengthen the knowledge economy through the development of existing institutions and the implementation of new programmes, with the following key elements:



The NJP identifies nine actions that will contribute to the strengthening of the domestic economy and enable the development of the innovation pillars of a knowledge-based, high added value economy.

- **Putting Hungarian research on the international stage:** to strengthen and recognise Hungarian scientific research at international level.
- **Bringing excellent innovation ideas to the market:** helping innovative Hungarian ideas to reach the market.
- **Focusing innovation investments:** investments focused on healthy living, green transition, digital switchover and security.
- **Providing predictable careers for Hungarian researchers:** stabilising the professional development and career paths of researchers.
- **Providing patent incentives for Hungarian businesses and inventors:** encouraging participation in patent procedures by offering incentives.

⁷ <https://cdn.kormany.hu/uploads/document/9/9c/9c4/9c456efcd6b945893a284dcc8ba2e455f7188a1.pdf>

- **Recognition of patents for doctorates:** encouraging innovation in scientific careers and doctoral training.
- **Promoting the exploitation of research results:** supporting innovative businesses to raise funds.
- **Setting up Science and Innovation Parks:** developing cooperation with universities and industry.
- **Supporting Hungarian innovation in the Carpathian Basin:** promoting Hungarian innovation activities in the region.

Harnessing the education, research and innovation opportunities offered by the Neumannn program is vital for regional smart specialisation strategies. Projects and activities supported under the programme contribute directly to the development of knowledge-intensive industries such as digital technologies, biotechnology and artificial intelligence. These industries play a key role in modern economies and have a fundamental impact on the innovative capacity and economic growth of regions.

The programme is closely linked to new EU innovation initiatives such as the New European Innovation Agenda (NEIA), which aims to create a dynamic, inclusive and sustainable innovation ecosystem in the EU. The integration of the support schemes and instruments provided by NEIA into the Johan von Neumannn Program will further strengthen the effectiveness of regional innovation strategies.

In addition, the Neumannn programme is in line with the objectives of the European Institute of Innovation and Technology (EIT) and the European Digital Innovation Centres (EDIH). The use of educational programmes and digital transformation support services offered by the EIT and EDIH will enable local actors to participate in innovation networks and projects at European level.

Within the framework of the European Green Deal, the NJP also plays a key role, given that the European Green Deal aims to make Europe climate neutral by 2050, and this is in line with the development of green technologies and sustainable innovations supported by the Program.

Taking advantage of the education, research and innovation opportunities offered by the programme, and ensuring close coordination with EU initiatives, is essential to boost the innovative capacity of regional economies and improve competitiveness.

Operational Programmes 2021-2027 Period

The Operational Programmes for the period 2021-2027 have the primary objective of making efficient use of the Structural Funds and promoting economic growth and employment in the region. These programmes play a critical role in developing local economies, modernising infrastructure and increasing innovation capacity. The programmes aim to act as a link between government support and local economic needs, ensuring dynamic regional development.

As part of the Partnership Agreement adopted by the European Commission on 22 December 2022, Hungary will receive nearly €22 billion worth of support for balanced territorial development, equitable climate and digital transition, while promoting an innovative and inclusive social market economy.

The Operational Programme for Economic Development and Innovation (GINOP) is particularly important in the 2021-2027 financial cycle as it directly supports innovation activities. GINOP aims to stimulate economic growth, improve competitiveness and develop innovation capacities and infrastructures.

Innovation is a key component of GINOP, which focuses on supporting research, development and innovation (RDI) activities. The programme aims to promote RDI activities by Hungarian businesses, support the introduction of new technologies and encourage cooperation between businesses and with scientific institutions. In addition, GINOP aims to strengthen the innovation capacity of small and medium-sized enterprises (SMEs), improve research infrastructure and develop human resources in the field of RDI.

Projects supported under GINOP include technological developments, product and service innovations, and the creation and development of research and development infrastructure. The programme will pay particular attention to digital switchover, ICT (Information and Communication Technology) based innovations and innovative solutions in the fields of energy efficiency and environmental protection.

The GINOP grants are critical for the Hungarian economy, especially for the SME sector, which is the backbone of the Hungarian economy. The programme will enable these businesses to access the latest technologies, develop their products and services and increase their market share both domestically and internationally.

The role of GINOP is also particularly important for regional development. The programme aims to reduce regional disparities, support the economic development of disadvantaged regions and foster the development of innovative ecosystems in different parts of the country. The programme supports RDI activities, promotes technological development and innovative solutions, and contributes to economic growth and regional development. Through GINOP, Hungary will be able to strengthen its competitiveness and promote the development of a knowledge-based economy.

As the timeframe of the Smart Specialisation Strategy for Central Transdanubia (CTS3) is 2023-2029, i.e. different from the general programming period (2021-2027), the strategy will be adapted to the next programming period to effectively support the region's innovation objectives.

Innovation Perspective of the Central Transdanubian Region

CTS3 objectives for the period 2023-29

The Central Transdanubian Region's Smart Specialisation Strategy (KDRIS 2023-27) is a critical step in promoting the economic and social development of the region. This strategy aims to meet rapidly changing economic conditions, technological advances and societal expectations. The CTS3 2023-29 sets out the following key objectives:

- **Exploiting innovation potential:** the new strategy aims to assess and exploit the region's innovation potential, stimulating the growth and competitiveness of local businesses.
- **Rethinking Sectoral Priorities:** the aim is to review the region's key sectors to support those with the greatest growth potential.
- **Social and Economic Integration:** the strategy aims to integrate social and economic aspects, ensuring sustainable development and social inclusion.
- **Regional and European Alignment:** the updated CTS3 2023-29 aligns regional priorities with the EU frameworks and Hungarian national strategies.

In updating the smart specialisation strategy of the Central Transdanubian Region, special attention should be paid to the current framework of the European Union and Hungary. These frameworks provide the strategic directions and support opportunities that are essential for the development of the region.

- **EU Framework - New European Agenda for Innovation (NEIA):** the NEIA aims to create a dynamic, inclusive and sustainable innovation ecosystem that includes strengthening research and innovation, improving the business environment and responding to societal challenges. This framework will be key to shaping the innovation strategy for Central Transdanubia.
- **European Institute of Innovation and Technology (EIT) and European Digital Innovation Centres (EDIH):** the EIT and EDIH support the integration of innovation, education and entrepreneurship in the region, with a particular focus on the dissemination and application of digital technologies. These institutions can provide significant support to the digital transformation of the region.
- **The European Green Deal and Related Initiatives:** the European Green Deal aims to make Europe climate neutral by 2050, thus promoting sustainable development. The integration of the European Green Deal initiatives into the CTS3 is key to facilitate the region's green transition.

- *Hungarian Framework:*
 - *Smart Specialisation Strategy (S3): S3 promotes smart specialisation of local economies, highlighting the importance of local strengths and assets.*
 - *Neumann János Programme: the programme strengthens the link between universities and the economy, supporting knowledge-based economic growth.*
 - *Operational Programmes: these programmes aim to use the Structural Funds effectively to promote economic growth and employment in the region.*

The coordinated integration of the EU and Hungarian frameworks into the CTS3 will ensure that the Central Transdanubian Region is able to take advantage of the opportunities available and achieve its economic and social growth objectives. A more detailed analysis of each framework will be presented in the following chapters, with a particular focus on the specific needs and specificities of the region.

Economic and social overview

Financial situation

The economic performance of the Central Transdanubian region has been growing steadily in recent years. In 2023, the region's GDP per capita will be €16,200 in purchasing power parity terms, which, although growing, is still below the European average. Economic growth is driven by manufacturing, trade and construction, while agriculture and tourism also play a significant role. The volume of industrial production will reach HUF 7,500 million per capita in 2023.

In the manufacturing sector, the automotive and mechanical engineering sectors are particularly prominent, with a number of multinational companies with sites that have brought significant investment to the region. There is also a significant inflow of foreign working capital, which contributes to economic growth and technological development. Gross value added per capita has also increased, thanks to the economic diversification of the region and the development of high value-added industries. The industrial employment rate is 41.35%, above the national average, indicating the region's industrial dominance. However, the unemployment rate in 2023 was 3.5%, one of the lowest in the country.

Cultural resources

The Central Transdanubian region is rich in cultural and natural resources, which are a major tourist attraction. The region is home to the Balaton-Highlands National Park, the Vértes and Dunazug mountain ranges, as well as Lake Velence and the Öreg Lake of Tata, all part of the Natura 2000 network. These areas are a major tourist attraction and contribute to the cultural richness of the region.

The cultural centre of the region is Székesfehérvár, which has a rich historical and cultural heritage. The city boasts a number of museums, theatres and cultural centres, which offer a variety of programmes and events for both locals and tourists. Besides Székesfehérvár, Veszprém and Esztergom are also important cultural centres.

Veszprém plays a particularly prominent role in the cultural life of the region. The "Agóra Veszprém" Cultural Centre is a modern, multifunctional facility serving the local community, offering a wide range of events and programmes, including theatre performances, art exhibitions, music festivals and educational programmes. Veszprém was also the holder of the title of European Capital of Culture 2023, which has seen several cultural events and developments, further enhancing the international reputation of the city and the region.

The region is home to a number of wine regions, such as the Etyek-Buda and Mora wine regions, which are renowned for their high-quality wines. These wine regions are not only important economically, but also contribute to the preservation of local cultural identity.

Talent management

Talent management is a top priority in the Central Transdanubian region. The region's higher education institutions, such as the University of Pannonia and the Székesfehérvár Campus of the Budapest University of Economics and Business, play a significant role in training and retaining a highly skilled workforce. These institutions not only excel in training professionals with higher education qualifications, but also contribute to increasing the innovation potential of the region through their research and development activities.

Talent programmes in the region aim to support young talent to develop and stay in the region. These programmes offer scholarships, internships and mentoring opportunities. In addition, several competitions and research projects in the region also contribute to talent development, providing opportunities for young people to showcase their skills and develop their knowledge.

Close cooperation between local businesses and educational institutions is also key to talent management, with several successful collaborative projects to support local talent and foster innovation. These collaborations contribute to the economic growth and competitiveness of the region.

Innovation Potential

Research and Development

The research and development (R&D) activity of the Central Transdanubian region plays a prominent role in Hungary's innovation potential. The region is home to a large number of higher education institutions and research institutes with significant R&D activities.

University of Pannonia (Veszprém): *its outstanding research activities include chemical engineering, environmental and biotechnological research. The university's biotechnology research and agrobiotechnology development has achieved significant results in the health and agricultural sectors.*

Budapest University of Economics and Business (Székesfehérvár Campus): *the university's business and economic research stands out, with a special focus on business innovation and economic development.*

University of Óbuda (Alba Regia Faculty of Technology): the institution carries out significant research in engineering and information technology, particularly in the fields of Industry 4.0, automation and robotics.

University of Dunaújváros: *The University of Dunaújváros is particularly known for its close cooperation with local industry, which has resulted in numerous R&D projects to develop the local economy.*

János Kodolányi University: *the institution has a significant social science base, which plays an important role in the region's social innovation projects.*

Higher Education Institutions in Tatabánya: *Higher education institutions in Tatabánya, such as Edutus University, play a significant role in the development of the local economy and R&D activities. The Technical Institute of Edutus University has established and maintains an extensive network of multi-level contacts with the Hungarian factories of large international companies located in the industrial parks of Komárom-Esztergom County, as well as with small and medium-sized enterprises established and owned in Hungary.*

MTA Agricultural Research Centre (Martonvásár): *the institute is engaged in agricultural research, especially in the fields of plant genetics, plant protection and soil science. It makes a significant contribution to agricultural innovation, which contributes to the development and competitiveness of the region's agricultural sector.*

Among the research institutes operating in the region, Bay Zoltán Applied Research Non-profit Ltd. stands out, which is involved in several research and development projects, especially in the field of Industry 4.0 and environmental technology. The Alba Innovation Park in Székesfehérvár also plays an important role in supporting R&D activities, providing innovative infrastructure for start-ups and SMEs.

Significant R&D investments are being made in the region with the support of the European Union and the Hungarian state. Programmes launched by the Ministry of Innovation and Technology, such as Horizon 2020 and Széchenyi Plan Plus, provide significant funding for research projects.

Deep Tech Areas

The region of Central Transdanubia is also characterised by the development of deep tech areas. These industries require a high level of technological innovation, and there are a number of companies and research institutes in the region engaged in such activities.

Companies in the region are prominent in Industry 4.0. Companies in the region are at the forefront of automation, robotics and the development of intelligent manufacturing systems. ABB and Grundfos are companies that have made significant investments in the region to develop Industry 4.0 technologies.

Research institutes and companies in the region are also active in artificial intelligence (AI) and machine learning. For example, joint research projects between Széchenyi István University and IBM are exploring the application of AI in the optimisation of industrial processes and the development of intelligent systems.

The Central Transdanubian region is also important in the field of biotechnology. The biotechnological research of the University of Pannonia and the development of local companies such as Biotalentum Ltd. contribute to the development of the health industry and agricultural biotechnology. Through the cooperation between the university and the companies, new biotechnological solutions and products are developed, which contribute to the innovation potential of the region.

There are significant developments in energy technologies in the region. E.ON and MVM are implementing projects to increase energy efficiency and integrate renewable energy sources into the region's energy supply. The development of smart grids and energy storage solutions will also contribute to the sustainable development of the region.

Financial and Infrastructure Support

A range of financial and infrastructure support is available for R&D and deep tech projects in the region:

- **European Regional Development Fund (ERDF):** *the ERDF finances the development of R&D infrastructure and technological and product development adapted to market needs.*
- **Széchenyi 2020 Programme:** *the programme will implement several research and development projects in the region, contributing to the spread of economic and social innovation.*
- **NKFIH: National Research, Development and Innovation Agency (NKFIH):** *the NKFIH offers a wide range of funding and funding opportunities for research institutions and businesses in the region. The NKFIH aims to develop Hungary's innovation ecosystem, increase R&D capacity and improve international competitiveness. Funding includes basic research proposals, industrial research and development projects, and support for start-ups and spin-offs. The NRDIH also coordinates international cooperation and helps Hungarian researchers and institutions to participate in European and global research networks. The resources and programmes available under the NRDI help to unlock the region's innovation potential and ensure the sustainability of economic growth.*

The Central Transdanubian Region has strong R&D and deep tech potential, fuelled by the region's universities and research institutions. To develop the innovation ecosystem, various financial and infrastructure supports are available to foster sustainable economic growth and technological development.

Organisational Structure

The role of the Central Transdanubian Regional Innovation Agency (CTRIA)

The Central Transdanubian Regional Innovation Agency (CTRIA) is a key player in the generation and coordination of innovation processes in the region. The Agency was established in 2005 and since then it has been involved in more than 100 international and national projects, working with more than 200 national and 100 foreign partners. CTRIA is

based in Székesfehérvár and provides a wide range of services to businesses, start-ups, R&D institutions, municipalities and non-profit organisations.

The main tasks and services of the CTRIA:

- *Innovation management: they support business development with a wide range of expertise and contacts, including IP consultancy, networking, partnering and training.*
- *Development of territorial innovation networks and network integration*
- *Technology transfer: assessing innovation ideas, identifying market gaps, protecting intellectual property.*
- *International project development: strengthening international innovation cooperation, with a particular focus on the European Union's Horizon 2020 and Horizon Europe programmes.*
- *Project development and management: developing, writing and managing national and international projects.*

The Agency is actively involved in the development of technology and innovation networks in the region. It is a member and coordinator of several clusters, such as the 6C Cultural and Creative Industries Cluster and the Innoskart Cluster. In addition, CTRIA is also the Bakony-Balaton Co-management Organisation, which promotes further regional development cooperation.

Sharing and transferring European good practices

Sharing and transferring European good practices is a key element of the innovation strategy of the Central Transdanubian region. To this end, CTRIA maintains close links with various European innovation networks and programmes that enable the transfer and application of best practices in the region.

The Agency is an active participant in the Horizon 2020 and Horizon Europe programmes, which provide substantial support for research and development projects. In addition, KDRIÜ is involved in several international projects, such as the Erasmus for Young Entrepreneurs programme, which offers young entrepreneurs the opportunity to gain international experience and networking opportunities.

The CTRIA is also an active participant in several international projects and networks such as EDIH (European Digital Innovation Centres), SS4AF (Smart Sensors 4 Agrifood), ERRIN (European Regional Research and Innovation Network) and the S3 Platform. These networks and programmes provide significant support for research and development projects.

CTRIA is involved in several international projects aimed at developing the region's innovation capabilities and strengthening cooperation with European partners.

Examples of such projects include:

- *CORE - Composting in Rural Environments: aims to promote composting in rural areas to reduce organic matter fraction and its associated negative impacts.*
- *Health Labs4Value: to create sustainable structures for the introduction of health innovations and the transfer of technology and knowledge in health systems in Central Europe.*
- *HIGHFIVE: Stimulating digital and green growth in the food processing industry through interregional innovation investments, building on the S3 Smart Sensors 4 Agrifood (SS4AF) strategy.*
- *Capacity2Transform: building the capacity of cultural and creative industries to support sustainable tourism and green digital transformation.*
- *F.A.C.T. - Foster Awareness on the relevance of Checking the Truth.*
- *CHERRY - making Culture tHe N°1 ally of European RecoveRY: Improving policies and local plans for the creative and cultural industries to respond to the pandemic and further develop the sector using innovative communication tools, digital technologies and services.*
- *DigitalTech EDIH - European Digital Innovation Hubs: providing complex services to support the digital transition, including cybersecurity, digital skills and blockchain technology.*
- *Food-scaleEU: Expanding Europe's digital agri-food accelerator ecosystem, fostering innovation and market access for food businesses.*

These projects help CTRIA to develop the innovation capacities of the Central Transdanubian Region and to remain competitive at international level. The active participation of the Agency in these projects contributes to the economic growth and sustainable development of the region.

To share European good practices, CTRIA regularly organises exchanges, workshops and training sessions to showcase and adapt best innovation practices in the region. The agency also provides consultancy services to help businesses in the region to participate in European tenders and access international markets.

SWOT analysis

The SWOT analysis aims to present the strengths, weaknesses, opportunities and threats of the Central Transdanubian region in terms of innovation potential and development opportunities.

Strengths

1. **Strong economic base:** the region has several strong economic sectors, such as automotive, machinery, chemicals and food. These sectors have significant R&D activities, which foster innovation.
2. **Excellent geographical location:** the favourable geographical location of the Central Transdanubian region ensures good transport and logistical links, which contribute to the efficiency of economic and innovation activities.
3. **High-quality education and research institutions:** universities and research institutes in the region, such as the University of Pannonia, the University of Óbuda, the Kodolányi János University, the Martonvásár Agricultural Innovation Centre and the Bay Zoltán Applied Research Non-profit Ltd., as well as the European Institute of Innovation and Technology (EIT) and the European Digital Innovation Centres (EDIH), make a significant contribution to R&D and innovation.
4. **Developed industrial parks and clusters:** the region has several industrial parks and innovation clusters that support technological development and innovation. Tatabánya, for example, is an important industrial centre that promotes regional economic growth.
5. **Up-to-date infrastructure:** in recent years, there has been significant investment in digital and physical infrastructure, including the expansion of broadband internet access and support for energy efficiency projects.

Weaknesses

1. **Limited access to finance:** SMEs and start-ups often faces difficulties in accessing adequate sources of finance, which hampers the implementation of innovation projects.
2. **Labour shortages:** the region is experiencing labour shortages, particularly in highly skilled areas, which are hampering technological development and innovation activities.
3. **Infrastructure development needs:** although there have been significant infrastructure developments in the region, there are still areas that need further development, particularly in digital infrastructure.

4. **Lack of innovation culture:** the innovation and entrepreneurial culture is not strong enough, which hinders the spread of creative and innovative solutions in the region.
5. **Lack of coordination at regional level:** innovation activities and development projects are not always well coordinated between the different actors, which can reduce the effectiveness of cooperation.

Opportunities

1. **EU funding:** the EU has several programmes and funding opportunities to support research and development and innovation, which can bring significant benefits to the region.
2. **Technological development and digitalisation:** the spread of digital technologies and Industry 4.0 is creating new opportunities for industry and services sectors, fostering innovation and increasing competitiveness.
3. **International cooperation:** expanding international research and development cooperation will provide the region with the opportunity to bring in new technologies and innovations and build international market links.
4. **Sustainability ambitions:** the growing importance of ecological and sustainability goals is creating new market opportunities for environmental technology and green innovations.
5. **Developing the innovation ecosystem:** taking advantage of the opportunities offered by the EIT and EDIH can contribute to the development of the innovation ecosystem and the faster diffusion of new technologies in the region.
6. **Agri-food and biotechnology development:** the Martonvásár Agri-Innovation Centre will create opportunities for agricultural and biotechnology research and development.

Threats

1. **Economic and political uncertainty:** economic crises and political instability can have a negative impact on the region's economic development and innovation activities.
2. **Competitive pressure:** Competitive pressure in the global market is a challenge for businesses in the region, especially SMEs.
3. **Technological lag:** the rapid development of new technologies and digital transformation are challenging businesses in the region. If they cannot keep pace with global technological trends, they risk being at a competitive disadvantage. This is

particularly true for small and medium-sized enterprises (SMEs), which often have fewer resources to adopt and apply new technologies.

4. **Demographic challenges:** the ageing of the region's population and the outward migration of young people could lead to labour shortages and a slowdown in economic growth in the long term. This could have a negative impact on innovation activities as the availability of skilled labour decreases.
5. **Environmental challenges:** climate change and environmental threats such as extreme weather events pose a significant risk to the region. These factors can affect infrastructure, agriculture and industry, which can have a negative impact on innovation potential.
6. **Funding difficulties:** although EU and Hungarian state funding provides significant resources for R&D activities, the availability and sustainability of funding may be uncertain in the long term. The availability of funding for R&D and innovation projects in the EU and in the EU15 is a major obstacle to the implementation of innovation projects.

The region of Central Transdanubia has a significant innovation potential, supported by strong economic fundamentals, excellent geographical location, high quality education and research institutions, and well-developed industrial parks and clusters. However, it also faces several challenges, including limited access to finance, labour shortages, infrastructure development needs and technological backwardness. It is important for the region to take advantage of the opportunities offered by the EU, to promote technological development and digitalisation, and to strengthen international cooperation. Addressing sustainability aspirations and environmental challenges is also key to preserving the region's long-term competitiveness and innovative capacity.

Identifying Key Sectors and Innovation Themes

The Central Transdanubian region has several key sectors with strong innovation potential. Below we present in detail the region's key industries and innovation themes.

Vehicle manufacturing/mechatronics

Vehicle manufacturing and mechatronics is one of the most dominant industries in the region. There are several large automotive suppliers in the Székesfehérvár and Veszprém area, which are also major players at international level. Companies in the region, such as Arconic-Köfém, Grundfos and ABB, are continuously developing their products and technologies, thus contributing to the region's innovation potential.

Metalworking

The metalworking industry also plays an important role in the region's economy. Companies operating in the industry, such as Fevill Fémipari Kft., Kárpátia Kft. and Ikarus, are implementing high quality technological developments that contribute to the competitiveness of the region. The development of the industry is closely linked to vehicle manufacturing and the automotive supply chain.

Food industry

The food industry is a traditional sector in the region with a significant potential for innovation. Companies operating in the region, such as Venus, Saga Foods and Pápai Hús, are constantly improving their products and production processes. Food safety, sustainability and improving product quality are key areas for innovation.

Creative and Cultural Industries (CCI)

Creative and cultural industries (CCIs) also play an important role in the economic and cultural life of the region. Veszprém, as European Capital of Culture 2023, plays a particularly prominent role in the cultural life of the region. The city hosts numerous arts festivals and cultural events that contribute to the development of the creative industries.

Tourism

Tourism is one of the priority sectors of the Central Transdanubian region. The proximity of Lake Balaton, as well as historical and natural attractions such as Veszprém Castle, the Bakony and Lake Velence, are major attractions. Tourism developments in the region, such as the expansion of accommodation and tourism services, contribute to economic growth and innovation.

Environmental Technology

In the field of environmental technology, companies and research institutes in the region are carrying out several innovative projects. Energy efficiency, the use of renewable energy sources and the development of waste management are key areas. Bay Zoltán Applied Research Non-profit Ltd. is involved in several environmental projects that contribute to the development of sustainability and the green economy.

Electronics, informatics

The electronics and IT sector also has significant innovation potential in the region. The Alba Regia Faculty of Technology of Óbuda University and local companies such as IBM and GE are carrying out several research and development projects in the field of information technology and electronics. Innovations in the industry contribute to the digital transformation and technological development.

Healthcare industry

The health industry is one of the region's priority sectors, involving several research and development projects. The biotechnology research of the University of Pannonia and local companies such as Biotalentum Ltd. are carrying out significant innovations in the field of health care and agrobiotechnology. The development of new medical devices and drugs contributes to improving the quality of healthcare.

Energy efficiency

In the energy sector, companies in the region, such as E.ON and MVM, are implementing a number of innovative projects in energy efficiency and the integration of renewable energy sources. The development of smart grids and energy storage solutions are also priority areas that contribute to sustainable development.

Biotechnology

The biotechnology sector is one of the fastest growing sectors in the region. The University of Pannonia and local companies are carrying out several research and development projects in the field of medical and agricultural biotechnology. The development of new biotechnological solutions and products contributes to the innovation potential and competitiveness of the region.

Social innovation

In the field of social innovation, the region has launched several initiatives to develop responses and solutions to societal challenges. Engaging local communities, strengthening social cohesion and supporting social entrepreneurship are key areas. Social innovation contributes to promoting social well-being and economic development.

Future Prospects and Strategic Directions

Based on the policy framework and the region's specificities and development orientations, the future development plans and strategic objectives are as follows:

- 1. Health and Medtech: Focusing on innovation in health services and medtech tools, in line with EU health strategies, with an emphasis on system-level integration and e-health solutions.*
- 2. Green transition: Supporting the green transition of the economy, including the development of energy efficiency, renewable energy sources and environmentally conscious innovation in line with EU environmental objectives.*
- 3. Digital transformation: Developing digital infrastructure, technologies and digital resiliences in line with the EU's digital switchover ambitions.*
- 4. Thematic Innovation Hubs and cooperation: close cooperation with the actors in the innovation ecosystem.*
- 5. Agri-food and biotechnology: Increasing the innovation capacity of the agri-food and biotechnology sectors, in line with EU food safety and biotechnology objectives.*
- 6. Creative, environmental industries and tourism: Developing creative industries, environmental industries and tourism contributing to economic diversification and sustainability.*
- 7. Education: Modernising the education system, methodologies, developing market driven educational trainings in line with EU education strategies.*

Strategic Actions and Proposals:

- 1. Integrated Stakeholder Engagement: Foster active involvement of all stakeholders, including local governments, businesses, educational institutions, and civil society, in comprehensive strategic planning and collaborative implementation processes.*
- 2. Partnership with National Innovation Agency (NIA) and Johan von Neumann Program (NJP): Maximize synergies and leverage resources offered by the NIA and NJP to bolster innovation, research, and development initiatives within the region.*
- 3. Continuous Monitoring and Evaluation: Implement regular assessments to gauge the effectiveness of strategic objectives and actions, ensuring flexibility for adjustments and improvements as needed.*
- 4. Adoption of European and International Best Practices: Study successful international models and adapt them to local conditions, integrating innovative approaches that have proven effective elsewhere.*

These strategic guidelines and proposals aim to ensure that the S3 Strategy for the Central Transdanubian region significantly contributes to economic growth, social development, and international competitiveness. The CTS3 2023-29 represents a dynamic, forward-looking, and integrated approach that harnesses the region's inherent strengths and opportunities while addressing global challenges and trends effectively.

DEVELOPMENT OBJECTIVES

R&D&I Capacity Building

The CTS3 „Building R&D&I Capacity” is based on two main pillars: the integration of the New European Innovation Agenda (NEIA) and the exploitation of synergies of the Johan von Neumann Program (NJP).

Integration of the New European Innovation Agenda (NEIA): *the NEIA aims to create a dynamic, inclusive and sustainable innovation ecosystem across the European Union. For the Central Transdanubian region, this integration represents an opportunity to strengthen research and innovation, improve the business environment and respond more effectively to societal challenges. To this end, the following steps are proposed:*

- 1. Research Infrastructure Development:*** *modernising and expanding regional research infrastructures to bring them in line with European standards and facilitate the creation of research centres of excellence.*
- 2. Improving the business environment:*** *creating a more business-friendly regulatory framework, increasing access to finance and strengthening the entrepreneurial culture.*
- 3. Tackling societal challenges:*** *supporting innovations that directly contribute to social well-being and environmental sustainability, such as projects to tackle climate change and social inequalities.*

Synergies of the Johan von Neumann Program (NJP): *the NJP aims to stimulate closer links between universities and industry and to facilitate faster market uptake of scientific results. To achieve this, the following measures are proposed:*

- 1. University-Business Link:*** *strengthening partnerships between local universities and businesses to get research results to the market and society faster.*
- 2. Support for Innovation Activities:*** *targeted use of the resources and tools offered by the NJP to support innovation projects and start-ups at local level.*
- 3. Alignment of R&D&I actions:*** *integrated use of the instruments and resources available under NEIA and NJP to maximise the capacity building of R&D&I in the region.*

In the Central Transdanubian region, the combination of NEIA and NJP strategies can be key to stimulating knowledge-intensive economic activities, developing regional economies, and strengthening structural adjustment to industrial transformation, particularly digitalization. Taken together, these measures will contribute to fostering the economic and social development of the Central Transdanubian region, while being closely aligned with broader EU objectives, including the "green transition" and the digital transition.

Development of the most relevant Sectors

Under the „Most Relevant Sectors” objective of the CTS3 regional innovation activities will focus on the following areas:

Cutting Edge Technologies and Health Innovations

Artificial Intelligence and Robotics: developments in artificial intelligence (AI) and robotics are key to the modernisation of industry in the region. These innovations will enable the automation of manufacturing processes, increase efficiency and create new business models. In the Central Transdanubian region, the integration of AI and robotics aims to:

1. **Industrial Automation:** introducing Industry 4.0 technologies in local manufacturing plants to increase production efficiency and flexibility.
2. **Establishment of Research and Development Centres:** to create research and development centres that focus on the latest trends in AI and robotics, thus fostering technological innovation in the region.

Developing health innovations: innovations in the health sector, in particular medical technologies, are vital to improve the health of the population and increase the efficiency of health services. The following actions are proposed for the region:

1. **Innovative Health Technologies Development:** to support pharmaceutical research and the development of advanced diagnostic tools.
2. **Encouraging Health Start-ups and Enterprises:** supporting local health innovation businesses to bring new products and services to market.

Developing Green Technologies

Developing Sustainable Development and Green Innovations: sustainable development and green technologies are a priority under the European Green Deal. In the Central Transdanubian region, priority is given to the development of the following areas:

1. **Energy Efficiency and Renewable Energy:**
 - Encourage the use of renewable energy sources such as solar and wind energy.
 - Support for energy efficiency projects for regional businesses and public institutions.
2. **Green Technologies and Environmentally Conscious Innovations:**
 - Encourage the development of environmentally friendly products and services.
 - Promoting innovative solutions for waste management and recycling.

Overall, these measures will contribute to the economic and social development of the Central Transdanubian region, while being in line with the EU's broader objectives. The focus on developing the most relevant sectors, such as artificial intelligence, robotics, health innovations, as well as promoting green technologies and sustainable solutions, will ensure

that the region responds to the challenges of modern economies and promotes technological progress and a sustainable future.

Twin transition

The aim of the "Twin Transition" in the CTS3 is to promote the digital and green transition in a coordinated way, which is essential for the social and economic development of the region. This double transition is implemented within the framework of the Johan von Neumann Program (NJP) and the European Green Deal (Greendeal).

Implementing the Digital Transition

The Digital Transition aims to promote technological development and digital innovation in the region. To this end, the following steps are proposed:

1. **Digital Infrastructure Development:**
 - Expand broadband internet access and digital communications networks in the region to bring fast internet to every business and household.
2. **Digital Skills and Education:**
 - Supporting digital education programmes and training in local educational institutions to meet the needs of the digital labour market of the future.
 - Developing the digital skills of workers to adapt to a digitally transformed workplace.
3. **Digital Innovation and Entrepreneurial Environment:**
 - Supporting startups and businesses using digital technologies, including e-commerce, data analytics and smart technologies.
 - Developing incentives and support schemes for local businesses to facilitate digital transformation.

Green Transition

The Green Transition aims to promote environmentally responsible and sustainable economic growth. The following steps are proposed:

1. **Renewable Energy and Energy Efficiency:**
 - Encourage the use of renewable energy sources such as solar and wind power.
 - Supporting energy efficiency investments for businesses and public institutions, such as the introduction of energy efficient buildings and processes.
2. **Environmentally Conscious Innovations and Technologies:**
 - Support the development of environmentally friendly products and technologies, such as products made from recycled materials.
 - Sustainable agriculture and green infrastructure, such as the development of urban green spaces and projects supporting biodiversity.

3. Green Society and Environmental Awareness:

- *Encouraging environmentally conscious behaviour among the population, including sustainable consumption and environmental education.*
- *Involving local communities in green initiatives, such as community gardens and supporting local environmental projects.*

Harnessing the synergies of the digital and green transition in the Central Transdanubian region will help to shape a future where technological progress and sustainability are in balance. The digital transition aims to increase economic competitiveness, while the green transition aims to improve environmental sustainability and quality of life. This dual transition will allow the region to contribute to national and European objectives while improving the living conditions and economic opportunities of local residents.

Skill Development

The Skill Development objective focuses on strengthening education and entrepreneurial culture within the framework of the CTS3, taking advantage of the opportunities offered by the European Innovation Agenda (NEIA) and the European Institute of Innovation and Technology (EIT)/European Digital Innovation Hubs (EDIH) initiatives. Achieving this objective is critical to increasing the competitiveness of the regional labour market and fostering future economic growth.

Education and Training Development

1. Digital Skills and Technology Education:

- *Expand digital education programmes and training in local educational institutions, with a focus on artificial intelligence, data analysis, programming and digital design.*
- *Working closely with the EIT/EDIH to organise educational programmes and workshops to support digital transformation, focusing on digital skills development.*

2. Lifelong Learning and Adult Education:

- *Developing and supporting adult learning programmes that enable professionals already in the labour market to update their knowledge and skills in line with current market needs.*
- *Providing online learning platforms and distance learning opportunities that offer flexible access to professional development.*

Entrepreneurial Culture and Innovation Ecosystem

1. Developing Entrepreneurial Mindsets and Skills:

- *Support for entrepreneurship training and mentoring programmes to develop entrepreneurial skills, business planning, financial management and market entry strategies.*
- *Support local entrepreneurial networks and incubators that connect entrepreneurs, investors and industry experts.*

2. Innovation Partnerships and Networking:

- *Working closely with the EIT/EDIH and other European innovation networks to help local entrepreneurs and start-ups access European and international markets.*
- *Organising events, workshops and conferences to strengthen the entrepreneurship and innovation ecosystem, where participants can share their experiences, knowledge and best practices.*

The aim of these measures is to prepare the labour market in the Central Transdanubian region for the challenges of the future by encouraging digital and innovative thinking and promoting entrepreneurship and networking skills. This will enable the region to seize the opportunities offered by digital transformation and innovation, thereby increasing economic competitiveness and social welfare.

Building Coherent Ecosystems and Networks

The Coherent Ecosystems and Networks objective focuses on the integration and interconnection of regional and European innovation ecosystems in the framework of the CTS3. This objective will be achieved by combining the networks of the European Innovation Agenda (NEIA), the European Institute of Innovation and Technology (EIT) and the European Digital Innovation Hubs (EDIH) initiatives. Through integration, the Central Transdanubian region will be able to leverage different European and local resources, knowledge and networks to foster innovation activities and economic development.

Connecting Regional and European Innovation Networks

1. Integration of European Innovation Initiatives:

- *Integrating the tools, knowledge base and networks offered by NEIA, EIT, and EDIH into local level strategies to enable the region to participate in innovation projects and programmes at European level.*
- *Exploiting synergies between European initiatives and regional innovation projects, for example in digital technologies, sustainable development and social innovation.*

2. Development of Joint Projects and Programmes:

- *Establishing joint innovation projects and programmes between European and local actors to promote regional economic development and social well-being.*
- *Active use of European funding opportunities such as Horizon Europe to support regional innovation projects.*

Building a coherent innovation ecosystem

1. Collaborative Platforms and Networking:

- *Organising innovation platforms and networking events to foster cooperation between local and European actors such as universities, research institutes, businesses and government agencies.*
- *Knowledge sharing and exchange of best practices between members of the innovation ecosystem to strengthen coherence and the achievement of common objectives.*

2. Local Innovation Capacity Development:

- *Developing the skills and capacities of local actors to actively participate in innovation networks at European level, including expertise, management skills and project management competences.*
- *Creating and supporting innovation incubators and accelerator programmes to help new innovative businesses start and grow in the region.*

By linking European and regional innovation ecosystems, the Central Transdanubian region will be able to participate more effectively in European innovation activities, facilitating a more efficient use of knowledge and resources. This coherent approach will help the region to increase innovation capacity, foster economic growth and improve social welfare.

PRIORITIES

Priorities of CTS3



Priority 1: Digital Transformation

The aim of the priority:

Focusing on digital technologies, information society development and the application of Industry 4.0 and 5.0 technologies. In the framework of the Digital Transformation priority, the Central Transdanubian Smart Specialisation Strategy aims at the development of digital technologies, the digital resilience, the information society, and the application of Industry 4.0 and 5.0 technologies. The implementation of this strategy aligns with the priorities of the European Union and Hungary, particularly in the fields of digital and green transformation and innovation policies.

Interventions of the priority:

1.1. Developing of Digital Technology: The digital transition in Central Transdanubia emphasizes the application of artificial intelligence, high-performance computing capabilities, and blockchain technology.

1.2. Developing of Digital Infrastructure: The development of digital infrastructure, including network expansion and increased bandwidth, as well as the digitisation of public services, are crucial components.

1.3. Improving of Digital Competencies: The development of digital competencies among the population and workforce is also a key goal, ensuring that the benefits of digital technologies are accessible to all through various training programs and educational initiatives.

1.4. Providing Innovation Hubs and Living Labs: A key focus is the development of thematic Innovation Hubs and Living Labs and fostering collaboration with institutions such as universities, colleges, clusters, innovation management organisations, accelerators, and incubators. These hubs and labs will drive the growth of SMEs, start-ups, and spin-offs in forward-looking sectors like artificial intelligence, biotechnology, robotics, and quantum technology.

1.5. Digitalisation of Public Services: The digitalisation of public services includes the enhancement of e-governance and e-administration, enabling citizens to handle their affairs more quickly and efficiently through online platforms.

1.6. Developing of Community Networks and Regional Collaborations: Strengthening community networks and regional collaborations is essential for fostering cooperation among businesses, research institutions, and universities in the region, working together to achieve digital and innovation goals.

1.7. Promoting Sustainability and Energy Efficiency: In line with the European Union's Green Deal, the digital transition must promote sustainability and energy efficiency, particularly in the areas of renewable energy and smart energy usage.

1.8. Developing Data Privacy and Cybersecurity: Ensuring data privacy and cybersecurity is paramount, guaranteeing that new digital systems are secure and reliable. Enhancing data security and regulating data protection are crucial for a successful digital transformation. These interventions align with the strategic frameworks of the EU and Hungary, including the New European Agenda for Innovation and the European Green Deal aiming to strengthen regional innovation ecosystems, foster entrepreneurship, and support sustainable development goals.

Priority 2: Sustainability and Green Transition

The aim of the priority:

Focusing on energy efficiency, renewable energy and environmentally conscious innovation. One of the key focuses of the Central Transdanubian Smart Specialisation Strategy (CTS3) is the green transition, aimed at reducing the ecological footprint and promoting sustainable development. The green transition goals include increasing the use of renewable energy sources, improving energy efficiency, promoting the circular economy, supporting sustainable agriculture, developing green transportation solutions, promoting sustainable urban development, and enhancing education and awareness. Below is a detailed explanation of these aspects.

Interventions of the priority:

2.1. Use of Renewable Energy Sources: A key goal in the region is to promote the widespread use of renewable energy sources such as solar, wind, and biomass, along with the development of related infrastructure. The use of such energy sources contributes to increased energy independence and reduced carbon emissions.

2.2. Increasing Energy Efficiency: Supporting energy efficiency investments in both the industrial and residential sectors is essential. This includes the implementation of energy-efficient buildings, smart grids, and energy-saving technologies, which help reduce energy consumption and costs.

2.3. Promoting the Circular Economy: Improving waste management, recycling, and resource efficiency in the region are crucial. Encouraging industrial symbiosis, where one industry's waste becomes a resource for another, contributes to sustainable economic growth and environmental protection.

2.4. Sustainable Agriculture and Food Production: Supporting sustainable agriculture and food production involves promoting organic farming, precision agriculture, and sustainable food production methods that minimize environmental impacts and enhance food security.

2.5. Twin Transition on Agrifood Ecosystem: The Twin Transition on Agrifood Ecosystem focuses on enhancing value chain development and digitalizing food systems to build a resilient food system. This initiative aims to integrate technological advancements with sustainable practices to ensure food security and resilience in the face of challenges.

2.6. Green Transportation Solutions: Greening the transportation sector is of paramount importance, including increasing the use of electric and hybrid vehicles and developing smart transportation systems and infrastructure. Expanding the network of electric charging stations is also a vital part of green transportation.

2.7. Sustainable Urban Development: Greening cities and towns involves increasing green spaces, implementing energy-efficient public lighting, and adopting sustainable construction practices. This contributes to better quality of life and the creation of environmentally friendly urban environments.

2.8. Education and Awareness: Launching training programs and campaigns for the public and businesses is crucial to raise awareness about the importance of green technologies and sustainability. These initiatives encourage the adoption of green solutions and sustainable lifestyles

2.9. Green Innovation and Research and Development: Supporting the research and development of sustainable technologies and solutions, as well as promoting green innovation among local businesses, is essential for the success of the green transition.

These guidelines and proposals ensure that the Central Transdanubian region's Smart Specialisation Strategy contributes to the region's economic growth, social development, and international competitiveness while promoting sustainability and reducing the ecological footprint.

Priority 3: Inclusive Society

The aim of the priority:

Focusing on social challenges, addressing climate change and social inequalities, as well as improving social well-being and environmental sustainability. The Inclusive Society priority within the Central Transdanubian Smart Specialisation Strategy focuses on addressing critical social challenges, mitigating the impacts of climate change, and enhancing both social well-being and environmental sustainability. This strategic approach aims to build a resilient and inclusive society capable of effectively addressing diverse societal challenges.

Interventions of the priority:

3.1. Addressing Social Inequalities: Central to this priority is promoting social integration and inclusion by supporting initiatives that facilitate the active participation of socially disadvantaged groups in all facets of society. This includes ensuring equal access to education, healthcare, and employment opportunities, thereby reducing disparities and fostering a more cohesive community.

3.2. Promoting Climate Change Management and Environmental Sustainability: Efforts to manage climate change and promote environmental sustainability are integral to the strategy. This involves developing comprehensive strategies for both climate change mitigation and adaptation, alongside initiatives to raise public awareness and education on environmental issues. Collaborative projects with local authorities, NGOs, and the private sector aim to enhance sustainable practices and green infrastructure development across the region.

3.3. Improving Social Well-being and Quality of Life: Enhancing the quality of life for all residents is a core objective. This encompasses supporting initiatives that improve housing, transportation, healthcare, heritage and tourism and cultural amenities. Special attention is given to ensuring that socially disadvantaged groups have access to essential services and opportunities for personal and community development.

3.4. Sustainable Economic Development and Job Creation: Promoting sustainable economic growth and diversifying local economies are crucial components of the strategy. Initiatives are focused on creating new job opportunities, particularly in sectors aligned with social well-being and environmental sustainability, such as the green economy and social entrepreneurship. It is also important to retain and support a highly skilled young workforce (entrepreneurs and researchers).

Through the Inclusive Society priority, the Central Transdanubian region aims to foster a resilient community that integrates social inclusion, environmental sustainability, and economic prosperity. This holistic approach seeks to strengthen community resilience, improve overall well-being, and ensure sustainable development for future generations.

Priority 4: Development of Flagship Sector

The aim of the priority:

The priority prioritises mechatronics, metal processing, food industry, cultural and creative industries (CCI), tourism, environmental technology, electronics, and healthcare industry. This strategic focus aims to drive the modernisation of the region's economy and enhance its competitiveness by leveraging advanced technologies and innovative approaches.

Interventions of the priority by key sectors:

*4.1. **Emphasising mechatronics and electronics** will bolster the region's capabilities in automation, robotics, and smart manufacturing, fostering competitiveness in global markets and advancing industrial innovation.*

*4.2. In the **metal processing sector**, there is a focus on enhancing manufacturing processes, materials innovation, and sustainable practices to strengthen the region's industrial base and export potential.*

*4.3. The **food industry** is targeted for modernisation through innovations in food processing, packaging, and quality control technologies, aiming to meet evolving consumer demands for safe, sustainable, and high-quality food products.*

*4.4. The **Cultural and Creative Industries (CCI)** sector is supported to harness creativity, digitalisation, and cultural heritage for economic growth, promoting local talent and cultural diversity.*

*4.5. **Tourism development** initiatives aim to enhance visitor experiences through digitalisation, sustainable tourism practices, and cultural tourism offerings, contributing to regional economic diversification and job creation.*

*4.6. **Environmental technology** innovations focus on sustainability solutions, including waste management, renewable energy, and clean technologies, to address environmental challenges and promote eco-friendly practices.*

*4.7. Advancements in **healthcare technologies** and innovations are prioritised to improve diagnostic capabilities, medical treatments, and healthcare services, leveraging digital health solutions and personalized medicine approaches.*

These interventions align with the strategic frameworks of the EU and Hungary, including the New European Agenda for Innovation and the European Green Deal.

Priority 5: Territorial Innovation Development

The aim of the priority:

Focusing on integrating regional strengths and resources to foster innovation, driving sustainable economic growth and social development within specific territories. Its aim is to strengthen regional economies and enhance innovation capacity by leveraging local resources and strengths. Under this priority, regions support innovation activities tailored to their specific characteristics and advantages, foster collaboration among businesses, research institutions, and local communities, and promote sustainable economic growth and social development within their territories.

Interventions of the priority:

5.1. Promoting Sustainable Economic Development: The Central Transdanubian S3 Strategy aims to support local economic development across Komárom-Esztergom, Veszprém, and Fejér counties. It focuses on advancing key sectors such as mechatronics, metal processing, food industry, cultural and creative industries (CCI), tourism, environmental technology, electronics, and healthcare. By supporting these sectors, the strategy seeks to diversify the economy, create employment opportunities, and foster high-value production.

5.2. Developing an Innovation Ecosystem: Central to the strategy is the strengthening of the regional innovation ecosystem. This involves fostering an environment conducive to collaboration between start-ups, SMEs, and research institutions. Emphasis will be placed on open innovation and networking along the quadruple helix model, which involves cooperation among academia, industry, government, and civil society. Initiatives include establishing science and innovation parks, facilitating technology transfer from academia to industry, and promoting entrepreneurship in emerging areas such as digital technologies and green innovation.

5.3. Infrastructure Development: Infrastructure development is a cornerstone of the strategy to support economic and innovation goals. Priority areas include expanding digital infrastructure to enhance broadband coverage and implementing smart city solutions. Additionally, investments in transportation networks, energy infrastructure, and sustainable environmental projects are crucial to improving business competitiveness and quality of life for residents.

5.4. Regional Specificities and Collaboration: The strategy acknowledges the unique characteristics and priorities of Komárom-Esztergom, Veszprém, and Fejér counties. In Komárom-Esztergom, the focus is on strengthening industrial innovation and leveraging its strategic location for logistical advantages. Veszprém County emphasizes innovation in high-tech sectors, sustainable agriculture, and cultural tourism. Fejér County prioritizes advancements in automotive manufacturing, renewable energy, and vocational education to meet local workforce needs.

5.5. European and National Alignment: Aligned with European and national strategies, the Central Transdanubian Regional Innovation Strategy aims to enhance regional competitiveness within a global context. It promotes international research collaborations, adheres to EU innovation policies, and contributes to sustainable development objectives. By

harnessing local strengths and promoting innovation across sectors, the strategy aims to enhance economic resilience and elevate living standards across Komárom-Esztergom, Veszprém, and Fejér counties.

In summary, the Central Transdanubian S3 Strategy integrates regional priorities with European guidelines to drive sustainable economic growth, fortify the innovation ecosystem, develop critical infrastructure, and capitalize on local strengths. By fostering collaboration and innovation, the strategy aims to position Komárom-Esztergom, Veszprém, and Fejér counties as hubs for technological advancement, economic diversification, and sustainable development in Hungary and beyond.

Priority 6: Resilient and Green Urban Growth

The aim of the priority:

The Resilient and Green Urban Growth priority addresses the integration of innovative solutions to foster urban development that is both resilient and environmentally sustainable across cities of varying sizes and functions. This priority recognizes the importance of tailored approaches to urban development, considering diverse urban contexts ranging from metropolises to smaller towns.

Innovative solutions play a crucial role in shaping the future of urban areas, aiming to make them greener and more resilient. These solutions encompass a wide range of initiatives such as the development of green infrastructure like urban parks and green roofs, the implementation of sustainable transportation systems including electric mobility and bike-sharing programs, the adoption of energy-efficient buildings and smart grid technologies, and the promotion of community-oriented urban planning strategies that prioritize mixed land use and walkability.

Formulating a dedicated urban priority is essential because cities act as hubs and facilitators of economic, social, and environmental processes. They serve as nodes for integration and network formation, crucial for fostering innovation and sustainable development on a regional and global scale. At the same time, cities are often focal points for intensified social and environmental challenges, including issues of inequality, pollution, and climate vulnerability. Therefore, addressing urban development as a distinct priority at the territorial level is necessary to effectively tackle these challenges and leverage urban areas as drivers of sustainable growth and resilience."

This expanded description outlines the strategic importance of focusing on Resilient and Green Urban Growth as a priority, emphasizing the role of cities as both catalysts for innovation and focal points for addressing societal and environmental issues.

Interventions of the priority:

6.1. Green Infrastructure Development: Investing in urban parks and green roofs helps create more sustainable and livable cities by enhancing biodiversity, reducing heat islands, and improving air quality.

6.2. Sustainable Transportation Systems: Implementing electric mobility solutions and bike-sharing programs reduces carbon emissions, alleviates traffic congestion, and promotes healthier lifestyles.

6.3. Energy-Efficient Buildings: Adopting advanced building designs and smart grid technologies increases energy efficiency, reduces operational costs, and lowers the carbon footprint of urban areas.

6.4. Community-Oriented Urban Planning: Prioritizing mixed land use and walkability in urban planning fosters inclusive communities, improves accessibility to amenities, and enhances the overall quality of life.

6.5. Dedicated Urban Priority Frameworks: Formulating urban policies that address social and environmental challenges head-on is essential for harnessing cities' potential as hubs of economic growth, innovation, and sustainability while mitigating issues like inequality, pollution, and climate vulnerability.

These interventions align with the strategic frameworks of the EU and Hungary, including the New European Agenda for Innovation and the European Green Deal.

THE ROLE OF THE ECOSYSTEM NODES IN THE IMPLEMENTATION OF THE CTS3

The development, continuous monitoring and implementation of the CTS3 and the operation of the regional innovation system requires a well-tracked and coherent coordination, with the Central Transdanubian Regional Innovation Agency as the central actor. It has a core role in the coordinated cooperation along quadruple helix and in the national and international embedding of the regional innovation ecosystem.

CTRIA therefore plays a key role in the preparation and implementation of the Smart Specialisation Strategy of Central Transdanubia (CTS3 2023-29). CTRIA is responsible for defining the strategy's guidelines, coordinating cooperation and achieving its objectives. The CTRIA is also responsible for promoting the economic and social development of the region by supporting innovation and technological development and managing professional a financial support action.

CTRIA plays an important role in the exchange and transfer of European good practices in the framework of different EU initiatives. This includes promoting the commercialisation of innovative ideas and technologies, focusing on R&D and innovation investments, and developing innovation hubs. CTRIA aims to act as a bridge between local entities (companies, educational institutions and research communities) and the European innovation ecosystem, helping to increase the region's innovation capacity and transnational integration.

The activities of CTRIA cover:

- Innovation and Technology Transfer along the whole innovation chain: supports businesses in the region to introduce and commercialise innovative technologies, including the development of new products and services and the improvement of existing practices.*
- Supporting Research and Development: actively supporting local research projects, with a particular focus on food, health, biotechnology, ICT, green technologies and creative industries.*
- Collaboration networks' development: to foster regional, national and international cooperation to give businesses and research communities in the region access to the latest scientific and technological advances. It has a highlighted focus on Living Labs and innovation nodes.*
- Capacity building: having dedicated support initiatives and being an accredited adult education organisation, CTRIA is running innovation capacity building programmes, events and trainings. This activity is addressing the end users on the one hand and the innovation support organisations on the other.*

Through the activities of CTRIA, the better exploitation of the potential of the innovation ecosystem is given, thus supporting the economic growth and social development of the region. CTRIA also plays a key role in the strategic and operational connection of the regional innovation ecosystem with the national institutions on the one hand, and several international thematic networks on the other.

Regional ecosystem nodes

The implementation of CTS3 is a collaboration-based process, involving different stakeholders along quadruple helix within and out of the region. The role of the involved stakeholders is precisely defined and included in individual cooperation agreements.

Several pre-defined key players cooperate in the organisational background of the implementation of the CTS3 as follows:

- Hungarian Association for Innovation (MISZ): as a professional and employer association, MISZ focuses on the economic promotion of innovation. Its aim is to make innovation in R&D and planning a real resource for the Hungarian economy. CTRIA acts as regional directorate of MISZ. As such all regional activities are coordinated by CTRIA.*
- University of Pannonia: University of Pannonia places a strong emphasis on strengthening links between business and academia, thus promoting the practical application of research results and the creation of added value. In particular, the research potential in life sciences, natural sciences and environmental sciences is outstanding.*
- Chamber of Commerce and Industry of Veszprém County: Being the biggest community of SMEs, the organization works for the interests of micro, small and medium enterprises, companies and all economic actors in Veszprém County to enhance economic development, innovation capacity and vocational education system of the region.*
- National Research, Innovation and Development Office: The National Research, Development and Innovation Office is a central budgetary body operating as a central office under the direction of the Minister responsible for the coordination of science and innovation policy.*

IMPLEMENTATION AND MONITORING OF CTS3

CTS3 is a key element of regional development, aiming to maximise the region's innovation potential and increase global competitiveness. This strategy is critical for the digital transition, for the development of scientific and technological infrastructure, and for fostering social and economic growth. The CTS3 integrates the opportunities offered by the NEIA and the NJP, linking them to regional objectives and resources to promote diversification of local economic activities and technological development. Additionally, the joint action with the members of the Smart Specialisation Platform on EU level is also grounded by CTS3.

Financial implementation

The Strategy has no directly dedicated public resources to be implemented, however there is a declared direct connection of the financial implementation to several regional, national and EU sources. For all the financial sources, CTRIA is responsible to manage the integration of CTS3's interventions. The CTS3 connected resources are as follows:

- 1. National Research, Development and Innovation Fund (NRDIF)*
- 2. ERDF Funds for Territorial Operational Programme (with link to the priorities of three covered counties)*
- 3. Direct ERDF funds (transnational cooperation programmes, Horizon, I3, etc.), especially the ones with Financial Support to Third Parties (FSTP) elements.*

Monitoring and evaluation

The monitoring and evaluation system of the CTS3 is based on the following methods:

- Interim Audits*
 - Regular progress reports are produced to monitor progress, including the status of indicators related to the different targets.*
 - Audits are carried out annually or more frequently if necessary to ensure that strategic objectives are on track.*
- Application of RIS Data and Other Indicator*
 - To assess the performance of STRIS, indicators from the Regional Innovation Scoreboard (RIS) database are used.*
 - These data allow comparison with other EU regions and benchmarking at international level.*
- Performance Measurement and Evaluation*
 - Assess progress against the targets set for the different objectives.*
 - Analysis of the results will help identify strengths and areas for improvement.*

- *Feedback Integration*
 - *The monitoring system is flexible and interactive, allowing the integration of expert and stakeholder feedback.*
 - *Periodic review of strategic directions and actions based on feedback.*
- *Continuous Improvement and Adaptation*
 - *Continuously fine-tune the strategy based on data and feedback to ensure STRIS remains relevant and effective in a changing regional and global environment.*

This system ensures that the objectives of CTS3 are realistic, measurable and in line with regional, national and EU innovation objectives. The process of monitoring and evaluation is key to ensuring the success of the strategy and to promoting the long-term development of the Central Transdanubian Region.